ENVIRONMENTAL IMPACT ASSESSMENT FOR THE GOURIKWA TO NARINA (BLANCO) 400KV TRANSMISSION LINE AND SUBSTATION UPGRADE

DEA Reference: 14/12/16/3/3/2/994

FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT

JULY 2017

VOLUME 1:
(MAIN REPORT & APPENDICES 1-3)

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PROJECT DETAILS

DEA Reference No.	**:**	14/12/16/3/3/2/994
Title	**:**	The proposed construction of the Gourikwa-Blanco 400kV Power line and Substations upgrade.
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Client	**:**	Eskom Holdings SOC Ltd (Eskom Transmission)
Status	**:**	Final EIA Report
Revision	**:**	0
Date	**:**	July 2017
Reviewed by:		Jubilee Bubala
Approved By:		Gesan Govender

INVITATION TO COMMENT ON THE DRAFT EIA REPORT

Envirolution Consulting (Pty) Ltd was appointed by Eskom Holdings SOC Limited to conduct the Environmental Impact Assessment (EIA) Process for the proposed construction of the Gourikwa to Blanco 400kV Power line and Substations upgrade. The development entails the construction of a 50-60km long 400kV Transmission power line from the Gourikwa Substation at Mossel Bay to the Narina (Blanco) Substation at George, in the Western Cape Province. Four alternative routes are being investigated.

The EIA process for the proposed construction of the Gourikwa to Blanco 400kV Power line and Substation commenced in early 2015 under the reference number: 14/12/16/3/3/2/921. This application has lapsed in accordance with Regulation 23 (1) of the EIA Regulations, 2014 and a new EIA process is currently being undertaken. This new process entails (1) the resubmission of a new application to DEA and the project will be assigned a new reference number, (2) the release of a Draft Scoping Report (DSR) and a Draft Environmental Impact Assessment Report (DEIAr) for public review and thereafter (3) submission the final reports to DEA for decision-making.

It must be noted that the contents of this Report has not changed significantly from the previous application as the scope of the project and the environment still remains the same. All additional information in this report (mostly relating to the public participation process) has been underlined throughout the report for ease of reference.

Members of the public, local communities and stakeholders were invited to comment on the Draft EIA Report which was made available for public review and comment at the following locations from **12 MAY 2017 – 12 JUNE 2017:**

- The Envirolution website at www.envirolution.co.za
- Dropbox link sent to registered I&APs
- George Public Library and Mossel Bay Public Library

Please submit your comments to:

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Comments can be made as written submission via fax, post or e-mail.

NB: ***I&APs were requested to advise if their comments have remained the same or if they have additional or new comments.***

EXECUTIVE SUMMARY

I. INTRODUCTION

Envirolution Consulting (Pty) Ltd was appointed by Eskom Holdings SOC Limited to conduct the Environmental Impact Assessment (EIA) Process for the proposed construction of a 400kV Transmission Power line from the Gourikwa Substation to the Narina (Blanco) Substation and the associated upgrades of these Substations (DEA Reference: 14/12/16/3/3/2/994)). The development entails the construction of a 50-60km long 400kV Transmission power line from the Gourikwa Substation at Mossel Bay to the Narina (Blanco) Substation at George, in the Western Cape Province .

A separate application and Scoping Report were submitted for the construction of a 200km long 400kV Transmission power line from the Narina Substation at George to the Droërivier Substation near Beaufort West, and findings of ***the respective impact assessments will now be sumitted as seperate EIA Reports.*** *(Project for Narina to Droerivier has the DEA Reference: 14/12/16/3/3/2/995)* **.**

In terms of the NEMA EIA Regulations (2014), published in Government Notice R. 982 in Government Gazette No. 38282 of 4 December 2014, under Section 24(5) of the National Environmental Management Act, 1998 (Act No.107 of 1998), a Scoping & Environmental Impact Assessment are required for the development due to the following listed activities (NEMA EIA Regulations 982, 983, 984, 985):

- The development of infrastructure or structures covering 50 square metres or more, within a watercourse or within 32 metres of a watercourse, measures from the edge of a watercourse: GR 983 Listing Notice 1 (12):
- The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from- a watercourse: GR 983 Listing Notice 1 (19)
- The development of a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres: GR 983 Listing Notice 1 (24).
- The expansion of facilities for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase :GR 983 Listing Notice 1 (47).The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275kV or more, outside an urban area or industrial complex: GR 984 Listing Notice 2 (9).
- The clearance of an area of 20 hectares or more of indigenous vegetation: GR 984 Listing Notice 2 (15).
- Development of masts or towers for telecommunication or radio transmission - GR 985 Listing Notice 3 Activity (3)
- The clearance of an area of 20 hectares or more of indigenous vegetationoad wider than 4 meters but less than 13,5 meters: GR 985 Listing Notice 3 Activity (4),
- Clearance of an area of 300 sqm or more of indigenous vegetation except - GR 985 Listing Notice 3 Activity (12),
- The development infrastructure or structures with a physical footprint of 10 square metres or more within a watercourse; GR 985 Listing Notice 3 (14):

The National Department Environment Affairs (DEA) will be the relevant decision-making authority as Eskom is a parastatal. The EIA authorisations need to be granted by the DEA for approval and setting of conditions prior to commencement of any construction activities.

The proposed development also triggers activities that require a Water Use License because it crosses several water courses. Therefore, before construction activities may take place, the activity will require a Water Use License as per requirement in the National Water Act (Act No.36 of 1998) (NWA) under Section 21 Water Uses. In terms of the NWA, this development requires a Water Use License for the following water uses:

- Section 21(c) impeding or diverting the flow of water in a watercourse and;
- Section 21 (i) altering the bed, banks, course or characteristics of a watercourse.

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II. NEED FOR THE PROJECT

A Customer Load Network (CLN) is a network within a specific geographical area, which in turn is a subdivision of a Grid. The West Grid consists of four Customer Load Networks, namely Peninsula, Southern Cape, West Coast and Namaqualand. The proposed 400kV Transmission power line from the Narina Substation to the Droërivier Substation forms part of Eskom's West Grid and the Southern Cape CLN. The proposed 400kV Transmission power line from the Gourikwa Substation to Narina Substation and from the Narina Substation to the Droërivier Substation forms part of Eskom's West Grid and the Southern Cape CLN.

The Gourikwa – Blanco 400 kV line and Blanco – Droërivier 2nd 400 kV line – triggered in 2013 by Eskom Peaking Generation due to generation integration requirements

At Gourikwa Power Station, the power output will be increased via the CCGT Conversion Project which will convert 5 x existing OCGT units at each station to CCGT. This will entail the installation of Heat Recovery Steam Generators (HRSG) that will use the heat from the exhausts of the gas turbines to create steam. The steam from the HRSGs will be used to drive two new steam turbines, leading to increased cycle efficiency. The resultant output per CCGT unit will be 225 MW comprising of 150 MW (gas turbine) + 75 MW (steam recovery). Additional Transmission network infrastructure is therefore required to enable an increase in power output in order to ensure compliance in accordance with the Grid Code.

The problematic double contingencies related to Power Station Grid Code compliance at Gourikwa are the loss of the:

- Gourikwa-Proteus 1 and 2 400 kV lines. This results in the islanding of the Gourikwa Power Station.
- Proteus – Bacchus and Droërivier – Blanco 400 kV lines. This results in the islanding of the Gourikwa Power Station together with Blanco and Proteus Transmission Substations.

In order to ensure that Gourikwa is Grid Code compliant, a 3rd line needs to be built out of the facility i.e. Gourikwa – Blanco 400 kV line and Blanco – Droërivier 2nd 400 kV line

There is also a potential for renewable energy and gas powered IPPs in the area that will require this infrastructure. An added benefit of these lines is that it will reduce the risk of major outages in the broader area during maintenance of the existing Transmission lines.

The need date is dependent on the commitment from the generation project/s.

III. PUBLIC PARTICIPATION PROCESS

The project and EIA process was made known as per the requirements of Regulation 41(2)(b), that state that written notice should be given in any of the manners provided for in section 47D of the Act. Interested and Affected Parties, including surrounding and affected landowners, Provincial, National

and Local Governments Departments were involved during the Public Participation Process (PPP). The summary of the PPP that commenced in March 2015 and was continued during the EIA phase is summarised as follows:

In compliance with regulation 41(2) (b): written notice was given to owner or person in control of land via registered mail or hand delivery, if the applicant is not the owner or person in control of the land the occupiers of the site where the line is planned and to owners and occupiers of land adjacent to the site where the line is to be erected and to any alternative sites where the line is to be erected. The PPP practitioner visited landowners between March 2015 and May 2015. Focus Group meetings were held during the previous EIA phase (September/October 2016) at properties where potential risk areas were identified.

Municipal councillors of the wards in which the sites and alternative sites are situated, and the other known organisations of ratepayers that represent the community in the area were informed of the project by means of invitations to attend the public meetings, where information regarding the project was presented, and opportunity was given for all to raise their concerns. The municipalities with jurisdiction in the project area include the Municipality of Mossel Bay, George, and the Eden District Municipality.

Organs of state and other parties that were informed, have included the Department of Water Affairs and Sanitation, and the Western Cape Heritage Agency. The latter department ha received Notifications of Intend to Develop (NIDs). We have received the comments of the Mossel Bay Heritage Society which were considered in the HIA document which was submitted to Heritage Western Cape.

The summary of the PPP that commenced in March 2015 and continued to October 2016 is summarised as follows:

In compliance with regulation 41 (2) (b); written notice was given to owner or person in control of land via registered mail or hand delivery, if the applicant is not the owner or person in control of the land. Notices were given to the occupiers of the sites where the line is planned and to owners and occupiers of land adjacent to the site where the line is to be erected and to any alternative sites where the line is to be erected. Notice boards were placed along the preferred and alternative routes at road crossings and places which are conspicuous and accessible by the public. To achieve this goal noties were erected at the boundary, on the fence or along the corridor of the proposed route, including the alternative routes. Proof of placement is attached in the format of geo-referenced photographs (See PPP report **Appendix 3**).

In some instances the addresses of land owners were not available from the Title Deeds and other measures had to be taken. The PPP practitioner visited landowners between March 2015 and May 2015 and obtained contact details of neighbours and I&APs from those who could be reached on properties along the routes. Members of the Public Participation Team undertook additional site visits in August 2015, during which time registered I&APs had the opportunity to attend meetings and discuss their concerns. More I&AP interviews are to be held during the review period of the DEIAR (September 2016), and minutes are included in this FEIAR.

Flyers were distributed to I&APs accompanied by a Background Information document (BID). A registration form with map was distributed. (Knock and drops) from March 2015 to end May 2015.
In compliance with regulation 41 (2) (c) and (d): A Newspaper advertisement was placed in The Herald (Eastern cape) on 8 April 2015, “Die Courier “ (Western Cape) on 2 April 2015 & Sunday Times

(National) on 29 March 2015 requesting Interested and Affected Parties (I&APs) to register, and submit their comments. Interviews with newspapers and journalists have resulted in several newspaper articles, some in print and others via social media and the internet. In compliance with regulation 41 (2)(a), 41(3) and 41 (4): Site notices were displayed within the boundaries of the study area from 5 March 2015.

A pre-assumed institutional I &APs database was developed. The database was expanded through networking and fieldwork throughout the process, also into the EIA phase.

Focus group meetings were held with the local councillors and various stakeholder groups to discuss the proposed project. These meetings were documented in Appendix 2 – PPP Report.

Comments/ issues were captured into a Comment and Response Report (CRR), included in the PPP Report (Appendix 2). Issues and comments raised during the public review period of the Draft Scoping Report have informed issues that would require further investigation were carried over to the EIA Phase. The Final Scoping Report has contained responses in this regard, but main issues were now carried through to the FEIAR. Main issues were conveyed to the specialist to guide their EIA Phase investigations, that are included as Appendix 4 of this Final EIA Report.

E-mail correspondence between the EAP, the PP consultant and the public has moved freely since the onset of the project and are added to the documentation on a continuous basis. Some e-mails were sent to I&APs in response to their telephonic or faxed queries. Limited interaction took place between July and September 2016, but it comments were received from a number of I&APs after the DEIAR was made available. Issues were captured in the Comments and Response Report, and correspondence included in the PPP Report's attachments.

The Draft EIAR was made available to the public and all registered I&APs for a review period of 30 days (16 September to 16 October 2016). Dates of the availability of the report were communicated to registered IAPs accordingly by means of SMS, phone calls, e-mail and follow-up newspaper articles. Comments and issues received during the above mentioned commenting period were responded to and added to this FEIAR to be submitted to DEA for consideration.

Members of the Public Participation Team have conducted site visits from March 2015 to end May 2015, and the technical team visited certain areas in August 2016. Focus group meetings were held with the local municipality and various focus groups to discuss the proposed project. These meetings were documented (see minutes in Appendix 2, PPP Report). The PPP and project team held focus group meetings during the public review period for the EIA draft report (September 2016).

A transparent process was followed. In compliance with regulation 41 (6); the PPP has ensured that information containing all relevant facts in respect of the application or proposed application has been and will be made available to potential interested and affected parties and that participation by potential or registered interested and affected parties is facilitated in such a manner that all potential or registered interested and affected parties are provided with a reasonable opportunity to comment on the application or proposed application. Unfortunately, there was a lack of written responses from local municipal representatives such as ward councillors, Town Clerk and Department Heads, despite continued efforts to involve and invite them. Numerous written requests were sent to these institutions. Visits were held with the Municipality of George and the Mossel bay Municipality to discuss the project during the review period of the DEIAR, and notes of these meetings are attached in **Appendix 3.1** (PPP Report) of this FEIAR.

NB: Previous public participation process is included in the PPP report in Appendix 3.1.

Following the lapsing of the previous application, a new EIA process was initiated, an application form was submitted to DEA along with the Draft Scoping report in February 2017. DEA has acknowledged receipt and acceptance of the application and the project **reference number DEA Reference: 14/12/16/3/3/2/994** was assigned. The final Scoping Report together with the Plan of Study was approved in May 2017. In terms of this acceptance, an EIA was required to be undertaken for the proposed project. The following additional PPP have been conducted to support the new EIA process:

- Release of the Draft Scoping Report for public comments;
- Release of the Draft EIA Report for public comments;
- Notification of the availability of the two draft reports to registered I&AP's on the distribution list
- New comments received are captured in a Comment and Response Report.

It must be noted that the PPP for the new EIA process is included in this Report as Appendix 3.2.

IV. ALTERNATIVES/DEVIATIONS CONSIDERED

Four (4) technically feasible alternative Transmission power line development corridors between 50-60 km have been identified for investigation within the study area during the EIA process.. A Corridor of 2 km in width was assessed for each alternative. The identified power line development corridors as proposed and the areas affected are described in more detail below.

Alternative 1: This corridor exits Gourikwa Substation in a north easterly direction and follows the R327 for approximately 8 km. It turns east and cuts across the mixed agricultural and natural landscape type, passing through the most eastern part of the Gondwana Private Game Reserve. It maintains a north-eastern direction, nearing the mountainous terrain of the Outeniqua Mountains, until reaching the approved site for the Narina Substation (proposed Alternative 5 was approved by DEA on 1 September 2016). The Narina/Blanco site is approximately 3-4 km west of the city of George and the Outeniqua Pass (N9).

Alternative 2: This corridor starts in the same direction as Alternative 1 but turns east just south of the Gondwana Private Game Reserve. It follows an easterly direction, crossing the Hartebeeskuil Dam before turning north east as it reaches the R328 between Hartenbos and Brandwacht. It passes south of Botlierskop Private Game Reserve and crosses Wolwedans Dam before turning north and reaching the Narina Substation site.

Alternative 3: This corridor is a variation of Alternative 2 and exits the Gourikwa Substation in an easterly direction. It brushes past the western outskirts of Hartenbos before turning north and joining Alternative 2. A Corridor of 2km in width was assessed for each route alternative. The route alternatives will also be assessed during the EIA phase and recommendations from the investigations are likely to inform a decision on the preferred alternative.

Alternative 4 was proposed in the Scoping Reports as an alternative that combines sections of the above three alternative in order to avoid areas where the infrastructure is perceived to impact more negatively on the receiving environment than the others. This was investigated in the EIA phase, but does not form part of the official application to DEA.

A No-Go option was assessed.

Site alternatives for the upgrade of the **substations** of Gourikwa MTS and Narina Transmission Substation will not be assessed in this EIA report since the Gourikwa substation already exists and infrastructure will only be upgraded within the existing footprint to accommodate the additional line connections. Important note: The Narina Transmission SS formed part of a separate project for which the EIA is handled by SEF in terms of the 2010 EIA regulations (DEA REF NO: 14/12/16/3/3/2/424 - NEAS REF NO: DEA/EIA/0001519/ 2012). The SEF projects are for the Narina substation and "loop in and out" Droërivier-Proteus 400 kV line. The EAP for that project has recommended their Alternative 5 substation site for approval, and **Alternative 5 and associated lines were approved by DEA on 1 September 2016).**

V. SUMMARY OF FINDINGS

The specialist findings of the EIA phase are summarised as follows:

Vegetation Assessment:

Almost all the vegetation types in the project area between the two distribution centres are listed as Critical Biodiversity Areas (CBAs) and threatened ecosystems. All four route alternatives cut across several Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs). Some sensitive systems are listed as threatened ecosystems. Alternatives 1 and 2 are the only two of the four alternatives that cut across the Swellendam Silcrete Fynbos. Alternative 1 is the only alternative that does not affect the South Outeniqua Sandstone Fynbos. The entire landscape has been transformed. Almost all areas, with arable soil, have been ploughed and subsequently the natural vegetation has been destroyed. Agricultural activities (crop and planted pasture production) have destroyed most of region's natural vegetation. Isolated pockets of natural vegetation (fynbos, renosterveld and riparian vegetation) remain in those areas unsuitable for crop production (rocky outcrops and steep slopes). This is the reason why most of the natural vegetation between Gourikwa and Narina distribution centres are listed as Critical Biodiversity areas (CBAs) and Ecological Support Areas (ESAs).

Fauna Assessment:

From a **faunal perspective it** is recommended that the Gourikwa - Blanco **Alternative 2 is the preferred** route option for the proposed power line. It must be noted that the Brandwagrivier Wetland System bird micro-habitats and the intact vegetation surrounding Wolwedans dam must be treated as "**No-go**" areas for roads or pylon hardstands and access/services roads along this alternative route. Should either Alternative 1 or 4 be chosen, bird diverters should be attached to the powerlines from Gondwana Private Game Reserve to the proposed Blanco Substation.

Avifauna Assessment:

From an avifaunal perspective it is recommended that the Gourikwa - Blanco Alternative 2 is the preferred route option for the proposed power line, providing the recommended mitigation measures are implemented. There are existing powerline infrastructures which mitigate many of the impacts associated with birds and powerlines. The existing service roads will result in less bird habitat being destroyed or fragmented during the construction phase of the project. Should alternative route option 1 be chosen, bird diverters should be attached to the powerlines from Gondwana Private Game Reserve to the proposed Blanco Substation. It is recommended that an avifaunal walkthrough of the final route option is done prior to construction to determine any sensitive areas that need to be avoided. All bird nest/roost sites encountered should be considered "No-Go" areas for any pylon hardstands or the construction of access roads. The power line should be constructed in close proximity to the existing power line as many birds will be aware of the existing infrastructure which may reduce collisions in low visibility conditions. All areas defined as having a medium avifaunal sensitivity must have bird diverters installed (spacing to be determined following ground-truthing).

Freshwater Resources Assessment:

According to the freshwater specialist, wetland areas within the study area consist largely of valley bottom wetlands that are associated with the rivers and are of similar ecological condition and importance. The habitat integrity of the rivers range from being moderately modified (upper reaches of the larger rivers as well as the smaller streams) to being in the seriously modified ecological state (lower reaches of the larger river systems). The riparian habitat of these rivers tends to be more impacted by the direct impact of the surrounding land use activities which has resulted in removal of the natural indigenous vegetation and the subsequent growth of invasive alien plants.

Although the upper reaches of the rivers in the study area are in general in a less modified ecological state, the **alternative corridor with the least potential** impact on the **freshwater features in the area** is likely to be the northern-most route (**Alternative 1**) as it would be more likely to be able to span the river valleys with little to no impact on the rivers and associated wetlands at the valley bottoms, while the southern corridors (Alternative 2 and Alternative 3) will need to cross the wide floodplains of the rivers. The alignment of the route within the corridor could also be determined to minimise the potential impact on the freshwater features within the study area. With mitigation, Alternative 1 is likely to have an impact of a very low significance to insignificant on the freshwater features while Alternative 2 is likely to have an impact of a very low impact. The Alternative 3 and 4 would have the largest potential impact on the freshwater features.

Heritage Assessment:

With respect the potential impacts to **palaeontological resources**, the Baseline assessment produced by Almond (2015) notes: “A substantial proportion of proposed power-line sectors will cross formations that are conservatively regarded as moderate to high sensitivity”. “In practice, however, the likelihood of significant **negative impacts** on fossil heritage on the ground is **low** over most sectors of these routes because the bedrocks here are often highly weathered, tectonically- deformed or covered by a substantial thickness of fossil-poor superficial deposits (scree, alluvium, soils, etc)”.

Overall, the **heritage studies** found that there are **no anticipated fatal flaws** with regard to the construction of the powerline and Alternative 1 or 2 are considered acceptable from an archaeological perspective. Alternative 3 and 4 may have some impacts on heritage resources because of the relative proximity of the line to the coast, and the higher probability of encountering archaeological sites. Alternative 2, it is more sensitive from an historical archaeological perspective. **Alternative 1** is the **preferred option** because of the lower probability of encountering ruined historical farm buildings. However from a **cultural landscape** perspective, **Alternative 1 is acceptable** but not preferred.

Soil, Land use & Agricultural Potential Assessment:

The agricultural potential of the study area is intimately linked to the availability of rainfall and water and as such the areas south of and immediately north of the Outeniqua Mountains have a high potential – not based on soil properties but rather on water characteristics of the landscape. The climate in this area is conducive to the growing of a range of crops and contributes to the high agricultural potential and intensive agricultural activities.

All the route corridors to the south and immediately within the Outeniqua Mountain area suffer the same limitation in the eastern section in that it **traverses an area of high intensity agriculture**. Regarding agricultural impact, the EIA phase studies have confirmed that all alternatives cross

agricultural land with grazing land, central pivot irrigation, fruit trees and/or planted dry lands. A large percentage of agricultural activities can still continue unhindered, but some economic losses could occur. The impacts of power line construction are high and pylon placement will have to be negotiated with landowners on a site-specific basis. In this regard there is no preference for any alignment as the specific alignment to be accepted will depend on the degree and success of negotiation with landowners and users.

Visual Assessment:

Regarding **Visual Impact**, The study area is predominantly rural with an extended farming community, with the exception of the coastal towns in the southern region and George on the eastern perimeter. Numerous tourist attractions are present in the western and central regions in the form of game reserves, offering luxury accommodation, and other outdoor activity areas such as hiking and horse riding. These tourist facilities rely on the scenic quality of the region and game drives are sometimes offered to experience the picturesque outdoors. Overall a medium viewer incidence is expected apart from the areas where major transport routes are crossed or near the coastal towns. Highly sensitive viewers and viewer groups occur all along the proposed routes. Concentrations of highly sensitive viewers and major tourist attractions have been identified at:

- Gondwana-, Hartenbos- and Botlierskop Game Reserve;
- Hartebeeskuil-, Klipheuwel- and Wolwedans Dams;
- Western outskirts of Hartenbos, Monte Christo Estate and Wolwedans; and
- All the tourist attractions and overnight facilities that are within the ZMVE;

It was found that the transmission line will impact on the visual quality of the visual resource by interfering with the prevailing natural semi-natural characters of the study area or interfering with the agricultural land uses. Although all routes have high impacts on both observers and the visual resource. **Alternative 1** is the **most preferred route**. The motivation is that the baseline environment is already impacted by the Proteus – Droërivier 400kV transmission line which lowers the sensitivity of the visual environment to some degree. One can argue that the project is more compatible with the baseline environment along Alternative 1, than the other two alternative routes. It is generally more acceptable to have two power lines of the same design and size, in one corridor and concentrating the impact in that corridor, than to spread the impact over a large area and thereby impacting on other landscapes that are free of transmission lines. Empirical research has indicated that two parallel running power lines are considered below the visual tolerance threshold in most cases, but three or more nears or exceeds the threshold, increasing cumulative impacts to unacceptable levels. This is especially relevant in landscapes with high scenic value or high tourist potential as can be found in parts of the study area.

In addition, Alternative 1 is the route that impacts on the least number of sensitive landscape features and steers clear of the least number of tourist attractions. Without drastic mitigation measures, the impact on the visual resource and sensitive observers remain high. Alternative 2 is more preferred over Alternative 3. Alternative 3 passes within 1 km of an urban area and the increased viewer incidence makes it less preferable than Alternative 2. Both these alternatives will have significant cumulative impacts due to the existing 2x132kV distribution lines in the same corridor. A significant increase in visual dominance of electrical infrastructure can be expected. Three power lines in one corridor are expected to exceed the visual tolerance threshold. The factor that adds weight to this statement is that each line will consist of a different type of tower that causes major visual incoherence and clutter.

Social Impact Assessment

According to the social impact assessment study that was undertaken, Alternatives 1 and 2 were of concern due to economic loss it will cause from disruption of pivot farming and on the specialised berry farm, losses and disruption in farming, and possible displacement of workers from accommodation. It was found that there was a concentration of pivot irrigation infrastructure in a relatively small proportion of Alternative 1, located south east of Jonkersberg. **If the alignment can avoid this area**, **Alternative 1 is feasible**. As the line can be placed anywhere within a width of 2 km; it is assumed that workers' homes can be avoided. Individual farms with specific needs such as the berry farm will need specific attention so as to avoid significant economic losses. Alternative 2 had a lower concentration of pivot farming and was therefore regarded as more favourable than Alternative 1. Alternative 1, however, has the potential to cause the least visual intrusion (as assessed by the Visual Impact Assessment specialist).Regarding Alternative 3, the negative visual intrusion of towers and lines would be a concern, and the possible negative impact on property values. In this regard, Alternative 2 was therefore considered to be most favourable from a social perspective.

Socio-Economic & Tourism Impact Assessment

The impact of the construction of the transmission lines on the **economy** includes the impact of the construction cost, the operational expenditure and the impact on the broader economy by allowing the power to strengthen the existing grid and limit the impact of power outages in the area. Capital expenditure data could not be obtained to quantify any impacts, but a number of expenditure categories are discussed. A number of components will have to be imported from other provinces into this region, like steel structures, cables, hardware, insulators and cement. This will generate economic activity and employment opportunities in those provinces. A local procurement policy can be considered by Eskom (where possible and if not already standard practice) on activities like site clearance and assembling to maximize the economic and job creation impact on the local municipalities.

From a pure **economic** point of view, with cost savings in mind **Alternative 1 can be recommended** given that this is the option that is shorter with the least number of bends. However, there is only a small marginal difference in cost given only 2km difference. From a **tourism** point of view, **Alternative 4 is recommended** given that this option will have the least amount of negative impact on tourism activities. Alternative 4 also seems to have the relative smallest impact on agricultural activities, although there are still a large number of farmers that will be impacted on. It will be important to work with the farmers to determine the best place for pylons and the lines and with game lodges to minimise the visual impact of these proposed lines and pylons.

Traffic Impact Assessment

According to the traffic specialist findings, construction **traffic** and the post construction traffic would be low without any significant impact on the existing traffic flows on the N2 or provincial roads. It will also have a negligible impact on the pavement structures. Furthermore, the impact of the traffic on the provincial gravel access roads will also be negligible with respect to service levels. When looking at the impact significance of the various phases, it can be concluded that all impacts will have a "Low" significance. According to the significance rating scale, a low significance can be defined as: "where this (low) impact would not have a direct influence on the decision to develop in the area" From an accessibility and traffic perspective **all alternatives are viable** although a route that is located in closer proximity to the National and larger Provincial roads would be preferable to handle freight vehicles. After construction, the generated site traffic would be limited to maintenance support, with only a few light vehicles accessing the site at regular inspection intervals.

Cumulative Impact Assessment:

Significant cumulative impacts that could result from the proposed line and other power line in the area include:

- Avifauna: Additional power line adds to the already existing power lines in the area and therefore increases the risk of bird collisions and deaths, further fragment natural habitats along the route option
- Vegetation: The loss of unprotected vegetation types on a cumulative basis from the broad area may impact the countries' ability to meet its conservation targets. The area is not included within a National Protected Areas Expansion Strategy focus area, and falls outside any threatened and or endangered ecosystem type / vegetation type. Although the vegetation type in the study area are classified as Least Threatened, it is poorly protected and certain habitats or communities may be subsequently affected.
- Visual intrusion and change of character of the area; and
- destruction of heritage artefacts.

The proposed line is in general proposed along routes where there are already power lines in place. Provided the new lines are constructed close to these lines such that the associated access roads can be shared, the cumulative impacts are likely to be low. Considering the findings of the specialist assessments undertaken for the project, **cumulative impacts** range from a **low to moderate significance** (on a landscape level in this region of the George and Mossel bay). The use of the EMPr and mitigation measures would assist in mitigating these negative impacts to an acceptable level.

VI. IDENTIFICATION OF KEY POTENTIAL IMPACTS

Potential risks and key issues identified during the Scoping Phase of the project were based on consultation with Interested and Affected Parties (I&AP's), experience with similar developments, desktop studies and current state of the environment of the site. The main issues identified through this study associated with the proposed powerline are summarised in **Table 1** below.

Table 1: Summary of significance of the potential impacts associated with the proposed Goruikwa-Blanco powerline without Mitigation and with mitigation.

Impact	Significance	
	Without Mitigation	With Mitigation
CONSTRUCTION		
Construction of power line in Critical Biodiversity Areas (CBAs), Ecological support areas (ESAs) and protected areas (PAs)	High	Medium
Destruction & Fragmentation of natural habitat	Medium	Low
Impacts on ephemeral streams and drainage lines	Medium	Low
Impacts on natural vegetation and ecosystems by invasive alien species.	Medium	Low
Habitat loss and fragmentation	Medium	Medium
Loss of Reptile Diversity.	Low	Low
Loss of Amphibian Diversity.	Low	Low
Loss of Mammal Diversity.	Low	Low
Impact of Dust and Noise.	Medium	Low

Loss of Bird Habitat	Medium	Medium
Disturbance and Displacement of Birds	Medium (alt1) Low (alt2-4)	Low
Loss of Bird Diversity and Species of Conservation oncern.	Low	Low
Modification of freshwater habitat, water quality impacts and possibly impedance of flow at river crossings	Low (alt1) Medium (alt2-4)	Low
Impact on Pre-Colonial Archaeology	Medium	Low
Impact on Colonial Period	Medium	Low
Impact on Graves	Medium	Low
Potential impact to Cultural Landscape elements	Medium (alt1) Low (alt2-4)	Low
Loss of agricultural land in areas of low intensity agriculture or land use pylon footprint	Low	Low
Loss of agricultural land in areas of high intensity agriculture or land use pylon footprint	High	High
COASTAL TOWNS LANDSCAPE TYPE – OBSERVERS (applicable to Alternative 3 & 4 only)	Medium	Low
COASTAL TOWNS LANDSCAPE TYPE – VISUAL RESOURCE (applicable to Alternative 3 & 4 only)	Medium	Low
INLAND RURAL LANDSCAPE TYPE - OBSERVERS	Medium	Low
INLAND RURAL LANDSCAPE TYPE – VISUAL RESOURCE	Medium	Low
Improved quality of life, through creation of jobs (positive)	Low	High
Increased pressure on local services	Medium	Low
Increased community health risks from possible increased exposure to HIV/AIDS	High	Low
Impact on agriculture (Socio-economic impact)	Medium	Low
Contribution to local economy (employment, use of contractors and purchases of local goods and servitudes) (Economic impact)	Low	Low
Tourism impact	Medium	Medium (alt1-3) Low (alt4)
Traffic Impact of Access to site	Low	Low
OPERATION		
Operation of power line in Critical Biodiversity Areas (CBAs), Ecological support areas (ESAs) and protected areas (PAs)	High	Medium
Destruction & Fragmentation of natural habitat	Medium	Low
Impacts on ephemeral streams and drainage lines	Medium	Low
Impacts on natural vegetation and ecosystems by invasive alien species.	Medium	Low
Habitat loss and fragmentation	Medium	Low
Loss of Reptile Diversity.	Low	Low
Loss of Amphibian Diversity.	Low	Low
Loss of Mammal Diversity.	Low	Low
Impact of Dust and Noise.	Medium	Low
Loss of Bird Habitat	Low	Low
Disturbance and Displacement of Birds	Low	Low
Loss of Bird Diversity and Species of Conservation oncern.	High (alt1) Medium (alt2-4)	Medium
Modification of freshwater habitat, water quality impacts and possibly	Low (alt1)	Low

impedance of flow at river crossings	Medium (alt2-4)	
Impact on Pre-Colonial Archaeology	Low	Low
Impact on Colonial Period	Low	Low
Impact on Graves	Low	Low
Potential impact to Cultural Landscape elements	Low	Low
Loss of agricultural land in areas of high intensity agriculture or land use pylon footprint	High	High
COASTAL TOWNS LANDSCAPE TYPE – OBSERVERS (applicable to Alternative 3 & 4 only)	High	High
COASTAL TOWNS LANDSCAPE TYPE – VISUAL RESOURCE (applicable to Alternative 3 & 4 only)	High	Medium
INLAND RURAL LANDSCAPE TYPE - OBSERVERS	High	High
INLAND RURAL LANDSCAPE TYPE – VISUAL RESOURCE	High	High
Improved quality of life from increased reliability of energy services(positive)	Medium	High
Increased community safety risks from increased direct exposure to electrical hazards	Medium	Low
Impact on agriculture (Socio-economic impact)	High	Medium
Provision of up to 225MW mid-merit electricity from Gourikwa (Economic impact) (positive)	Medium	Medium
Contribution to local economy (employment, use of contractors and purchases of local goods and servitudes) (Economic impact)	Low	Low
Tourism impact	High (alt1-3) Medium (alt4)	High (alt1-3) Medium (alt4)
Traffic Impact of Access to site	Low	Low

VII. CONCLUSION (IMPACT STATEMENT)

The project is needed to strengthen the existing transmission network so that it can evacuate the additional power generated at the Gourikwa power stations when they come on line. This will promote continuous power supply for the Western Cape region, particularly when there is a unit outage at Koeberg Nuclear Power Station. The positive impacts, however, must not be undone by the negative impacts associated with establishing and operating the transmission line. The project is intended to strengthen the network. The “No-Go” option was again considered in the EIA phase. The no-go option implies the consequences of not construction of the 400KV Transmission Power Line and the implications on sustainable development. The project will enable the transmission of generated electricity to the national grid, which will support the IDPs and SDFs in terms of surety (reliability) of supply. A No GO Alternative would Socio-economic benefits are likely to result from the proposed project and might include job creation, which cannot be achieved with a No Go Alternative. Although the project might have negative impacts on local and regional level, the benefits of the construction of the power line will stretch wider than the borders of the region and will add to the National Electricity infrastructure that will result in an improved assurance of supply.

This Final EIA Report has been prepared to allow public review and so that comments (and responses thereon) can be included in the Final EIAR, to subsequently allow for informed decision making by the authorities regarding the approval or rejection of the project. It is the opinion **EAP that the project should be authorised**. The findings of the specialist studies undertaken within this EIA to assess both the benefits and potential negative impacts anticipated as a result of the proposed project conclude that there are **no environmental fatal flaws** that should prevent the proposed project from

proceeding, provided that the recommended mitigation and management measures are implemented. The significance levels of the majority of identified negative impacts have been reduced by implementing the mitigation measures recommended by the specialist team during the EIA process, and this specifically included the consideration of the facility layout in relation to sensitivities identified. The project has considered constraints, and is considered to meet the requirements of sustainable development. Environmental specifications for the management of potential impacts are detailed within the draft Environmental Management Programme (EMPr) for the Gourikwa-Blanco 400kV powerline included within **Appendix 7.**

It is clear from the specialist studies (**Appendix 4**) undertaken that there are negative impacts for with all four route alternatives, also all alternatives have sections that would make the choice of that route the preferred alternative. However, none of the routes have an entirely acceptable alignment and would entail extreme management and mitigation measures to be taken on a specific section. During the Public Participation Process, resistance has been given to all alternatives. The negative impacts that were identified in the Scoping Phase were therefore investigated by means of more detailed studies during the EIA Phase. During the Public Participation Process, concerns related to bird collisions were prominent, in particular where water bodies are present on the ground. Most power lines that traverse large tracks of rural land will impact to a certain degree on the production potential of the land. However, to evaluate this loss a perspective on the production capability of the specific farm/vegetation area must be done in order to establish magnitude of loss the farmer. For the particular study area of Gourikwa to Blanco, **visual and agricultural impacts were identified by I&APs as a very prominent concern**. Alternative 1 was preferred by some specialists due to the location further from large wetlands and further north of the holiday homes that are located around Klein Brak and Hartenbos. Alternative 1 was not recommended by Vegetation study as it cuts across larger areas of natural vegetation than the other options. This report (refer to **Appendix 4.1**) also noted that the majority of these Red Data plant species present area are bulbs, forbs, succulents and creepers. This means that if the power line corridor will be cleared of shrub vegetation, a relatively large portion of Red Data species would not be destroyed. Therefore, as many of the impacts are also subjectively weighted with impacts being visual of nature or perceived to be of a quality of life diminishing nature, consideration must be given to priority of impacts. It will be impossible to continue with any project if every individual's needs are separately considered and the "diminishing background" and cumulative effect is not mentioned.

Based on the above, the types of impacts that should be avoided would be those that cannot be mitigated with good result. For this project, this would be the visual impacts, the heritage and the impacts on the Freshwater Resources to some extent. Sensitive ecological features such as vegetation and fauna habitats could be avoided during the detail design phase of the project, by careful placing of tower footprints and following the measures contained in the EMPr (to be finalised after EA). **Technically, alternative 3 is preferred** as explained in section 8.2.2, however the study area along Alternative 3 is characterised by many tourism activity, where land owners and their employees are dependent on the income from this industry. For this reason it is believed that the alternative with the least impacts on the majority of the community as well as the alternative with the least impact on the heritage resources would be the **environmentally** best option, in this case Alternative 1 is therefore the best option. Technical challenges (e.g. mountains) can be overcome in the detail design phase and careful placement of tower structures. Environmentally, those impacts that are unavoidable could still be minimised by environmental management and mitigation during all phases of the project. Environmental constraints can be overcome by the implementation of mitigation measures that can minimise the negative impacts of Alternative 1 as recommended by the specialists in the examples below:

- **Vegetation**: There should be a preconstruction walk-through of the development footprint/project site in order to assess the pylon footprint areas for Red Data species as well as sensitive ecosystems such as streams, wetlands, etc.. In addition, a search and rescue operation should be done to remove plant species which can be successfully transplanted
- **Fauna**: Manipulate the power line alignment to avoid rocky outcrops and steep mountainous areas to mitigate against impacting on reptiles and reptiles of SCC (please refer to section 8.5 for further site specific mitigations meatures to reduce the impacts).
- **Avifauna**: Should alternative 1 be chosen, it is recommended that bird diverters are installed on all powerline infrastructures between Gondwana Private Game Reserve as it is anticipated that numerous bird SCC will utilise these areas for hunting/foraging.(please refer to **section 8.5** for further site specific mitigations measures to reduce the impacts)
- **Social**: Concentration of pivot irrigation infrastructure are located south east of Jonkersberg along Alternative 1, if the alignment can avoid this area, Alternative 1 is feasible. As the line can be placed anywhere within a width of 2 km; it is assumed that workers' homes can be avoided. Individual farms with specific needs such as the berry farm will need specific attention so as to avoid significant economic losses.

Careful planning and negotiations with land owners will be of crucial importance before finalising the exact placement of the pylons and 55m servitude within the 2 km corridor that was evaluated for this alternative This will minimise the direct (mostly visual) impacts by investigating slight deviations in the route (within the approved corridor) as well as either avoiding impacts on production land or only causing temporary disturbance (during construction). An impact that should be limited is the necessity of creating new access routes (limiting additional bush cutting and clearance of potentially sensitive vegetation). By avoiding the identified sensitive areas, the future maintenance on the chosen route will be easier and create fewer impacts of significance, particularly on those features that have been identified during the Public Participation Process.

Thus, after assessing all alternatives on EIA phase level, it was concluded that **Alternative 1** would be the option where the "mitigation hierarchy" have be applied through better avoidance and minimisation of major impacts has been achieved and is therefore recommended as the **preferred alternative**.

VIII. RECOMMENDATIONS

The EAP **recommends that the Alternative 1** be considered for EA. Should the project be approved, an important component of the project would be to fine-tune the 55m servitude design (placement of the footprints) in terms of the receiving environment in the approved corridor of 2km wide. This would require a walk-down of the line and subsequent negotiations with all land owners to ascertain how the impacts on their properties can be mitigated, e.g through relocation of infrastructure, compensation or other acceptable measures. Construction will not be possible before agreements have been reached with all land owners along the entire route.

The following conditions would be required to be included within an authorisation issued for the project:

- All mitigation measures detailed within this report and the specialist reports contained within **Appendix 4** to be implemented.
- The draft Environmental Management Programme (EMPr) as contained within **Appendix 7** of this report should form part of the contract with the Contractors appointed to construct and maintain the proposed powerline and substation upgrades and will be used to ensure compliance with

environmental specifications and management measures. The implementation of this EMPr for all life cycle phases of the proposed project is considered key in achieving the appropriate environmental management standards as detailed for this project.

- The placement of power line pylon on high intensity agriculture will have to be negotiated with landowners on a site-specific basis.
- Eskom must measure the EMFs where stakeholders have requested it, particularly to address concerns about cumulative impacts of EMFs and impacts on vulnerable populations such as children.
- The relevant Water Use License for water uses to be obtained from DWS.
- Applications for all other relevant and required permits required to be obtained by Eskom must be submitted to the relevant regulating authorities. This includes permits for the transporting of all components (abnormal loads) to site, disturbance to any heritage sites, and disturbance of protected vegetation.
- **Vegetation**: A preconstruction walk-through by an ecologist of the development footprint/project site in order to assess the pylon footprint areas for Red Data species as well as sensitive ecosystems such as streams, wetlands, etc. Where these cannot be totally avoided, a permit to be obtained for removal of protected trees (DAFF) and provincially protected flora that are affected.
- **Fauna**: Where possible access/service roads and pylon bases should be planned and constructed to avoid being located in areas defined as highly sensitive or areas which have been described as valuable habitats for protected faunal species. Where access roads and/or pylon bases do need to be located within any of the defined sensitive areas then ground-truthing to determine exact road routes and pylon base locations should be carried out. It must be noted that the **Brandwagrivier Wetland System** and the intact vegetation surrounding **Wolwedans dam** must be treated as "**No-go**" areas for roads or pylon hardstands and access/services roads.dam must be treated as "No-go" areas for roads or pylon hardstands and access/services roads.
- **Avifauna**: Where access roads and/or pylon bases do need to be located within any of the identified sensitive areas then there should be further ground-truthing by an avifaunal specialist to determine exact road routes and pylon base locations so to, where possible, avoid site specific sensitive areas such as nests and roosts. **All bird nest/roost** sites encountered should be considered "**No-Go" areas** for any pylon hardstands or the construction of access roads. The power line should be constructed in close proximity to the existing power line as many birds will be aware of the existing infrastructure which may reduce collisions in low visibility conditions. All areas defined as having a medium avifaunal sensitivity must have bird diverters installed (spacing to be determined following ground-truthing). These areas include suitable habitat for numerous powerline priority species (e.g. cranes, bustards, and storks).
- **Freshwater Resources:** It is recommended that a **buffer of 50m from the top of the river banks and/or approximately 100m from the edge of the wetland areas** be allowed for as a development setback for the construction of the pylons.
- **Heritage**: A **walk-down** of the line will be required historical **archaeological material** after the final powerline route has been decided. It would concentrate on areas immediately around farm buildings and structures to ensure that a sufficient buffer has been implemented to avoid impacts to historic kraals, rock arts, old sheds, rubbish dumps and graves.
- **Agriculture:** The placement of power line pylon on high intensity agriculture will have to be negotiated with landowners on a site-specific basis.

COMPLIANCE CHECKLIST

i. LEGAL REQUIREMENTS IN TERMS OF THE EIA REGULATIONS

Table 2 below details how the legal requirements of **Appendix 3** of the 2014 EIA Regulations have been addressed within this report.

Table 2: Legal requirements in terms of the 2014 EIA regulations

REGULATIONS 2014 GNR 982: Appendix 3: CONTENT OF ENVIRONMENTAL IMPACT ASSESSMENT REPORTS.	**Cross-reference in this EIA report**
1. Environmental impact assessment process (1) The environmental impact assessment process must be undertaken in lin with the approved plan of study for environmental impact assessment. (2) The environmental impacts, mitigation and closure outcomes as well as th residual risks of the proposed activity must be set out in the environmenta impact assessment report.	(1) The EIA process has been undertaken according to the approved plan of study (2) Chapter 7
2. The objective of the environmental impact assessment process is to, through a consultative process— (a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context; (b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location; (c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment; (d) determine the—- (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and (ii) degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources, and (cc) can be avoided, managed or mitigated; (e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment; (f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity; (g) identify suitable measures to avoid, manage or mitigate identified impacts; and (h) identify residual risks that need to be managed and monitored.	(a) Chapter 3 (b) Section 2.2 (c) Chapter 7&8 (d) Chapter 7 (e) Chapter 7 (f) Chapter 7 (g) Chapter 7 (h) Chapter 7
3. An environmental impact 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—	
(a)details of—	Appendix 6.1

i. the EAP who prepared the report; and ii. the expertise of the EAP, including a curriculum vitae;	
(b)the location of the activity, including: i. the 21 digit Surveyor General code of each cadastral land parcel; ii. where available, the physical address and farm name; iii. where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Appendix 1
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is— i. a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or ii. on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Appendix 1
(d) a description of the scope of the proposed activity, including— i. all listed and specified activities triggered and being applied for; and ii. a description of the activities to be undertaken including associated structures and infrastructure ;	Chapter 1 and Section 3.2
(e) a description of the policy and legislative context within which the development is proposed including— i. an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and ii. how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	Chapter 3
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 2.2 and section 2.3
(g) a motivation for the preferred site, activity and technology alternative;	Appendix 6.4 (Technical evaluation process for alternatives)
(h) a full description of the process followed to reach the proposed preferred alternative within the site, including: i. details of all the alternatives considered; ii. details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; iii. a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; iv. the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; 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; vi. the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential	(i) Section 2.3 (ii) Chapter 6 (iii) Chapter 6 (section 6.7) and Appendix 3 (iv) Chapter 4 (v) Chapter 7 (vi) Chapter 7 (Section 7.3) (vii) Chapter 8 (section 8.3) (viii) Chapter 7 (ix) N/A (x) Chapter 8 (

environmental impacts and risks associated with the alternatives; vii. positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; viii. the possible mitigation measures that could be applied and level of residual risk; ix. if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and x. a concluding statement indicating the preferred alternatives, including preferred location of the activity;	section 8.4)
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including— (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Chapter 7
(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;	Chapter 7
(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Chapter 8
(l) an environmental impact statement which contains— (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	i. Section 8.1 ii. Appendix 1.2 iii. Chapter 8.3
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr;	Appendix 7
(n) the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;	Section 8.4
(o) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Section 8.5

(p)	a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 6.11
(q)	a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section 8.5
(r)	where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity wil be concluded, and the post construction monitoring requirements finalised;	N/A
(s)	an undertaking under oath or affirmation by the EAP in relation to: (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	Appendix 6.1
(t)	where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A
(u)	an indication of any deviation from the approved scoping report, including the plan of study, including– (i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and (ii) a motivation for the deviation;	N/A
(v)	any specific information[1] that may be required by the competent authority; and any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A
(w)	any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A

ii. DEA REQUIREMENT FOR THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Table 3 outlines DEA requirements as outlined in the acceptance of the scoping report dated July 2017, and where the requirements have been addressed within this report for ease of reference.

Table 3: Information Requested By DEA

INFORMATION REQUIREMENTS	CROSS REFERENCE IN THIS EIA REPORT
i. Please include the Start, Middle and End point coordinates for the proposed power line and the substation in the EIR;	Section 1.1 for powerline coordinates and Section 2.3.2 for the Blanco (Narina Sustation)

INFORMATION REQUIREMENTS	CROSS REFERENCE IN THIS EIA REPORT
ii. Please ensure that all issues raised and comments received during the circulation of the SR from registered I&APs and organs of state which have jurisdiction (Including this Department's Biodiversity Section) in respect of the proposed activity are adequately addressed in the EIR. Proof of correspondence with the various stakeholders must be included in the EIR. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments. The Public Participation Process must be conducted in terms of Regulation 39, 4041, 42, 43 & 44 of the EIA Regulations 2014.	Comment noted, all prior PPP is summarised in a report in Appendix 3, all issues raised by Organs of State and I&APs will form part of the FEIAr prior to the submission to the Department.
iii. In terms of Appendix 3 of the EIA Regulations, 2014, the report must include an undertaking under oath or affirmation by the EAP in relation to: o the correctness of the information provided in the reports; o the inclusion of comments and inputs from stakeholders and I&APs; o the inclusion of inputs and recommendations from the specialist reports where relevant; o any information provided by the EAP to interested and affected parties and o responses by the EAP to comments or inputs made by interested or affected parties.	Affirmation by the EAP is attached in Appendix 6.1 of the EIA report
iv. In accordance with Appendix 3 of the EIA Regulations 2014, the details of- (i) the EAP who prepared the reporl; and (ii) the experlise of the EAP to carry out Scoping and Environmental Impact Assessment procedures; must be submitted.	Details and expertise of the EAPs are attached in Appendix 6.1 of the EIA report
v. You are further reminded that the EIR to be submitted to this Department must comply with all the requirements in terms of the scope of assessment and content of scoping reports in accordance with Appendix 3 and Regulation 23(1) of the EIA Regulations, 2014.	The EIA report has been drafted in accordance with Appendix 3, this is illustrated in Table 1.
vi. Please ensure that the Final EIR includes at least one A3 regional map of the area and the locality maps included in the final EIR illustrate the different proposed alignments and their start, middle and end points coordinates. The maps must be of acceptable quality and as a minimum (Google maps will not be accepted for decision-making purposes), have the following attributes: o Maps are relatable to one another; o Cardinal points; o Co-ordinates; o Legible legends; o Indicate alternatives; o Latest land cover; o Vegetation types of the study area; and	Comment noted

INFORMATION REQUIREMENTS		CROSS REFERENCE IN THIS EIA REPORT
	○ A3 size locality map.	
vii.	Further note that in terms of Regulation 45 of the EIA Regulations 2014, this application will lapse if the applicant fails to meet any of the timeframes prescribed in terms of the these Regulations, unless an extension has been granted in terms of Regulation 3(7).	Comment noted

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ABBREVIATIONS AND ACRONYMS

AIA	Archaeological Impact Assessment
BGCMA	Breede Gouritz Catchment Management Agency
CBA	Critical Biodiversity Area
CITES	Committee for International Trade in Endangered Species
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DEIR	Draft Environmental Impact Report
DFA	Development Framework At
DSR	Draft Scoping Report
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EC DEDEAT	Eastern Cape Dept of Economic Development, Environmental Affairs & Tourism
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMFs	Electro-Magnetic Fields
EMP	Environmental Management Programme
ESA	Ecological Support Area
EWT	Endangered Wildlife Trust
FSR	Final Scoping Report
GA	General Authorisation in terms of Section 39 of the NWA
GN	Government Notice
ha	Hectares
HIA	Heritage Impact Assessment
HW	Heritage Western Cape
I&APs	Interested and Affected Parties
IBA	Important Bird Area (BirdLife SA)
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IRP	Integrated Resource Plan
IUCN	International Convention on the Conservation of Nature
kV	Kilovolt
LDO	Land Development Objectives
mm	Millimetres
MTS	Main Transmission Substation
MW	Mega Watt
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act 107 of 1998 as amended in 2006
NEMBA	National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NFEPA	National Freshwater Ecosystem Priority Area
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID	Notice of Intend to Develop
NPAES	National Protect Areas Expansion Strategy
NSBA	National Spatial Biodiversity Assessment
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PNCO	Provincial Nature Conservation. Ordinance

PoS	Plan of Study
POSA	Plants of South Africa species list
PV	Photo Voltaic
RDB	Red Data Book
S&EIR	Scoping and Environmental Impact Reporting
SA	South Africa
SABAP2	South African Bird Atlas Project 2
SAHRA	South African Heritage Resources Agency
SARCA	South African Reptile Conservation Assessment
SCC	Species of Special Concern
SDF	Spatial Development Framework
SIA	Social Impact Assessment
SKEP	The Succulent Karoo Ecosystem Programme
SOC	State Owned Company
SPLUMA	Spatial Planning and Land Use Management Act
STEP	Sub-tropical Thicket Ecosystem Planning
TNSP	Transmission Network Service Provider
ToR	Terms of Reference
TSS	Transmission Substation
VIA	Visual Impact Assessment
WCHRA	Western Cape Heritage Resources Agency
WULA	Water Use License Application

1 INTRODUCTION

1.1 Project Background

Envirolution Consulting (Pty) Ltd was appointed by Eskom Holdings SOC Limited to conduct the Environmental Impact Assessment (EIA) Process for the proposed construction of the Gourikwa to Blanco 400kV Power line and Substations upgrade. The development entails the construction of a 50-60km long 400kV Transmission power line from the Gourikwa Substation at Mossel Bay to the Narina Substation at George, in the Western Cape Province. The study area falls within the boundaries of the Eden District Municipality, in the Western Cape Province, with the nearest Municipalities being Mossel Bay Local Muncipality and George Metropolitan Muncipallity. Refer to **Figure 1** for an overview of the study area..

A separate application and Scoping Report were submitted for the construction of a 200km long 400kV Transmission power line from the Narina Substation at George to the Droërivier Substation near Beaufort West, and findings of ***the respective impact assessments will now be sumitted as seperate EIA Reports.***

Four (4) technically feasible alternative Transmission power line development corridors ranging between 50-60 km have been identified for investigation within the study area during the EIA process as shown in Figure 1. A Corridor of 2 km in width was assessed for each alternative. The identified power line development corridors as proposed and the areas affected are described in more detail below.

Alternative 1: This corridor exits Gourikwa Substation in a north easterly direction and follows the R327 for approximately 8 km. It turns east and cuts across the mixed agricultural and natural landscape type, passing through the most eastern part of the Gondwana Private Game Reserve. It maintains a north-eastern direction, nearing the mountainous terrain of the Outeniqua Mountains, until reaching the Narina Substation (Alternative 5 was approved by DEA on 1 September 2016). The Blanco site is approximately 3-4 km west of the city of George and the very picturesque Outeniqua Pass (N9).

Alternative 2: This corridor starts in the same direction as Alternative 1 but turns east just south of the Gondwana Private Game Reserve. It follows an easterly direction, crossing the Hartebeeskuil Dam before turning north east as it reaches the R328 between Hartenbos and Brandwacht. It passes south of Botlierskop Private Game Reserve and crosses Wolwedans Dam before turning north and reaching the Narina Substation site.

Alternative 3: This corridor is a variation of Alternative 2 and exits the Gourikwa Substation in an easterly direction. It brushes past the western outskirts of Hartenbos before turning north and joining Alternative 2. A corridor of 2km in width was assessed for each route alternative.

Alternative 4 was proposed in the Scoping Reports as an alternative that combines sections of the above three alternative in order to avoid areas where the infrastructure is perceived to impact more negatively on the receiving environment than the others.

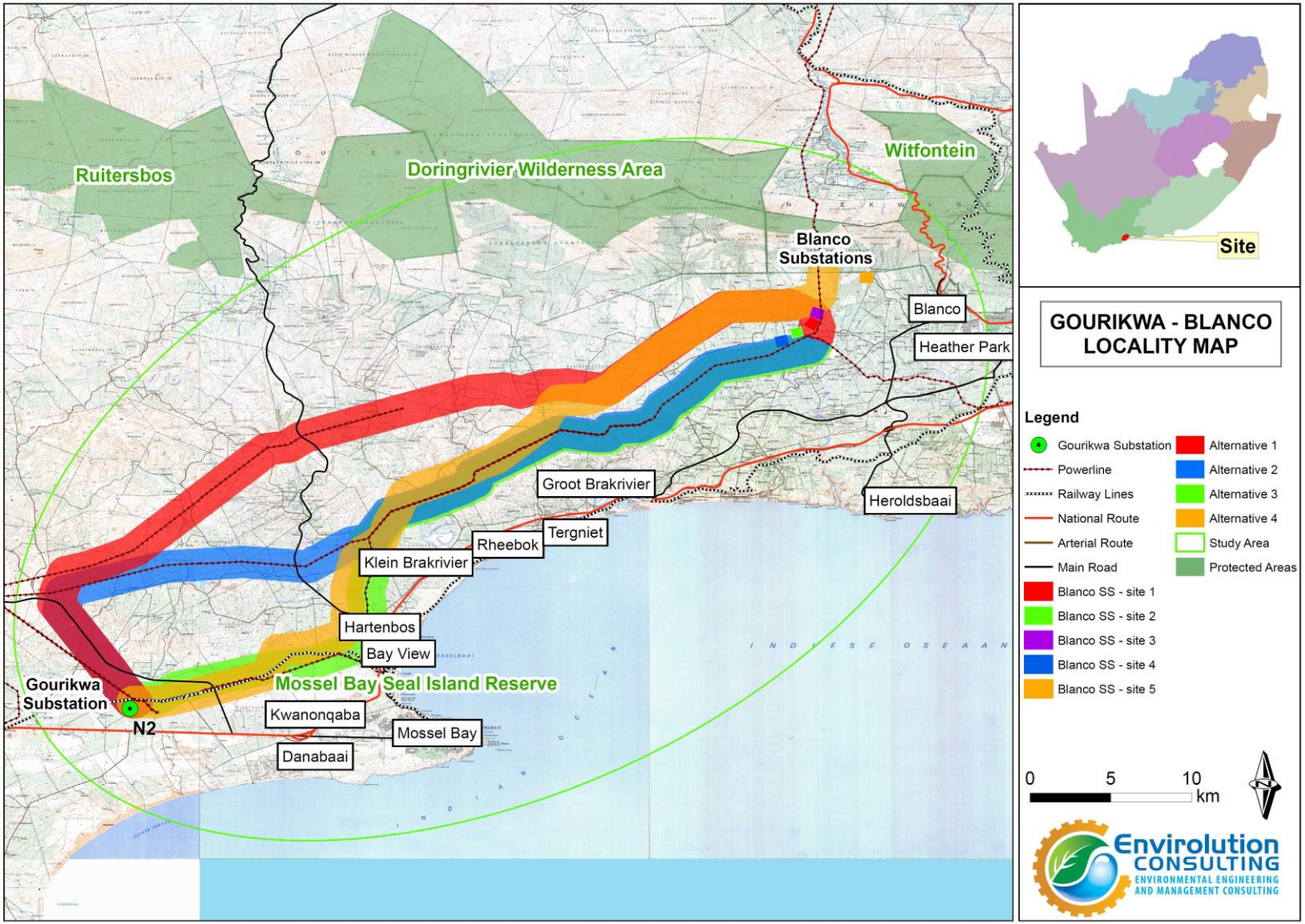

Figure 1: Study Area (Please refer to A3 size maps in Appendix 1)

The Start, Middle and End point coordinates for the power line alternatives are outlined as follows:

Coordinates Points	Alternative 1		Alternative 2	
	Latitude	Longitude	Latitude	Longitude
Start	33°55'35.97"S	22°22'18.24"E	33°55'35.97"S	22°22'18.24"E
Middle	33°59'51.92"S	22° 7'26.25"E	34° 3'1.24"S	22° 7'44.22"E
End	34° 9'59.58"S	21°57'37.59"E	34° 9'59.58"S	21°57'37.59"E
	Alternative 3		**Alternative 4**	
	Latitude	Longitude	Latitude	Longitude
Start	33°55'35.97"S	22°22'18.24"E	33°55'35.97"S	22°22'18.24"E
Middle	34° 0'48.06"S	22°11'59.10"E	34° 0'48.06"S	22°11'59.10"E
End	34° 9'59.58"S	21°57'37.59"E	34° 9'59.58"S	21°57'37.59"E

1.2 Conclusions from the Scoping Phase

Several desktop specialist studies were undertaken for the purposes of identifying potential impacts and potential fatal flaws relating to the proposed powerline. The impacts identified as potentially resulting from the project broadly included agricultural, ecological, heritage, visual, and social impacts.

At the scoping phase, Alternative 1 was recommended as the preferred route due to the location further from the sensitive Fynbos areas, from large wetlands and further north of the holiday homes that are located around Klein Brak and Hartenbos. The Scoping level assessment has indicated that this route may impact negatively on certain sensitive vegetation, game farms and intensive farming activities. The Scoping level assessment has however indicated that this route may impact negatively on Game Ranches and on intensive farming activities. During the Public Participation Process, concerns related to bird collisions were prominent, in particular where water bodies are present on the ground.

Loss of vegetation along sections of the Alternative 1, 2 and 3 routes is expected to impact on farming land, the hospitality industry and income. The latter situation also needs to be evaluated in specialist agricultural, visual and social studies. During the Public Participation Process, resistance has been given to all three alternatives as a result a fourth Alternative was recommended that combines all three alternatives.

No environmental fatal flaws were identified to be associated with the broader site during the Scoping stage of the EIA process and the Final Scoping Report was subsequently accepted by DEA.

1.3 Requirement for an Environmental Impact Assessment Process

The proposed projects are subject to the requirements of the Environmental Impact Assessment Regulations (2014 EIA Regulations) in terms of the National Environmental Management Act (NEMA, Act 107 of 1998, as amended). NEMA is national legislation that provides for the authorisation of certain controlled activities known as “listed activities”. In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed, and reported on to the competent authority (the decision-maker) charged by NEMA with granting of the relevant environmental authorisation. The application is subject to Scoping and Environmental Impact Reporting. A Scoping and Environmental Impact Assessment Report (EIR) had to be completed for the proposed project and the information from the EIR must then be presented to the authorities for decision-making. The application for authorisation was handed in along

with the Draft Scoping Reports. The National Department of Environmental Affairs (DEA) is the competent authority for this project. Through the decision-making process, the DEA will be supported by both the •Western Cape Department of Environmental Affairs and Development Planning and the Eastern Cape Department of Economic Development and Environmental Affairs (DEDEA)

The EIA is undertaken using the following phased approach as required by the Department of Environmental Affairs (DEA):

- **Phase 1**: Project Initiation: authority consultation, site visits, the initiation of the environmental process and public participation;
- **Phase 2**: Compilation of the Scoping Report, identification of the specialist studies, and compilation of Plan of Study of Environmental Impact Report (EIR);
- **Phase 3**: The compilation of the EIR and the draft Environmental Management Programme (EMPr);
- **Phase 4**: The compilation of the site specific EMPr.

1.4 Objectives of the EIA process

The scoping phase included desk-top studies and served to identify potential impacts associated with the proposed project and to define the extent of studies required within the EIA Phase. Input from the project proponent, specialists with experience in the study area and in EIAs for similar projects, as well as a public consultation process with key stakeholders, which included both government authorities and interested and affected parties (I&APs), was included in the evaluation of impacts.

The EIA Phase aimed to address those identified potential environmental impacts and benefits (direct, indirect and cumulative impacts) associated with the project including design, construction, operation, and decommissioning, and recommend appropriate mitigation measures for potentially significant environmental impacts. The purpose of this EIA report is to consider the impacts associated with the proposed powerline. This EIA report aims to provide the environmental authorities with sufficient information to make an informed decision regarding the proposed project.

The release of a draft EIA for a 30 day period will provide stakeholders with an opportunity to verify that issues that they raised through the EIA Process have been captured and adequately considered. The final EIA Report for submission to the DEA will incorporate all issues and responses raised during the public review period of the draft report.

1.5 Project Team

Project Applicant

Name:	**Eskom Holdings SOC Ltd**
Contact Person:	Rudzani Ranwedzi
	(Senior Environmental Advisor, ERE: Land Development)
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Environmental Assessment Practitioner

Company Name:	Envirolution Consulting (Pty) Ltd

Name: Sheila Bolingo
Physical Address: Vista Place, Suite 1a & 2, No 52, Cnr Vorster Avenue & Glen Avenue, Glenanda
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Telephone Number: (0861) 44 44 99
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E-mail: sheila@envirolution.co.za

Expertise of the EAP to carry out the EIA procedures

- Cheda Sheila Bolingo, the principle author of this Basic Assessment holds an Honours Bachelor degree in Environmental Management and 5 years of experience in the consulting field. Her key focus areas are on strategic environmental assessment and advice on environmental impact assessments; public participation; environmental management programmes, and mapping through ArcGIS for variety of environmental projects. She is currently involved in several diverse projects across the country.
- Gesan Govender, the project manager and Environmental Assessment Practitioner (EAP) responsible for this project, is a registered Professional Natural Scientist and holds an Honours degree in Botany. He has over 15 years of experience within the field of environmental management. His key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIA's for several diverse projects across the country.

Specialists

In order to adequately identify and assess potential environmental impacts associated with the proposed project, Envirolution Consulting has appointed the following specialist consultants (**Table 4**) to conduct specialist impact assessments:

Table 4: Project Specialists

Discipline	Organisation	Contact Person & Details
Public Participation & Facilitation	3E Consulting	**Samuel M Scott** Mobile: +27 (0)835862906 sam.scott@vodamail.co.za
Fauna (Vertebrates)	EOH Coastal and Environmental Services	**Craig Sholto-Douglas** Tel 046 622 2364
Vegetation Assessment	EnviroNiche Consulting Biodiversity and Environmental Consultants	**Johann du Preez** Tel: 022 376 4404 greenrsa@gmail.com
Economic & Tourism Assessment	Economic Modelling Solutions (EMS)	**Dr Johannes Jordaan** johannes.jordaan@economicmodelling.co.za +27 82 320 9996 (mobile) +27 86 552 1942 (fax)
Heritage Assessment (Archaeology, Cultural & Palaeontology)	ACO Associates Naturaviva	**Dr Lita Webley** Tel: 021 706 4104 lita.webley@aco-associates.com **John Almond** & **Dr Wendy Taylor** 021 462 3622 naturaviva@universe.co.za
Agricultural Assessment	ARC-Institute for Soil, Climate and Water	**Dr Garry Paterson** 012 310 2601 (w); 083 556 2458 (cell) garry@arc.agric.za

Social Impact	Amina Ismail	**Amina Ismail** 082 452 9799 solanum@worldonline.co.za
Visual Impact	i-scape	**Mr. Mader van den Berg** Cell: 076 169 1435 Fax: 086 520 4677 i-scape@vodamail.co.za
Wetlands & River Systems	Blue Science	**Dana Grobler** Tel: +27 (0)21 851 0555 Fax: +27 (0)86 620 181 dana@bluescience.co.za
Traffic Impact	Blue Science	**Hermanus Steyn** Tel: +27 21 5269454 Hermanus.Steyn@aurecongroup.com

2 PROJECT DESCRIPTION

2.1 Project Motivation

Eskom is planning to increase the power output at the existing Gourikwa Power Station generating facility at Mossel Bay in the Western Cape. This will increase the output at Gourikwa by 375 MW, increasing the total output at the power station to an expected 1125 MW by 2018. An increase in power output will require strengthening of the existing Transmission network, in order to evacuate the additional power generated.

Various combinations of 400 kV and 765 kV Transmission lines were assessed for the loading scenarios at Gourikwa. Results showed that loading will result in islanding of the Gourikwa power station in one scenario, and the islanding of the power station together with the Blanco and Proteus Transmission Substations in the second scenario. This means that if the project does not go ahead, then increased power generation at Gourikwa will overload the grid and cut off power supply from the power station. Therefore, in order to ensure that Gourikwa is Grid Code compliant, a third line needs to be built out of the facility. Four options for the proposed line were considered.

When the available options were technically evaluated, the line from Gourikwa MTS to the Droërivier Substation via the Narina Substatio (Alternative 5 site that was approved by DEA on 1 September 2016) was preferred based on the natural path for the power to flow. This can be attributed to the future generation in the Cape Peninsula and surrounding area. This option is also in alignment with the proposed second Droërivier – Proteus 400 kV line as per the Technical Development Plan. For the Gourikwa-Narina option, a 400 kV Transmission line from Gourikwa to Blanco (which is the next closest load centre) will have to be established.

Servitudes for the Transmission lines will need to be acquired. The EIA is being undertaken to assess the impact of the introduction of the Transmission lines between Mossel Bay and George. Impacts associated with the physical infrastructure of the power line and its 55m servitude (27.5m on either side of the centre of the line) will be assessed for the study. In addition, impacts associated with a distance of 1 km alongside each side of the line will also be assessed. If the project is authorised and routes secured, it is expected that the construction phase of the project will be over a period of up to 2 years, subject to confirmation by Eskom. The operations phase is expected be for a period of 40 to 50 years.

2.2 Need and Desirability

Eskom Holdings is the biggest producer of electricity in South Africa; it also transmits electricity via a transmission network which supplies electricity at high voltages to a number of key customers and distributors. Eskom is a vertically integrated company licensed to generate, transmit and distribute electricity. The transmission licence is held by Eskom Transmission, the transmission network service provider (TNSP). Planning the transmission network is the responsibility of the Grid Planning Department in the Transmission Division.

According to the Eskom Transmission Ten Year Development Plan 2011-2021 (TDP, **attached as Additional Information in Appendix 6.3**), the 400kV transmission lines are a result of the development of a more meshed transmission 400kV network to provide greater reliability and thus improve the levels of national network security. These new transmission lines form part of the long-term strategy to develop a main transmission backbone from which regional power corridors can be supported.

The proposed 400kV transmission power line from Gourikwa Substation to the Narina Substation forms part of the power corridors that will connect generation pools to one another and to the major load centres in the country. This backbone and regional power corridor network structure will allow the increasing system demand to be supplied and the power from new power stations to be integrated more efficiently into the transmission network and distributed where required, both under system-healthy and system-contingency conditions.

The development of the transmission backbone and the associated regional power corridors were reviewed as part of the Strategic Grid Study which considered the potential development scenarios beyond the 10-year horizon of the Transmission Development Plan (TDP) until 2030. The objective of this strategic study was to align the transmission network with the requirements of the generation future options and those of the growing and future load centres. This Strategic Grid Study has enabled the 10-Year TDP to be aligned with the future long-term development of the whole Eskom system.

A Customer Load Network (CLN) is a network within a specific geographical area, which in turn is a subdivision of a Grid. The West Grid consists of four Customer Load Networks, namely Peninsula, Southern Cape, West Coast and Namaqualand. The proposed 400kV Transmission power line from the Gourikwa to the Narina Substation and to the Droërivier Substation forms part of Eskom's West Grid and the Southern Cape CLN.

In summary: The Gourikwa – Blanco 400 kV line and Blanco – Droërivier 2nd 400 kV line – triggered in 2013 by Eskom Peaking Generation due to generation integration requirements

At Gourikwa Power Station, the power output will be increased via the CCGT Conversion Project which will convert 5 x existing OCGT units at each station to CCGT. This will entail the installation of Heat Recovery Steam Generators (HRSG) that will use the heat from the exhausts of the gas turbines to create steam. The steam from the HRSGs will be used to drive two new steam turbines, leading to increased cycle efficiency. The resultant output per CCGT unit will be 225 MW comprising of 150 MW (gas turbine) + 75 MW (steam recovery). Additional Transmission network infrastructure is therefore required to enable an increase in power output in order to ensure compliance in accordance with the Grid Code.

The problematic double contingencies related to Power Station Grid Code compliance at Gourikwa are the loss of the:

- Gourikwa-Proteus 1 and 2 400 kV lines. This results in the islanding of the Gourikwa Power Station.
- Proteus – Bacchus and Droërivier – Blanco 400 kV lines. This results in the islanding of the Gourikwa Power Station together with Blanco and Proteus Transmission Substations.

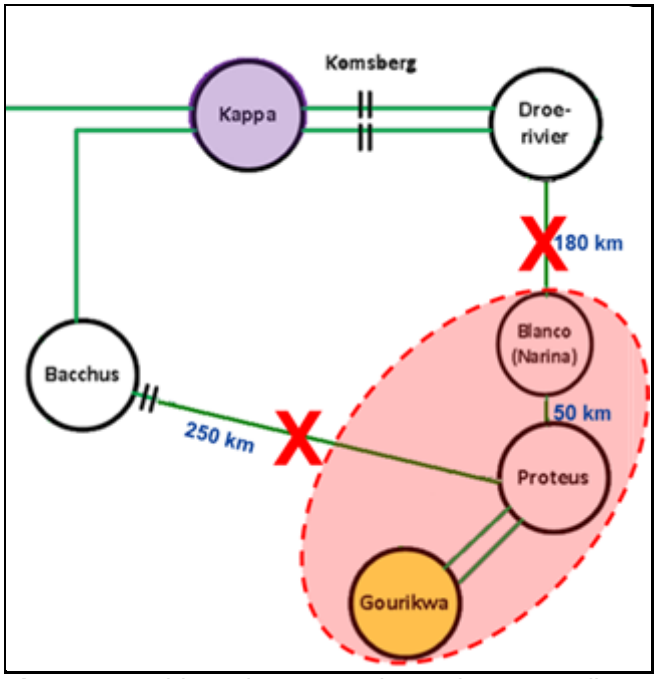


Figure 2: Problematic N-2 Contingencies at Gourikwa

In order to ensure that Gourikwa is Grid Code compliant, a 3rd line needs to be built out of the facility i.e. Gourikwa – Blanco 400 kV line and Blanco – Droërivier 2nd 400 kV line

There is also a potential for renewable energy and gas powered IPPs in the area that will require this infrastructure. An added benefit of these lines is that it will reduce the risk of major outages in the broader area during maintenance of the existing Transmission lines.

The need date is dependent on the commitment from the generation project/s.
In additional to the above, local benefits of the proposed development include benefits to the local economy through possible job creation in the construction phase as well as during the operational phase of the development. The construction for the proposed power line is estimated to last for approximately two years.

2.3 Description of Alternatives

The extent of the study area and the selection of the alternative alignment positions gave consideration to aspects such as ecological impacts, social impacts, visual impacts, technical feasibility and cost.

The following criteria were considered by Eskom Transmission in the identification of technically feasible corridors for the establishment of a new 400kV Gourikwa-Blanco Power Line and Substation Upgrade

- A number of technically viable and cost effective corridors and substation sites were identified
- As far as possible, the number and magnitude of angles along the line should be minimised in order to allow the use of less expensive and visually less-intrusive tower types
- Crossing over of existing major power lines should be avoided as far as possible as this increases the potential for technical incidents during operation
- The alignment should cater for known topographical/terrain constraints of the tower types to be used, and soil conditions for the foundations in terms of geotechnical suitability and costs

- The proposed alignment should provide for the need of appropriate access roads to the servitude and tower positions for both construction and maintenance/operation phases
- Care should be taken to avoid the following as far as tower positioning and access road construction are concerned:
  - extensive rock outcrops;
  - rugged terrain, hills and mountains;
  - active clay soil, vleis and floodplains;
  - potential unstable side-slope terrain; and
  - eroded and unstable areas.
- Other issues which technically affect the location of a Transmission power line include:
  - agricultural lands, in particular those under irrigation
  - large water bodies
  - open-cast mining
  - crossing points with roads, rail and telecommunication lines at off-set angles less than 60°.
- The following obvious and observable environmental issues were taken into account:
  - human settlements and communities;
  - land use (where possible)
  - passing between water bodies (bird flight paths usually extend between water bodies)
  - ecologically sensitive areas
  - scenic areas with high visual/aesthetic quality and
  - untransformed indigenous vegetation.

2.3.1 Transmission power

Four (4) technically feasible alternative Transmission power line development corridors between 50-60 km have been identified for investigation within the study area during the EIA process (Refer to **Figure 1**). . A Corridor of 2 km in width was assessed for each alternative. The identified power line development corridors as proposed and the areas affected are described in more detail below.

Alternative 1: This corridor exits Gourikwa Substation in a north easterly direction and follows the R327 for approximately 8 km. It turns east and cuts across the mixed agricultural and natural landscape type, passing through the most eastern part of the Gondwana Private Game Reserve. It maintains a north-eastern direction, nearing the mountainous terrain of the Outeniqua Mountains, until reaching the future Narina Substation. The Narina site is approximately 3-4 km west of the city of George and the very picturesque Outeniqua Pass (N9).

Alternative 2: This corridor starts in the same direction as Alternative 1 but turns east just south of the Gondwana Private Game Reserve. It follows an easterly direction, crossing the Hartebeeskuil Dam before turning north east as it reaches the R328 between Hartenbos and Brandwacht. It passes south of Botlierskop Private Game Reserve and crosses Wolwedans Dam before turning north and reaching the Narina Substation site.

Alternative 3: This corridor is a variation of Alternative 2 and exits the Gourikwa Substation in an easterly direction. It brushes past the western outskirts of Hartenbos before turning north and joining Alternative 2. A Corridor of 2km in width was assessed for each route alternative. The route alternatives will also be assessed during the EIA phase and recommendations from the investigations are likely to inform a decision on the preferred alternative.

Alternative 4 was proposed in the Scoping Reports as an alternative that combines sections of the above three alternative in order to avoid areas where the infrastructure is perceived to impact more negatively on the receiving environment than the others. This was investigated in the EIA phase, but does not form part of the official application to DEA.

The 400kV powerline between Gourikwa substation and the Narina Transmission substation has to be constructed in a narrow band between the mountains and the ocean. This presents a serious challenge in terms of providing three practical corridors. Two corridors (Alternative 1 = Red and Alternative 2 = Blue) have been identified. A third corridor, namely Alternative 3 (Green) is a deviation from the Blue corridor to the south before it joins the alignment of Alternative 2. All the proposed corridors have been aligned to run parallel to existing power lines where possible. And a fourth option (Alternative 4) that combines sections of the above three line. The existing power lines are shown on **Figure 3..**

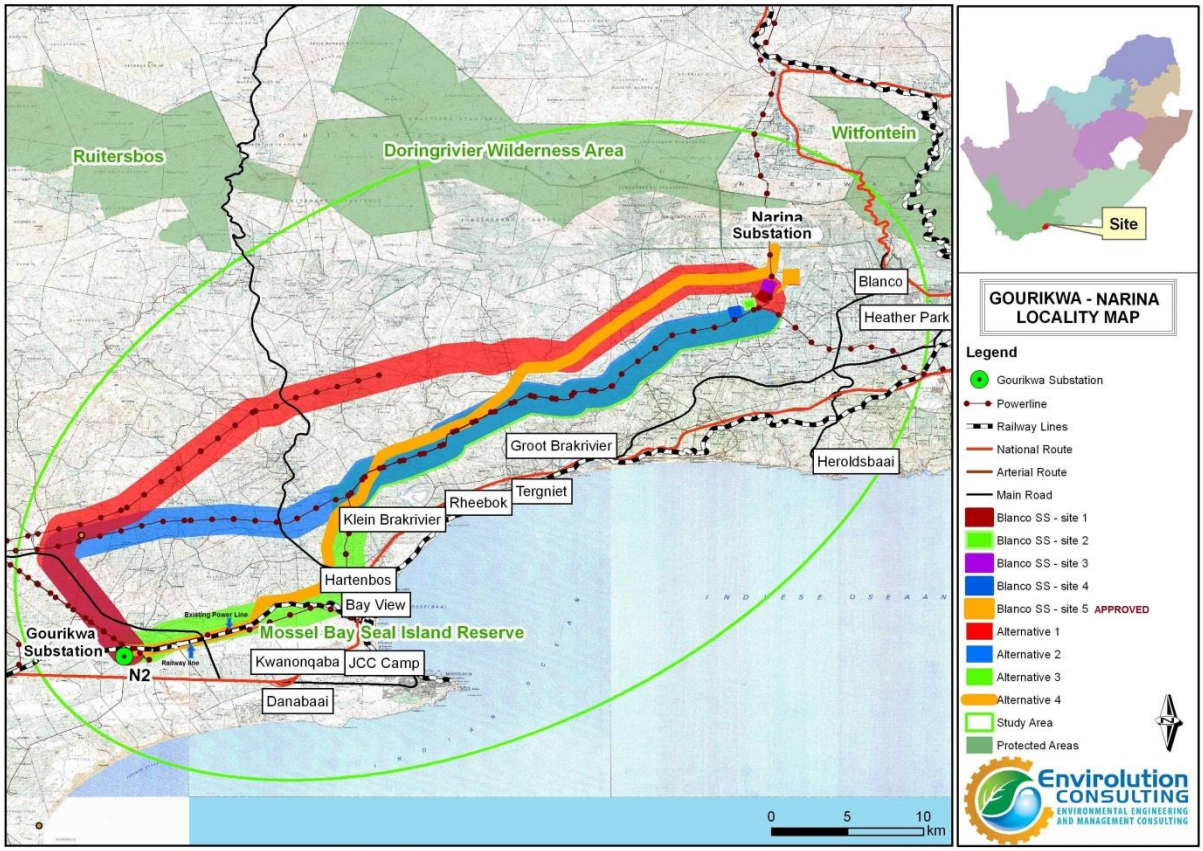


Figure 2: Existing power line infrastructure

2.3.2 Substations

The **Gourikwa MTS** from where the line will be constructed is located on the farm Mossel Bay Rd 399/0 and it is located west of Gourikwa power station. The substation is located about 15 km west of the town of Mossel Bay, and is north of the N2 highway in the Western Cape Province. The 400kV yard is located on the Northern side of the substation.

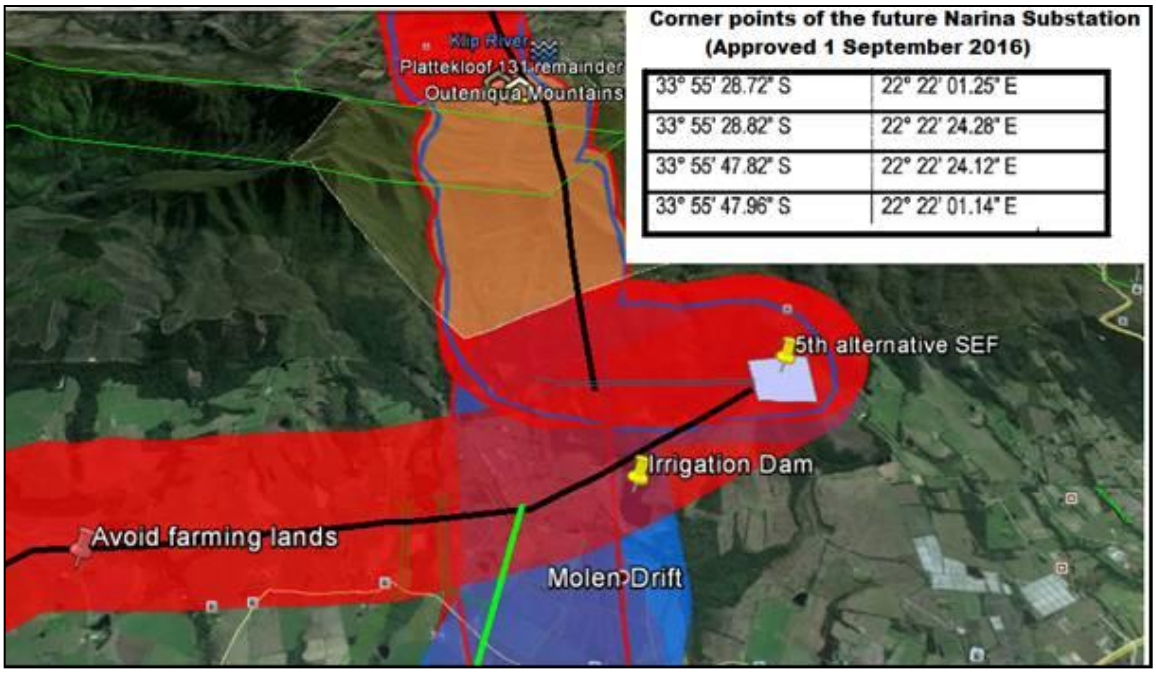
The expansion of the Gourikwa substation (to accommodate the proposed new 400kv Transmission line to Narina substation) will require new infrastructure is in the immediate vicinity of the existing

substation. This is an existing facility, thus no site alternative to this point for the alternatives to traverse form is feasible and no assessment of the MTS will be done .

The Narina Substation is not yet built. It is currently proposed to be situated 60km North-East of Gourikwa substation. The EIA for this substation was concluded in 2016 and the proposed Alternative 5 was approved by DEA on 1 September 2016. The application for the Narina Substation does therefor not form part of this EIA for the 400kV line that is proposed between the future Narina Substation and Gourikwa MTS.

The project will require connection to the proposed **Narina substation that was approved by DEA** on 1 September 2016 (DEA REF NO: 14/12/16/3/3/2/424 - NEAS REF NO: DEA/EIA/0001519/ 2012).

The construction of the Blanco Narina Transmission Substation falls outside the scope of this project, and the alternative substation site 5 (recommended by SEFSA and approved by DEA on 1 September 2016) is located in the foothills of the Outeniqua Mountains, approximately 4.5km north east of the existing Blanco Distribution Substation.



2.3.3 No-go alternative

The No-go option implies that the Project does not proceed, and Eskom does not go ahead with the construction of the 400 kV power line or the upgrade of the substations.

The electricity demand in South Africa is placing increasing pressure on Eskom's existing power Transmission capacity. Eskom is planning to increase the power output at the existing Gourikwa Power Station generating facility at Mossel Bay in the Western Cape. This will increase the output at Gourikwa by 375 MW, increasing the total output at the power station to an expected 1125 MW by 2018. An increase in power output will require strengthening of the existing Transmission network, in order to evacuate the additional power generated.

The 'do-nothing' alternative will result in future Transmission capacity shortages and power supply 'shedding' for this region. The 'do-nothing' alternative is therefore not considered to be a feasible alternative and will not be considered further within the EIA process.

2.4 Description of the proposed activities

2.4.1 Infrastructural description

The four route alignment alternatives should require similar tower designs, with the same technical specifications. The specialist studies during the EIA process have now determined which route is the preferred route, but only after that route has been authorised, the details regarding the number, tower design and other support infrastructures associated with the power line can be finalised. The Water Use License applications will then be undertaken.

Based on similar projects, it is anticipated that the following types of towers may be used on this project:

- Cross rope suspension tower;
- Compact cross rope suspension tower;
- Guyed-V suspension tower;
- Self-supporting suspension tower;
- Self-supporting strain tower; or
- Guyed strain structures.

The design of the pylons/towers can only be finalised once the specific placement has been determined. Illustrative examples of 400 kV transmission pylons are shown as **Figure 4**.

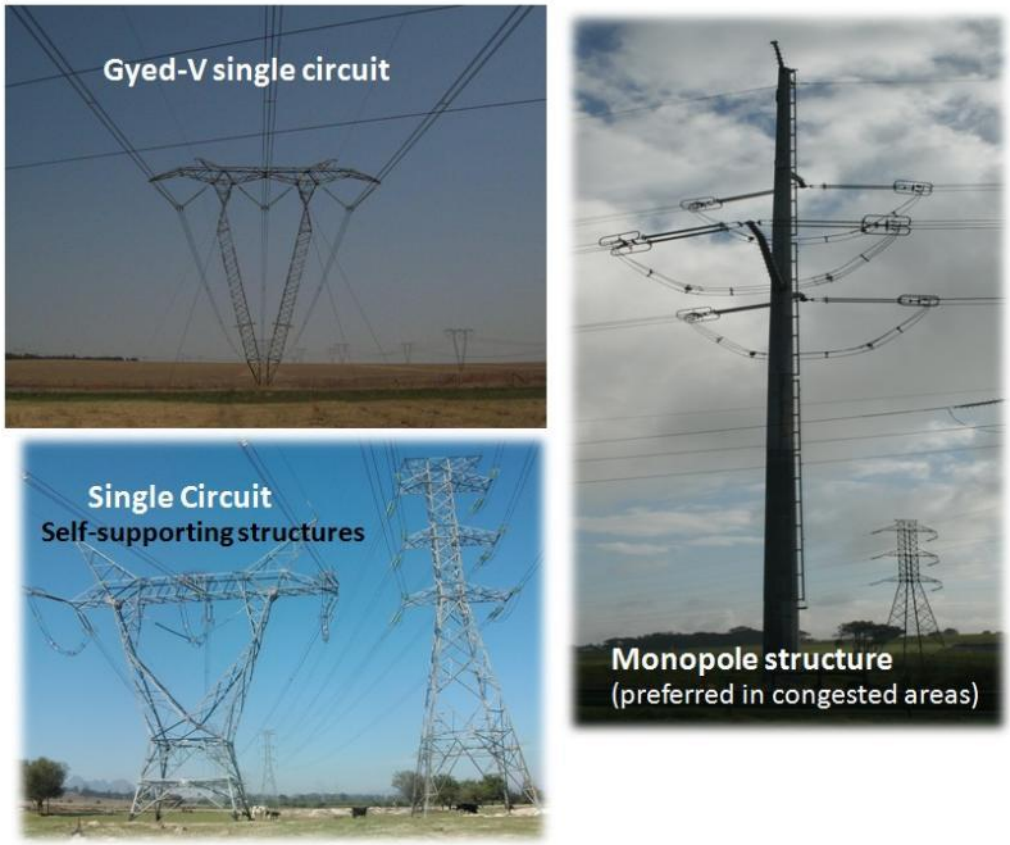


Figure 3. Pylon options

2.4.2 Servitude Requirements

A servitude of 55m is required for a single 400kV power line. A separation distance will be required between the 400kV and other lines, since two of the proposed routes will run parallel to existing power lines for a short distance. **For this project, a servitude of 55m has been proposed.** Power line servitudes are occasionally secured along existing servitudes such as roads and pipelines. In cases where the servitude is required next to a road reserve, a distance up to 95m from the centre of road to edge of power line servitude may be required. The land beneath the overhead lines can be continued to be used, as normal, by the landowners. Eskom, however, require that no dwellings or vegetation/crops higher than 4 m be established within the servitude. SPLUMA, the National Spatial Planning Land Use Management Act, has come into being since September 2015. The establishment and zoning requirements for the Sub-stations must be considered by the Proponent and the necessary Service Providers appointed in order for the process to be completed, prior to commencement of construction, as most of the property on which sub-stations of this magnitude are built is still zoned as agriculture.

2.4.3 Clearance Requirements

It is anticipated that a 6m strip will be cleared to facilitate access and construction, except where tower erection and stringing requires more space. Eskom have their internal guidelines and standards for Bush Clearance and Maintenance within Overhead Power line Servitudes. This

document provides minimum clearances for overhead conductors that will need to be taken into account in the formulation of any power line development.

2.4.4 Required Services

During the EIA phase, all alternatives will be assessed and findings will be included in the Environmental Impact Assessment Report (EIR). In addition, the draft Environmental Management Programme (EMPr) will include a site walk down exercise that will guide the final location of proposed infrastructure.

Access Routes & Storm Water

Most areas along the four proposed routes are reasonably accessible and can be reached via the existing public and farm roads. During the site visits it was noted that some sections of the Preferred Option (Alternative 1, Red line) transverses large Private Game Reserve areas, for which careful planning and mitigations will be crucial, should these areas not be avoided in totality. Temporary access routes of 6m wide will be required to construct the lines in areas where the pylons will be placed on private properties, such as farms and reserves. The details and permissions will be negotiated after the project has been approved.

Storm water will be managed according to the Eskom Guidelines for Erosion Control and Vegetation Management as well as the Environmental Management Programme (EMPr), which will be compiled for the construction phase.

Construction Site Camps

The power line construction contractor would need to set up at least one site camp but this does not necessarily need to be near the power line route. The contractor may however prefer to use a fully serviced site at another location. The contractor will be encouraged to utilised already disturbed areas for construction camp purposes, in order to minimise cumulative impacts. It is likely that a number of construction camps would need to be established for the construction period.

Sewage

A negligible sewage flow is anticipated for the duration of the construction period. Chemical toilets will be utilised during construction, and the contactor will ensure regular treatment of these facilities. The toilets will be serviced regularly, as specified by the final site specific EMPr.

Solid Waste Disposal

All solid waste will be collected at a central location at each construction site and will be stored temporarily until removal to an appropriately permitted landfill site in the vicinity of the construction site.

Electricity

The construction team might have temporary connection and supply of electricity from the existing network. Diesel generators will be utilised as an option for the provision of electricity.

2.5 Eskom Project Procedure – Construction of Power Lines

Eskom uses the following procedure2 for the construction of their new transmission lines.

2.5.1 Planning

The Transmission System Planning Department of Eskom are the system network planners which formulate five-year, ten-year or 20-year Transmission Development Plans (TDP), which are strategic documents aimed at identifying the entire infrastructure required throughout South Africa for the transmission of electricity. All projects initiated by the Eskom planners have to be in line with the requirements stipulated in the TDP. All projects which are initiated are thoroughly investigated to ensure that they are both viable and feasible before being approved for implementation.

2.5.2 Appointment of EIA Practitioners

Once a project is internally approved to be investigated, the Eskom Land and Rights Department initiates the process of the Environmental Impact Assessment (EIA). In the case of this Gourikwa to Narina project, a Scoping and EIA Process was followed by Envirolution Consulting (Pty) Ltd. The purpose of the process is as follows:

- To identify both the positive and the negative impacts on the environment, communities and the local economy;
- To identify the impact on the proposed infrastructure;
- To recommend all possible mitigation measures for each impact identified; and
- To develop a plan for implementing the mitigating measures.

All the available information has now been gathered and collated into this document called the Environmental Impact Assessment Report (EIAR), to be submitted to the decision making authority, the National Department of Environmental Affairs (DEA). The document will provide the DEA with all the alternative routes assessed during the EIA process and recommend the least impacting route for authorisation. If authorised, the DEA will issue an Environmental Authorisation, which will allow Eskom to implement the project. An Environmental Authorisation (EA) normally stipulates all conditions that should be adhered to before construction can commence. One such condition would be to finalise an Environmental Management Programme (EMPr) for approval by DEA before construction can commence. During construction, an Environmental Compliance Officer (ECO) must be employed to ensure that the specifications of the EA and EMPr are adhered to.

2.5.3 Land and rights acquisition

Once a positive uncontested Environmental Authorisation has been granted, the process of securing the servitude or title of the said portions of land will commence. To achieve this, the following activities have to be completed:

- The legal boundaries are identified for each property affected by the project;
- The legal ownership of each property is identified;

[2] *Eskom Fact Sheet: Construction of power lines*

- An independent property evaluator is appointed to determine the market value of the affected properties; and
- Negotiations are conducted by Transmission negotiators with each lawful landowner to acquire the rights to construct power lines over their properties. Rights are also acquired from affected statutory bodies and mineral right holders.

All land and rights acquired for the purpose of building power lines are registered at the Deeds Office accordingly under title deeds or servitudes.

2.5.4 Survey and line design

Topographical surveys are conducted subsequent to identifying and securing servitudes. The survey information is used by the design engineers to design the tower foundations, structures, buildings, and the exact placement of structures.

The draft EMPr (part of this EIA) will be finalised when all the profiles and local site plans are available (after EA has been given). The EMPr will outline all activities to be undertaken, where such activities are to take place, responsible persons, all possible environmental or social impacts, mitigation measures, rehabilitation plans, monitoring methods, the frequency of monitoring as well as performance indicators. The EMPr is a legally binding document which is used to ensure that Eskom adheres to all conditions of the Environmental Authorisation and EIAR.

2.5.5 Construction

A procurement process is followed to identify a suitable construction contractor. During this process all potential contractors are invited to bid for the implementation of the project. Various factors are considered when appointing these contractors. Factors considered include but are not limited tp; capacity, legal status, adherence to all Eskom standards (ie safety, quality, and environment) and other legislated regulations, policies and procedures.

2.5.6 Rehabilitation & Maintenance

After the project has been completed, all affected properties are rehabilitated to their original status. Landowners sign off release forms to confirm the rehabilitated status.

Vegetation in servitudes needs to be kept under control to allow access and to prevent the spread of veld fires. This will be undertaken by experienced contractors and permission will be obtained from land owners where access is required over private property

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3 LEGISLATION AND GUIDELINES CONSIDERED

3.1 Requirement for an EIA

The overarching environmental legislation for the management of the environment in South Africa is the National Environmental Management Act, 1998 (Act 107 of 1998) ("NEMA"). Its preamble states that sustainable development requires the integration of social, economic and environmental factors in the planning, implementation and evaluation of environmental decisions to ensure that development serves present and future generations. Important sections of NEMA include:

- Section 2: The NEMA principles
- Section 28 Duty Of Care
- Section 30 The Prevention of incidents and reporting should an incident occur

Chapter 5 of NEMA makes provisions for regulations to be formulated and published. In December 2014, new EIA Regulations were published, that are relevant to the EIA to this project:

Regulation Gazette No. 10328 Vol. 594 Pretoria, 4 December
R. 982: Environmental Impact Assessment Regulations (EIA Regulations)
R. 983.: EIA Regulations Listing notice 1
R. 984.: EIA Regulations Listing notice 2
R. 985.: EIA Regulations Listing notice 3

The development triggers activities in terms of the National Environmental Management Act, Government Notices R982, R983, R984 and R985 as shown in **Table 5.** In terms of the 2014 NEMA EIA Regulations, Scoping & Environmental Impact Assessments are required for the proposed powerline between Gourikwa to Blanco SS due to the following listed activities:

Table 5 EIA Listed Activities Applicable applied for to be authorise

Detailed description of listed activities associated with the project	
Listed activity as described in GN R 983, 984 and 985	**Description of project activity that triggers listed activity**
GR 983 Listing Notice 1 **(12):** The development of (xii) infrastructure or structures covering 50 square metres or more Where such construction occurs- (c) if no development setback line, within a watercourse or within 32 metres of a watercourse, measures from the edge of a watercourse,	The proposed power line pylons will impede upon watercourses or pylon structures situated within 32 metres of a watercourse.
GR 983 Listing Notice 1 **(19):** The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic	The power line will require the removal or infilling of material more than 5 cubic metres from a watercourse.

metres from- i.) a watercourse	
GR 983 Listing Notice 1 **(24):** The development of- ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres	The project entails the development of temporary access roads of approximately 6m wide to allow vehicles to access the areas of construction. These roads will be required in areas where the alignment will not follow the existing roads and servitudes where access will be possible without new roads.
GR 983 Listing Notice 1 **(47):** The expansion of facilities for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.	Additional 400kV feeder bays will be required at the Droerivier Substation
GR. 984 Listing notice 2 (9): The development of facilities or infrastructure for the transmission and distribution of **electricity with a capacity of 275kV or more**, outside an urban area or industrial complex	The project entails the development of infrastructure for transmission and distribution of electricity (with a capacity of 275kV, of which sections will be located outside the urban areas)
GR 984 Listing Notice 2 **(15):** The clearance of an area of 20 hectares or more of indigenous vegetation	The clearing of more than 20 hectares of indigenous vegetation will be undertaken during construction of the power line.
GR 984 Listing Notice 3 **(3):** The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower- (a) is to be placed on a site not previously used for this purpose; and (b) will exceed 15 metres in height **(f) In Western Cape:** I. All areas outside urban areas; or ii. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose, within urban areas.	Masts for telecommunication will be constructed at existing and proposed sub-stations. These masts are required to receive communication from surrounding towers.
GR 985 Listing notice 3 **(4):** The development of a **road wider than 4 meters** with a reserve less than 13,5 meters. **(f)In Western Cape** (i) Areas outside urban areas; (aa)Areas containing indigenous vegetation (ii) Areas in urban areas; (cc) areas zoned for conservation use (dd) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority	The project entails the development of temporary access roads of approximately 6m wide to allow vehicles to access the areas of construction. These roads will be required in areas where the alignment will not follow the existing roads and servitudes where access will be possible without new roads.
GR 985 Listing Notice 3 **(12)**: The **clearance of an area of 300 sqm or more of**	The project will require the clearance of more than 300 sqm of indigenous vegetation between Mossel Bay and

indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management (a) In Western Cape provinces: i. Within any critically endangered or endangered where such clearance of ecosystem listed in terms of section 52 of the NEMBA or indigenous vegetation is prior to the publication of such a list, within an area that is required for maintenance has been identified as critically endangered in the purposes undertaken in National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional management plan. iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.	George. Sections of the lines will be located in areas of Fynbos vegetation n land that is zoned open space. Private Game Ranches are located on the corridors that are proposed for the infrastructure, where conservation is practised.
GR 985 Listing Notice 3 (**14):** The development of: (xii) infrastructure or structures with a physical footprint of 10 square metres or more. within a watercourse; **(f) In Western Cape** i. Areas outside urban areas; (aa)Areas containing indigenous vegetation ii. Areas in urban areas; (cc) areas zoned for conservation use (dd) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority	There is drainage lines on the proposed study are which will be impacted by the proposed infrastructures within an area defined as a CBA.

3.2 Legislation and Guidelines that have informed the preparation of this EIA Report

The following legislation and guidelines have informed the scope and content of this EIA Report:

- National Environmental Management Act (NEMA) 107 of 1998
- EIA Regulations, published under Chapter 5 of NEMA (GNR R982 in Government Gazette No 38282 of December 2014)
- Guidelines published in terms of the NEMA EIA Regulations, in particular:
  - Public Participation in the EIA Process (DEA, 2014)

* Integrated Environmental Management Information Series (published by DEA)

Several other Acts, standards or guidelines have also informed the project process and the scope of issues assessed in this report. A listing of relevant legislation is provided in **Table 6**, where the level of applicability of the legislation or policy to the activity/project is detailed.

Table 6: Relevant legislative and permitting requirements applicable to the proposed project

Legislation	Applicable Requirements	Relevant Authority
National Environmental Management Act (Act No 107 of 1998)	The EIA Regulations have been promulgated in terms of Chapter 5 of the Act. Listed activities which may not commence without an environmental authorisation are identified within these Regulations. In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation. In terms of GN R982, R983, R984 and R985 of December 2014, a Scoping and EIA Process is required to be undertaken for the proposed project *The final EIA report is to be submitted to the DEA and Provincial Environmental Departments in support of the application for authorisation.*	Department of Environmental Affairs (DEA) Western Cape Department of Environmental Affairs and Development Planning
National Environmental Management Act (Act No 107 of 1998)	In terms of the Duty of Care Provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, stopped or minimised. In terms of NEMA, it has become the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts. *While no permitting or licensing requirements arise directly by virtue of the proposed project, this section will find application during the EIA phase and will continue to apply throughout the life cycle of the project.*	DEA
National Water Act (Act No 36 of 1998)	The development also triggers activities that require a Water Use License (WUL) because it crosses several water courses. Therefore, before construction activities may take place, the activity will require a Water Use License as per requirement in the National Water Act (Act No.36 of 1998) (NWA) under Section 21 Water Uses. In terms of the NWA, this development requires a Water Use License for the following water uses: • Section 21(c) impeding or diverting the flow of water in a watercourse and; • Section 21 (i) altering the bed, banks, course or characteristics of a watercourse. The purpose of the EIA Regulations is "to regulate the procedures and criteria as contemplated in Chapter 5 of the National Environmental Management Act relating to the submission, processing and consideration of, and decision on applications for environmental authorisation for the commencement of activities in order to avoid detrimental impacts on the environment, or where it cannot be avoided, ensure mitigation and management of impacts to acceptable levels, and to optimise positive environmental impacts, and for matters pertaining thereto". *A water use license (WUL) is required in terms of Section 21(c) and*	Department of Water and Sanitation (DWS)

Legislation	Applicable Requirements	Relevant Authority
	21 (i) of the National Water Act. If wetlands or drainage lines are impacted on, or the regulated area of a watercourse (being the riparian zone or the 1:100yr floodline whichever is greatest).	
National Environmental Management: Air Quality Act (Act No 39 of 2004)	S18, S19, and S20 of the Act allow certain areas to be declared and managed as "priority areas." Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with relevant emission standards. GN R 827 – National Dust Control Regulations prescribes general measures for the control of dust in all areas	DEA Affected District and Local Municipalities
National Heritage Resources Act (Act No 25 of 1999)	» S38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including » The construction of a road, power line, pipeline, canal or other similar linear development or barrier exceeding 300 m in length; » Any development or other activity which will change the character of a site exceeding 5 000 m^2 in extent » The relevant Heritage Authority must be notified of developments such as linear developments (i.e. roads and power lines), bridges exceeding 50 m, or any development or other activity which will change the character of a site exceeding 5 000 m^2; or the re-zoning of a site exceeding 10 000 m^2 in extent. This notification must be provided in the early stages of initiating that development, and details regarding the location, nature and extent of the proposed development must be provided. *The Heritage Specialists on the project team will ensure compliance with these requirements, and has submitted the Notice of Intent to Develop (NID) to Western Cape Heritage. A permit may be required should identified cultural/heritage sites on site be required to be disturbed or destroyed as a result of the proposed development.*	South African Heritage Resources Agency (SAHRA) Provincial Heritage Resources Authority
National Environmental Management: Biodiversity Act (Act No 10 of 2004)	In terms of S57, the Minister of Environmental Affairs has published a list of critically endangered, endangered, vulnerable, and protected species in GNR 151 in Government Gazette 29657 of 23 February 2007 and the regulations associated therewith in GNR 152 in GG29657 of 23 February 2007, which came into effect on 1 June 2007. In terms of GNR 152 of 23 February 2007: Regulations relating to listed threatened and protected species, the relevant specialists must be employed during the EIA Phase of the project to incorporate the legal provisions as well as the regulations associated with listed threatened and protected species (GNR 152) into specialist reports in order to identify permitting requirements at an early stage of the EIA Phase. The Act provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (GG 34809, GN 1002), 9 December 2011). GNR 598: The Alien and Invasive Species (AIS) Regulations provides for the declaration of weeds and invader plants.	DEA

Legislation	Applicable Requirements	Relevant Authority
	Under this Act, a permit would be required for any activity which is of a nature that may negatively impact on the survival of a listed protected species. *An ecological study has been undertaken as part of the EIA Phase. As such the potential occurrence of critically endangered, endangered, vulnerable, and protected species and the potential for them to be affected has been considered. This report is contained in Appendix 4 of the EIA Report.*	
National Forests Act (Act No. 84 of 1998)	In terms of S5(1) no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a license granted by the Minister to an (applicant and subject to such period and conditions as may be stipulated". Protected trees: According to this act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. The prohibitions provide that ' no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister'. Forests: Prohibits the destruction of indigenous trees in any natural forest without a licence. *All the alternative routes cut across small pockets of Southern Afrotemperate Forest (FOz1) along the slopes of the larger rivers such as the Klein Brak and Groot Brak Rivers. Species such as Outeniqua Stinkwood (Ocotea bullata), Mountains Yellowwood (Afrocarpus falcatus & Podocarpus latifolius), Assegaai (Curtisia dentata) and Cheesewood (Pittosporum viridiflorum) could occur.* *Permits must be obtained from DAFF (Department of Agriculture, Forestry and Fisheries) to remove individual of any of these abovementioned species. The contractor must apply for these permits in a phased manner.*	Department of Agriculture, Forestry and Fisheries
National Veld and Forest Fire Act (Act 101 of 1998)	In terms of S13 the landowner would be required to burn firebreaks to ensure that should a veldfire occur on the property, that it does not spread to adjoining land. In terms of S13 the landowner must ensure that the firebreak is wide and long enough to have a reasonable chance of preventing the fire from spreading, not causing erosion, and is reasonably free of inflammable material. In terms of S17, the applicant must have such equipment, protective clothing, and trained personnel for extinguishing fires. *While no permitting or licensing requirements arise from this legislation, and this Act will find application during the construction and operational phase of the project.*	Department of Agriculture, Forestry and Fisheries
Minerals and Petroleum Resources Development Act (Act No 28 of 2002)	According to S27 of the act, any person who wishes to apply to the Minister for a mining permit must simultaneously apply for an environmental authorisation and must lodge the application (repealed by section 23 (b) of Act 49 of 2008). Requirements for Environmental Management Programmes and Environmental Management Plans are set out in S39 of the Act (repealed by section 33 of Act 49 of 2008) S53 Department of Mineral Resources: Approval from the Department of Mineral Resources (DMR) may be required to use land surface contrary to the objects of the Act in terms of section 53 of the Mineral and Petroleum Resources Development Act, (Act No	DMR

Legislation	Applicable Requirements	Relevant Authority
	28 of 2002). Section 42 of Act 49 of 2008 (Repealed of section of S53) states that the Minister may cause an investigation to be conducted if it is alleged that a person intends to use the surface of any land in any way that could result in the mining of mineral resources being detrimentally affected.''. *As no borrow pits are expected to be required for the construction of the facility, no mining permit or environmental authorisation is to be obtained.*	
Electricity Regulation Act 4 of 2006	This Act governs the control of generation and supply of electricity in South Africa and the existence and functions of the National Energy Regulator. The Act aims to establish a national regulatory framework for the electricity supply industry; to make the National Energy Regulator the custodian and enforcer of the national electricity regulatory framework; to provide for licences and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated; and to provide for matters connected therewith.	Department of Energy
Hazardous Substances Act (Act No 15 of 1973)	This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products. » Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc, nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance » Group IV: any electronic product; and » Group V: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force. *It is necessary to identify and list all the Group I, II, III, and IV hazardous substances that may be on the site and in what operational context they are used, stored or handled. If applicable, a license is required to be obtained from the Department of Health*.	Department of Health
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	The Minister may by notice in the *Gazette* publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. The Minister may amend the list by – » Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list. In terms of the Regulations published in terms of this Act (GN 921), A Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities (Category A and B) while Category C Activities (such as storage of waste) must be undertaken in accordance with the necessary norms and standards. Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that: » The containers in which any waste is stored, are intact and not	Hazardous Waste –DEA General Waste – Provincial Authorities

Legislation	Applicable Requirements	Relevant Authority
	corroded or in » any other way rendered unlit for the safe storage of waste. » Adequate measures are taken to prevent accidental spillage or leaking. » The waste cannot be blown away. » Nuisances such as odour, visual impacts and breeding of vectors do not arise; and » Pollution of the environment and harm to health are prevented. *As no waste disposal site is to be associated with the proposed project, no permit is required in this regard.* *Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of the Act, as detailed in the EMPr (refer to Appendix G).* *The volumes of waste to be generated and stored on the site during construction and operation of the facility will not require a waste license.*	
National Road Traffic Act (Act No 93 of 1996)	» The technical recommendations for highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed. » Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts. » The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations. *An abnormal load/vehicle permit may be required to transport the various components to site for construction. These include:* *Route clearances and permits will be required for vehicles carrying abnormally heavy or abnormally dimensioned loads.* *Transport vehicles exceeding the dimensional limitations (length) of 22m.* *Depending on the trailer configuration and height when loaded, some of the power station components may not meet specified dimensional limitations (height and width).*	South African National Roads Agency Limited (SANRAL) (national roads) Provincial Department of Transport
Conservation of Agricultural Resources Act (Act No 43 of 1983)	Regulation 15 of GNR1048 provides for the declaration of weeds and invader plants, and these are set out in Table 3 of GNR1048. Declared Weeds and Invaders in South Africa are categorised according to one of the following categories: Category 1 plants: are prohibited and must be controlled. Category 2 plants: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread. Category 3 plants: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the	DAFF

Legislation	Applicable Requirements	Relevant Authority
	floodline of watercourses and wetlands. These regulations provide that Category 1, 2 and 3 plants must not occur on land and that such plants must be controlled by the methods set out in Regulation 15E. *While no permitting or licensing requirements arise from this legislation, this Act will find application during the EIA phase and will continue to apply throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies must be developed and implemented. In addition, a weed control and management plan must be implemented.* *The permission of agricultural authorities will be required if the Project requires the draining of vleis, marshes or water sponges on land outside urban areas. However, none of these activities are expected to be undertaken on site.*	
Subdivision of Agricultural Land Act (Act No 70 of 1970)	Details the subdivision of agricultural land and provisions under which the act is triggered. It also provides for the approval of such division by the Minister of Agriculture. Applies for subdivision of all agricultural land and long-term leasing of portions of agricultural land. *Long-term leases on portions or subdivision of the site properties will require an approval of the Minister of Agriculture. An application to DAFF will need to be submitted detailing the areas to be subdivided or leased for the purposes of the proposed development. An application in terms of SALA will need to be undertaken and submitted following the issuing of an environmental authorisation for the proposed project.*	(DAFF) Provincial Departments of Agriculture and Environment - commenting authority. Local Municipality – competent authority
Spatial Planning And Land Use Management Act 16 OF 2013	**This Act** has the main objectives to: • provide for a uniform, effective and comprehensive system of spatial planning and land use management for the Republic; • ensure that the system of spatial planning and land use management promotes social and economic inclusion; • provide for development principles and norms and standards; • provide for the sustainable and efficient use of land; • provide for cooperative government and intergovernmental relations amongst the national, Regulations under the SPLUMA not in force yet. Legislation that regulates Land Use Planning has lead to "spatial planning tools" that are contained in Municipal and District Strategic Management Frameworks (SMFs), Strategic Development Initiatives (SDIs) and Municipal By-laws. These include the by-Laws of the Eden District Municipality, the George Local Municipality and the Mossel Bay Municipality. The Eden District Municipality's Municipal Health By-Laws were Published in Western Cape Provincial Gazette 6566 of 17 October 2008. (see Chapter 8 waste management). and the Mossel Bay Local Municipality's By-Law Relating To Public Nuisances (Published in Western Cape Provincial Gazette 6688 of 18 January 2010) has relevance. The Land Use Planning Ordinance (Ordinance 15 of 1985) has relevance in the Western Cape Province.	Local municipalities
Development Facilitation Act (Act No 67 of 1995)	**The Development Facilitation Act** contains development facilitation regulations under the Regulations under Development facilitation Act 3. The Act is directed at provincial and local spheres of government; and serves to re-address the imbalances of the past and to ensure that there is equity in the application of spatial development planning and land use management systems. Provides for the overall framework and administrative structures for	Provincial Department of Environmental Affairs

Legislation	Applicable Requirements	Relevant Authority
	planning throughout the Republic. S (2-4) provide general principles for land development and conflict resolution. The applicant must submit a land development application in the prescribed manner and form as provided for in the Act. A land development applicant who wishes to establish a land development area must comply with procedures set out in the DFA.	

3.3 Policy Guidelines

The following Guideline documents have been considered in the preparation of this report:

- Department of Environmental Affairs (DEA) Integrated Environmental Management Guideline Series 7, Public Participation in the EIA Process as published in Government Gazette No. 33308, 18 June 2010; and
- Implementation Guidelines (published for comment) in Government Notice 603 of 2010
- Integrated Environmental Management Information Series (Booklets 0 to 23) (DEAT, 2002 – 2005);
- Western Cape Department of Environmental Affairs & Development Planning (DEA&DP Guideline on Transitional Arrangements, August 2010)
- (DEA&DP Guideline on Alternatives, August 2010)
- DEA&DP, Guideline on Public Participation (August 2010)
- DEA&DP Guideline on Need and Desirability (, August 2010)
- Guidelines for Involving Specialists in the EIA Processes Series (DEA&DP; CSIR and Tony Barbour, 2005 – 2007)
- DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7.

4 APPROACH TO UNDERTAKING THE EIA PROCESS

An EIA process refers to that process (in line with the EIA Regulations) which involves the identification of and assessment of direct, indirect, and cumulative environmental impacts associated with a proposed project/ activity. The EIA process comprises two main phases: i.e. **Scoping Phase** and **EIA Phase**. The EIA process culminates in the submission of an EIA Report (including an Environmental Management Programme (EMPr)) to the competent authority for decision-making.

The Public Participation Process (PPP) was conducted in accordance with **Chapter 6 of the Environmental Impact Assessment Regulations, Published in Government Notice R982 (2014)**. In addition the PPP was guided by the Integrated Environment Management Guidelines Series 7, Public Participation in the EIA process, published in Government Gazette no. 33308, 18 June 2010.

4.1 Purpose of Public Participation

The engagement of Interested and Affected Parties (I&AP's) and the Stakeholder Engagement Process is an important part of any environmental Impact assessment. The main objectives of the Stakeholder Engagement / Public Participation Process includes amongst others:

- Informing the adjacent landowners, tenants, residents' associations, ward councillors, the local municipality and other organs of state of the proposed project;
- Establishing lines of communication between the stakeholders, I&AP's and the project team;
- Providing all parties with an opportunity to exchange information and to express their views and concerns regarding the proposed project;
- Obtaining comments/input from stakeholders and I&AP's, and ensuring that all views, issues, concerns and queries raised are fully documented; and
- Identifying all the significant issues associated with the proposed project

In line with the 2014 Regulations, the Draft Scoping Report, which included the Plan of Study for EIA was distributed for public comment for a period of more than 30 calendar days. All comments received from I&AP's were recorded and responded to and were included in the Issues and Response Report within the Final Scoping Report (FSR). The FSR was submitted to the DEA for consideration with copies to the Western Cape Department of Environmental Affairs and Development Planning (DEADP) in whose jurisdiction the project is located. The FSR was approved by DEA on 5July 2016, after which the EIA phase has commenced.. **The Draft EIA Report was made available for public review and inputs from 16 September 2016 to 16 October 2016 (initial EIA application).**

4.2 Scoping Phase & EIA Phase Public Participation

The following has been undertaken as part of the **initial EIA process**:

- Notification and Consultation with Organs of State that may have jurisdiction over the project, including:
  - Provincial departments
  - Parastatals and Non-Governmental Organisations
  - Local Municipality and District Municipality
- Focus group meetings and a public meeting
  - Open Days/Focus Group meetings which serve as information sessions to introduce the proposed project to the public and to discuss the project aim were held during the review period of the Draft Scoping Report, and details were included in the Final Scoping Report.

- During the EIA Phase, focus group meetings are planned for 19-22 September 2016 to discuss progress on the project.

- Telephonic consultation sessions (consultation with various parties from the EIA project team, including the project participation consultant, lead EIA consultant as well as specialist consultants).
- Written, faxed or e-mail correspondence.

A record of the above consultation in the EIA process is included within **Appendix 3.**

In terms of the requirement of Chapter 6 of the EIA Regulations of December 2014, the following key public participation tasks are required to be undertaken:

- Fixing a notice board at a place conspicuous to the public at the boundary or on the fence of—
  (i) the site where the activity to which the application relates is or is to be undertaken; and
  (ii) any alternative site mentioned in the application;
- Giving written notice to:
  (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  (v) the municipality which has jurisdiction in the area;
  (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
  (vii) any other party as required by the competent authority.
- Placing an advertisement in:
  (i) one local newspaper; and
  (ii) in at least one provincial newspaper.
- Open and maintain a register/ database of interested and affected parties and organs of state.

» Release of a Draft EIA Report for Public Review

» Preparation of a Comments and Responses Report which documents all of the comments received and responses from the project team.

In compliance with the requirements of Chapter 6 of the EIA Regulations, 2014, the following summarises the key public participation activities conducted to date.

4.2.1 Placement of Site Notices

Site notices were displayed within the boundaries of the study area from 5 March 2015.

4.2.2 Steps taken to notify I&AP's

i. Stakeholder and land owner Identification

Potential or registered interested and affected parties, including the competent authority, may be provided with an opportunity to comment on reports and plans contemplated in subregulation (1) prior to

submission of an application but must be provided an opportunity to comment on such reports once an application has been submitted to the competent authority.
Comments of interested and affected parties to be recorded in reports and plans
44. (1) The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.

(8) Any public participation process must be conducted for a period of at least 30 days.
Stakeholder and land owner identification will provide a basic understanding of the social context in which the public participation process will be undertaken in the project. The following methods have been used for Stakeholder and land owner identification:

- Windeed searches to identify landowners;
- Consultation with Provincial, District and Local Authorities; and
- Consultation with farmers Association;

ii. Project Announcement

Access to all information that could influence interested and affected parties has been initiated by the project announcement, which included the placement of site notices and distribution of Background Information Documents (BID's) in the area between Mossel Bay and George has commenced during March and April 2015. The public participation process (PPP) part in the EIA was announced in March 2015 and was done as described below.

- Distribution of flyers
  Flyers were distributed to I&APs accompanied by a Background Information document (BID). A registration form with map was distributed. (Knock and drop) from March 2015 to end May 2015.
- Background Information Documents
  A Background Information Document was produced and distributed during Scoping phase, which included:
    - A "knock and drop" exercise during visits to farms and towns between George and Mossel Bay;
    - Open Day meetings;
    - Information Sharing Sessions with Councillors and officials; and
    - Requests for information after advertisements and articles have appeared in the press.

4.2.3 Newspaper advertisement

- Newspaper advertisement
  Newspaper advertisement was placed in *Die Courier* (Western Cape) on 2 April 2015 & Sunday Times (National) on 29 March 2015 requesting Interested and Affected Parties (I&APs) to register, and submit their comments.

- Newspaper articles
  Newspaper articles were encouraged and numerous reporters were approached and supplied with information on the project. This resulted in the publication of numerous news articles published, broadening the reach of the public notification process.

4.2.4 I&AP Register

An I&AP's register was opened and maintained in terms of Regulation 42 and contains the names, contact details and addresses of:

i. all persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;
ii. all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and
iii. all organs of state which have jurisdiction in respect of the activity to which the application relates.

4.2.5 Registered I&AP entitled to comment on reports and plans

In terms of regulation 43 and 44 I&AP are entitled to comment on reports and plans and the comments must be recorded in the report. Any responses that have been received during the registration period for I&APs, was included in the Final Scoping Report. Issues that were raised up to the drafting of the Final Scoping Report were included and new/ other issues and registrations that were received during the review period were added to the Final Scoping Report. All issues raised by the public during the period between acceptance of the FSR and the review period for the Draft EIAR were added to the Final EIAR that will now be submitted to DEA for consideration of EA.

4.2.6 Review of the Draft Reports

1. **Public Review of Draft Reports**: For the Scoping Phase, a notice (in the form of an article) was placed in the local media (Die Burger 1 February 2016) regarding the availability of the draft SR and the period for comments. The Draft Scoping Report was publically available to all registered I&AP's and Organs of State for review, on the Envirolution website at www.envirolution.co.za. CDs were available upon request. Additional time was allowed to accommodate the Public Holidays that were between 15 December 2015 and 5 January 2016.

   For the EIA phase, the draft EIAR was made available to stakeholders and the public for a review period of 30 days. A follow-up notice (in the form of an article) was placed in the local media (Die Burger 16 September 2016) regarding the availability of the draft EIAR and the period for comments that will end on 16 October 2016. After the commenting period for the EIA phase has expired, Envirolution (Pty) Ltd has considered the comments received, respond to it and completed the final EIAR. Envirolution will now submit the final EIAR together with any comments received on the draft EIAR to the Department of Environmental Affairs.

2. **Authority Review of Draft Reports**: The Draft EIA Reports were sent to:
   - Western Cape Department of Environmental Affairs and Development Planning;
   - Department of Water and Sanitation (Breede Gouritz Catchment Management Agency (BGCMA))
   - Cape Nature; and
   - Department of Environmental Affairs.
   - Department of Agriculture , Forestry and Fisheries
   - District and Local Municipalities

4.2.7 Comments and Responses Report

At the end of the announcement phase, all comments/input from stakeholders and I&AP's, were captured in the Issues and Response Report (IRR) which formed part of the Scoping reports, the FEIAR Report, and subsequently to the FEIAR. The Comments and Response Report includes

responses from members of the EIA project team and/or the project proponent. This is included in **Appendix 3.1 and Appendix 3.2 (for the additional PP)**..

4.2.8 Additional Public Participation Process for the new EIA process

Following the lapsing of the previous application, a new EIA process was initiated, an application form was submitted to DEA along with the Draft Scoping report in February 2017. DEA has acknowledged receipt and acceptance of the application and the project **reference number DEA Reference: 14/12/16/3/3/2/994** was assigned. The final Scoping Report together with the Plan of Study was approved in May 2017. In terms of this acceptance, an EIA was required to be undertaken for the proposed project. The following additional PPP have been conducted to support the new EIA process:

- Release of the Draft Scoping Report for public comments;
- Release of the Draft EIA Report for public comments;
- Notification of the availability of the two draft reports to registered I&AP's on the distribution list
- New comments received are captured in a Comment and Response Report.

NB: This new PPP undertaken is appended as an addendum to the Public Participation Report (see point 4.2.9 below).

4.2.9 Public Participation Report

A specialist report is attached to this Final EIA Report document, summarising the Public Participation Process (PPP) that the project consultants have performed in the initial application, which subsequently form part of the new EIA application. The Comments that were received on the Draft Scoping Report during the review period were included in the Final Scoping Report and again in the Draft EIAR, and this Final EIAR. The Comments and Response Report has been updated and included in this EIA Draft Report as Appendix 3. New comments that were received during the review of the draft document were included and responded to in this Final EIA Report**. It must be noted that the PPP for the new EIA process is included in this Report as Appendix 3.2.**

4.3 Summary of Issues Raised by I&AP's

Issues and concerns raised by I&AP's have been integrated into the Issues and Responses Report. The issues and concerns were raised by means of:

- issues raised during open day meeting and focus group meetings;
- written submissions in response to advertisements
- telephonic communications with I&AP's;
- issues raised through written correspondence received from I&AP's (fax, email and mail).

The issues raised during the Scoping Phase of the project are presented in the PPP report (**Appendix 3**), and issues raised in the period between the public review period of the DSR and the DEIAR are included in the list below. The two lists below provide a summary of the main issues that were raised during the Scoping and EIA Phases (See Appendix J of PPP report for table with responses)

Issues raised during the initial Scoping Phase

1. Impact of the project on property prices (holiday homes, farms and tourist facilities). The power line will degrade the aesthetic appeal of farms and other properties in terms of beauty and market value.
2. Health risks and impact on radio and TV reception.
3. Concerned about the lifespan of the generation plant as it has "passed its original planned

engineering lifespan". The plant is corroding and Petro SA is starting to lay off staff as the gas field have been depleted. Where is the generation plant going to get diesel to drive the turbines?

4. Can the line not go through the industrial area where it does not have a negative visual impact? Can the line go in the forestry area near the slope of the mountain that has not been used?
5. Development is planned in Aalwyndal and Hartenbos hills, Sunshine Valley. Opposition to the route next to Monte Cristo Estate.
6. The Moss Airfield and training centre, requires low level training for helicopters. Impact on Transnet properties.
7. Transnet Railway Reserve is crossed at various sectors, and Transnet Freight Rail Infra, Bellville, should be contacted when finalising the route.
8. Impact on Blue Cranes, Cori Bustards, Owls etc. The line markers have dropped off and are inefficient on existing lines. New permanent markers should be used.
9. Losses in agricultural land and use of farming equipment will also be restricted near power lines. Use of pivot points will be restricted. New Macadamia plantation planned.
10. Swampy areas and valleys should be avoided.
11. Concerns about effect on ecotourism – Nature Conservancies, game drives and breeding programmes, quad rides Hiking, Bicycle rides and bird watching
12. Maintenance and rehabilitation not being done properly.
13. Wedding Venues and Guest Houses may lose attraction if lines run across the facility grounds. The line will have a financial impact on the international visitors to game lodges as they are attracted there primarily for its unspoilt butty and photographic potential. (photographic tourism venue).
14. Safety aspect during construction was a concern as well, especially during holidays when they do school children holiday programs.
15. There are already two power lines across some farms.
16. Alternatives 2 and 3 are located on level ground above flood lines and are the only area where workers' housing can be constructed. Existing buildings will be impacted upon.
17. The need for the power lines . Where is the electricity going to come from? Does this project imply that more power stations and gas import projects will be required in the Mossel Bay area?
18. On the properties Klipheuwel 143/3 and Rheeboksfontein 140/2, Eskom High Voltage powerlines already exist and another one is located on inland properties, Hartebeeskraal 122//8, A third powerline across the aforementioned properties would seriously impact upon their value for recreational and game purposes.
19. Maintenance issues. Project construction must be given to a suitably qualified and competent private enterprise firm to construct to ensure minimum damage to properties.
20. The alternative (3) route closest to the sea crosses the Little Brak estuary and is also close to intensive agricultural land. These areas support a large population of large birds such as blue cranes and flamingos which are both very susceptible to death from powerlines. Along the route are also extremely rare populations of plants such as *Haworthia Kingania*. Eskom activities will destroy this last remaining population of a very rare plant.
21. Eskom to negotiate a location where no irrigation takes place or on land which is not suitable for irrigation purposes. Avoid placing power line across existing irrigation.
22. Plan tower positions. River crossings, maintenance roads, new bridges or existing, water use licences etc, ecosystem analysis
23. How much water will be needed for construction and which sources will it be derived from
24. Potential loss of source of income if farmers have to close down business
25. Mining of sand, gravel (conglomerate) sometimes requires blasting. How close to lines can we

blast?

26. This line will be traversing a renowned Gondwana Game reserve with predators such as lions. The visual impact on the reserve will be extensive. Concerned that the initial study for socio economic and tourism impact has come to a preconceived notion without any form of site visits. Impact that the power pylons will have on tourism at Nyaru Game Lodge's reserve. Aesthetic views will be degraded influencing tourist experience at the lodge and thus the value of the safaris on the reserve. This is a very important point since Nyaru Game Lodge's main income is derived from tourism.

27. The Outeniqualand/Geelhoutboom area is a high potential, intensive agricultural area and provides a living to thousands of people. The heritage and culture, together with the natural beauty of the landscape serve as attraction for visitors to the area and the foundation of the entire tourism industry. Ensure that our serious objection is recorded and properly studied by the relevant experts. Yellow wood trees, Knysna Loeries and Fungi in the area should be protected. Rare and critically endangered plant species (e.g.: Haworthia kingiana and Haworthia chloracantha var. subglauca) grow on the slopes where the pylons will be constructed. Haworthia kingiana, which is one of the last few populations left in the wild of this critically endangered plant species.

28. Larger birds could be affected by the power cables since they could fly into them. Smaller passerine birds could also be affected by the construction, and consequential habitat destruction of the pylons. One of the most important of these species is the endangered Agulhas Long-billed Lark (*Certhilauda brevirostris*), which occurs in the Mossel Bay Shale Renosterveld, which is the most prominent vegetation type on the reserve. Currently the reserve boasts with a strong population of this species (166), and we do certainly not want that fact to change deue to the construction of the power pylons.

29. The Honey Badger (Mellivora capensis) and Grysbok (Raphicerus melanotis) are two of the many other mammal species. The Spotted Eagle – Owl (Bubo africanus) and Jackal Buzzard (Buteo rufofuscus) are a common sight in the area. Dead Jackal Buzzards and Spotted Eagle-Owls are frequently found under existing power lines. Therefore what will the new proposed power line entail for these species? The farm is also home to the Secretary bird (Sagittarius serpentarius) and a breeding pair of endangered Blue cranes (Anthropoides paradiseus). Many other Blue cranes have been seen flying across the farm to their breeding and nesting sites. Blue cranes regularly collide with power lines, as they fail to see lines.

30. The power line will degrade the aesthetic appeal of farms in terms of beauty and market value. It will also cause a loss in valuable agricultural land, as no crop or pasture may be planted underneath the power line.

31. The use of farming equipment will also be restricted near power lines. The proposed power lines might pose a health risk for the people living near it. These pivots are used for the irrigation of the pastures and are essential for the functioning of the farm. Pivots are spread out over the whole farm, therefore preventing any possible alley way for the proposed power line.

Issues raised during the initial EIA Phase

The main issues of concern that were raised during the Review Period of the DEIAR (see Issues and Response Tables, Appendix J in PPP report) were:

1. Visual Impact on game farms, conference centre and housing developments
2. Fire hazards could increase during construction and maintenance Eskom has a better idea of the situation now where this alternative (Alt 1) transverses this property.
3. engineers to take care not to cross the flood plains unless there is no other option. Visual Impact on Game Farm natural character & tourist facilities
4. New private estates are planned, and will overlook the new line if not placed with care

5. Line could be close to staff housing
6. Roads are used for game drive, mountain bike cycling and walking routes to be avoided
7. Limit physical disturbance of game, in particular breeding camps
8. The lines make a buzzing sound which is not perceived ideal.
9. Would the line pose any health risk to animals?
10. Helicopters are used once or twice a year to dart animals
11. New fences will have to be constructed if the breeding programme must move out of the way of the proposed 400kV line. Eskom will have to contribute towards the cost.
12. Avoid game reserves because of the higher value of such a land use (than agriculture).
13. Some farms are located on soil that is scarce, and is used for vegetables. There are fields and ostrich camps on the entire farm and it will not be economical if a portion is lost to a servitude.
14. Production of ostrich meat for the EU, requires strict access control (because of bird flu etc), even the water is analysed and blood tested if ostriches are to be moved. It will be problematic if Eskom vehicles are on the property for construction or maintenance.
15. There are scarce fungi at the river
16. Some guest houses are of heritage value (1850) that has been in the family for generations.
17. Existing house is located on the boundary of the servitude. If the new line is to be constructed parallel to that line, this will impact very negatively on the house and the plans to convert it into a guest house in future will be impossible.
18. Impact on wedding venue and guesthouses,
19. Plans to plant Avocado trees which will now not proceed if the line is to be constructed on the farm.
20. Land values are much more now and the emphasis is on permanent crops, another line will impact badly on these areas
21. What does it mean to “strengthen the network” Why not upgrade but build a new line? Can we expect another 400kV line in 10 years?
22. Cape Nature has conservation targets (e.g. as on the CBA layers that consultants use in EIAs), and accept that some areas will be lost for conservation. However Cape nature has strong CBA ideas of what can be allowed and in which areas. Much of the land in the region has already been lost to agriculture, so of the natural vegetation has been replaced. Only if these areas are expanded, the impact will need to be carefully considered.
23. There is a new Strategic Development Framework (SDF) that include the precinct plan of Alwynsdal (up to Moss Industria) that may be impacted upon should Alternatives 3 or 4 be approved.
24. There is a Landfill at Industria and a new proposed regional landfill site (access via PetroSA). Noted. Alternative 1 is recommended. Once EA has been received, negotiations will take place with all land owners, including the municipalities.
25. George Municipality’s jurisdiction stretches from Uniondale to Groot Brak. We are pro-development and feel that environmental laws restrict municipalities and businesses too much. We would welcome it if EIA projects could proceed through the system with fewer delays, to promote development in the region. In addition to this, Eskom power is too expensive for Municipalities to make a profit on, and thus cannot be managed sustainably. We will have to find alternative sources such as solar. We support the drive to take away the monopoly of Eskom, in favour of municipal management.
26. Will George Municipality benefit from the project? For instance, we need to connect Uniondale and George via wifi/fibre.

The most important issues can be categorised into the following:

Visual impact – Tourism, Game Lodges, Wedding Venues, Eco estates, property value
Ecological -Impact on birds and wetland areas Disturbance of natural areas - impact on rare plants (Yellow wood trees, fungi, aloe) and animals
Economic issues - loss of farming infrastructure (e.g. pivot point, shade net & storage) and land, disturbance of current activities (e.g. pivot points), loss of tourism resulting in lower income, property values - compensation
Social impact – Job creation, Maintenance and rehabilitation, Cumulative impacts

These particular issues were investigated in more detail during the EIA Phase. Specialist studies have referenced to the issues that have been raised by the public and stakeholders during the Scoping Phase.

Main comment received/Issues raised during the **NEW** EIA Process

a. Eskom is a state-owned utility and the first principle should be that the state uses its own properties over which these linear activities can be undertaken. Our Client alerts the competent authority to the fact that the property to the North and adjacent to our Client's property, is owned by the state and the preferred alternative for the state and Eskom, should be to construct the proposed power lines as well as the incidental infrastructure, over the state owned land and not over..

NB: The above issues and responses are recorded in the CRR (refer to Appendix 3.2)

5 DESCRIPTION OF THE AFFECTED ENVIRONMENT

This section provides a description of the environment that may be affected by the proposed Gourikwa to Blanco project, as stipulated in the EIA Regulations (Appendix 3 Section (h) iv). The requirement is that the description of the footprint should focus on the Geographical, physical, biological, social, economic, heritage and cultural aspects. Wider background to the study area was provided in the Scoping Reports and has included information on the climate, geology, etc and was intended to provide an overview of the affected environment. The environmental specialist studies that were undertaken to inform this EIA Report, have focussed on significant environmental issues of the project.

5.1 Geographical Environmental Attributes/Features

Geographical features are man-made or naturally-created features of the Earth. Natural geographical features consist of landforms and ecosystems.

5.1.1 Climate

The coastal belt has cool, moist to wet winters and warm, moist summers (Koch, 2006). The long-term average annual rainfall is between 800 and 1 000 mm. Average temperatures vary between 12oC (daily min) and 27oC (daily max) in summer and between 6oC (daily min) and 13oC (daily max) in winter. The extreme high temperature that has been recorded is 39.5oC and the extreme low temperature –1.5ºC.

The area normally receives about 662mm of rain per year, with rainfall occurring throughout the year. The lowest rainfall (36mm) occurs in June and the highest (78mm) in November. The average midday temperatures for George range from 18.2°C in July to 27.6°C in February. The region is the coldest during July when the mercury drops below 7°C on average during the night.

5.1.2 Topography, Soils and Geology

The topography in general slopes relatively steeply from the Outeniqua Mountains towards the sea, with foothills just south of the mountains followed by a narrow, flat coastal strip which is interspersed with river valleys.

The soils consist largely of poorly drained soils with a marked clay accumulation becoming seasonally wet and having a high erosion potential. Within the valley floors of the lower river reaches as well as along the coastal strip (cream/pale brown areas) grey sandy soils occur that overlie deeper alluvial soils.

On the slopes of the foothills (grey/brown areas), sandy leeched soils with organic matter overlay hard or weathering rock. Rocks of the Cape Supergroup underlie most of the area, while Pre-Cape and Cretaceous rocks and unconsolidated deposits of recent age occupy smaller areas.

The Pre-Cape rocks comprise the Maalgaten Granite to the west of George. Strata of the pre-Cretaceous Table Mountain Group, which consists mainly of super mature quartz sandstones with subordinate shales, were subjected to severe north-south orientated compressive stresses. This produced the Cape Fold Belt with the more resistant strata, the Peninsula and Kouga Formations, forming the prominent east-west trending mountain ranges. The softer sandstones of the Tchando Formation and the shales of the Cederberg and Baviaanskloof Formations have weathered to form the intermountain and platform valleys.

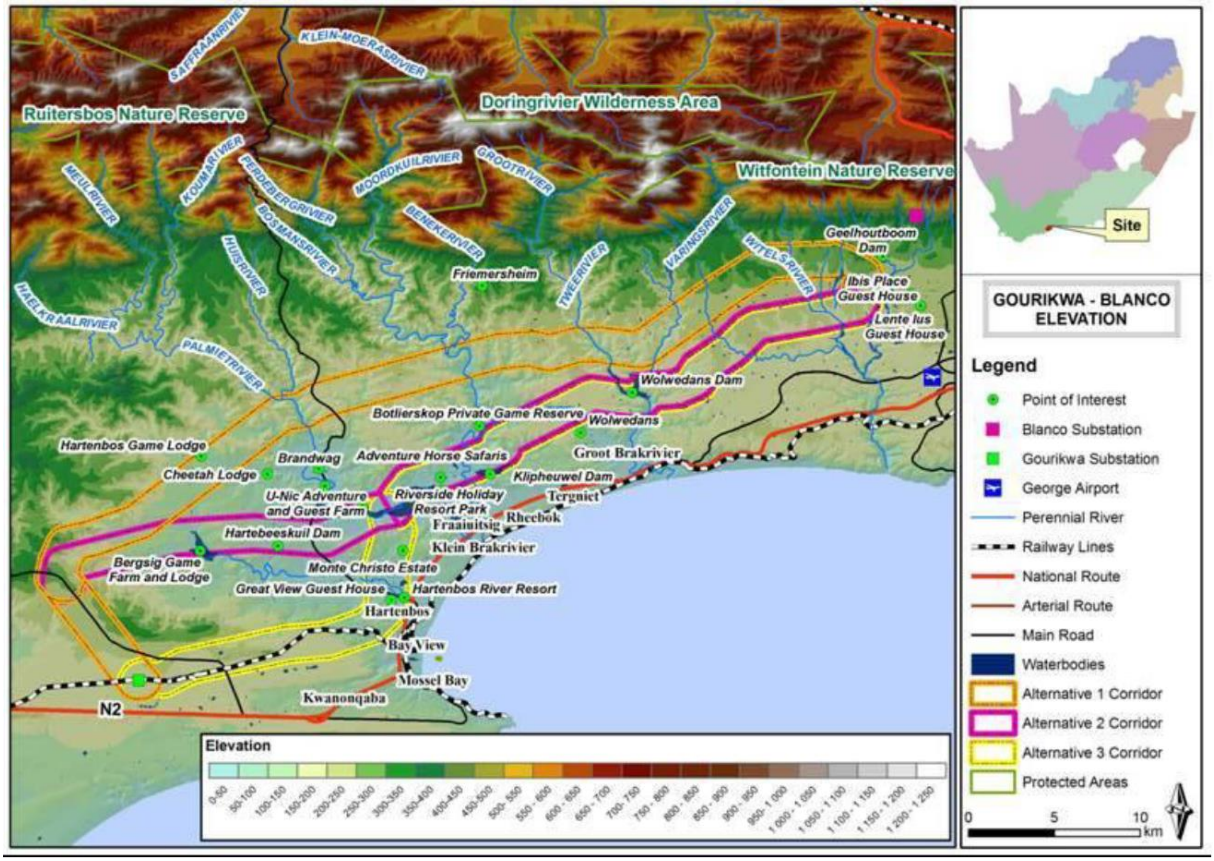

Figure 4. Elevation of the Study Area

5.2 Water Resources

The study area lies in the George and Mossel Bay Municipal areas on the Southern Cape coast. Most of the proposed routes lie within the coastal plain between the foothills of the Outeniqua Mountains and the Indian Ocean. This area falls largely within the catchments of the small coastal rivers in the Gouritz Water Management Area, with most of the rivers being considered to be of a high ecological important and sensitivity. The surrounding land use consists largely of cultivated land and livestock as well as plantations. The vegetation within the river valleys is in general densely invaded with black wattle *Acacia mearnsii* trees.

The study area largely lies within the southern coastal strip between Mossel Bay and George. The topography in general slopes relatively steeply from the Outeniqua Mountains towards the sea, with foothills just south of the mountains followed by a narrow, flat coastal strip which is interspersed with

river valleys. The rivers within the study area are short rivers with a relatively steep gradient that are fed by numerous small tributaries. Numerous storage dams have been constructed within the rivers.

Key information related to water resources which may be impacted upon

Descriptor	Name / details
Water Management Area	Gouritz WMAs
Catchment Area	Lower Gouritz tributaries; Hartenbos; Klein and Groot Brak and Maalgate Catchments
Quaternary Catchment	Lower Gouritz tributaries – Stink and Buffels (J40E); Hartenbos; Klein Brak and small coastal streams (K10A, B, D&F); Groot Brak (K20A); and Maalgate (K30A)
Present Ecological state*	Lower Gouritz tributaries: Stink (C); Buffels (D); Hartenbos, Klein Brak and small coastal streams (D); Groot Brak (C); and Maalgate (D)
EISC – Ecological Importance and Sensitivity	Lower Gouritz tributaries: Stink & Buffels (High); Hartenbos, Klein Brak and small coastal streams (Moderate/High); Groot Brak (High/Very high); and Maalgate (High/Very high)
Type of water resource	Rivers and streams
Latitude	34°09'58.5"S
Longitude	21°57'37.3"E
Latitude	33°55'32.0"S
Longitude	22°22'08.4"E
Status of Environmental authorisation process	This freshwater assessment report is prepared as input into the EIA process

* *Where C = moderately modified; D = largely modified*

- **Rivers**

With the potential impacts of the proposed activities, it is often the access roads associated with the transmission lines that are likely to have a greater impact on the freshwater features than the power lines themselves as the lines can usually span the freshwater features such that the pylons can be constructed outside of the rivers and wetland areas as well as their recommended buffer areas, whereas the roads need to be constructed through the freshwater features. It is thus often best if the new power lines are placed adjacent to existing lines or roads where new roads do not need to be constructed as part of the project.

Biodiversity Conservation Value of the Rivers

River	FEPA status	CBA status
Lower Gouritz tributaries – Stink and Buffels Rivers	No River FEPAs only Valley bottom wetland areas	River corridors and associated wetland areas contained
Some small coastal streams at	FEPA River Catchment and Valley	

River	FEPA status	CBA status
Mossel Bay	bottom wetland areas	within aquatic Critical Biodiversity Area with buffers or within Ecological Support Area
Hartenbos River and its tributaries	Phase 2 FEPA and Valley bottom wetland areas	
Klein Brak and its tributaries	Phase 2 FEPA for Moordkuil Catchment and Valley bottom wetland areas	
Groot Brak and its tributaries	Fish Support Area and Valley bottom wetland areas	
Maalgate River	No River FEPAs only Valley bottom wetland areas	

The Stink and Buffels Rivers are two south-westerly flowing tributaries of the lower Gouritz River that enter the river just upstream of and within the Gouritz Estuary. Only the very upper reaches lie within the corridor of Alternative 1. Both rivers are approximately 30km in length and drain a relatively flat area that has been largely modified by farming activities. As a result the rivers have also been significantly modified with much of the indigenous vegetation along the river banks having been removed.

At Mossel Bay there are a number of small rivers that drain the coastal plain, which is relatively flat or gently undulating and incised by river valleys. The more significant of these streams the occur within the study area are the Blinded River, a small stream which discharges into Vales Bay to the west of Mossel Bay and the Tweekuilen River which rises near the PetroSA refinery and flows for approximately 10 kms to the sea. The surrounding land cover consists of cultivated land interspersed with natural vegetative cover and industrial areas of Mossel Bay (Mossdustria and Voorvaai). The Gourikwa Substation is located at the headwaters of the Blinde River.

The Hartenbos River is approximately 34km long and rises in the coastal plain near Mossel Bay, discharging into the sea via a small estuary at Hartenbos. The surrounding catchment and the river have been modified significantly by grain/wheat farming, livestock grazing, sand mining and urban development (lower reaches). The Hartebeeskuil Dam has also been constructed about 12km upstream of the estuary.

The Klein Brak, Groot Brak and Maalgate Rivers rise in the Outeniqua Mountains east of George. These rivers flow across the narrow coastal plain to the sea near the small towns of Klein-Brakrivier, Groot-Brakrivier and Glentana/Herolds Bay respectively. The rivers are still largely natural within their upper reaches that lie within formally protected areas, however their middle and lower reaches are also progressively impacted by pine forests immediately below the protected areas and then mostly by agricultural activities on the lower lying areas. Urban development tends to only occur near the river mouths. Many of the tributaries and parts of the main stem of the rivers however flow within deep valleys that have not been impacted by the surrounding land use activities.

- **Ecological importance and sensitivity of the rivers**

The ecological importance and sensitivity of the rivers within the study area range from being of a moderate to very high ecological importance and sensitivity. This is due to the fact that these relatively small rivers are very sensitive to flow and water quality changes and contain habitats (such as Gouritz Valley Thicket, coastal riparian forests and link to the Hartenbos, Klein Brak and Groot Brak Estuaries) and biota (frog species and fresh and estuarine fish species including the Knysna or Cape seahorse *Hippocampus capensis*) that are unique to the area.

The Ecological Importance and Sensitivity (EIS) assessment considers a number of biotic and habitat determinants surmised to indicate either importance or sensitivity.

Results of the EIS assessment for the tributaries within the study area

Biotic Determinants	Lower Gouritz tributaries – Stink and Buffels Rivers	Some small coastal streams at Mossel Bay	Hartenbos River and its tributaries	Klein Brak and its tributaries	Groot Brak and its tributaries	Maalgate River
Rare and endangered biota	2	2	3	4	4	3
Unique biota	2	2	3	4	4	3
Intolerant biota	3	3	3	3	3	3
Species/taxon richness	2	2	3	4	4	3
Aquatic Habitat Determinants						
Diversity of aquatic habitat types or features	2	2	3	4	4	2
Refuge value of habitat type	2	2	2	3	3	3
Sensitivity of habitat to flow changes	2	3	3	3	3	3
Sensitivity of flow related water quality changes	2	3	3	3	3	3
Migration route/corridor for instream and riparian biota	3	2	3	3	3	2
National parks, wilderness areas, Nature Reserves, Natural Heritage sites & areas, PNEs	1	1	2	4	4	2
Median	2.1	2.1	2.8	3.5	3.5	2.7
EIS CATEGORY	Moderate/ High	Moderate/ High	High	Very high	Very high	High

Freshwater fish species that are endemic to these rivers are retail barb *Barbus Gurney* that occur within the tributaries of the lower Gouritz River, as well as Cape galaxias *Galaxia zebra Tus*, Cape Kuyper *Scandella cadences* and Eastern Cape red fins *Pseudobarbus afer* that occur in the Southern Cape rivers. These fish species all have a *Near threatened* conservation status. The Knysna seahorse has been formally recognized as endangered by the World Conservation Union as it has the most limited distribution of all seahorse species and is the only estuarine seahorse species.

Approximately 60km of 400kV power line is being considered from the Gourikwa Substation to the new Blanco Substation. Four alternative routes (Alternative 3 is a deviation of Alternative 2 and Alternative 4 represents a combination of Alternative 1 to 3, taking into consideration mapped

constraints in the basic assessment process) are being considered where a 2km wide corridor is being investigated for all the route alternatives. These alternative route will need to cross the small coastal rivers that occur within the coastal strip between Mossel Bay and George, either crossing the upper reaches of the rivers (Alternative 1) or the middle reaches (Alternative 2), or in the case of the deviation of Alternative 2, the lower reaches of the rivers in the western portion of the study area. Alternative 4 would thus cross lower to middle reaches of rivers in the western portion of the study area and upper reaches in the eastern portion.

With the potential impacts of the proposed activities, it is often the access roads associated with the transmission lines that are likely to have a greater impact on the freshwater features than the power lines themselves as the lines can usually span the freshwater features such that the pylons can be constructed outside of the rivers and wetland areas as well as their recommended buffer areas, whereas the roads need to be constructed through the freshwater features. It is thus often best if the new power lines are placed adjacent to existing lines or roads where new roads do not need to be constructed as part of the project.

In terms of the selection of the route selection for the transmission lines, it is recommended that a buffer of 50 from the top of the river banks and/or approximately 100m from the edge of the wetland areas be allowed for as a development setback for the construction of the pylons. This recommended buffer would also apply to the Narina Substation (Alternative 5 site approved by DEA on 1 September 2016).

Although the upper reaches of the rivers in the study are in general in a less modified ecological state, the alternative corridor with the least potential impact on the freshwater features in the area is likely to be the northern-most route (Alternative 1) as it would be more likely to be able to span the river valleys with little to no impact on the rivers and associated wetlands at the valley bottoms, while the southern corridors (Alternative 2, the Deviation of Alternative 2 or Alternative 3 and Alternative 4) will need to cross the wide floodplains of the rivers. The alignment of the route within the corridor could also be determined to minimise the potential impact on the freshwater features within the study area.

All of the streams in the area are considered to be a high ecological importance as well as being relatively sensitive to disturbance. They are however all already mostly in a moderately to largely modified ecological state. Within the study area however, the aquatic features that are of particular importance and sensitivity from an aquatic ecological point of view are the estuaries and associated floodplain wetlands of the Hartenbos, Klein Brak and Groot Brak Rivers. In terms of the selection of the route selection for the transmission lines, the potential freshwater impacts associated with the alternative power line routes is very similar if positions and mitigated as recommended. It is recommended that a buffer of 50 from the top of the river banks and/or approximately 100m from the edge of the wetland areas be allowed for as a development setback for the construction of the pylons. This recommended buffer would also apply to the proposed new Narina Substation. The preferred route will need to as far as possible avoid these areas or make use of existing access roads and disturbed areas. Although the upper reaches of the rivers in the study are in general in a less modified ecological state, the alternative **corridor with the least potential impact on the freshwater features in the area is likely to be the northern-most route (Alternative 1) as it would be more likely to be able to span the river valleys with little to no impact on the rivers and associated wetlands at the valley bottoms,** while the southern corridors (Alternative 2, Alternative 3 and Alternative 4) will

need to cross the wide floodplains of the rivers. The alignment of the route within the corridor could also be determined to minimise the potential impact on the freshwater features within the study area.

A water use authorization may need to be obtained from the Department of Water and Sanitation: Western Cape Regional Office for approval of the water use aspects of the proposed activities.

5.3 Agriculture

During the Scoping investigation, it was found that no map units occur where more than 50% of the soils are of high potential. The areas with the highest proportions occur in the western half of the study area, along the Hartenbos and Little Brak Rivers. Alternative 1 crosses a smaller proportion of such zones, while Alternatives 2 and Alternative 3 cross more high potential soils.

During the EIA Phase specialist investigation (Terragis 2016), the agricultural field areas that were identified for the alternatives were distributed as shown in the image that follows:

Agricultural field areas (ha) for the different alternative routes

	Agricultural Field Type (ha)					
Route and alternative	Annual crop cultivation / planted pasture rotation	Horticulture	Viticulture	Shade net	Pivot irrigation	Old fields
Gourikwa-Blanko Alt1	4440.3	111.8	-	1.5	431.5	1.9
Gourikwa-Blanko Alt2	4694.5	10.0	-	4.0	609.3	-
Gourikwa-Blanko Alt3	2980.0	10.0	-	4.0	585.2	-
Gourikwa-Blanko Alt4	2904.0	139.4	-	1.8	340.1	1.9

More detail regarding the agricultural composition along the respective alignments was obtained. The two maps below show the distribution of the Field Types along the line alternatives:

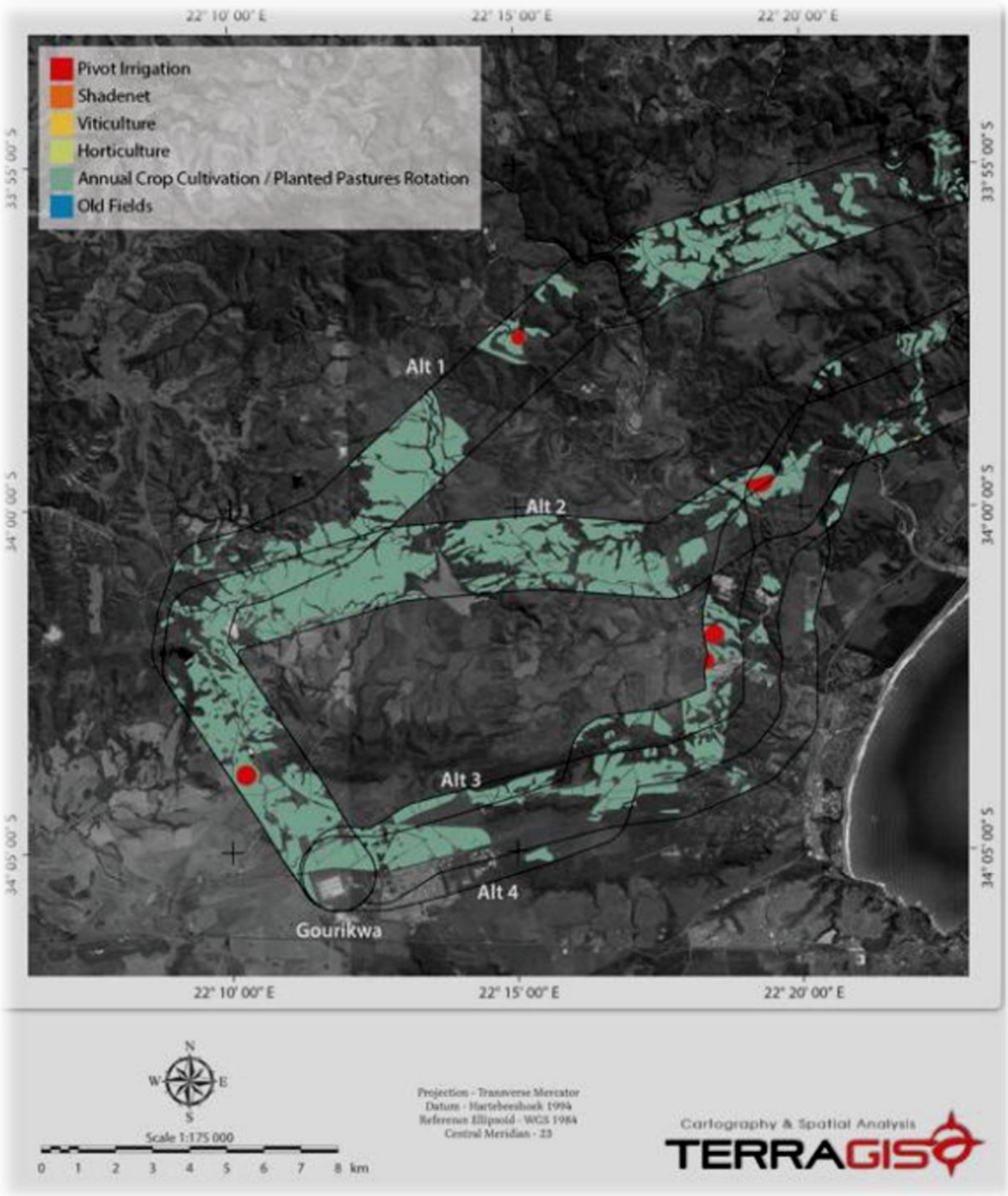

Figure 5 Agricultural Field Types Map 1

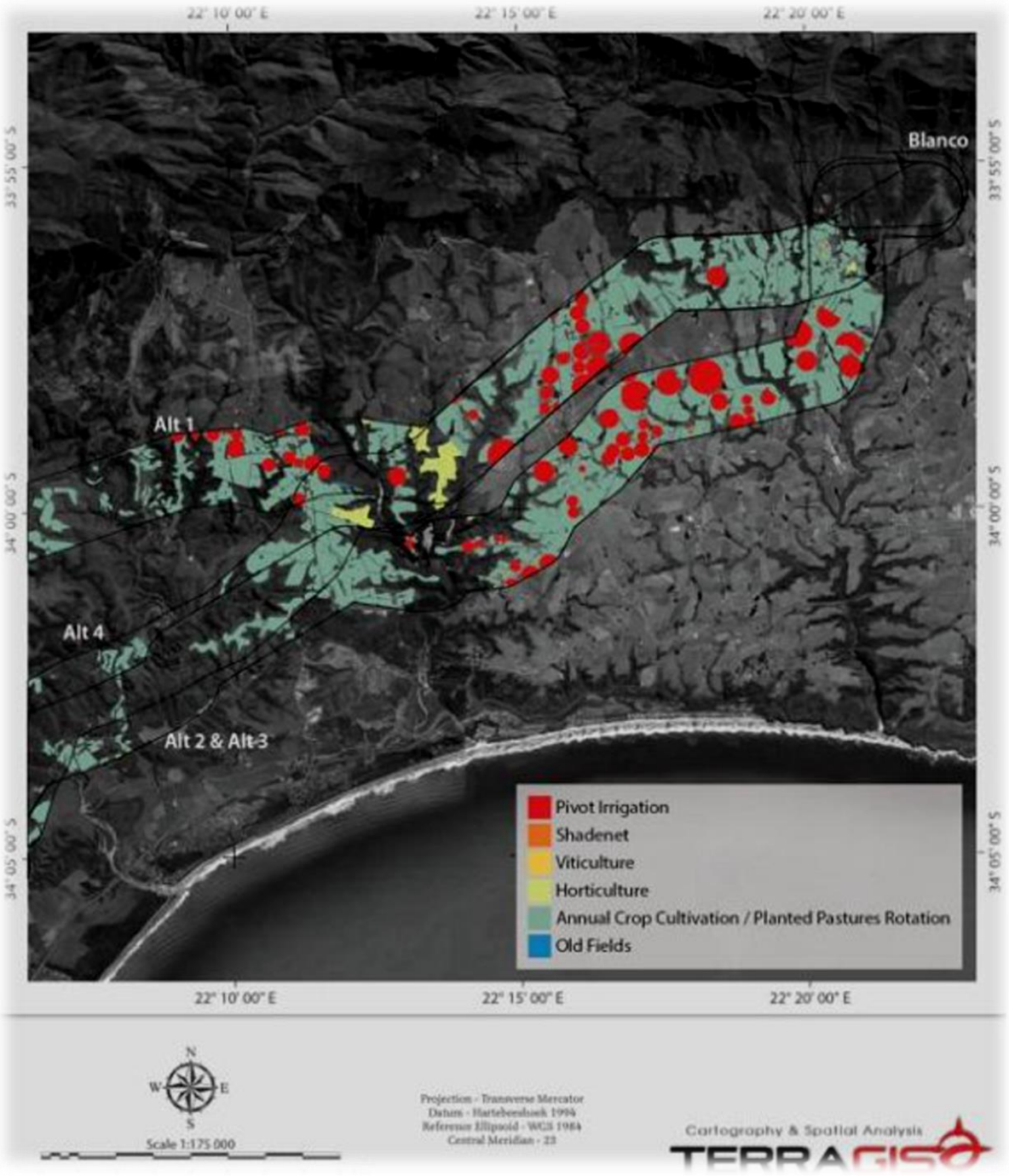

Figure 6 Field Types Map 2

- **Irrigated land**

In terms of irrigation, the areas within the study area under irrigation coincide with the zones with the highest potential soils, along the rivers mentioned above. Such irrigation will mostly be operative in the hotter, drier summer months. The coastal belt (south of the study area) has sufficient rainfall for dry-land cultivation, where suitable soils occur.

Spanning such areas with a transmission line might well be problematic, so more in-depth studies would need to be carried out at potential crossing points to avoid active areas of irrigation, such as centre-pivots or any overhead sprayers.

○ Soil Erosion Hazard

Erosion is a natural, though long-term, process and without it, soil formation would not occur. However, when the process is unnaturally accelerated, usually by human intervention, the results can be severe. The two forms of soil erosion are wind erosion, where sandy topsoils that become exposed may be removed in the dry season by the action of wind, and water erosion, where topsoils that become exposed can be washed away by water flowing over the soil surface.

The study area is not one where significant zones of soils susceptible to water erosion occur (le Roux et al., 2008). Susceptible areas would generally include soils where sandy topsoils abruptly overly more clayey, usually structured subsoils ("duplex" soils), but in a relatively high rainfall area such as the southern Cape coastal belt (Section 2.4), there will generally be enough of a vegetation cover to ensure that water erosion does not occur, except in isolated extreme cases. This is supported by the absence of areas of sheet erosion, as recorded in the National Land-Cover Database (CSIR, 2005). In addition, there are only isolated erosion gullies that have been mapped.

Wind erosion is also not potentially a serious problem for most of the study area. The topsoils are not excessively sandy, and the low rainfall means that grazing pressures are generally low, although organic carbon levels for the area are generally between 0.5% and 1.0% (Schoeman & van der Walt, 2004).

○ Project impacts on Agriculture

The construction of a transmission line has only isolated impacts on the soil resource, due to the relatively small, separated footprints of the pylons. However, if an access road is constructed, especially in steeper areas or where erodible soils occur, the possibility of accelerated soil erosion is a reality.
Mitigation: Specific soil conservation measures, such as contouring, culverts and diversion channels would need to be considered in susceptible areas. In addition, regular monitoring of such roads would need to be carried out.

Regarding cultivation and agricultural potential, the main susceptible areas would be areas of irrigation, such as where the transmission line crosses rivers.
Mitigation: Here, care should be taken to avoid any areas where irrigation is currently being practiced.

All four alternatives cross agricultural land with grazing land, central pivot irrigation, fruit trees and planted dry lands. A large percentage of agricultural activities can still continue unhindered, but there will be some economic losses. From aerial photos, it seems as if the crossing of prime agricultural land seems to be the least with Alternative 1. From an economic point of view, Alternative 1 is preferred given that this is the shortest option, with the least number of bends. It also seems to be the option that will have the least impact on prime agricultural land.

Figure 7: Farming activities under Alternative 1 line (just north of Varingsrivier)

- **Grazing Capacity**

The coastal belt has a relatively favourable situation, with the capacity in the range of 5-10 ha/lsu, compared to around 14-20 ha/lsu or more in the Klein Karoo (Schoeman & van der Walt, 2004). This classification does not apply to game farming, where more detailed specialized knowledge is required, mainly in terms of relating plant species composition in both the grass layer and woody layer to the requirements of various grazing and/or browsing species of game.

5.4 Biological Environmental Attributes

5.4.1 Nature Reserves

A number of Private Game Reserves and Game Farms are located in the study area. **Nature Reserves in the area include the following:**

- The Gamka Nature Reserve covers most of the Gamka Mountain range. The reserve was established in 1974 with the objective to conserve a population of endangered Cape Mountain Zebra and their natural habitat.
- The Goukamma Nature and Marine Reserve is situated in the vicinity of Sedgefield between George and Knysna. The 2 500 ha nature reserve, with a coastline of 14 km, and the adjacent marine reserve extend seawards for 1.8 km. It includes a long beach, an extensive dune field with some of the highest vegetated dunes in South Africa, the Goukamma River and its estuary, and the Groenvlei Lake.
- The Outeniqua Nature Reserve is located near George and is accessible from Mossel Bay, Knysna and Oudtshoorn. The primary function of this nature reserve is the conservation of water resources.
- The Swartberg Nature Reserve is situated in the vicinity of Oudtshoorn in the Swartberg Mountains between the Great and Little Karoo.

Conservation Areas	Size	Managed by
Gamka Mountain Nature Reserve	10 428 ha	WCNCB
Goukamma Nature and Marine Reserve	2 900 ha	WCNCB
Grootvadersbosch Nature Reserve	250 ha	WCNCB
Boosmansbos Wilderness Area	15 202 ha	WCNCB
Keurbooms River Nature Reserve	740 ha	WCNCB
Outeniqua Nature Reserve	38 000 ha	WCNCB
Gamkapoort Nature Reserve	12 176 ha	WCNCB

5.5 Ecology

5.5.1 Vegetation

The specialist study for the EIA phase (Du Preez 2016) has confirmed that the section between Narina substation and Gourikwa substation is located over highly transformed land. The natural vegetation has been replaced by crops and planted pasture. There are areas with natural vegetation and here the clearing of vegetation and digging of pylon foundations will affect the footprint areas and the area directly around it. It is unlikely that significant amount of natural habitat will be lost.

Much of the indigenous vegetation within the coastal plan has been transformed by agriculture, with only the steeper hill and mountain slopes still containing largely indigenous vegetation. Within the river valleys, indigenous vegetation still remains within narrow riparian zones but has become invaded by alien shrubs and trees such as black wattles *Acacia mearnsii* and *Eucalyptus sp*. Sedges and reeds occur within the stream channels. The study area lies within the Fynbos Biome and, according to Marcina (2006) consists of the following indigenous vegetation types:

Vegetation Type	Conservation Status	Colour in Figure 9
Garden Route Shale Fynbos (FFc1)	Endangered	
Garden Route Granite Fynbos (FFg5)	Endangered	
Groot Brak Dune Strandveld (FS9)	Endangered	
South Outeniqua Sandstone Fynbos (FFs19)	Vulnerable	
North Langeberg Sandstone Fynbos (FFs15)	Least threatened	
Albertina Sand Fynbos (FFd9)	Vulnerable	

Much of the indigenous vegetation within the coastal plan has however been transformed by agriculture, with only the steeper hill and mountain slopes still containing largely indigenous vegetation. Within the river valleys, indigenous vegetation still remains within narrow riparian zones but has become invaded by alien shrubs and trees such as black wattles *Acacia mearnsii* and *Eucalyptus* sp. Sedges and reeds occur within the stream channels.

The regional data indicates that the extent of intersection of highly threatened aquatic and terrestrial **vegetation types that are still ecologically intact will be highest in alternative 3.** Alternatives 1 and 2 do not differ much in terms of intersection of CBA's. Both Alternatives 1 and 2 intersect areas that contain known populations of threatened plant species. The data regarding occurrence of

threatened species are not complete and several other threatened species populations may occur along the proposed corridors.

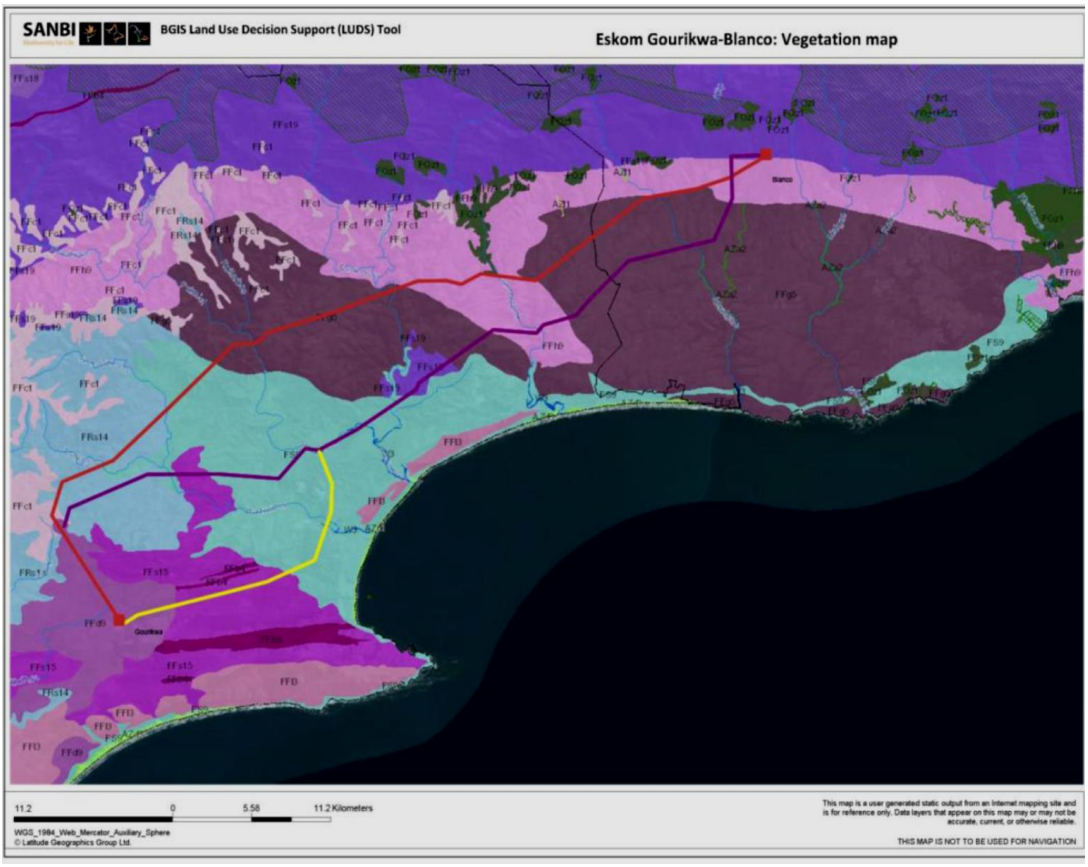

Figure 8: Vegetation map

The specialist study for the EIA phase (Du Preez 2016) has confirmed that several Red data protected and species occur within the vicinity of the project area. There is a potential for Red data species as well as species protected within the relevant provincial and national legislations to occur at or near the pylon sites. The Red Data, protected and any other species a loss of individuals or localised populations is unlikely to lead to a change in the overall conservation status of these species. However, in the case of threatened plant species, loss of a population or individuals could lead to a direct change in the conservation status of the species and possible extinction. This may arise if the proposed pylon construction and bush clearing will destroy such a species' habitat.

There is a slight likelihood for some impacts such as an increase in surface runoff into the drainage system and the spread of erosion into the system might occur but as the pylon positions are widely spaced and their positions can be changed, the possibility exist to totally avoid impacts on a stream. Therefore the extent of these impacts can be regarded as moderate and with the necessary monitoring and mitigation measures in place, these impacts on the ephemeral drainage line can be avoided.
For any other species a loss of individuals or localised populations is unlikely to lead to a change in the overall conservation status of these species. However, in the case of threatened plant species, loss of a population or individuals could lead to a direct change in the conservation status of the species and possible extinction. This may arise if the proposed pylon construction and bush clearing will destroy such a species' habitat. Fortunately, due to the ability of the vegetation partly restores itself (succession) the vegetation will grow back if ESKOM stop the bush clearing actions. However it

will take many years (40+) to restore the vegetation in a natural way. Even then the restoration would still not be exactly as before the disturbance. (Du Preez 2016).

Figure 9: Example of vegetation that has re-established around the pylon footprint

In this highly transformed areas there are be some impacts (agricultural origin) already affecting the ephemeral streams. An additional set of impacts caused by a pylon in or very close to a stream could contribute to cumulative impacts.

There is a slight likelihood for some alien invasive species might colonise the disturbed areas. Their impacts could be disastrous for the population of Red Data and other protected species because of their restricted habitats Therefore the extent of these impacts can be regarded as moderate and with the necessary monitoring and mitigation measures in place, these impacts on the natural vegetation can be limited (Du Preez 2016).

Figure 10: Gondwana Game Reserve landscape

Figure 11. Vegetation in the Study Area

A list of Indigenous Plant Species was received from the Brandwag Farmers Association (via Pierre Fourie from the Nyaru Game Reserve), regarding species that can been found in the **remaining natural** areas (reserves) between Mossel Bay and George. The list was included in the Scoping reports. For the EIA Phase of the project, EnviroNiche Consulting was appointed to undertake a floristic impact assessment to determine the impacts which may be triggered by the proposed development. The requirements of this assessment were to undertake a specialist study to assess the floristic biodiversity and ecology of this proposed linear development as well as to determine the significance of the impacts this proposed 400kV powerline will have within the identified project site. New plant lists are included in the EIA phase (2016) specialist study report.

The EIA Phase specialist study has confirmed that a number of vegetation types in the project area are listed as Critical Biodiversity Areas (CBAs) and threatened ecosystems. The reasons why these vegetation types are listed as endangered ecosystems are because they have a relatively high plant species diversity but due to human impacts, especially agricultural practices such as ostrich, sheep and goat farming as well as crop production, relatively few natural areas remain in these vegetation types.

Route alternatives between Blanco substation and Gourikwa substation:

The ancient coastal terrace between the Outeniqua Mountains and the present coastline has been eroded over millions of years to form an extensive undulating plain dissected by numerous streams. This created a landscape of roundish crests, gentle slopes and relatively deep valleys. Agricultural activities almost destroyed the entire region's natural vegetation. Isolated pockets of natural vegetation remain in those areas unsuitable for crop production. This is the reason why the vegetation types between Gourikwa and Blanco substations are listed as Critical Biodiversity areas.

All four route alternatives cut across almost all the CBAs present between the Gourikwa and Blanco substations except Alternative 1 which does not cut across the Groot Brak Duine Strandveld (Status: Endangered). The Gourikwa substation is situated on the Albertinia Sand Fynbos (Status: Vulnerable). The other vegetation types are the Swellendam Silcrete Fynbos (Status: Vulnerable), the Mossel Bay Shale Renosterveld (Status: Endangered), Groot Brak Duine Strandveld (Status: Endangered), Garden Route Granite Fynbos (Status: Endangered), The Garden Route Shale Fynbos (Status: Vulnerable). All these vegetation types are situated on crests and slopes. The only vegetation type restricted to the drainage lines (rivers and streams) is the Cape Lowland Alluvial Vegetation (Status: Critically Rare). This particular vegetation type is dominated by shrubs and trees which occur along the steep slopes and in deep valleys where water accumulates. This Cape Lowland Alluvial Vegetation will not be negatively affected by any of the power line alternatives because the pylons will only be on high-lying ground.

The entire landscape has been transformed. Almost all areas, with arable soil, have been ploughed and subsequently the natural vegetation has been destroyed. Where natural vegetation occur the typical structure of the natural vegetation present along these route alternatives is a relatively low fynbos or renosterveld of varying densities. According to the Plants of South Africa species list (POSA) the total number of Red Data plant species present in the quarter degree squares which will be crossed by the power line alternatives are 195. The majority of these Red Data plant species present in the quarter degree squares are bulbs, forbs, succulents and creepers. However a number shrubs which are dominated by proteas and ericas also occur. This means that if the power line corridor will be cleared of shrub vegetation, a relatively large portion of Red Data species would not be destroyed. In terms of the environmental impacts of the powerline Alternative 1 and Alternative 2 cut across larger areas of natural vegetation. It is therefore recommended that Alternative 3 or Alternative 4 be considered as the preferred power line route none of the routes can and the relatively short distances of sensitive vegetation types that will be affected by the construction and maintenance of Alternative 1, Alternatives 3 and 4 are regarded as the better options.

There are two existing power lines that go across the Outeniqua Mountains. Here pockets of natural forest occur on the sea side of the Outeniqua Mountains. The proposed powerline route is parallel to these existing power lines. Care must be taken not to plan the power line over any of these forests. In

terms of the National Forest Act (Act 84 of 1998), the protected tree species present within the project site corridor are the Yellowwood species (*Podocarpus falcatus* and *P. latifolius*). In case these trees will be affected permits must be obtained to cut or remove them.

5.5.2 Fauna

During the EIA phase, a specialist faunal study was undertaken by Coastal& Environmental Services (August 2016). It was found that, due to the high aridity in the northern parts of the project area, faunal diversity is relatively low, particularly for aquatic species and large herbivores. However, many desert-adapted reptiles are endemic or near-endemic to the region. Much of the historical large mammal fauna in the region was greatly reduced or even extirpated during the 19th-20th century, although some have subsequently been re-introduced into Private Game Reserves and Protect Parks within the study area. According to historical records, 69 species of reptile, 22 species of frog and toad, 314 species of bird, and 90 species of mammals have distribution ranges which include or are part of the project area (ADU, 2015; IUCN, 2015; SABAP2).

A list was received from the Brandwag Farmers Association (via Pierre Fourie from the Nyaru Game Reserve), regarding animals that have been found in the remaining natural areas (reserves) surrounding Mosselbay. The list formed part of the Scoping Report. Most animal species are difficult to spot due to their small size, their nocturnal habits or restriction to the wilderness areas of conservation areas (such as Nyaru Game Reserve, the Gondwana Private Game Reserve, Botlierskop Private Game Reserve and the Hartenbos Nature Reserve areas).

Mammals

During the EIA phase specialist investigations, seventeen (17) mammal species were recorded during the survey. Mammal species were identified by: i) direct observation, ii) scat/pellet identification, iii) identification of tracks (spoor). One SCC was recorded, namely the White Rhinoceros (Ceratotherium simum), which was observed in a private reserve (which will remain undisclosed). See Annexure A-3 of the Faunal Specialist reports for a full species list.

Numerous ‘exotic’ species such as the Sable Antelope (*Hippotragus niger*) seen above have been introduced into the area following the boom in rare game breeding. As many areas throughout the project area have been fenced off by private game farmers, more and more non-native mammal species are being introduced into the project area.
From a mammalian perspective the majority of these species discussed are highly mobile and are unlikely to be impacted on directly or significantly by the proposed powerline development.
However,for less mobile species such as the Fynbos Golden Mole (*Amblysomus corriae*), the Long-Tailed Forest Shrew’s (*Myosorex longicaudatus*), and Duthie's Golden Mole (*Chlorotalpa duthieae*), impacts are likely to be more significant during the construction phase.

One Endangered, one Protected, and one Vulnerable mammal species have distributions that coincide with the project area and are listed on National Environmental Management: Biodiversity Act (NEMBA). NEMBA identifies species that have a high conservation value or national importance that require national protection (DEAT 2007). Additionally, 6 species are listed on the IUCN Red Data List under varying statuses. For a full list of mammal species with distributions which include the project area, please see appendix A-3 of the Faunal Specialist Report.

Scientific Name	Common Name	IUCN	NEMBA	CITES	PNCO
Amblysomus corriae	Fynbos Golden Mole	NT	-	-	-
Ceratotherium simum	White Rhinoceros	NT	-	Appendix II	Schedule 1
Chlorotalpa duthieae	Duthie's Golden Mole	VU	-	-	-
Diceros bicornis	Black Rhinoceros	CR	Endangered	Appendix I	Schedule 1
Hyaena brunnea	Brown Hyaena	NT	-	-	Schedule II
Mellivora capensis	Honey Badger	-	Protected	-	Schedule II
Myosorex longicaudatus	Long-tailed Forest Shrew	VU	-	-	Schedule II
Mystromys albicaudatus	White-tailed mouse	EN	-	-	-
Panthera pardus	Leopard	NT	Vulnerable	Appendix I	Schedule II

Figure 12 (a,b,c): Mammals of conservation concern likely to occur in the project area

Reptiles

During the EIA phase specialist investigations, a total of three (3) reptile species (Blue-Spotted Lizard, Knysna Dwarf Chameleon and South African slug eater) were recorded during the survey . See Appendix A-1 of the Specialist Faunal Report for a full species list of reptile species which may occur within the project area.

Species: Blue-Spotted lizard (*Ninurta coeruleopunctatus*)

Status: Least Concern, endemic to Eastern and Western Cape provinces with a restricted range. **Schedule II on PNCO.**

Location: North of Molen Drift, George (33°54'42.95"S 22°21'41.44"E). **Found in rocky habitat at proposed Narina Substation 5.**

Species: Knysna Dwarf Chameleon (*Bradypodion damaranum*)

Status: Least Concern, endemic to Eastern and Western Cape provinces with a restricted range. **Appendix II on CITES.**

Location: Molen Drift, George (33°56'44.87"S 22°21'6.40"E). **Found in riparian alien stands within buffer of alternatives 1, 2 and 4** (eastern section of project area).

Species: South African slug-eater (*Duberria lutrix lutrix*)

Status: Least Concern, Widespread. **Schedule II on PNCO**

Location: Found at Wolwedans dam Wolwedans (33°59'50.07"S 22°12'48.43"E). **Within buffer of alternatives 2 and 4**.

Cape Girdled lizard (*Cordylus cordylus*) recorded on proposed alternative 1.

Figure 12 (a,b,c): Reptile species identified during the EIA Phase specialist study

Amphibians

For the EIA phase, a field survey was carried out by the specialists (Coastal and Environmental Services) from the 22nd to the 27th of July 2017. During the EIA phase specialist investigations four (4) species of amphibians were recorded during the survey. All species of frog and toad appear on Schedule II of the PNCO.

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Species: Cape river frog (*Amietia fuscigula*)

Status: Least Concern, Widespread

Location: North of Molen Drift, George (33°54'42.95"S 22°21'41.44"E)

Species: Clicking Stream Frog (*Strongylopis grayii*)

Status: Least Concern, Widespread

Location: Molen Drift, George (33°56'39.34"S 22°21'10.05"E)

Species: Boettger's Caco (*Cacosternum boettgeri*)

Status: Least Concern, Widespread

Location: Wolwedans dam, Wolwedans, (34° 0'35.70"S 22°13'2.78"E)

Species: Raucous Toad (*Amietophrynus rangeri*)

Status: Least Concern, Widespread

Location: Wolwedans dam, Wolwedans, (34° 0'35.70"S 22°13'2.78"E)

Figure 13 (a,b,c,d): Amphibian species identified during the EIA Phase specialist study

5.5.3 **Avifauna**

Regional Overview of Birds: As result of the wide diversity of habitats found along the route of the proposed powerline there is a considerable number of bird species which have been recorded in the region (SABAP2). Bird records from the area have identified 314 bird species and the importance of the region is recognised by the presence of the Outeniqua Important Bird Area (IBAs), coastal habitats, numerous wetlands, and the ecotone between thicket and fynbos habitats. A total of 174 bird species were recorded during the survey, including 12 bird SCC and 6 'powerline priority species'. Please see Appendix A-1 for a full species list.

Birds of conservation concern: There have been 30 bird species of conservation concern (SCC) recorded in the area of the proposed powerline and alternative route (**Table 7**) of which four (4) are recorded as regionally endangered (EN).

Table 7: Bird SCC recorded along the Gourikwa-Blanco powerline routes

Common Name	Scientific name	Global Status	Regional Status	Recorded during survey
Bustard, Denham's	*Neotis denhami*	**NT**	**VU**	✓
Bustard, Ludwig's	*Neotis ludwigii*	**EN**	**EN**	✓
Buttonquail, Hottentot	*Turnix hottentottus*	**EN**	**EN**	-

Crane, Blue	*Anthropoides paradiseus*	**VU**	**NT**	✓
Curlew, Eurasian	*Numenius arquata*	**NT**	**NT**	-
Duck, Maccoa	*Oxyura maccoa*	**NT**	**NT**	-
Eagle, African Crowned	*Stephanoaetus coronatus*	**NT**	**VU**	-
Eagle, Martial	*Polemaetus bellicosus*	**VU**	**EN**	-
Eagle, Verreaux's	*Aquila verreauxii*	LC	**VU**	✓
Falcon, Lanner	*Falco biarmicus*	LC	**VU**	✓
Finfoot, African	*Podica senegalensis*	LC	**VU**	-
Flamingo, Greater	*Phoenicopterus ruber*	LC	**NT**	-
Flamingo, Lesser	*Phoenicopterus minor*	**NT**	**NT**	-
Flufftail, Striped	*Sarothrura affinis*	LC	**VU**	✓
Harrier, Black	*Circus maurus*	**VU**	**EN**	✓
Kingfisher, Half-collared	*Alcedo semitorquata*	**LC**	**NT**	✓
Korhaan, Southern Black	*Afrotis afra*	**VU**	**VU**	✓
Lark, Agulhas Long-billed	*Certhilauda brevirostris*	LC	**NT**	-
Lark, Barlow's	*Calendulauda barlowi*	LC	**NT**	-
Marsh-harrier, African	*Circus ranivorus*	LC	**EN**	✓
Pipit, African Rock	*Anthus crenatus*	LC	**NT**	-
Rock-jumper, Cape	*Chaetops frenatus*	LC	**NT**	-
Roller, European	*Coracias garrulus*	**NT**	**NT**	-
Secretarybird, Secretarybird	*Sagittarius serpentarius*	**VU**	**VU**	✓
Stork, Black	*Ciconia nigra*	LC	**VU**	-
Tern, Caspian	*Sterna caspia*	**LC**	**VU**	-
Tern, Damara	*Sterna balaenarum*	**NT**	**CR**	-
Vulture, Cape	*Gyps coprotheres*	**EN**	**EN**	-
Warbler, Knysna	*Bradypterus sylvaticus*	**VU**	**VU**	-
Woodpecker, Knysna	*Campethera notata*	**NT**	**NT**	✓

Powerline Priority Bird Species: The Eskom–Endangered Wildlife Trust Strategic Partnership has identified several interactions between birds and electrical infrastructure, highlighting the significant impacts that electrification can have on birds (Smallie *et al*., 2009). Research indicates that the birds most prone to powerline (and associated infrastructure) impacts include vultures, eagles, cranes, bustards, storks, and flamingos (Smallie *et al*., 2009), many of which are found within the proposed project area. The list of "powerline priority species" found below (**Table 8**) is based on the bird species described in Smallie *et al.,* (2009), as well as electrocution and collision data relevant to the proposed powerline routes supplied by the Endangered Wildlife Trust (2016) and Eskom (2016). Although not all species listed are considered SCC, species which have historically been impacted on by powerline developments have been included. The list takes into account the likeliness of priority species to occur within/traverse the proposed alternatives.

Table 8: Gourikwa-Blanco Powerline Priority Species List

Common Name	Scientific name	Global Status	Regional Status	Electrocutions/ collisions recorded by EWT/Eskom
Bustard, Denham's	*Neotis denhami*	**NT**	**VU**	-
Crane, Blue	*Anthropoides paradiseus*	**VU**	**NT**	✓
Eagle, African Crowned	*Stephanoaetus coronatus*	NT	**VU**	-
Eagle, Martial	*Polemaetus bellicosus*	**VU**	**EN**	✓
Eagle, Verreaux's	*Aquila verreauxii*	LC	**VU**	-
Eagle-owl, Cape	*Bubo capensis*	LC	LC	✓
Eagle-owl, Spotted	*Bubo africanus*	LC	LC	✓
Goose, Spur-winged	*Plectropterus gambensis*	LC	LC	✓
Secretarybird, Secretarybird	*Sagittarius serpentarius*	**VU**	**VU**	-
Stork, Black	*Ciconia nigra*	LC	**VU**	-
Stork, White	*Ciconia ciconia*	LC	LC	✓

Bird species most likely to be impacted on by the proposed powerline are described below.

Denham's Bustard (*Neotis denhami*), a regionally Vulnerable species, was recorded in fynbos on the foothills of the Outeniqua Mountain Range while conducting a driven transect along a section of proposed alternative 1. The species is known to occasionally frequent cultivate fields. As the species typically breeds in grasslands and lowland fynbos, proposed alternative 1 is likely to have the greatest impact on the species.

The globally Vulnerable **Blue Crane** (*Anthropoides paradiseus*) was recorded in cultivated pastures in the eastern section of the project area. In the Western Cape this species is known to frequent agricultural fields, mostly composed of cereal crop fields and planted pastures. As the species have frequent local movements (usually from one agricultural area to another), all of the proposed powerline routes are likely to have an impact on the species. Powerline related mortalities for the species have been recorded in the project area (EWT, 2016).

The regionally Vulnerable **African Crowned Eagle** (*Stephanoaetus coronatus*) was not recorded during the field survey. However, the species has been recorded in the project area (SABAP2). The species prefers forest, alien plantations, and dense gorges. Based on the species habitat preference, proposed alternative 1 is likely to have the greatest impact on the species.

The globally Vulnerable and regionally Endangered **Martial Eagle** (*Polemaetus bellicosus*) is rare in mountainous areas, preferring open woodland in flat areas. The species is also known to utilise high-tension pylons as perches (Roberts, 2016). The species is likely to be impacted on by all of the proposed alternatives. Although the species was not recorded during the field survey, powerline related mortalities for the species have been recorded in the project area (EWT, 2016).

The regionally Vulnerable **Verreaux's Eagle** (*Aquila verreauxii*) was recorded during the survey approximately 3.5 kilometres to the east of the proposed Narina substations. The species strictly prefers mountainous areas with steep cliffs (used for nesting). Although the species nests on the Outeniqua Mountains to the north of the proposed alternatives, it is likely to forage in lower lying areas. Alternative 1 is likely to have the biggest impact on the species due to its proximity to the Outeniqua Mountains.

The Cape and Spotted **Eagle-Owls** (*Bubo sp*.) are both listed as species of Least Concern on regional and global Red Lists. However, powerline related mortalities for both of the species have been recorded in the project area (EWT, 2016). Spotted Eagle Owls (*Bubo africanus*) are found in a wide variety of habitats. The species is likely to be impacted on by all of the proposed alternatives. Cape Eagle Owls (*Bubo capensis*) roost and nest in caves and crevices associated with rocky habitats. Alternative 1 is likely to have the greatest impact on this species.

Spur-winged Goose (*Plectropterus gambensis*) and **White Stork** (*Ciconia ciconia*) are both listed as species of Least Concern on regional and global Red Lists. However, powerline related mortalities for both species have been recorded in the project area (EWT, 2016). Both species are known to frequent agricultural fields and cultivated lands, therefore all of the proposed powerline routes are likely to have an impact on both species.

Although no powerline related mortalities have been recorded in the area for the regionally Vulnerable **Black Stork** (*Ciconia nigra*) and the globally and regionally Vulnerable **Secretarybird** (*Sagittarius serpentarius*), powerline related mortalities outside the project area have been recorded. Secretarybirds were recorded in grassland habitats during the field survey and Black Storks have been recorded during SABAP2. Habitats suitable for both species are found throughout the greater project area, therefore all of the proposed alternatives are likely to have an impact on both species.

5.6 Land use, Social and Socio-Economical Attributes

The proposed alternative transmission lines pass through the Eden District Municipality (DC4) (within the Western Cape Province. Land use within the study area consists largely of cultivated land with some natural areas (pale green areas) along river valleys and on higher lying areas. Mossel Bay and George are larger towns in the immediate area, with the smaller residential areas of Hartenbos, Klein Brak and Groot Brak along the coastline (grey areas).

A number of storage dams (blue areas) occur along the rivers, particularly in the Klein Brak River System. Forestry occurs along the foot of the Outeniqua Mountains.

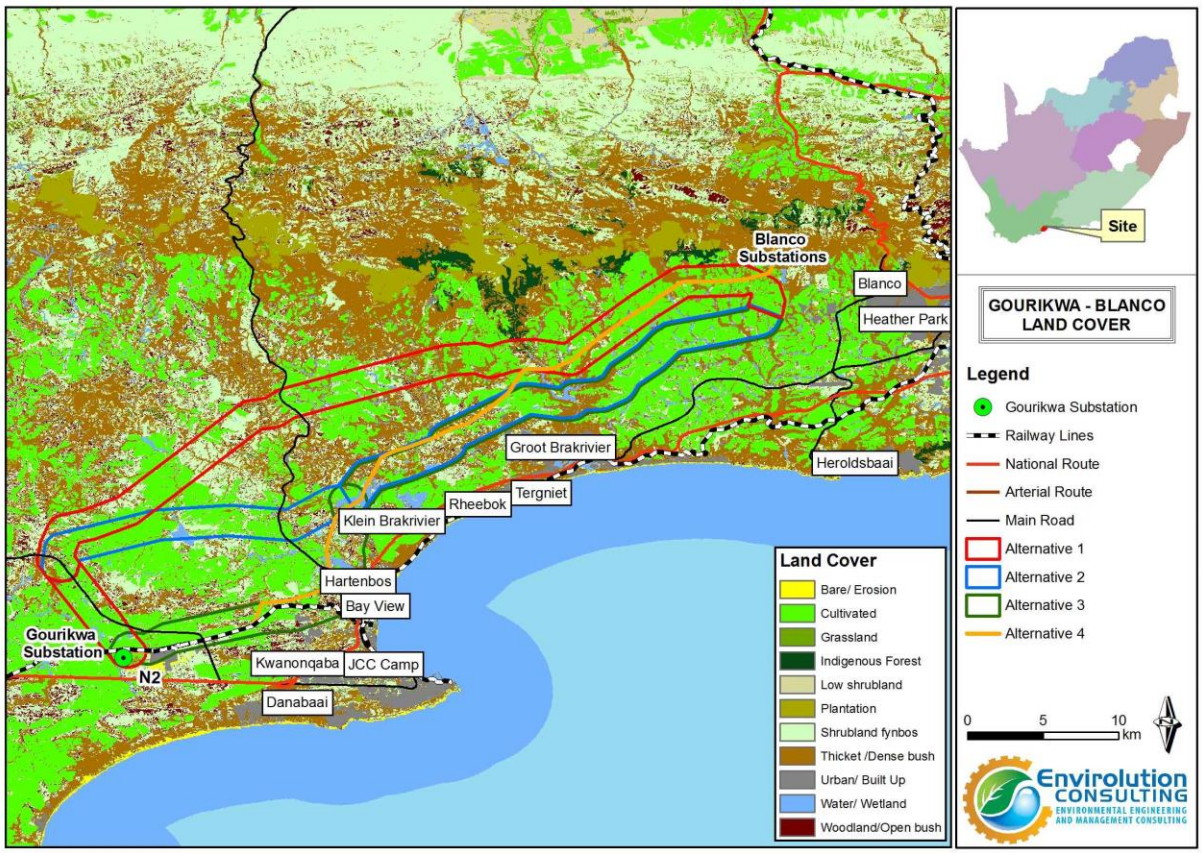

Figure 14: Land Cover Map

A number of formally protected areas in terms of the National Environmental Management Protected Areas Act (green hatched areas) occur within the Outeniqua Mountains such as Ruitersbos and Witfontein Nature Reserves and the Doringrivier Wilderness Area. The rivers in the area, in particular the Groot and Klein Brak Rivers and their estuaries are also considered to be of a very high ecological importance and sensitivity.

Eden District Municipality (DC4)

The Eden District Municipality consists of 7 local municipalities and has an estimated population of just over 574 200 according to the 2011 census. The area has a population density of 24.6 people per km^2. The "Eden District Municipality 2014/2015 First Draft Reviewed IDP" states that agriculture has transformed 18.58% of the natural landscape to cultivated lands, as has afforestation (exotic plantations) by 2.55%. Built-up land only covers 0.62% of the Eden area, but this is presently increasing sharply. Most of the mountainous areas and the Little Karoo, which are under extensive agriculture, game farming and conservation land uses, falls within the category "Shrubland / Fynbos".

Local municipalities

The local municipalities that form part of the transmission line study area are the George Local Municipality (WC044 part of Eden), Mossel Bay Local Municipality (WC045 part of Eden). The wards that are affected by the project alternatives are: ward s 4,5,7 and 14 in Mossel Bay and ward 22 in George.

George Local Municipality

George Local Municipality is one of 7 municipalities in the Eden District Municipality. It has an estimated population of over 193 500 and a population density of 37.3 people per km^2. George is the major city within the area and has an estimated population of 157 394 according to the 2011 Census. Other towns include Wilderness (population 6 164), Uniondale (population 4 525), Haarlem (population 2 376) and Harolds Bay (population 704). The municipality covers an area of 5 191 km^2 in the Garden Route and Little Karoo. It extends northeast over the Outeniqua Mountains to include the eastern end of the Little Karoo as far as the Swartberg mountains. George is a popular holiday and conference centre and the administrative and commercial hub of the Garden Route.

The GDP of the George Local Municipality is estimated at R3.38 billion with general government (R891 million), wholesale and retail (R489 million) and business services (R399 million) contributing the most. The municipal area straddles the Southern Cape and Little Karoo regions of the Western Cape Province, and is situated almost halfway between Cape Town and Port Elizabeth. It was stated in the Integrated Development Plan (IDP) for George (2014/15) that the George Municipality now administers a vast and diverse geographic area that extends from the dry and climatically extreme Little Karoo in the north, to the wetter more temperate Garden Route in the south. The area is rich in natural beauty that includes mountains, forests, lakes and the sea. The utilisation of forest trees led to the establishment of a timber industry in 1776 by the Dutch East India Company. The municipal area also includes fertile farmlands and timber plantations along the coastal plain, fruit orchards in the Langkloof and arid grazing areas in the Little Karoo. The George area has an active, high-value **agricultural sector** including produce such as hops, vegetables, flowers and dairy products, and aquaculture. Although these activities may not create many jobs, they contribute significantly to local employment and earnings with steady land-reform efforts helping to reduce inequalities[3].

Three important national roads – N2, N9 and N12 – traverse the area, and George regional airport serves the Southern Cape and Little Karoo, including the neighbouring towns of Mossel Bay, Oudtshoorn, Knysna and Plettenberg Bay. Prior to the incorporation of Wards 24 and 25 the municipal area was 1 068 km² in extent, but the DMA has added an additional 4 170 km². Stats SA report that 148 021 people lived in the area in 2007 (including the previous DMA), of which approximately 80% resided in the regional service centre of George, 12% in the towns, villages and coastal enclaves of Wilderness, Herolds Bay, Uniondale, Touwsranten, Haarlem, Hoekwil, and Victoria Bay, and 8% in rural hamlets and on farms. According to the George Economic Development Profile, 2012, the total population for 2011 is estimated at 188188 with a 2.1% growth rate per annum since 2008. The map below depicts the spatial structure of the town of George and hinterland.

Given the rapid population growth and the role of the Southern Cape as retirement haven for many South Africans, the **construction sector** foresees steady growth and at least stable employment. Although George is not a coastal resort, these trends should also apply to the town. In addition, the local climate and a strong forestry sector helps to create a much wider range of building structures than found in other parts of South Africa.

[3] *Second Review of the George IDP 2014-15*

Due to its location, George attracts much of the region's more specialised retail and wholesale trade establishments. This further boosts this sector and is not likely to change in the foreseeable future. It is, however, key that the municipal and district managements satisfy the accommodation and other requirements of these enterprises.

Although the relatively small population of the area has prevented the Southern Cape from becoming a major **industrial growth** point, the area has over the years succeeded in attracting some innovative industries (in bio-tech, ICT software and agro-processing). The closure of some factories in the recession years has illustrated the negative impact of sector problems and has stressed the need for proactive municipal policies.

George currently has the widest spectrum of school and tertiary education facilities in the Southern Cape[4]. These include quality private schools as well as university and other tertiary-level facilities. It seems likely that these facilities will enlarge in line with expanding local needs and national trends in educational-supply facilities. Once again, such expansion depends quite crucially on the municipality's policies of facilitation. George has a wide range of health facilities and services, and it would seem natural for this position to continue in future if facilitated by local, district and provincial authorities.

Mossel Bay Local Municipality

Mossel Bay Local Municipality is one of 7 municipalities in the Eden District Municipality. It has an estimated population of over 89 430 and a population density of 44 people per km2. Mossel Bay is the major town with an estimated population of 59 031 according to the 2011 Census. Other towns include Hartenbos (population 4 196), Little Brak River (population 2 037), Reebok (population 1 112), Tergniet (population 1264) and Great Brak River (population 10 619). South west of Mossel Bay are a number of smaller coastal villages, including Boggomsbaai and Vleesbaai. Herbersdale (population 666), Brandwacht (population (1 470) and Friemersheim (population 1 235) are situated in the interior of the municipality closer to the mountains. The municipality covers an area of 2 011 km2.

The GDP of the Mossel Bay Local Municipality is estimated at R7.2 billion with business services (R1.5 billion), wholesale and retail (R1.3 billion) and general government (R903 million), contributing the most.

5.7 Traffic

For the EIA phase, a Traffic Impact Assessment was conducted by Aurecon (see **Appendix 4.10** of the FEIAR). Proclaimed provincial roads make up the bulk of roads between towns in the Central Karoo. Of these, the N12 links to the N1 at Beaufort West and connects to Oudtshoorn, George, the Southern Cape and the N2. The R61 also connects with the N1 at Beaufort West and provides access to Aberdeen/Graaff-Reinet and the inland areas of the Eastern Cape. The R63 trunk road connects to the N1 in the northeast of the area and passes to the south through Murraysburg and on to Graaff-

[4] *Second Review of the George IDP 2014-15*

Reinet, and to the north, to Victoria West in the Northern Cape. The R407 connects Prince Albert with the N1 in the north at Prince Albert Road, and connects with the N12 in the south. The R309 (Vleiland Road) to Seweweekspoort, which connects to Calitzdorp, is a vital link between Laingsburg and the R62, and the R309 requires upgrading.

The roads are maintained on an agency basis by the District Municipality on behalf of the Provincial Government Department and funding is provided for the service provided. Projects are registered and the agency service is delivered in terms of an agreed programme. There is no known road planning that will directly affect the development.

An existing main railway line is located along the N12 and could be utilised to transport equipment to the site. A station is located in the area and it should be possible to use the station (depending on the status of roads serving the station). Although the railway line is active, it must be accepted that all equipment might not be transported via rail, with the result that one or more of the other routes mentioned, will also be utilised. From a roads and traffic point of view, utilisation of the railway line should be considered.

5.8 Tourism

Notwithstanding certain limiting factors (like the rising fuel price) the **tourism sector** of the Southern Cape remains one of the strongest pillars of future LED[5]. This also applies to George, even though it is not located at the coast. Through its central location within the “tourism region” George is able to attract many tourism, accommodation and catering-related specialist services and facilities, which help to stimulate LED. Natural assets include parts of the Garden Route National Park and the Baviaanskloof Wilderness Area.

According to Domestic Tourism Survey of 2013 from Statistics South Africa, the Western Cape had 2.7 million domestic overnight trips or 9.2% of the total overnight trips (expressed per province as the main destination of overnight trips). More than half (58%) of the overnight trips to the Western Cape was for leisure/vacation/holiday. According to the mode of transport, 77% of all overnight trips to the Western Cape were with a car. A total of 1.97 million of the overnight trips to Western Cape originated from within the Western Cape while 413 000 came from Gauteng. A total of 112 000 came from the Eastern Cape and 80 000 from Northern Cape.

A number of nature reserves are included in the study area, including Doringrivier Wilderness Area, Witfontein Nature Reserve and Mossel Bay Seal Island Reserve; however, none of the proposed alternatives’ corridors crosses any of these nature reserves. There are also a number of tourism beaches in the study area, but none of them will be affected by the transmission lines.

Visual impacts are arguably one of the most significant impacts that are associated with transmission lines. Therefore, the visual qualities of these attractions need to be preserved as far as is practically possible. This can be done through the careful placement of towers and power lines against the landscape, avoiding mountain tops, using valley bottoms, choosing the option with the shortest distance or placing it in areas that already have visual interference of manmade objects. The

[5] *Second Review of the George IDP 2014-15*

presence of a transmission line may negatively affect the sense of place of natural areas, potentially negatively affecting eco-tourism attractions such scenic hiking trails, eco-adventures, and the like. This could have negative social and economic consequences, such as loss of revenue for business enterprises, loss of employment and reduced economic contributions to local GDP.

George area

There are a number of tourism attractions, including the George museum, Outeniqua Mountains, Montagu Pass (that was declared a National Monument in 1972), Fancourt (National Monument and well-known hotel) and Lake system (Wilderness, Swartvlei, Sedgefield and Groenvlei). The area is host to the George Old Car Show, that was first held in 1997, the George Cheese Festival (since 2002) and the George NAM Sevens Premier League. The George airport was built in 1977 and served 560 432 passengers in 2013, up from 154 000 in 2003.

In the 2014/15 IDP, the George Local Municipality highlights the need to promote the municipality as a sports, tourism and business destination. This includes the re-establishment of a Tourism Bureau, and projects like the Apple Express and the Outeniqua Choo-Choo train project are essential for tourism development in the rural areas. Further tourism opportunities include business tourism, agri-tourism, eco-tourism (hiking, birding, etc) and adventure-tourism potential like paragliding, canoeing, absailing, diving and mountain biking. Strengths also include the natural beauty of the area, the national parks, moderate climate, long sandy beaches and good hotels, guesthouses and restaurants.

Mossel Bay area

The Mossel Bay draft IDP (2015) mentions tourism as their first strategic priority 'Grow the economy and create jobs through Tourism'. This is set out in objectives that include: to create an enable environment for economic growth in the tourism industry and uplifting communities, to facilitate development and an investor friendly environment for job creation and an attractive CBD area with a well-developed port/waterfront area.

Specific tourism projects include the development, maintenance and marketing of hiking trails, establishing a flea market alongside the N2 on an open area on the eastern side of De Dekke Restaurant and the establishment of worm farming (and composting) projects in the community. Other projects include the upgrading of Klein Brak River allusion facilities to blue flag standard, presenting annual festivals unique to Great Brak River and upgrade and maintain holiday resorts and caravan parks to increase tourism.

5.9 Specific cases that were highlighted during the PP consultation period

A number of issues were raised during the public participation process and a detail list of these issues is available. Below are specific issues that were raised and general point that covers issues that was raised by a number of farmers. It is very important that cognise is given to the farming and other economic activities that could be impacted by the construction of the transmission lines and the final planning of the pylons are done to choose an optimal path that makes economic sense from a construction point of view, but that have a minimum impact on the current economic activities.

Gondwana Game Reserve (Mainly Alternatives 1, potentially Alternative 2)
Both Alternatives 1 and 2 (and 3) traverses the south-eastern side of the award winning Gondwana Game Reserve. This game reserve provides an authentic safari experience in the Garden Route on an 11 000 hectare private game reserve with free roaming Big 5 Game. The Gondwana Game Reserve is

situated 25 minutes outside Mossel Bay of the R327. The corridors for Alternative 1 (red) and Alternative 2 (Blue) as well as the existing line (red) traverses the property. Alternative 1 will cross the property will Alternative 2 will most likely be visible from the south-eastern side of the property. It will be very important to work with the property owner and director Mark Rutherfoord to plan the best position of the transmission lines to minimise the impact on the Reserve.In this section Alternative 3 follows the same path as Alternative 2.

Nyaru Game Lodge (Alternative 1)
Nyaru Game Lodge is 30 minute drive from George Airport and right in the heart of the Garden Route and is located west of the R328 and will be impacted on by Alternative 1. The Lodge caters to guests who want to see the beauty and natural wonders of South Africa and offers exciting 4x4 game drives, quad bike safaris and helicopter flights. There are 17 different species of game and wildlife including giraffe, zebra, the rare black impala and much more. They also have conference and wedding facilities (http://www.nyarugame.co.za/nyaru-game-lodge/).

According to Pierre Fourie (Brandwag Boerevereniging) the power pylons can have a negative impact on the birdlife, especially as larger bird could be affected by the power cables since they could fly into them. Secondly management is concerned about the impact that the power pylons will have on tourism at the reserve. It is the perception that aesthetic views will be degraded influencing tourist experience at the lodge and thus the Corridor of Alternative 1 (red) and Alternative 2 (blue) value of the safaris on the reserve. This is would impact negatively on icome since Nyaru Game Lodge's main income is derived from (eco)tourism.

Botlierskop Private Game Reserve (Alternative 2, 3 and 4)
This 3500 hectare game reserve will potentially be impacted by Alternative 2, 3 and 47 depending on the location of the pylons. This reserve has 4 of the Big 5, rare antelope species and unique bird life. Tourist activities include guided game drives, horseback safaris, guided bush trails, spa treatment, a walk with lions, fishing, tennis and canoeing (http://www.botlierskop.co.za). Helicopters are used to manage game and transmission lines may pose a risk.

Hartenbos Private Game Lodge (Alternative 1 and 2)
Hartenbos Private Game Lodge is situated on Goedemoed 166 portion 13 and Hartebeestkuil 213, portion 17. This is an 860 hectares game farm borders with Nyaru Game Lodge that is on their Eastern Side. They have 13 species of antelope, giraffe, zebra and 135 species of birds. The lodge offers 4 star accommodation, self-catering, conference facilities, functions and weddings, game drives, quad rides and mountain biking (http://hartenbosgamelodge.co.za/). Both Alternatives 1 and 2 will have an impact.

Farm Uitkyk 224 (Alternative 1)
According to Brain Robertson, Section 16 of the Farm Uitkyk 224 is located on the Jonkersberg road between George and Grootbrakrivier. There are a number of central pivots on the farm that will be impact if Alternative 1 is chosen. There are also a number of Macadamia nut trees on the farm. It will be important to work with the farmers in these areas to limit the impact on farming activities so that the farms can still operate as sustainable economic units.

During the public participation process mention is made about objections against alternatives 3 and 4. According to Arthur Cockcroft from section 15, 11 and 4 of Farm Uitkyk 224 the planned transmission line (Alternative 1) will traverse a section where they are planning to build an eco-tourism lodge and that the visual impact of the proposed lines will terminate the planning of this lodge.

Grace Guest House (Alternative 1)
According to Nicolette Meyer the sustainability of the farm Grootsorgfontein is at risk if Alternative 1 is chosen. Their farm, of 50 hectares, is farmed optimally and their central pivots and other farming activities will be impacted on. They also have a restored 1850 family farmstead that is used as a guest house with 360 degrees views of the Outeniqua Mountains and Mossel Bay that will be impacted on by the transmission lines. However, impact can be minimised if the line is situated next to the existing line that is north of Grootsorgfontein.

Klipheuwel Trust & Rooiheuwel Farms Klein Brak (Alternative 2 and 3)
According to Johan Robertson they prefer Alternative 1 ("the inland route") as Alternatives 2 and 3 would traverse their property as there are already two power lines that crosses their property and a third would seriously impact on their value for recreational and game purposes. According to him, the route closest to the sea crosses the Little Brak estuary and is also close to intensive agricultural land. These areas support a large population of large birds such as Blue cranes and flamingos which are both very susceptible to death from power lines. Along the route are also extremely rare populations of plants such as Haworthia Kingania. They believe Eskom activities will destroy this last remaining population of a very rare plant. According to them the route along the escarpment, approximately 10 kilometres inland will be more beneficial to plant and bird populations.

Van Greunen boerdery (Alternative 2)
According to Valcor Farm Experience, Van Greunen Boerdery comprises of 1 788ha of farmland, of which 1 311ha is under irrigation, run by 4 brothers. This includes 3 dairy farms and 1 vegetable farm. Vegetables include broccoli and potatoes. Broccoli is delivered to McCains frozen foods in George, where it is processed and frozen and potatoes are mainly planted for seed production. A small amount of potatoes are produced for human consumption in the South Cape. On the Jersey farm there are 700 cows in milk and on the two Holstein farms they have 900 and 800 cows respectively. They opened their gates officially in 2004 to one of the Holstein farm for visitors where they take groups, as well as individuals on a tour of the farm. From the information on the Valcor website it seems as if Alternative 2 will traverse the farm.

Negative impact on farming and forestry
A number of other farmers that are not specifically mentioned above (like the Jonck family farm and Apieskloof Boerdery CC, both impact by Alternative 2 and the Berry farm mentioned by Chrisleo Botha, impacted by Alternative 1) raised concerns during the public consultation process regarding negative impacts that the transmission lines will have on crops (especially when pivot irrigation is used). The Berry farm make use of shade netting at about R1 million per hectare. Concerns are also raised regarding losses of fruit and nut trees and forest areas that will be impacted or damaged during construction as well as the visual impact of the transmission lines.

Other general issues included limited maintenance of existing Eskom infrastructure and Eskom appointed construction companies/workers being incompetent and insensitive to the environment.

Monte Christo Eco Estate (Alternative 3)

> This Estate is a 54 hectare development with 470 residential, businesses, retirement and cluster housing developments. The corridor for Alternative 3 is west of the Estate and could impact on property prices.

Outeniquabosch Lodge (Alternative 2)
The corridor for Alternative 2 is to the northern side of Outeniquabosch lodge.

Wolwedans dam (Alternative 2)
The Wolwedans dam is in the Great Brak River and is the main source of water for the municipality of Mossel Bay and is used as a tourism destination. There are already transmission lines that cross the dam but additional lines can have a cumulative impact.

Sand and Stone Quarries (Alternative 4, potentially Alternative 3)
There are sand and stone quarries located of the R328 north-west of Hartenbos. This includes the Maandagskop Quarry on Farm Hartenbosch No: 217. Depending on the pylon positions, this could potentially impact Alternative 4 and 4. The existing mining contributes to the deterioration of the scenic qualities of this area (PHS Consulting, 2014).

5.10 Heritage and Cultural Aspects of the environment

The application and EIA process has been initiated by engaging **Heritage Western Cape** with a **Notice of Intent to Develop (NID)** to get them on board and request inputs and comments.

5.10.1 Historical Background

This area was historically referred to as Outeniqualand. Government posts were established at Mossel Bay (1787) and George (1777) to regulate the use of timber. Transportation of the timber by sea began in 1788. Outeniqualand was gradually settled fron the west during the 18th century. An outspan developed on the eastern banks of the Groot Brak River and a wooden bridge was built across the river (Franklin 1975). There are a few farms in the area with historic qualities (Fransen 2004; Fransen 2006). They include Patrysvlei (c 1840); Goedemoed (1850's); Brandwacht (c1810); Plaatjieskraal (c1810) and Fancourt (c. 1860s).

The significant Middle Stone Age archaeological sites of Cape St Blaize (excavated by Leith in 1888) and Pinnacle Point (excavations by Curtis Marean ongoing since 2000) are on the coast near Mossel Bay. They are located at least 10 km to the south-east of the proposed powerline across rolling open landscape. The archaeological landscape of Mossel Bay - Pinnacle Point are of outstanding archaeological significance (Grade II) but they will not be impacted.

Hart (2005) has assessed the construction of the Open Cycle Gas Turbine Power Station at the PetroSA facility at Mossel Bay as well as the proposed transmission lines to the Proteus substation. His walk-down of the line revealed isolated Early Stone Age (ESA) and Middle Stone Age (MSA) artefacts but no surface indications of significant archaeological material. Nilssen & Yates monitored earthmoving operations at the OCGT site and recovered a number of ESA artefacts. Nilssen (2009) examined a pipeline route at the Mossdustria plant and noted that ESA artefacts are common but no palaeontological or colonial material remains were observed. Nilssen (2005a) surveyed the farm Vaalevalley 219 between the Hartenbos River and the Klein Brakrivier and recorded a range of archaeological sites including ESA, MSA and Later Stone Age (shell midden) material. Nilssen (2005b) surveyed the area known as the Hartenbos Heuwels and reported on only a few isolated MSA artefacts. Nilssen (2005c) also noted scatters of ESA and MSA material but did not recommend any further work. Kaplan (1996) identified at least six low density scatters of LSA material at Great Brak River, close to the coast.

It is clear that while ESA and MSA stone artefacts are widely scattered across the landscape, the LSA material (such as shell middens) is in general found close to the coast (Nilssen 2005).

5.10.2 Cemeteries and Graves

Formal cemeteries are associated with settlements such as Mossel Bay, Great Brak River and George. Smaller farm graveyards are often found on farms. Nilssen (2005a) reported on some graves on the farm Vaalevalley 219 along the coast near Klein Brakrivier. Halkett (2014) reported on cemeteries within the powerline corridors near the proposed Narina Substation but noted that they could be avoided through micro-siting of the pylons. Yates (2006) noted graveyards during his survey of the farm Geelhoutboom 318 near Blanco. He gives these graves a very high rating (IIIA).

5.10.3 Palaeontological Resources Identified:

The Baseline (desktop) assessment was conducted by John Almond of Natura Viva cc who has considered the probability of sectors of potentially high palaeontological sensitivity occurring:

- The area situated to the northwest and north of Mossel Bay and mainly concern outcrop areas of Mesozoic continental rocks of the Uitenhage Group. They include the Early Cretaceous Kirkwood Formation that has yielded important fossil material of dinosaurs and other terrestrial vertebrates, petrified woods and other well-preserved plant material, as well as the Early Cretaceous Hartenbos Formation that is also rich in fossil;
- Small outcrop areas of shell-rich estuarine deposits of the Klein Brak Formation Bredasdorp Group) may also be transected by the power-line corridors to the north of Mossel Bay;
- From the Klein-Brakrivier north-eastwards to Blanco the corridors are of low palaeontological sensitivity since they overlie highly deformed and metamorphosed Late Precambrian sediments of the Kaaimans Group and associated intrusions of the Cape Granite Suite.

The footprint for the proposed Narina Substation on the western outskirts of George is underlain at depth by highly metamorphosed, deformed sediments (schists, hornfels) of the Saasveld Formation (Kaaimans Group). These Late Proterozoic metasediments are unfossiliferous. The Precambrian bedrocks are overlain by superficial deposits of low palaeontological sensitivity and, furthermore, are probably highly weathered near-surface. **The palaeontological impact significance of the construction of Narina Substation is therefore assessed as LOW.**

Small outcrop areas of shell-rich estuarine deposits of the Klein Brak Formation (Bredasdorp Group) may also be transected by the power-line corridors to the north of Mossel Bay. From the Klein-Brakrivier northeastwards to Blanco, the corridors are of low palaeontological sensitivity since they overlie highly deformed and metamorphosed Late Precambrian sediments of the Kaaimans Group and associated intrusions of the Cape Granite Suite.

Pending grond truthing (after EA has been given and pylon points have been chosen) there is no preference on palaeontological heritage grounds for any particular power-line route option between Gourikwa and Narina.

5.10.4 Archaeological Heritage Resources Identified:

The Archaeological Assessment was conducted by Lita Webley of ACO Associates cc who has identified the following in the study area:

- Reports indicate that scatters of ESA and MSA stone artefacts are thinly dispersed across the landscape. They are considered of low significance;
- A few caves and rock shelters have been recorded in rocky outcrops and in incised valleys and gorges inland from the coast. Some contain LSA archaeological material and have the potential to be significant. One koppie identified in the survey which may contain archaeological sites is

Botelierskop but others may exist. The Wolwedans Cave near the Great Brakrivier occurs in such a steep sided valley;

- Ruined farmhouses, including barns, kraals and stone walling are considered colonial archaeology and they may occur inside the powerline corridors;
- A number of farm cemeteries and scattered individual graves have been recorded in the area by other CRM practitioners and more may exist inside the powerline corridors.

5.10.5 Cultural Landscape Heritage Resources Identified:

The Cultural Landscape Assessment was conducted by Stefan de Kock of Perception Planning who has divided the study area into three distinctive cultural landscapes types, and discussed the findings accordingly:

- The Outeniqua area extends between the upper reaches of the Great Brak and the Outeniqua Pass, and is an undulating landscape characterised by forestry, stock farming and intensive agriculture as well as rural occupation and tourism-orientated activities. Its links to forestry and agriculture, together with heritage resources such as historic structures and graveyards, provide a sense of historic context and continuity. This cultural landscape is considered to have regional & local historic, aesthetic and social cultural significance (Grade IIIB);
- The area between the Great Brak and Little Brak Rivers - is less accessible, hilly and rugged, with limited agriculture along the higher-lying plateaus. Much of this landscape has been incorporated into private game reserves. Areas closer to the coastline have mostly been transformed through low density urban development, which has significantly eroded the quality of the cultural landscape. Whilst retaining natural beauty within the northern half of this area, few if any historic elements, which could provide a sense of historic continuity, seem to have survived until present day. From this perspective therefore, the entire area is considered of low local historic, aesthetic and social cultural significance (Grade IIIC).
- The Mossel Bay area - between the Little Brak River and the PetroSA site, this landscape retains a predominant agricultural character with some private game reserves. The northern half of this area includes tourism routes of aesthetic significance such as the R328 (to Oudtshoorn) and a section of the R327 (leading to Herbertsdale). The southern half of this area - along the coastline - is mostly dominated by urban-related development. The landscape has been altered through mining activities and environmental authorisation for at least two wind energy facilities has been issued. While historically significant and retaining areas of moderate scenic beauty (northern portion of the study area), few historic elements remain within the landscape. The southern portion of this area has been transformed significantly through existing (and permitted) urban-related development thus permanently altering the landscape character. This area is therefore considered to be of no local historic, aesthetic and social cultural significance (Ungradable).

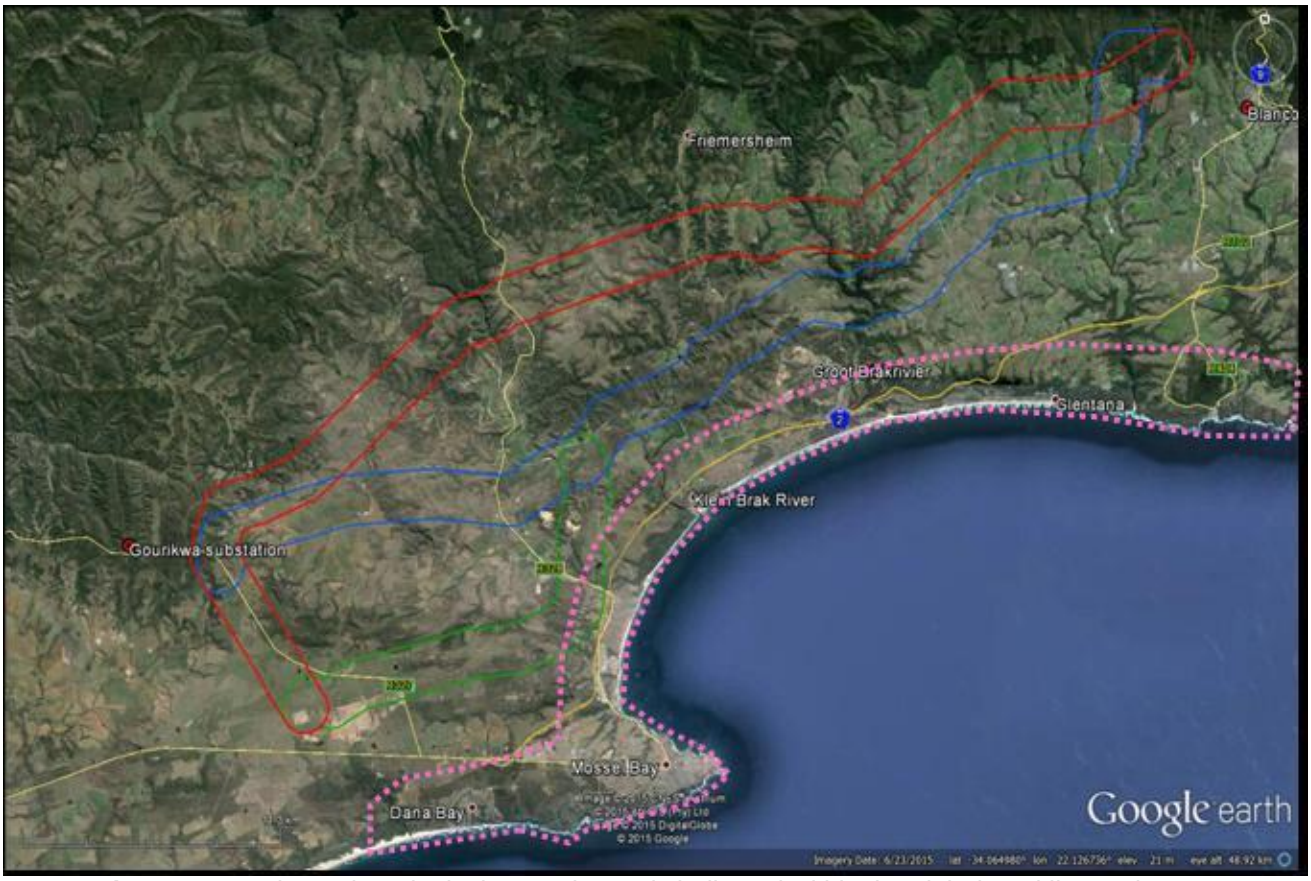

Figure 1516: The archaeological coastal zone is indicated within the pink dotted lines. The most significant archaeological sites are found in this area and it should be avoided.

Figure17: View along Alternative 2 indicating the impacts of the existing 400Kv 520 Guyed Vee towers and line on the undulating countryside Land

6 DESCRIPTION OF ISSUES AND POTENTIAL IMPACTS

An important element of the scoping process was to evaluate the issues that were raised during the Public Participation Process (PPP) and technical processes and ensure that those identified as key issues are included within the scope of the EIA process. The EIA phase now includes the assessment of the issues and risks that have been identified.

The activities that are associated with the construction, maintenance and operation of the proposed power line and substations, which could potentially have an impact on the environment, are also highlighted in this section. In addition, the Department of Environmental Affairs guide on assessing cumulative effects[6] describes that it is not practical to analyse the cumulative effects of an action on every environmental receptor. Therefore, for cumulative effects analysis to help the decision-maker and inform interested and affected parties, it must be limited to effects that can be evaluated meaningfully. This chapter will highlight potential impacts and issues that can be evaluated.

Existing Eskom access roads (for the distribution lines) are said to have already created erosion (e.g. animals walking along these tracks creating permanent unwanted paths). At this stage a limited impact on existing infrastructure and services are anticipated during the construction phase. Existing road crossings are limited and are expected to successfully respond to project management and mitigation measures.

6.1 ISSUE: Risk of impacts on the ecology

6.1.1 Vegetation (refer to Appendix 4.1)

During the EIA Phase studies, the above findings were confirmed (PJ du Preez, August 2016). A number of vegetation types in the project area are listed as Critical Biodiversity Areas (CBAs) and threatened ecosystems. The reasons why these vegetation types are listed as endangered ecosystems are because they have relatively high plant species diversity but due to human impacts, especially agricultural practices such as ostrich, sheep and goat farming as well as crop production, relatively few natural areas remain in these vegetation types.

Ecological sensitivity: The sensitivity assessment identifies those parts of the project site that will a have a medium to high conservation value or that will be sensitive to disturbance. Areas containing untransformed natural vegetation, high diversity or habitat complexity, Red List organisms or systems vital to sustaining ecological functions are considered sensitive. In contrast, any transformed area that has no importance for the functioning of ecosystems is considered to have a low sensitivity. There are features within the project site or just outside of the project site that may be considered to have a medium conservation value, as follows:

- Streams (perennial & seasonal) and wetlands (pans): Episodic streams and pans with a medium to high sensitivity occur on the plains between Gourikwa and Narina distribution centres.

[6] *DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism (DEAT), Pretoria*.

- Sensitive vegetation: The plant communities in the Fynbos, Renosterbos and riparian vegetation can all be regarded as sensitive. ***None of the four proposed alternatives affect any Afromontane forests patches***.
- Threatened and protected plant species: There are a number of protected and Red Data species present along the powerline routes. There are 173 Red Data species noted in the quarter degree squares over which the alternative routes are planned..
- Critical Biodiversity areas (CBAs), Ecological support areas, Threatened Ecosystems and Protected areas: Cape Nature published a new biodiversity sector plan for the Western Province. According to the Western Cape Biodiversity Sector Plan (WCBSP) (2017) the power line corridors (Alternatives 1, 2, 3 & 4) cut across many newly identified Critical Biodiversity Areas (CBAs), Ecological Support Areas (ECAs) as well as protected areas (WCBSP) (2017)(Please refer to **Appendix 4.1**).

According to the Plants of South Africa species list (POSA) the total number of Red Data plant species present in the quarter degree squares which will be crossed by the power line alternatives are 173. The majority of these Red Data plant species present in the quarter degree squares are bulbs, forbs, succulents and creepers. However a number shrub which are dominated by proteas and ericas also occur. Protected trees, in terms of the Forest Act, also occur in the region. They are *Widdringtonia nodiflora and Sideroxylon inerme.* This means that if the power line corridor will be cleared of shrub vegetation, a relatively large portion of Red Data species would not be destroyed.

Possible Impacts

Impacts on indigenous natural vegetation

Potential impacts on vegetation ecology and flora may include:

- negative change in conservation status of habitat;
- increased vulnerability of remaining portions to future disturbance;
- general loss of habitat for sensitive species;
- loss in variation within sensitive habitats due to loss of portions of it;
- general reduction in biodiversity;
- increased fragmentation (depending on location of impact);
- disturbance to processes maintaining biodiversity and ecosystem goods and services; and
- loss of ecosystem goods and services.

A detailed field study may find mitigation actions that will limit the negative impacts of the proposed development along either alternative 1 or 2. Sections of Alternative 3 may render areas that will not be able to mitigate through mitigation, and Critical Biodiversity Areas in particular should be avoided. It is possible that during field investigations, areas are identified for this alternative that could be considered.

Establishment and spread of declared weeds and alien invader plants

Exotic species are often more prominent near infrastructural disturbances than further away. Consequences of this may include:

- loss of indigenous vegetation;
- change in vegetation structure leading to change in various habitat characteristics;
- change in plant species composition;
- change in soil chemical properties;
- loss of sensitive habitats;
- loss or disturbance to individuals of rare, endangered, endemic and/or protected species;
    - fragmentation of sensitive habitats;
- change in flammability of vegetation, depending on alien species;

- hydrological impacts due to increased transpiration and runoff; and
- impairment of wetland function.

The detailed field study has identified mitigation actions that will limit the negative impacts related to invader plants.

Fragmentation of sensitive habitats

Fragmentation may occur if vegetation is completely cleared below the power line, which does not appear to be the case in the study area where grasslands occur. It is therefore assumed that no clearing will take place and that localized fragmentation may only occur where access roads are required to be constructed.

6.1.2 Fauna

The main impacts likely to be caused by power lines being constructed along either Alternative Route 1, 2, 3 or 4 will include:

1. Habitat loss and fragmentation: There will be some loss of faunal habitats through the clearing of vegetation for service/access roads and the construction of pylon bases. The extent of habitat loss will be dependent on how many new service/access roads need to be made and the number of pylon bases. This is usually a loss of vegetation (plant communities) that supply food or shelter, but may include abiotic features such as the loss of temporary wetlands, caves or a rocky outcrop.
2. Loss of Reptile Diversity: There is the potential for some reptile species to be disturbed and possibly killed by the construction activities where service/access roads and pylon bases impact reptile habitats.
3. Loss of Amphibian Diversity: There is the potential for some amphibian species to be disturbed and possibly killed by the construction activities where service/access roads and pylon bases impact amphibian habitats. The majority of amphibians are associated with wetland and/or river habitats which are abundant along all of the proposed route alternatives
4. Loss of Mammal Diversity: There is a possibility that some mammal species may be impacted as a result of the clearing of vegetation for service/access roads and the construction of pylon bases. Nocturnal mammal species may be killed on the roads if there is an increase in the number of project vehicles using roads at night. The golden moles, which live underground, are likely to be impacted on the most during the construction phase if the powerline crosses through areas inhabited by them.
5. Impact of Dust and Noise: The impacts of noise and dust are likely to result from the construction of the various components of the power lines. Roads especially are known to alter physical characteristics of the environment and it is likely that all species may be affected to some extent, the faunal group most likely to be impacted by the increase in dust and noise levels is amphibians. Increased dust levels can cover wetland areas and inhibit amphibian's ability to feed and breed.

The sensitivity (**Figure 18**) was developed using available spatial planning tools (e.g. NFEPA, Protected Areas, CBAs, etc), distribution ranges of SCC, process areas such as perennial rivers and pristine wetlands, and specialist ecological knowledge. Areas defined as "sensitive" during the desktop scoping phase were visited during a field survey to verify sensitivities and conduct checklists of species present on site, as well as the likeliness of species to occur within areas due to habitat preferences.

Identified **No-Go** areas (unless recommendations and mitigation measures are implemented) include:

- **Riparian areas** highlighted in red on the sensitivity map
- **Brandwagrivier Wetland System** (number 5 on the map)

Identified areas of **high sensitivity** include:

- Process areas such as perennial rivers, pristine wetlands and wetland clusters identified by NFEPA that are important for amphibian habitat and ecosystem functioning; and
- Formal Protected Areas.

Areas of **medium sensitivity** include:

- Wetlands according to NFEPA which are not pristine;
- Critical Biodiversity Areas; and
- Non-perennial rivers.

Areas of **low sensitivity** include:

- Areas that are highly impacted by current land use and provide little value to the ecosystem; and
- Highly degraded areas that are unlikely to harbour any SCC.

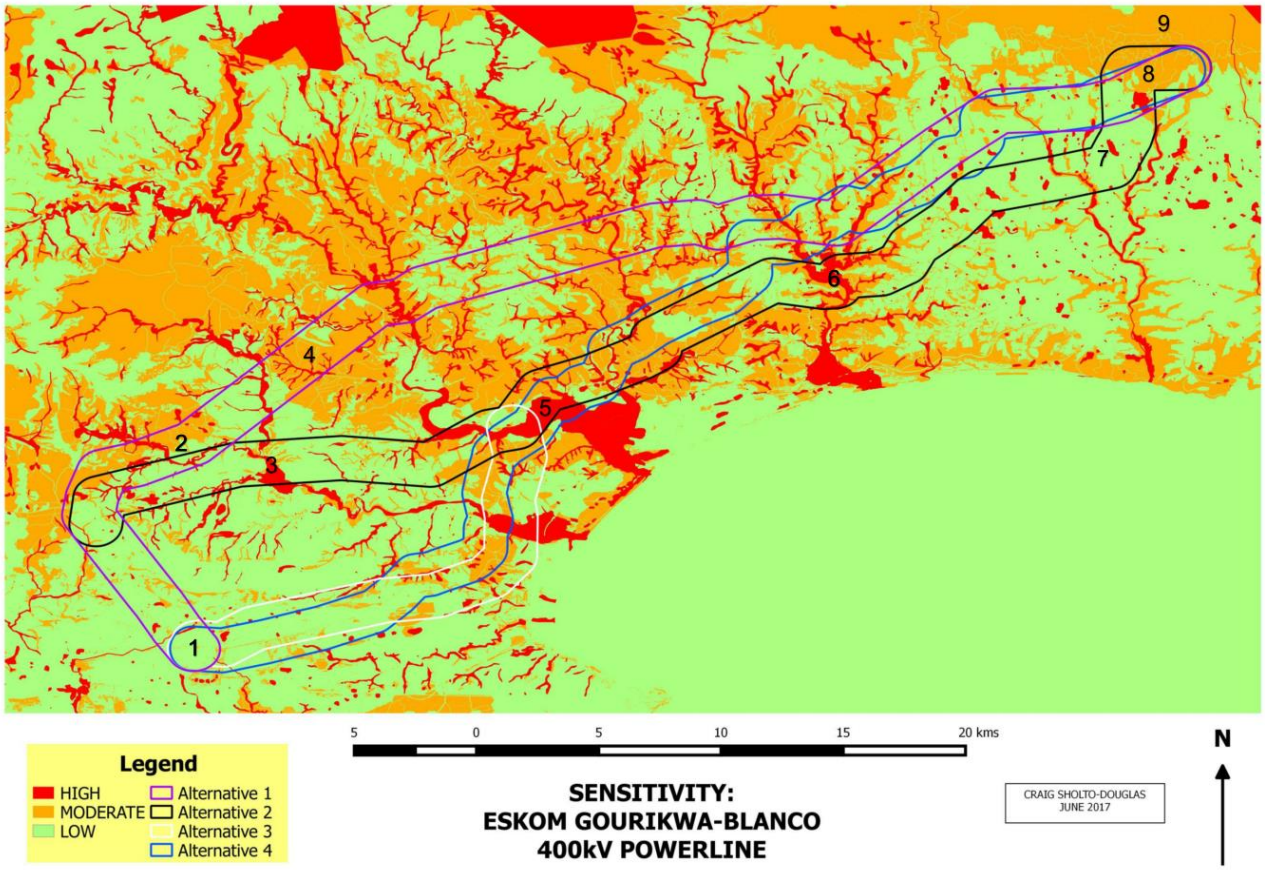

Figure 18: Fauna sensitivity map of the project area

6.1.3 Avifauna

A field survey was carried out by the specialists from the 22nd to the 27th of July 2017. Transects were driven or walked during daylight hours to record all bird species encountered during the survey. Habitats pre-defined as having a high avifaunal sensitivity or known to harbour species of conservation concern were mapped prior to the field trip. These areas were all actively surveyed with the aim of ground-truthing habitats in order to make accurate species composition associations. Apart from the pre-defined sensitive areas, the field survey was conducted using an opportunistic approach to list avifaunal species encountered along the proposed route options.

Areas and habitats surveyed include:

- Gourikwa substation;
- Gondwana Private Game Reserve;
- Hartenbos Game Reserve;
- Hartebeeskuil Dam;
- Klipheuwel Wetland System;
- Wolwedans Dam;
- Grootbrakrivier to Molen Drift Agricultural lands;
- Proposed Narina substation sites; and
- South Facing slopes of the Outeniqua Mountain Range.

Site sensitivity: The sensitivity map (**Figure 19**) was developed using available spatial planning tools (e.g. NFEPA, IBAs, Protected Areas, CBAs, etc), distribution ranges of SCC, process areas such as perennial rivers and pristine wetlands, and specialist ecological knowledge. Areas defined as "sensitive" during the desktop scoping phase were visited during a field survey to verify sensitivities and conduct checklists of species present on site, as well as the likeliness of species to occur within areas due to habitat preferences.

Identified **No-Go areas** (unless recommendations and mitigation measures are implemented) include:

- Rocky outcrops on the Outeniqua Mountain range (IBA) which provide suitable breeding/nesting sites for raptors of conservation concern (location of substation option 5).
- All breeding and roosting sites encountered during the construction phase.

Identified areas of high sensitivity include:

- Important Bird Areas (IBAs) and nesting areas for bird SCC; and
- Formal Protected Areas.

Areas of medium sensitivity include:

- Wetlands according to NFEPA;
- Critical Biodiversity Areas; and a
- 5km buffer around the IBA.

Areas of low sensitivity include:

- Areas that are highly impacted by current land use and provide little value to the ecosystem; and
- Highly degraded areas.

An avifaunal sensitivity map has been created to illustrate areas of high, medium and low sensitivity (**Figure 28**). This map has been created as a guide to identify the preferred route for the field survey.

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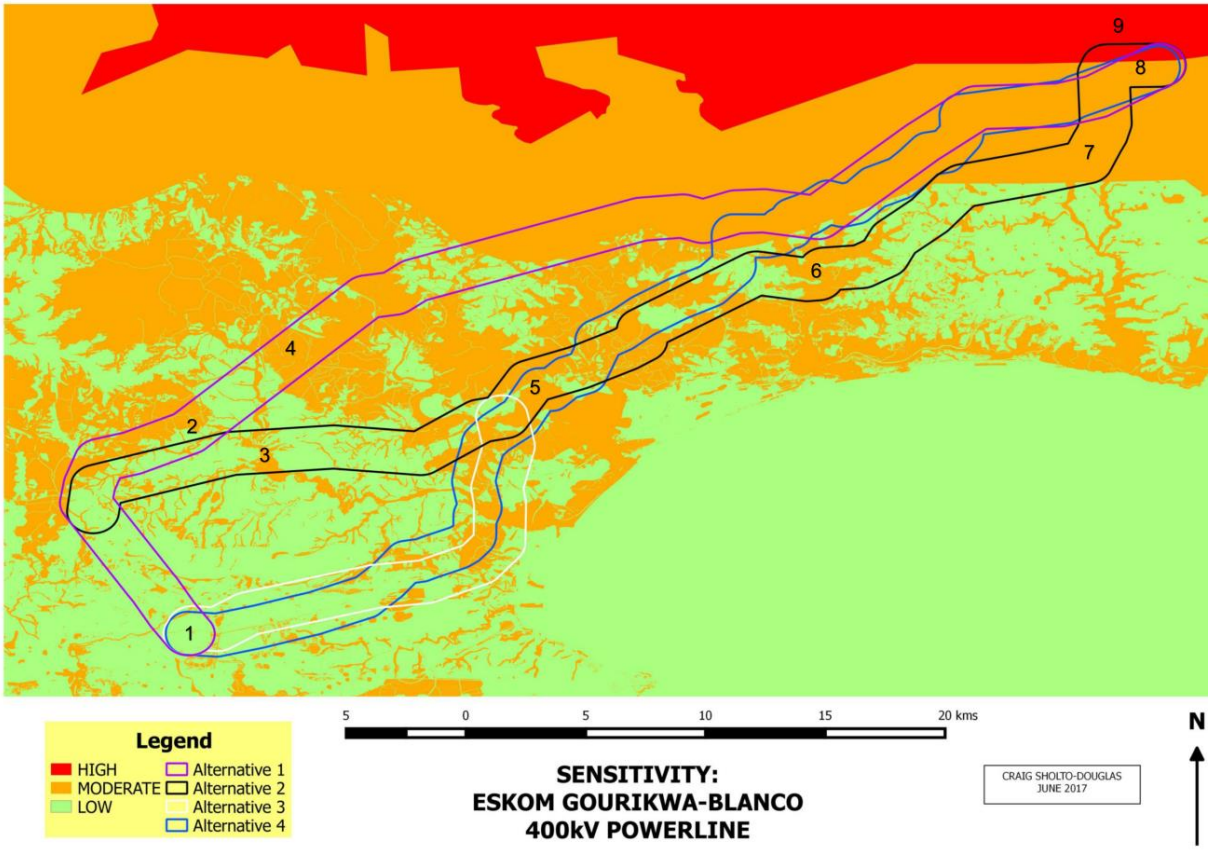

Figure 19 : Avifaunal sensitivity map of the project area

Possible impacts: The main impacts likely to be caused by power lines being constructed along either Alternative Route 1, 2, 3 or 4 will include:

1. Loss of Bird Habitat:

Construction: There will be some loss of bird habitat through the clearing of vegetation for service/access roads and the construction of pylon bases. The extent of habitat loss will be dependent on how many new service/access roads need to be made and the number of pylon bases required. This is usually a loss of vegetation (plant communities) that supply food and shelter, but may include abiotic features such as the loss of temporary wetlands, caves or rocky outcrops, which provide suitable nesting or roosting sites. All routes will pass through numerous private game reserves (Gondwana, Hertenbos, Nyaru, Botlierskop) and CBAs at certain sections of the respective routes. The survey found that alternative 1 will pass through the most ‘intact’ habitats of all of the proposed route options. Alternative 1 is also the closest route to the Outeniqua Mountains IBA. A substantial portion of this route option falls within the 5km buffer around the Outeniqua IBA. Various pristine rivers and drainage lines fed by the Outeniqua Mountains will need to be traversed along this route option. Construction of pylon hardstands and road infrastructures through these areas will fragment and destroy habitats utilised by numerous bird species.

Operation: During operation there will be the need to keep the area beneath the power lines clear which will involve grass cutting and shrub clearance where necessary. The creation of new roads may provide access to previously inaccessible areas which may increase poaching rates or natural resource use.

2. Disturbance and Displacement of Birds

Construction: Birds will be disturbed by the powerline construction activities (e.g. noise, dust, operation of heavy machinery, anthropogenic activities). There is the potential for some nesting birds to be displaced during construction activities where service/access roads and pylon bases are located within a close proximity to nesting sites. This impact will be greater for Alternative 1 compared to the other route options as alternative 1 will pass through the most 'intact' habitats of all of the proposed route options. Alternative 1 is also the closest route to the Outeniqua Mountains IBA.
Operation: Birds will utilise pylons to construct nests or to use as roosts. There will be continued disturbance during the operation of the powerline due to maintenance activities. The powerline infrastructures can also act as a barrier for birds in flight, and can influence flight paths of migratory species.

3. Loss of Bird Diversity and SCC

Construction: There may be some disturbance of bird species during construction phase but this will probably be limited to very local and short-term disturbance. Some birds, particularly nocturnal species such as owls and night-jars may be killed on the roads if there is an increase in the number of project vehicles using roads at night.
Operation: The main issue during the operation phase is the possibility of bird species colliding with the power lines while in flight or being electrocuted by contacting live parts of the system. As there are numerous bird species of conservation concern which inhabit the project area, the likelihood of collision is high and the potential impact is significant. The length of the power line and the abundance of habitats associated to different bird species compositions further exacerbate the potential impact. Alternative 1 runs parallel to the Outeniqua Mountains and is the closest route option to the Outeniqua IBA. A substantial portion of this route option falls within the 5km buffer around the Outeniqua IBA. For this reason collisions/impact with foraging bird species are more likely than the other alternatives. During the survey, the majority of flights recorded by large-bodied birds occurred closest to the proposed alternative 1.

6.2 ISSUE: Risk of impact on Wetlands and Surface Water Bodies(refer to Appendix 4.4)

A freshwater assessment was done for the proposed Eskom Project between the Gourikwa and Narina Substations. The study area largely lies within the southern coastal strip between Mossel Bay and George. The rivers within the study area are short rivers with a relatively steep gradient that are fed by numerous small tributaries. Numerous storage dams have been constructed within the rivers. Aquatic features which occur within the study area include the following:

- Lower Gouritz tributaries – Stink and Buffels Rivers;
- Some small coastal streams at Mossel Bay;
- Hartenbos River and its tributaries;
- Klein Brak and its tributaries;
- Groot Brak and its tributaries; and
- Maalgate River.

Wetland areas within the study area consist largely of valley bottom wetlands that are associated with the rivers and are of similar ecological condition and importance. The habitat integrity of the rivers range from being moderately modified (upper reaches of the larger rivers as well as the smaller streams) to being in the seriously modified ecological state (lower reaches of the larger river systems). The riparian habitat of these rivers tends to be more impacted by the direct impact of the surrounding land use activities which has resulted in removal of the natural indigenous vegetation and the

subsequent growth of invasive alien plants. Within the instream habitat, water abstraction and flow modification have the most impact, particularly on the lower reaches.

Figure 20. Wetlands impacts per alternative

G-B Alternative 1	This alternative crosses many rivers, wetlands, and wetlands clusters identified by NFEPA. These areas provide habitats suitable for a variety of amphibian species and are vital to maintain ecosystem functioning. Of the three Gourikwa-Blanco alternatives, this one crosses the most perennial rivers due to its proximity to the escarpment. However, these rivers are likely to be fast flowing and less habitable for amphibian species than the lower reaches of the rivers, which would be crossed by the other alternative routes. Alternative 1 will also cross the most natural/pristine wetlands of the alternative routes.
G-B Alternative 2	Alternative 2 will transect more areas identified as wetland clusters than alternative 1. This route will also cross many perennial rivers. Generally, the wetlands classified outside of wetland clusters are in a less natural condition than the other 2 alternatives. However, this alternative has many habitats suitable for a variety of amphibian species.
G-B Alternative 3	This alternative crosses one NFEPA identified wetland clusters and one perennial river. Many of the wetlands in this area are considered degraded. It is more likely that this alternative can avoid pristine wetlands and perennial rivers than the other two alternatives.

The ecological importance and sensitivity of the rivers within the study area range from being of a moderate (smaller tributaries and streams) to very high ecological importance and sensitivity (larger estuarine systems). This is due to the fact that these relatively small coastal rivers are very sensitive to flow and water quality changes and contain habitats (such as Gouritz Valley Thicket, coastal riparian forests and link to the Hartenbos, Klein Brak and Groot Brak Estuaries) and biota (frog species and fresh and estuarine fish species including the Knysna or Cape seahorse *Hippocampus capensis*) that are unique to the area.

Construction may lead to some direct or indirect loss of or damage to seasonal wetlands or drainage lines. This will lead to localised loss of wetland habitat and may lead to downstream impacts that affect a greater extent of wetlands or impact on wetland function. Where these habitats are already stressed due to degradation and transformation, the loss may lead to increased vulnerability (susceptibility to future damage) of the habitat. Physical alteration to wetlands can have an impact on the functioning of those wetlands. Consequences may include:

- Increased loss of soil;
- Loss of or disturbance to indigenous wetland vegetation;
- Loss of sensitive wetland habitats;
- Loss or disturbance to individuals of rare, endangered, endemic and/or protected species that occur in wetlands;
- Fragmentation of sensitive habitats;
- Impairment of wetland function;
- Change in channel morphology in downstream wetlands, potentially leading to further loss of wetland vegetation;

- Change in runoff and drainage patterns; and
- Reduction in water quality in wetlands downstream of road.

The specialist study that was conducted by Blue Science (June 2015) stated that it is often the access roads associated with the transmission lines that are likely to have a greater impact on the freshwater features than the power lines themselves as the lines can usually span the freshwater features such that the pylons can be constructed outside of the rivers and wetland areas as well as their recommended buffer areas, whereas the roads need to be constructed through the freshwater features. It is thus often best if the new power lines are placed adjacent to existing lines or roads where new roads do not need to be constructed as part of the project.

With the potential impacts of the proposed activities, it is often the access roads associated with the transmission lines that are likely to have a greater impact on the freshwater features than the power lines themselves as the lines can usually span the freshwater features such that the pylons can be constructed outside of the rivers and wetland areas as well as their recommended buffer areas, whereas the roads need to be constructed through the freshwater features. It is thus often best if the new power lines are placed adjacent to existing lines or roads where new roads do not need to be constructed as part of the project.

In terms of the selection of the route selection for the transmission lines, it is recommended that a buffer of 50m from the top of the river banks and/or approximately 100m from the edge of the wetland areas be allowed for as a development setback for the construction of the pylons. This recommended buffer would also apply to the proposed new Narina Substation. Although the upper reaches of the rivers in the study are in general in a less modified ecological state, the alternative corridor with the least potential impact on the freshwater features in the area is likely to be the Alternative 1 as it would be more likely to be able to span the river valleys with little to no impact on the rivers and associated wetlands at the valley bottoms, while the southern corridors (Alternative 2 and Alternative 3) will need to cross the wide floodplains of the rivers. The alignment of the route within the corridor could also be determined to minimise the potential impact on the freshwater features within the study area.

A water use authorization will need to be obtained from the Department of Water and Sanitation: Western Cape Regional Office for approval of the water use aspects of the proposed activities where lines cross water courses and where pylons are to be placed within the 32m buffer area of wetlands and rivers. A detailed field study may find mitigation actions that will limit the negative impacts of the proposed development alternatives.

6.3 ISSUE: Risk of impact on Heritage resources (refer to Appendix 4.5)

Based on a review of archaeological sites in the general area of the proposed powerline we may anticipate that ESA and MSA material will be found thinly scattered across the landscape. They are generally of low significance and no mitigation will be required. LSA sites are more likely to occur along the coast. There are no anticipated fatal flaws with regard the construction of the powerline. The Heritage desktop review has concluded that there are no archaeological reasons to exclude the use of any of the proposed powerline alternatives.

6.3.1 Impact on Pre-Colonial Archaeology

Since heritage sites, such as archaeological sites, are non-renewable, it is important that they are identified and their significance assessed prior to development. The main cause of impacts to archaeological sites is direct, physical disturbance of the material itself and its context. The

significance of an archaeological site is highly dependent on its geological and spatial context. This means that even though, for example a deep excavation may expose buried archaeological sites and artefacts, the artefacts are relatively meaningless once removed from the area in which they were found. The impacts are likely to be most severe during the construction period although indirect impacts may occur during the operational phase of the project. It is possible that the pylon footings may impact directly on surface and below-surface archaeological remains. However, previous surveys, inland of the coast, have not identified any significant archaeological remains. A targeted survey at the walk-down phase can address these issues.

6.3.2 Impact on Colonial Period

The construction of pylons in close proximity to farmsteads may result in the destruction of historic rubbish dumps (middens), old kraals or the ruins of old dwellings. For this reason, a targeted walk-down of the line will be required after the final powerline route has been decided.

6.3.3 Impacts to Graves

The pylons may be constructed on/or in close proximity to farm graveyards. A survey during the walk-down phase can address these issues.

Human remains are the most complicated aspects of heritage to mitigate since they require their own public participation process (See Section 36 of the NHRA) before they can be exhumed. Human remains are protected by a plethora of legislation including the Human Tissues Act (Act No 65 of 1983), the Exhumation Ordinance of 1980 and the National Heritage Resources Act (Act No 25 of 1999). In the event of human bones being found on site, HWC must be informed immediately and the remains removed by an archaeologist under an emergency permit. This process will incur some expense as removal of human remains is at the cost of the developer. Time delays may result while application is made to the authorities and an archaeologist is appointed to do the work.

6.3.4 Anticipated Impacts On Heritage Resources:

Impacts on Palaeontology:

A substantial proportion of proposed power-line sectors will cross formations that are conservatively regarded as moderate to high sensitivity in palaeontological heritage terms (*cf* palaeo-sensitivity maps on the SAHRIS website). In practice, however, the likelihood of significant negative impacts on fossil heritage on the ground is low over most sectors of these routes because the bedrocks here are often highly weathered, tectonically-deformed or covered by a substantial thickness of fossil-poor superficial deposits (scree, alluvium, soils *etc*).

Impacts on Archaeology:

While the footprint of the tower is relatively small, impacts to heritage resources may occur.

- Powerlines running in proximity to the coastline, may result in the destruction of highly significant archaeological sites;
- Caves and rock shelters, whilst not directly impacted by the construction of a tower footing, may be damaged or vandalised as a result of easier human access;
- In situ scatters of ESA and MSA stone artefacts may be damaged although the likelihood of this occurring is very low;

- In situ, LSA archaeological sites may be damaged by the construction of the tower footings and access roads;
- Ruined structures and historic rubbish dumps may be impacted by the tower footings and access roads. The likelihood of this occurring is medium;
- The proposed tower footings may result in the destruction of farm cemeteries and graves.

Impacts to Cultural/Built Landscape:

These cultural landscape qualities are perceived from all public roads through and around the area, including the N2 National Road and this landscape is therefore sensitive to any large-scale and/or visually intrusive development or infrastructure, such as the proposed pylons for the transmission lines. However, a significant portion of the study area (including the Outeniqua area) is traversed by an existing Eskom overhead transmission line, which invariably already impacts on the scenic qualities of the area. It is noted that the alignment of these existing overhead transmission lines, for the most part, follows the proposed Alternative 2 and Alternative 3 route alignments. New infrastructure to be installed along either one of these alternative alignments would tend to be viewed within the context of the existing overhead transmission lines.

With regard the Outeniqua area: Although this is an evolving landscape, the notion of agriculture and forestry remains evident within the landscape through the occurrence of modest farm buildings of typical local vernacular, pastures as well as forestry along the foothills of the Outeniqua Mountain range. These cultural landscape qualities are perceived from all public roads through and around the area, including the N2 National Road and this landscape is therefore sensitive to any large-scale and/or visually intrusive development or infrastructure.

However, a significant portion of the study area (including the Outeniqua area) is traversed by an existing Eskom overhead transmission line, which invariably already impacts on the scenic qualities of the area. It is noted that the alignment of these existing overhead transmission lines, for the most part, follows the proposed Alternative 2 and Alternative 3 route alignments. New infrastructure to be installed along either one of these alternative alignments would tend to be viewed within the context of the existing overhead transmission lines.

With regard the Great Brak to Little Brak Rivers: Given the scenic qualities of the northern portion of this area, which is likely to become more evident should conservation continue, proposed grading for this cultural landscape (Grade IIIC) as well as the alignment of existing overhead transmission lines through this area, proposed Alternative alignments 2 and 3 are both acceptable.

With regard the Mossel Bay rural area: Anticipated impacts associated with proposed route alignments through the Mossel Bay rural cultural landscape would need to be considered within the context of its proposed grading (ungradable), which is partly informed by the pattern of existing and permitted development within this area.

Cumulative Impacts

Alternative 2 will run in parallel with an existing 400 kV line. The addition of a second 400 kV powerline in parallel with the existing line may result in a cumulative impact.

Line Option Recommendations:

There are no anticipated fatal flaws with regard the construction of the powerline and **Alternative 1 or 2 are considered acceptable** from an archaeological perspective. Alternative 3 poses problems because of the relative proximity of the line to the coast, and the higher probability of encountering

archaeological sites. From a Cultural Landscape perspective, Alternatives 2 or 3 are both considered acceptable.

6.4 ISSUE: Impact on areas of Agriculture (refer to Appendix 4.6)

All four alternative corridors will traverse this landscape type that features grazing land, central pivot irrigation, fruit trees and planted dry lands. A large percentage of agricultural activities can still continue unhindered, but there will be some economic losses. From aerial photos, it seems as if the crossing of prime agricultural land seems to be the least with Alternative 1. From an economic point of view, Alternative 1 is preferred given that this is the shortest option, with the least number of bends. It also seems to be the option that will have the least impact on prime agricultural land.

Typical agricultural activities undertaken in the study area refer to ostrich, sheep and goat (Angora, Boer Bok) farming, cattle farming, hunting, lucern production and crop production (vegetables & fruit e.g. strawberries). During the construction phase, the possibility of stock losses due to theft and/or poaching, increase in noise and the actual construction activities placing stress on the animals, would remain of concern. Livestock should thus be moved away from the construction activities and/or be fenced off. This could intrude on the implementation of the rotational grazing system used by farmers.

On various properties in the area, the farmers created stock watering dams. Due to the arable land, the farmers' are dependent on these systems, in addition to the groundwater for their subsistence, livestock and irrigation needs. It is important to avoid negatively impacting on the water berms with the tower footprints and/or servitude alignment. The maximum distance between towers for a 400 kV transmission line varies from 350 metres to 400 metres and it might thus be possible to span these berms.

The construction of a transmission line has only isolated impacts on the soil resource, due to the relatively small, separated footprints of the pylons. However, if an access road is constructed, especially in steeper areas or where erodible soils occur, the possibility of accelerated soil erosion is a reality.

Specific soil conservation measures, such as contouring, culverts and diversion channels would need to be considered in susceptible areas. In addition, regular monitoring of such roads would need to be carried out.

Regarding cultivation and agricultural potential, the main susceptible areas would be areas of irrigation, such as where the transmission line crosses rivers. Care should further be taken to avoid placing towers within the water furrows made by property owners, and to take cognisance of farmer's planning where pivot points are concerned. The property owners of the farms at Alternative 1 in the vicinity of George have indicated that the centre pivot irrigation system on their farms would be initiated or expanded. The line alignment should thus take this in consideration and should avoid having any impact on such possible farming activities and infrastructure.

6.5 ISSUE: Visual Impact (refer to Appendix 4.7)

The project brings about the risk of a negative visual impact for all three alternatives (alternative 4 is the combination of the three). This is a permanent impact that cannot be fully mitigated. The best mitigation would be avoidance. Visual and aesthetic impacts will result from the construction activities

of excavation, erection of towers and transporting of materials. In most areas the construction activities will however be of short duration.

The pristine character of the visual resource will be affected due to the introduction of new anthropogenic elements in an otherwise natural environment. Farmers within 1km of the servitude will experience maximum visual exposure. It is possible to detect the power line over larger areas up to 5km. All farmers in this zone may experience an impact on their views to the mountains. Tourists travelling along the N9 may experience glimpses of the transmission line. Hikers hiking through the Outeniqua Mountains may have very clear views of the transmission line when viewed from the crest of the mountains.

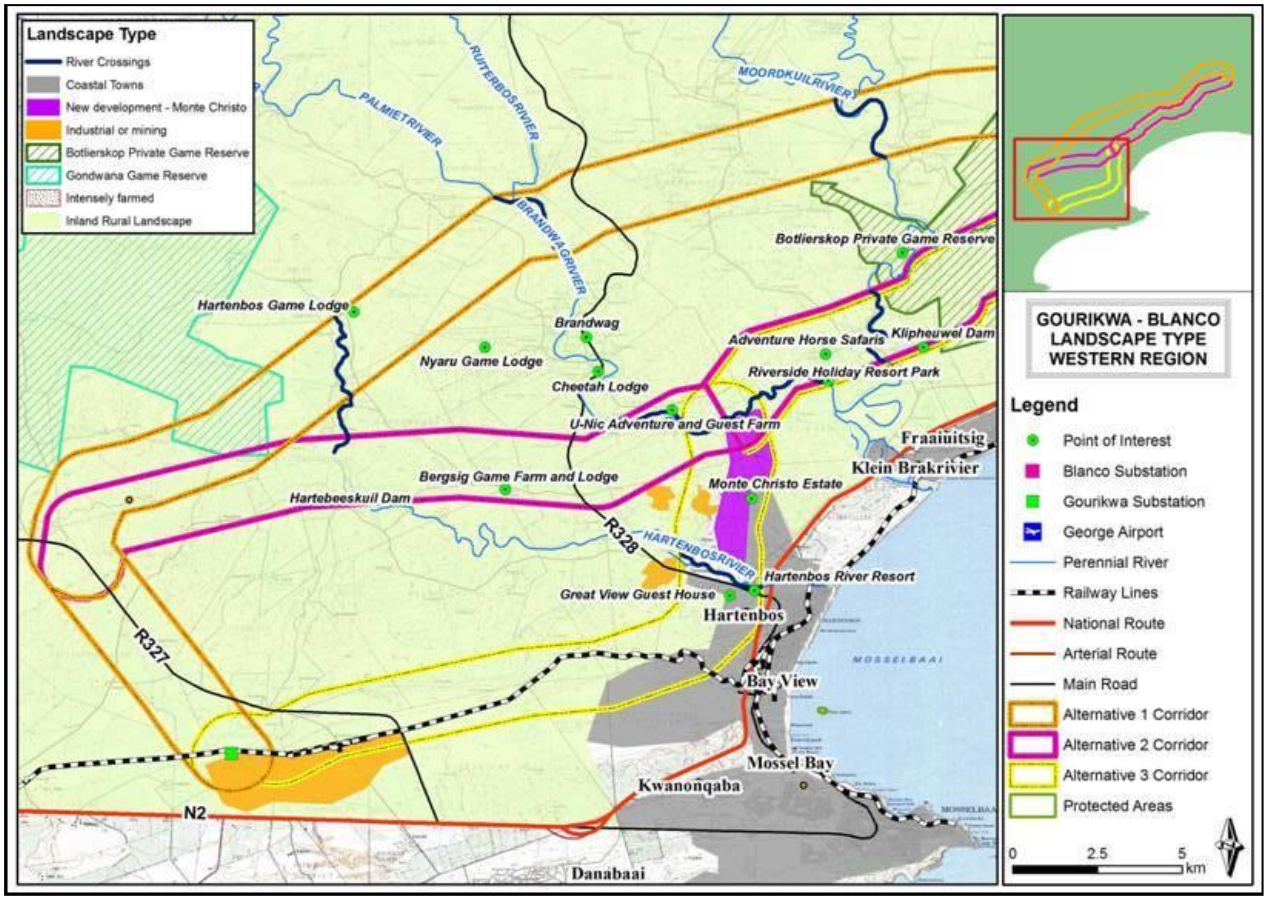

Figure 21. Landscape type in the Western Region

The foothills of the Outeniqua Mountains are mostly conserved and protected by privately owned game farms and reserves. Large areas consist of natural vegetation and pristine landscapes.

The pristine character of the visual resource will be affected due to the introduction of new anthropogenic elements in an otherwise natural environment. Unique landscape features that will be affected are Hartebeeskuil Dam, Klipheuwel Dam, Brandwacht and Groot Brak Rivers as well as all the smaller ravines and hillcrests.

Tourists visiting the game farms such as Botlierskop-, Gondwana Private Game Reserve, Nyaru-, Cheetah Lodge etc, will experience an intrusion on their views. Tourists travelling along the main transport routes such as the R327 and R328 may experience glimpses of the transmission line.

Large parts of the study area consist of privately owned farms and access is often restricted. The photographic record in the specialist report (i-Scape 2016) represents views from publicly accessible places.

6.5.1 Coastal Towns - Affected receptors

Findings of the specialist study in the EIA Phase related to the Coastal Towns and affected receptors are summarised in the paragraphs to follow.

- Permanent residents of the coastal towns are considered highly sensitive due to their sustained exposure to the potential visual impacts and their attentive interest towards their living environment. Those that may be affected by Alternative 3 reside west of the N2 in the Hartenbos Extensions of Vyf Brakke Fonteinen, south of the R328 and Monte Christo Estate. Houses are mostly build to face into the direction of a visually pleasing view. The houses on the west and south facing slopes are directed towards views of the ocean, i.e., away from the proposed route. Houses that have no ocean view often face other natural features such as valleys, rivers or mountains. This is the case with many of the properties in Vyf-Brakke Fonteinen and along Geelhout and Kameeldoring Streets west of the N2. The extension of Wolwedans, north of Groot Brak will be affected by Alternative 2, whereas the western part of Blanco is exposed to possible visual impact from all three alternative as they meet Blanco Substation.
- Tourists are generally considered highly sensitive. Their main reason for visiting the study area is often related to the outdoor activities associated with the beach. The beach zone is considered outside of the ZVI. Tourists may travel or temporarily stay near Alternative 3 where two accommodation facilities have been identified, namely Great View Guest House and Hartenbos River Resort. Their exposure to the potential visual impact is generally short.
- Motorists travelling on the N2 may be exposed to glimpses of Alternative 3 but the intrusion on their views are expected to be insignificant. Their sensitivity is considered low as their attention is generally focussed on the road and their exposure to roadside objects is brief due to the speed they travel.

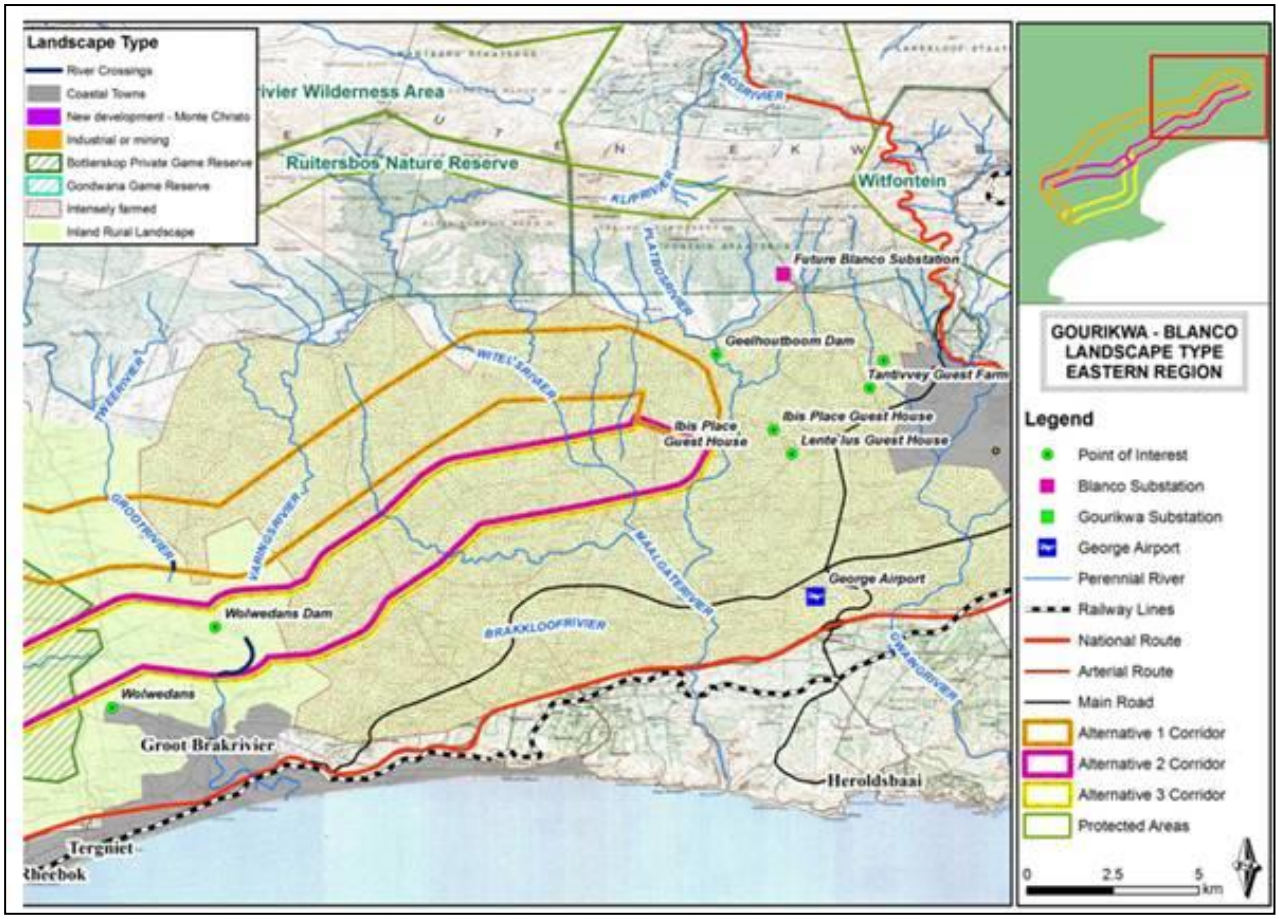

Figure 22 Landscape type in the Eastern Region

Distance from sensitive viewpoints:

- Alternative 3 is within 1 km from the western outskirts of Hartenbos and pass west of Monte Christo Estate. It also crosses the R328 which is considered a major transport route to Oudtshoorn;
- Great View Guest House and Hartenbos River Resort are two tourist destinations that will be impacted and are located within the ZMVE of Alternative 3;
- Alternative 2 pass within 1 km north of Wolwedans community and the small holdings near Wolwedans Dam; and
- All three alternatives meet with the proposed Blanco Substation approximately 4 km north west of the suburb of Blanco.

6.5.2 Inland Rural Landscapes - Affected receptors

Findings of the specialist study in the EIA Phase related to the Inland Rural Landscapes and affected receptors are summarised in the paragraphs to follow.

- Farming communities are scattered across the Inland Rural LT. The eastern part, between Groot Brak River and George, consists of smaller farm portions and a higher concentration of farm residents are expected in this region. West of the Groot Brak River, the farms are generally larger with the exception of small holdings near Wolwedans Dam and the western outskirts of Hartenbos. These residents are considered highly sensitive due to their sustained exposure to the potential visual impacts and their attentive interest towards their living environment.
- Several tourist destinations are present in the study area, mostly in the form of game reserves, lodges and bed & breakfast accommodation. Accommodation are offered and tourists are

entertained with game drives, horse rides and other outdoor activities. Other tourist destinations are the three large dams in the study area namely, Wolwedans-, Klipheuwel- and Hartebeeskuil Dam. Fishing and birding are considered some of the activities offered at these locations. In all of the aforementioned cases, tourist enjoy the outdoor environment with an expectation of high visual qualities and scenic views. Tourists are regarded as viewers with a high sensitivity. Their reason for visiting is to experience the outdoor environment and scenery offered by the natural environment.

- The study area is considered to have a sparse primary and secondary road network but a more intricate tertiary network of gravel roads. The main roads that are crossed by the alternative alignments are the R327 and R328. None of them are formally recognised scenic routes although pleasant scenes are experienced from these roads of the Outeniqua Mountains. Their exposure to the power lines will be momentarily and their sensitivity are considered low, due to the speed at which they travel and the short visual exposure. The secondary and tertiary roads are mostly travelled by the farmers that reside in the area. Their sensitivity is considered higher as they experience a much greater exposure to the source of impact as they travel the roads regularly.

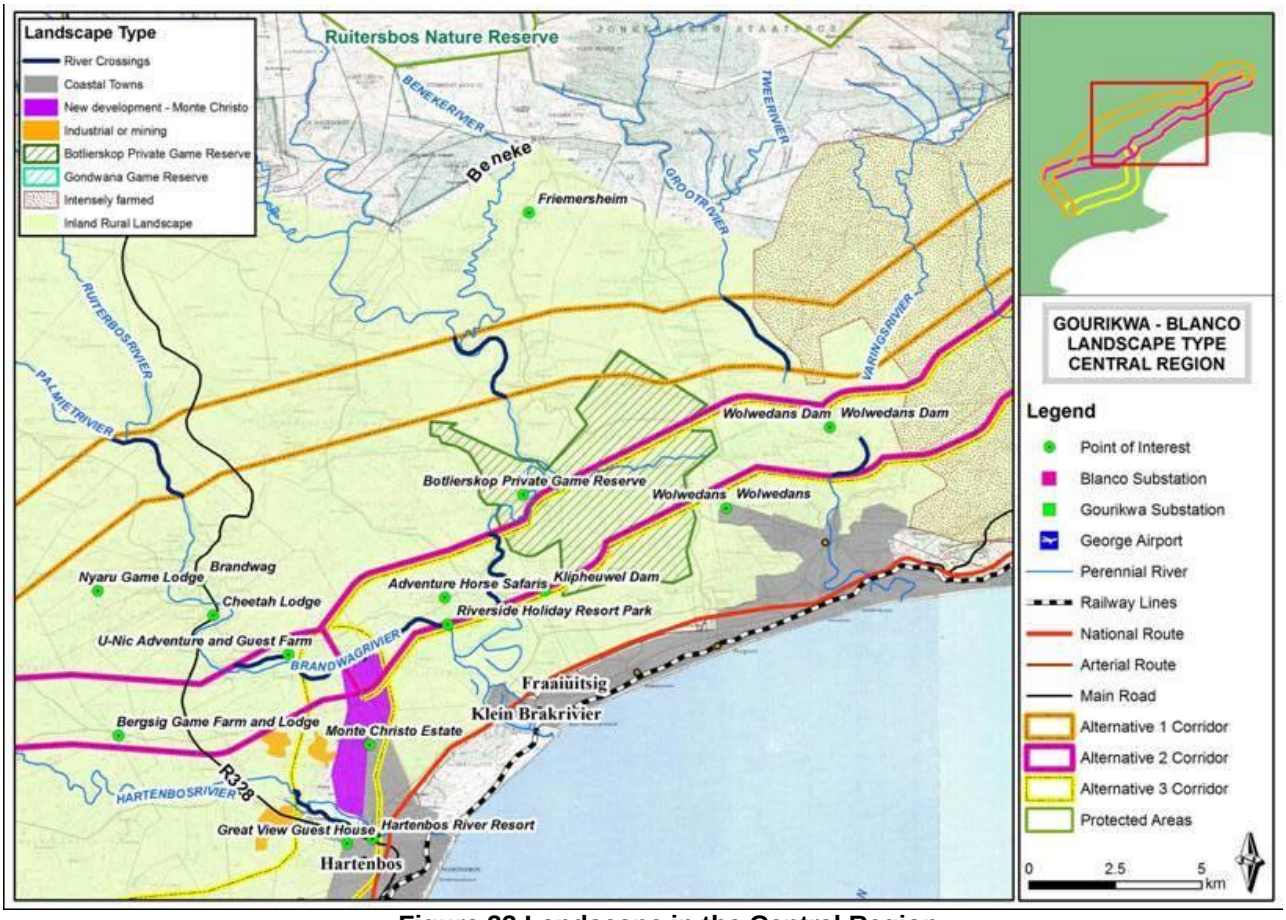

Figure 23 Landscape in the Central Region

Distance from sensitive viewpoints:

- Alternative 1 is within 1 km of the following sensitive viewpoints:
    - It is parallel to the R327 and crosses over the road near the entrance to Gondwana Game Reserve;

- It traverses the southern section of the Gondwana Game Reserve;
- It passes through Hartenbos Game Lodge;
- It crosses over the R328, north of Brandwag;
- It traverses the northern section of Botlierskop Game Reserve
- It crosses over Geelhoutboom Dam; and
- It impacts on all the farm residents within the ZMVE of the alignment.

- Alternative 2 is within 1 km of the following sensitive viewpoints:
  - It is parallel to the R327 and crosses over the road near the entrance to Gondwana Game Reserve;
  - It passes south of the Gondwana Game Reserve;
  - It crosses over the southern parts of the Hartebeeskuil Dam;
  - It passes north of Bergsig Game Farm and Lodge;
  - It crosses over the R328, south of Brandwag;
  - The corridor passes near to U-Nic Adventure and Guest Farm, Riverside Holiday Resort Park and Adventure Horse Safaris, between R328 and Klipheuwel Dam;
  - It crosses over the Klipheuwel Dam;
  - It traverses through the central region of Botlierskop Game Reserve;
  - It crosses the Wolwedans Dam; and
  - It impacts on all the farm residents within the ZMVE of the alignment.

- Alternative 3 is within 1 km of the following sensitive viewpoints:
  - It crosses the R327 north of Mossdustria;
  - It passes the western outskirts of Hartenbos;
  - It crosses the R328 west of Hartenbos;
  - The corridor passes near to U-Nic Adventure and Guest Farm, Riverside Holiday Resort Park and Adventure Horse Safaris, between R328 and Klipheuwel Dam;
  - It crosses over the Klipheuwel Dam;
  - It traverses through the central region of Botlierskop Game Reserve;
  - It crosses the Wolwedans Dam; and
  - It impacts on all the farm residents within the ZMVE of the alignment.

6.5.3 Sensitive and Representative Viewpoints

Landscape character sensitivity

The sensitivity of a landscape's character is a measure of the robustness of its character and the ability of the landscape to accommodate certain changes without detrimental impacts to its qualities.

a) A landscape character with a high sensitivity will typically have one or a combination of the following attributes:

   - A low Visual Absorption Capacity (VAC);
   - A high degree of inter-visibility with adjacent landscapes;
   - A well-established identity and sense of place;
   - Is often in a pristine natural condition with high ecological value that contributes to a valued aesthetic condition; and
   - Is considered scarce or uncommon.

b) A landscape character with a low sensitivity will typically have one or a combination of the following attributes:

   - A high VAC;

- Is often visually isolated with a low degree of inter-visibility with adjacent landscapes;
- A poorly established identity and sense of place;
- Is often greatly developed to an extent where no or very little aesthetic features exist; and
- Is considered common and found in numerous places.

Coastal Towns

The alternative routes that will have any significant impact on this LT is **Alternative 3** and the first section of **Alternative 4** where the corridor intersects with the western regions of Hartenbos. Should the transmission line follow this route it will not affect the existing settlement patterns, but future development will have to allow for a safe 55m wide servitude which will impact on settlement patterns. The Coastal Towns LT is considered a landscape with **medium** sensitivity along its western outskirts. It is considered a transition zone between the urban and rural landscape.

- Generally, the study area has a medium VAC due to the varied landscape further away from the coastline. The low growing natural vegetation does little to contain views and panoramic views can be experienced from high laying areas. The degree of inter-visibility varies across the study area as elevated vantage points provide distant panoramic views, but views in a valley are often contained;
- The identity of the coastal towns is generally recognised for simple one or two storey houses overlooking the Indian Ocean, and a relaxed holiday sense of place. Some of the newer developments are upmarket and the architecture style is often modern. As mentioned before, the towns have transformed from previously small and intimate holiday destinations, to well established coastal towns with a large percentage of permanent residents and a commercial component. A lack of available space along the coastline has forced development to occur further inland. The character of the towns is gradually transforming as urban development encroaches on the open space north and west of the N2;
- The coastal towns are densely developed along the coastline, but fractured development is present north and west of the N2 in the ZMVE of Alternative 2&3. Vyf-Brakke Fonteinen is a small holdings west of Hartenbos between the N2 and the Mossel Bay Airfield. Monte Christo is an upmarket development on the Farm Hartenbosch 217 and has plans to extend northwards to the Farm Outeniquasbosch 149. Wolwedans is situated north west of Groot Brak with small holdings scattered around the Wolwedans Dam. These developments experience some of the rural character of the Inland Rural LT and views of the hills and naturally occurring vegetation adds value to the outskirt developments;
- Available space for property development along the coastline is a scarce resource, therefore towns are expanding into the rural landscapes on the outskirts. Views of nearby hills, valleys and even distant views of the Outeniqua Mountain Range add value to the properties. These scenes are considered limited and scarce in its region; and
- Other power lines are located in the proposed corridors of Alternative 2&3. It provides a baseline condition that is already impacted by power infrastructure but is also nearer to a visual intolerance threshold.

Inland Rural Landscapes

The Inland Rural LT is considered **moderate** to **highly** sensitive. The highly sensitive regions are in the western and central regions where a concentration of visual amenities is present. The eastern region is moderately sensitive due to its intensely farmed land use, but individual features are considered highly sensitive:

- VAC varies across the study area but generally a medium to high VAC is experienced in the western and central regions, with a moderate to low VAC present in the eastern region. High variation levels occur in the terrain near to the Outeniqua Mountains and along some of the major rivers, all the way down to the coast. Very flat, plain conditions are present between Groot Brak River and George (Eastern region) and near the Gourikwa Substation, extending west. Vegetation cover provides limited screening potential in the intensely cultivated areas of the eastern and Gourikwa Substation regions and on the level areas of the western and central regions. Exotic woodlands often occur in the study area, providing localised screening;
- Inter-visibility is limited in the central and western regions due to the varied terrain. Panoramic views can be experienced from high laying areas. The level terrain in the eastern region and around Gourikwa Substation facilitates high levels of inter-visibility and distant views can be experienced;
- Pristine and semi-natural environments are fragmented with the game reserves protecting large portions of the Fynbos vegetation. Natural river vegetation can be seen in the numerous small tributaries and valleys, but is often mixed with exotic trees. The intensely cultivated eastern region is transformed and semi-natural ecosystems are limited to steep slopes and valleys of which there are few;
- The entire study area is part of the Garden Route and is renowned for its scenic views and entertainment value. Luxury accommodation and outdoor activities are mostly present in the western and central regions and offer unique interactions with the natural environment. The scenic quality and natural character of the landscape is highly valued and are considered a scarce resource in the region; and
- A couple of existing power lines are present in the Inland Rural LT of which the largest power line is the 400kV Proteus-Droërivier that follows a similar alignment as Alternative 1. Two lower voltage distribution lines follow a similar route as Alternative 2 (known as Proteus – Blanco) and a single distribution line follows Alternative 3. It provides a baseline condition that is already impacted by power infrastructure but is also nearer to a visual intolerance threshold.

The towns closest to **Alternative 3** have transformed the landscape to create a new landscape character that can generally be classified as a coastal town character. Hartenbos is the town that may experience the greatest impact with the implementation of Alternative 3. It will impact on the town's expansion and settlement patterns as it has to maintain a servitude where no development can occur. Residents from the town of Hartenbos will experience the greatest impact due to the proximity of the servitude to their houses. Also during the holiday season large numbers of tourists visit the area and will also be affected due to the presence of the transmission line. Their views of the mountain ranges to the north will be affected. Motorists travelling on the N2 highway will experience a brief exposure to the transmission line.

The rural landscape character is normally sparsely developed and characterised by open fields, bordered by low wire fences or tree avenues leading up to farmsteads or farming communities. The introduction of a 400kV transmission line will contrast with the existing character. Unique landscape features that will be affected are Wolwedans Dam, Groot Brak River and Maalgat River as well as all the smaller ravines and hillcrests. Tourists visiting guest farms and guest houses, especially those on the western outskirts of George will see the lines.

During construction it is expected that most of the impacts will revolve around the damaging of vegetation around the tower footprint. Foundation excavation will expose the underlying soil and will impact on the natural features of the landscape. The presence of a workforce in the servitude will place emphasis on the construction activity and will attract a higher degree of attention.

The construction of towers is considered low intensity construction as the damage to the vegetation is considered localised and easily rehabilitated. One aspect that can cause significant impacts on both the landscape and the visual receptors is the clearing of vegetation in the servitude. This often results in a very distinct linear corridor that is highly visible. This action removes vegetation that often contributes to the quality of the natural landscape. The significance of vegetation clearance will be a function of how long the section of clearance is, how visible it is from sensitive viewpoints and to what degree it will impact on the character of the landscape.

The operational phase will be marked by the commissioning of the power line. The rhythmic spacing of towers/poles across the landscape may cause visual intrusion due to its unfamiliar character, imposing scale and possible servitude clearance that will emphasise the corridor.

Cumulative visual impact from numerous power lines in parallel will also increase its visual dominance in the landscape and may reach a threshold point. The landscape and visual receptors in the study area is considered to be generally highly sensitive. This will be narrowed down during a site investigation to identify the areas of highest to lowest sensitivity.

6.5.4 Landscape Type: Mountainous and Wilderness Area

The mountainous and wilderness landscape type will be affected by all three corridors as it nears the Narina Substation site (Alternative 5 site approved by DEA on 1 September 2016). The proposed site of the Narina Substation is located in this landscape type, on the foothills of the Outeniqua Mountains. It should be mentioned at this stage that the boundaries of the landscape type might change once a thorough site investigation is done.

Affected Receptors

The affected landscape features will be small tributaries that originate from the mountains, farm dams and the forested foothills of the mountains. They should be seen as a unit that collectively contribute towards a single visual resource. These features are important as it contributes to the value of the visual resource and any alternation to it could affect the character of the landscape.

The affected observers are expected to be the farmers that regularly travel on the dirt roads along the foothills of the mountains. Protected wilderness areas exist along the crest of the Outeniqua Mountains and possible hiking trails may look down on the Narina Substation site and the transmission line. It is unclear at this stage where the hiking trails are, but further investigation will follow.

The very picturesque Outeniqua Pass (N9) passes 3 km east of the Blanco Site. This is a gateway to the Garden Route and considered a scenic route. It is a much-travelled route by tourists visiting the area and is an important transportation connection between the Klein Karoo and George. The visibility analysis and site investigation will reveal if the proposed project will be visible from this route.

The most north western part of George is located within 5km from the proposed corridors. The residents in the area may experience views to the power line. Their views of the magnificent Outeniqua Mountains may be affected but can only be confirmed once the pylon placement and final alignment are known.

Sensitivity of The Visual Resource

The sensitivity of the visual resource is considered high as this is a region with very little anthropogenic elements and borders the pristine Outeniqua Mountains. The transmission towers are

considered large structures and in contrast with the existing landscape character. Their presence will change the pristine natural character that currently prevails. This will impact on the value of the visual resource.

The residents in the study area are classified as visual receptors of high sensitivity owing to t o their sustained visual exposure to the proposed development as well as their attentive interest towards their living environment. Tourists, such as hikers, are also regarded as receptors of high sensitivity. Their main reason for visiting the area is to experience and enjoy the picturesque and pristine natural environment. They have high expectations in terms of the scenic quality.

It appears that a couple of farmsteads in the Molen Drift area will be within the Zone of Maximum Visual Exposure, i.e. within 1 km of the proposed corridors. Most other farmsteads are more to the south as the Outeniqua Mountain range is a physical border for any development further north. A couple of dirt roads provide access to this part of the study area but it is unclear who uses the roads. It is presumably the local farmers.

The western outskirts of George and the Outeniqua Pass (N9) are within 3-4km of the corridors. The visibility of the proposed project will be assessed on site to determine if these observers will be impacted, and to what degree.

6.5.5 Natural Landscapes

Alternative 1 &2 traverses the central and eastern part of this landscape type. Alternative 3 brushes past the southern part between this landscape type and the town of Hartenbos, before linking up to Alternative 2.

Affected Receptors
The affected landscape receptors will be the undulating hills occupied by natural vegetation, streams, rivers, valleys and other unique topographical features. A concentration of game farms is located in this region and conserves large areas of fauna and flora. The Hartenbos River feeds the Hartebeeskuil Dam, which will be affected by Alternative 2.

Alternative 2&3 will pass close to the smaller Klipheuwel Dam. Some of the other larger rivers in the study area that will be traversed by the corridors are the Brandwag and Moordkuil Rivers. The proposed power line will add anthropogenic structures to a landscape that is predominantly natural. It will impact on the character of the landscape and influence the value of the visual resource. Within this landscape type, many game farms and private reserves are tourist attractions and cater for luxury outdoor activities and experiences. Tourists will be affected because they'll enter the study area through the local road network and visit these tourist attractions. Robinson Pass (R328) connects Oudtshoorn to Mossel Bay and is considered as one of the major transport routes. Other observers in this landscape type will be the local farm residents.

Sensitivity of Receptors
The sensitivity of the visual resource is considered high as this is a region with very little anthropogenic elements and are generally free of electrical infrastructure of this scale. The transmission towers are considered large and in contrast with the existing landscape character. Their presence will change the pristine natural character that currently prevails. This will impact on the value of the visual resource.

The residents in the study area are classified as visual receptors of high sensitivity owing to their sustained visual exposure to the proposed development as well as their attentive interest towards their

living environment. Tourists are also regarded as receptors of high sensitivity. Their main reason for visiting the area is to experience and enjoy the picturesque and pristine natural environment. They have high expectations in terms of the scenic quality.

Distance from Source Of Impact

Alternative 1 will traverse a part of the Gondwana Private Game Reserve. The exact locations of the camps and accommodation will be confirmed during field investigation. Alternative 2 passes over the northern part of the Hartebeeskuil Dam and will also pass in very close proximity to Riverside Holiday Resort and Botlierskop Private Game Reserve. These locations are considered sensitive viewpoints due to the tourism potential. Other nearby tourism locations are Nyaru Game Lodge and Cheetah Lodge near Brandwacht. These lodges are between Alternative 1 & 2, approximately 2km from the corridor. These tourist attractions were identified, using a Google search and Google Earth geographical data. More may be identified during the fieldwork. Farmers residing in the area will also be affected due to the corridor passing close to their farmsteads or over their farms.

6.5.6 Landscape type: Coastal Towns & Cities

Alternative 3 will affect the town of Hartenbos as this corridor traverses the northern and western side of the town. The north western part of George is approximately 4km from the proposed Narina Substation site. A couple of guest farms and tourist accommodation are situated in the outskirts of the Blanco Suburb and is considered in the Zone of Visual Influence (ZVI). This was confirmed during the fieldwork of the EIA phase.

Affected Receptors

The western and northern part of the town of Hartenbos will be directly affected due to the close proximity of Alternative 3. The town is expanding in this direction and the transmission line will impact on settlement patterns as well as impact on views towards the mountainous terrain to the north. Residents and motorists are the observers that will be most affected. The town of Hartenbos i-s also a popular tourist attraction during holiday seasons, adding tourists as a receptor group. The N2 highway is a prominent transport route that carries high volume traffic. Alternative 3 passes very close to the N2 and motorists may experience glimpses of
the transmission line. This was confirmed during the fieldwork of the EIA phase.

Sensitivity Of Receptors

The residents in the study area are classified as visual receptors of high sensitivity owing to their sustained visual exposure to the proposed development as well as their attentive interest towards their living environment.
Tourists are also regarded as receptors of high sensitivity. Their main reason for visiting the area is to experience and enjoy the picturesque and pristine natural environment. They have high expectations in terms of the scenic quality. Motorists are often classified as viewers with a low sensitivity due to their momentary view and experience of a potential visual impact. As a motorist's speed increases, the sharpness of lateral vision declines and the motorist tends to focus on the line of travel.[7] This adds weight to the assumption that under normal conditions, motorists will show low levels of sensitivity as their attention is focused on the road and their exposure to roadside objects are brief.

Distance from Source of Impact

[7] *USDOT, 1981*

Alternative 3 is within 1km from the N2 highway and traverses the western and northern parts of Hartenbos.

6.6 ISSUE: Impact on Social environment (refer to Appendix 4.8)

The energy infrastructure project can deliver many benefits in the long term for communities in the Western Cape. Potential negative impacts are also anticipated in the short, which can be reduced or avoided with management measures.

The potential social impacts are identified and assessed for the EIA phase (Amina Ismail, 2016) in this section. Management measures have been recommended in the Environmental Management Plan to mitigate potential negative impacts or enhance possible positive impacts.

It is anticipated that the project has the potential to realise the following positive social impacts:

- Improved quality of life, through
    - Creation of jobs (**during construction**);
    - Increased reliability of energy services (**during operations**); and
    - Improved community health from the introduction and maintenance of safer sources of energy (**during operations**).

The project can possibly also introduce negative social impacts, including:

- Loss of assets and disruption in people's lives because of physical displacement, which can arise if residences are located in the same path as the power infrastructure (**during construction**);
- Increased community safety risks from increased direct exposure to electrical hazards, if there is tampering or dangerous contact with power infrastructure (**during operations**).
- Increased community health risks if workers' camps do not have access to basic services such as sanitation and waste removal (**during construction**);
- Increased community health risks from possible increased exposure to HIV/AIDS (**during construction**).

Potential Construction Phase Impacts

The anticipated impacts associated with the construction phase of the project are of a short duration, temporary in nature, but could have long term effects on the surrounding environment. The following impacts are anticipated during the construction of the proposed transmission line:

Impact on job opportunities

Power line construction does not create large scale job opportunities. Limited opportunities for local labour are expected as the majority of the construction activities would be undertaken by specialist contractors, which are invariably from the larger population centres.. The short term benefits in this regard are thus deemed to be of a low significance.

Influx of Workers

An influx of workers from outside the study area could negatively impact on the daily living and quality of life of the property owners whose properties are affected by the transmission line alignment. This would mostly only materialise during the intermittent periods when the construction activities are taking place on those properties.

Influx of Jobseekers

An influx of jobseekers is possible, although the rural, remote and sparsely populated study area makes the gathering of large numbers of jobseekers at the construction areas unlikely.

Construction camp impacts

Projects of this nature sometimes involve the development of a construction camp(s) where the temporary construction workers are accommodated. This in itself could impact on the daily living and movement patterns of those living in close proximity to such a facility. Cumulative impacts include misbehaviour of construction workers at the construction camp and mismanagement which could result in safety and security concerns, social conflict and environmental problems. The exact location of a construction camp would determine the intensity of the impact.

Impacts on daily living and movement patterns

Construction related activities could impact on the daily living and movement patterns of the locals e.g. increased construction vehicle activity on the local roads and possible construction of new access roads. This would especially be evident in the agricultural areas where numerous gravel roads connect to tarred roads. Where construction work has to be undertaken on private properties it could also have a negative impact on those owners' daily living and movement patterns.

Impacts on daily living and movement patterns also refer to the increased noise pollution during construction activities, especially where construction would take place in close proximity to dwellings situated in low ambient noise areas (agricultural land). Right-of-way clearing and construction activities, however, will be short term. Noise will thus only be temporary generated and if construction activities adhere to all relevant legislation in this regard and limit construction activities to normal working hours, the impact is anticipated to be minimal.

Disturbance of infrastructure and services

The proposed routes intersect or are not in close proximity to existing infrastructure services such as telecommunication and railway lines. Road crossings are limited. Many rain harvesting features such as berms are evident in the area and great care should be taken to avoid placing towers or construction roads within these structures

Figure 24 During construction of new infrastructure (Gyed V-pylons)[8]

Impact on Land use
The proposed alternatives traverse agricultural land. Commercial small stock farming is the predominant land use and it is expected that the impact will be limited and small stock farming could continue undisturbed.

Health related impacts
Health related impacts during the construction phase of the proposed project refer to the spread of sexually transmitted diseases such as HIV/AIDS between workers (usually outsiders) and the local population. The impact of HIV/AIDS on productivity in the study area is already a source of concern. Specific concerns relate to possible promiscuous activities at construction camps if these are located in close proximity to existing settlements and towns.

Safety and Security Impacts
Safety and security impacts include construction related risks and accidents, uncontrolled vehicular access, the perceived increase in crime as a result of outsiders being in the area. Whether real or perceived, these risks would need to be assessed.

Potential Operational Phase Impacts
The operational phase of power lines is a long term process. The impacts usually associated with this phase are therefore perceived by affected parties to be more severe, although not necessarily the case as transmission power lines could be referred to as a "dormant operation". Maintenance undertaken during the operational phase is however also expected to have some short-term impacts.

The following impacts are anticipated to occur during the operational stages of the proposed project:

Impact on Job Opportunities
It could be expected that existing Eskom Employees will be responsible for the maintenance of the line and servitude, although some temporary maintenance work could be undertaken by locals, such as repairing damaged roads or fences. The management of the substation and wind farm would be also be managed by Eskom, potentially not resulting in additional Employment opportunities.

Impacts on daily living and movement patterns
Maintenance activities would be undertaken only when required. The impacts on the daily living and movement patterns of affected residents are thus expected to be limited.

Impact on regional and local economy
It is not anticipated that the proposed project would have a significant long term bearing on the affected Local Municipalities, the local communities and/or on the local economy. The electricity generated by the proposed wind farm will feed into the National Electricity grid, managed by Eskom Transmission. The local electricity distribution is managed by Eskom Distribution and the status quo of local electricity service delivery might not change.

[8] *Photo: Eskom Transmission Development Plan 2015-2024*

Property values

Potential devaluation of properties would depend on the exact location of the line on each property, the land-use, visual impact and possible negative impact on the overall sense of place

Social issues identified during the public participation process

The public participation process for the EIA commenced in April 2015, when landowners were informed about the proposed development. Inputs received from Interested and Affected Parties (A&APs) during this period included comments and concerns about potential social impacts. These are captured in **Table 9** below

Table 9: Comments and concerns received when landowners were informed about the proposed development

Change in social aspect	Nature of impact
Visual, resulting in **economic impacts**	Visual changes will result in changes in the character of properties. This will have a negative economic impact. Property values and prices will drop. There will be reduced interest in tourism as the nature of the landscape will be affected from a reduction in the quality of the landscape for photography, birding and nature hikes. The planned line will also pass in front of some holiday homes, disrupting the view, and possibly leading to a reduction in property value. Properties potentially affected: Gondwanda Game Reserve, an equestrian estate outside of Mossel Bay town, an eco-estate in George that has an eco-wilderness camp planned for the area through which the line will pass, Monte Christo eco estate in Mossel Bay, holiday homes and caravan parks. Two Eskom High Voltage power lines pass through the properties, Klipheuwel 143/3 and Rheeboksfontein 140/2. A third power line across the properties would seriously impact upon the property value for recreational and game purposes. One Eskom high voltage power line currently passes through an inland property, Hartebeeskraal 122/8.
Farming activities disturbed, resulting in: - **economic displacement** from losses in economic activities and jobs -**physical displacement** if workers must give up their residential status on the farm. -	Farming activities will be disturbed. Irrigation farmers are specifically worried about areas under centre pivot irrigation, with many channels, roads and irrigation lines that may be disrupted and cease to function. The route closest to the sea crosses the Little Brak estuary and is also close to intensive agricultural land
Social and Economic Development Plans disturbed, resulting in **loss of development and economic opportunities**.	Future development planning for, for example, housing estates, roads, helicopter pads, holiday resorts, industries, wind and solar plants planned for the area housing estate will have to be modified
No Eskom project, the **"No Go" alternative**	Social impacts if the line is not constructed
Poor project management for construction, environmental management, resulting in **economic losses** in the form of compensation	Employees were poorly skilled and management was poor in previous Eskom projects,. Eskom has no record of environmental management. No attempt was made to rehabilitate or re-imburse owners for damage suffered. We can only hope that the project is given to a suitably qualified and competent private enterprise firm to construct
Security and safety threats	Eskom does not remove vegetation from its servitudes. This presents unsightly areas

Change in social aspect	Nature of impact
	where illegal squatters tend to live, posing a security risk to residents.
Economic viability of projec	The gas field is at its end and Petro SA is retrenching staff. How is Eskom going to drive those turbines?
Noise	Existing power line are noisy
Concerns about radiation from Electromagnetic fields and, resulting in **health impacts**	Radiation from lines is a concern.

Interested and Affected Parties were formally invited to submit comments when the Draft Scoping Report was available for public comment. All comments have been retained, for consideration of any linkages between social aspects and other specialist issues. Loss of biodiversity, for example, can negatively impact on tourism. Consequently, the social and economic development of an area can decline.

During the Scoping Phase, some I& APs have registered concerns about the health and safety impacts of electromagnetic fields created by power lines. This impact could not be assessed (see explanation in Section 6.5.4), but the report recommends that the concerns must be addressed. Management measures are therefore provided in the Environmental Management Plan for responding to the concerns. Similarly, not all other potential impacts that were raised by I & APs could not be assessed but management measures are provided in the EMP to respond to the issues. These potential impacts are the likelihood of job losses due to losses in economic activity, and safety and security risks introduced during construction or operations.

Physical and economic displacement could not be assessed because of the 2km latitude provided to mitigate the impacts associated with them. However, a Socio-economic impact study was done by the specialists and the findings are contained in a separate report. The loss of jobs brought about by the the loss of economic activity, for example, could not be assessed. Economic and physical displacement, however, are two important criteria considered when assessing the line alternatives (in Section 8.2). Management measures are also provided in the Environmental Management Programme (EMPr) for mitigating the consequences of physical and economic displacement.

6.7 ISSUE: Socio-Economic Impacts (refer to Appendix 4.9)

The impact of the construction of the transmission lines can be subdivided in two categories. One is the impact of the construction cost, purchasing of servitude and operational expenditure of the transmission lines on the surrounding local municipalities and secondly the impact on the broader economy by strengthening the power availability to a growing economy. No potential average construction cost or potential land value information was available at the time of this study and as such no potential impacts could be quantified.

According to Kevin Leask[9], "The most economical way to build power transmission infrastructure is in a straight line from the source of the power to those who need it". However, it is important to "…take account of social, environmental and heritage concerns".[10]

According to Eskom (2014), it costs about **R2.8 million per km** for a 400 kV transmission line (depending on terrain, types of structures required, etc). As a result a transmission line of 178 km can cost about R498 million compared to a line of 270 km that will be about R756 million. Potential costs categories that are encountered during the construction phase (capital expenditure period) are:

- Civil engineering costs (including access roads);
- Earth works (site clearances, foundations, etc);
- Structures (cement foundations, steelworks, electric cables, substations, electrical equipment, etc);
- Line material (hardware, insulators, conductors, earth wire, etc);
- Transport of material and workers;
- Purchasing of servitude area.

Major upstream categories include:

- Manufacturing of structural steel for pylons and cables;
- Manufacturing of cement.

The estimated cost of the proposed Droërivier-Narina-Gourikwa 400 kV Transmission Power Line is R 1 429 743 066[11], i.e R 285 948 613. This project for the section between Gourikwa and Narina substations forms approximately 20% of this budget (60km of the total 260km). Some of the capital equipment including steel structures, cables, hardware, insulators, etc. and cement for the foundations will be manufactured outside the study area in places like Gauteng, Western Cape and Coega and this will support economic activity and employment in those areas. Where possible, local suppliers will be invited to tender for the supply materials and plant.

It can be advised that Eskom gives preference to local procurement where possible to enhance the positive impact on the local area, although it needs to be taken into consideration that certain skill or certificate will be required in specialist areas and phases. It could also be considered to provide the necessary training in cases where applicable to share skills and experience with the local committee.

The local economy will also benefit through aspects like accommodation, retail, entertainment, etc. Money can also be injected into the pockets of the landowners by buying the servitude area for the transmission line. This will depend on which alternative transmission line option is used and on the land value per ha for the region. **Table 10** shows average farm prices for a selection of properties in the George area. Prices vary vastly depending on factors like infrastructure (including houses, guesthouses, etc.), water and boreholes (and water rights), fencing, game, etc. Results show the average size for farms in the George area, given the selection of 16 farms for sale during the time

[9] *Eskom chief engineer for transmission planning*
[10] *CSIR, 2014*
[11] *Eskom Transmission Development Plan 2015-2024*

the study was conducted, is 188 hectares and an average price per hectare is R287 698. However, there is a large difference between the minimum and maximum price per hectare.

Table 10: Average farm prices for a selection of farm properties[12]

	Average farm size, ha (> R5 million)	Average price per ha	Min price per ha	Max price per ha	Sample size
George	188	R287 689	R42 474	R857 143	16

During the Public Participation Process, it came to light that many farmers are concerned about the impact of the project on their existing and planned pivot point irrigation systems. Alternative 2 crosses the Wolwedans Dam that is considered a valuable natural feature. Alternative 1 passes more to the north of the dam, crossing the inlet from the Groot Brak River. Alternative 2 & 3 are in very close proximity to Klipheuwel Dam, passing just north of it. Tourism and recreational activities are believed to be practiced on and around the dams, adding to the economy of the region.

6.8 ISSUE: impact on Tourism and Economic Impact Assessment (refer to Appendix 4.9)

The impact of the proposed transmission lines on the tourism industry will be limited, apart from the visual impact in the context of the "sense of place". The George municipal area is part of the Garden Route with scenic mountains, farms, forests and valleys. Tourists also visit the Groot and Klein Karoo area to experience the "wide open horizons" and "rural lifestyle" without the visual interference of transmission lines. Results from the visual impact study can be used to limit the impacts of the transmission lines. One of the ways can be to let the major section of the Alternative 1 transmission lines run parallel to N12. This is also the shortest route.

The impact of the construction of the transmission lines on the economy includes the impact of the construction cost, the operational expenditure and the impact on the broader economy (by allowing the power to be delivered to the existing grid). Capital expenditure data could not be obtained from Eskom to quantify any impacts, but a number of expenditure categories are discussed. A number of components will have to be imported from other provinces into this region, like steel structures, cables, hardware, insulators and cement. This will generate economic activity and employment opportunities in those provinces. A local procurement policy can also be considered by Eskom (where possible and if not already standard practice) on activities like site clearance, road building and assembling to maximize the economic and job creation impact on the local municipalities.

The transmission lines will have some, although a limited impact on the agricultural activity, given the grazing capacity and that grazing can continue under the transmission lines. The operational expenditure will have limited opportunity for employment creation. From an economic point of view, with cost savings in mind, the shortest route, i.e. Alternative 1 can be recommended.

[12] *Source: Selected farms from safarmtraders.co.za (May 2015)*

6.9 ISSUE: Impacts on Roads and Traffic (refer to Appendix 4.10)

An increase in traffic can be expected during the construction phase. The movement of machinery and vehicles will constitute an additional source of noise to the study area. However, this will be limited to the period of construction and mitigation can involve the use of equipment fitted with noise abatement technology (where possible) and the restriction of construction to certain days and times. A Traffic Impact Assessment was undertaken during the EIA Phase, and the results are summarised below.

Considering the size and extent of the study area as well as details of the exact tower positions are still unknown, it is difficult to estimate exactly which roads will be utilised for the transport and consequently deliver equipment to the site from various centres. It was therefore decided to firstly assess the access roads outside the study area for importing components and consequently site access roads within the study area being utilised during construction.

Importing Components

Equipment required for construction of the power line will consist of three main categories, all transported from different locations. The categories are the foundations (concrete and reinforcing), the structure and hardware (steel) as well as cables for the stringing of the conductor. It is accepted that the foundation material will be imported locally, with the steel and strings being transported from Johannesburg or imported from Port Elizabeth. The construction process and associated equipment and material required is shown below:

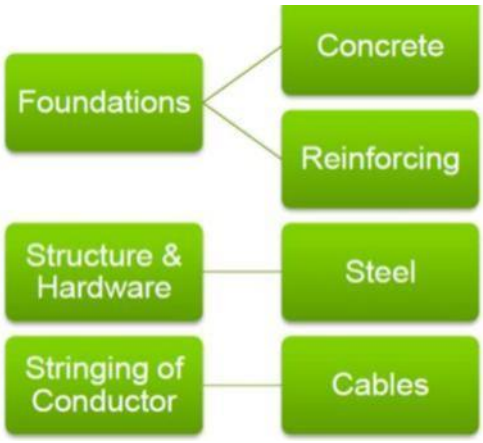

Figure 25 Construction process

The potential ports for landing imported equipment are Port Elizabeth, Saldanha or Cape Town. Port of Mossel Bay is considered not suitable for the handling of imported freight and logistic operations required. Port Elizabeth is the preferred port, with a route length of 330km. It should be noted that the Ports Authority also has preferences on freight imports, which should be respected.

Figure 16. Normal freight vehicle

The route from the alternative Port of Saldanha is about 540km and is the least preferred route. However, it still offers an alternative, should Port of Port Elizabeth not be available for any reason. While Cape Town Port is the second closest port to the site (430km), it would most probably not be able to accommodate the imported elements, due to potential congestion. It is suggested that the transporting contractor executes a more detailed study before transporting any of the components, to confirm the preferred and alternative routes for each element required for the project. Should any of the preferred sections be unavailable for any reason, a combination of routes should also be considered. The closest manufacturing centre will most likely be Johannesburg, which is situated 930km from the site. For the largest part of the route from Johannesburg, the National Route 1 will be used. There are, however, toll fees payable on this specific route, which can be avoided by using alternatives.

Material sources for road building and concrete works are available in George, Oudtshoorn or Beaufort West and all material will most likely be transported from these towns on the N1 and the N12. To reduce traffic on the access roads, consideration could be given to sourcing material for road building and concrete aggregate from new or existing quarries/sources in the vicinity of the site, provided that approvals will timeously be obtained with respect to the target implementation programme. It is noted that the approval period for such quarries/sources is typically 12 to 18 months. The possible siting of quarries and/or borrow pits will be confirmed prior to construction, once a geotechnical investigation has been conducted.

Site Access Roads

In general are all public roads (National, Provincial and Municipal) considered viable for the use of general freight. For the line between Gourikwa (Mossel Bay) and Narina (at Blanco, George) there are four equally viable alternatives for the first section of the proposed transmission line are considered.

Summary of Traffic impacts:

The general freight will comprise building materials such as concrete and reinforcement, structural steel, and cables for the stringing of the conductor. The imported freight will preferably be transported from Port of Port Elizabeth to the site. The preferred freight route from Port Elizabeth comprises surfaced roads for the majority of the way where site entrances might consist of gravel roads in some cases. This route is predominantly on National or Provincial Roads, with suitable conditions for the transport of normal freight, or abnormal loads with permits. Toll fees are required on this route at

Tsitsikamma and abnormal permits might be required for certain elements but have to be confirmed once the construction process commences.

Building materials will most likely be transported from Oudtshoorn or Beaufort West, while certain elements will be transported from manufacturing centres in South Africa - most likely Johannesburg or Port Elizabeth. The transport of elements from these manufacturing centres will be predominantly on National and Provincial roads, which presents no limitations for normal freight.

There is a limited risk of delays to the various deliveries required for the construction of the power line, due to potential routine road maintenance works (such as repairs and reseals). The impact of such activities is dependent on the scheduling of deliveries and of roads contracts, and may be mitigated by the use of the alternative routes proposed in this report. In general, no obvious problems were identified associated with the transport of freight along the proposed routes to the site, nor for the accesses required for the construction and maintenance of the facility. It will, however, be necessary to confirm certain aspects such as clearances, bridge capacities, etc., by the logistics contractor as part of their preparation as this will be dependent on the actual vehicles configuration used.

From an accessibility and traffic perspective it is clear that for the section from Gourikwa to Narina/Blanco, all alternatives are viable although the alternative with the shorter length and in closer proximity to the National and larger Provincial roads would be preferred.

Finally the use of aircraft for transporting any freight to remote sites will have to comply with the South African Civil Aviation Authority's Regulations (South African Civil Aviation Authority, 2016) but is not expected to have any impacts on traffic. Coordination with other actions in the area where helicopters are used for fire fighting, game management or private operations will be required.

6.10 ISSUE: Maintenance of infrastructure (on private properties)

Maintenance activities would be undertaken only when required for the life of the line. It is not anticipated that this would have severe negative intrusions on the landowners, mainly due to the size of the affected properties (lines could be situated far away from homesteads and other dwellings) and the fact that stock farming activities such as grazing could continue underneath the proposed line and within the servitude. However, complaints were received during the PPP process (March-April 2015) regarding the maintenance of power lines. Issues related to maintenance include the following:

- The need for additional access routes which could result in erosion, intrusion, loss of land;
- Maintenance personnel leaving gates open;
- Maintenance personnel driving on private roads without obtaining permission first;
- Maintenance personnel driving through the veld;
- Littering during construction and maintenance;
- Maintenance personnel accessing properties without prior notification and
- Illegal capturing or poaching of game and other livestock and theft of plants.

The effects of misconduct such as those mentioned above could result in long-term secondary negative impacts with possible negative financial implications for farmers and damage to the environment. For the maintenance activities of the line, proper conduct and mitigation measures could address the possible negative impacts.

Operations at the substation are anticipated to be of a low input and are thus not expected to negatively impact on the daily living and movement patterns of the affected residents. Access to the substation already exists, thus it is anticipated that the existing status quo at the substation would continue.

6.11 GAPS, Limitations and Assumptions of the study

A number of limitations and assumptions, as described below, are noted for this environmental impact assessment.

- Due to the vast area covered by this linear project and time limitations, individual properties could not be inspected. Use was made of a desktop assessment by examining the projected transmission line routes that were mapped onto Google Earth. Comments from the public participation process provided details of the concerns on the affected properties which were investigated by means of interviews, focus group meetings and consultation.
- Although various methods of communication were used to inform IAPs of the project and the EIA process, it should be understood that participation is a voluntary involvement and that communities are not equally mobilised or comfortable to attend public forums or communicate via modern technologies such as e-mail, sms, the internet or fax.
- Many of the impacts are linked or inter-related. There are therefore areas of overlaps between the specialist reports, and similarities in the Scoping Report and the EIA Report. In order to minimise duplication and prevent reader fatigue but still provide the information required by the EIA Regulations, the focus was placed on those issues that were identified as potential risks. The PP process has guided the areas of detail studies to a large extent.
- Certain issues such as the loss of livelihood and residential status on farms, related to loss of jobs due to a reduction in farming activity, or reduction of property values could not be assessed within the scope of the EIA process. Physical displacement as a result of loss of household assets if residences are located in the same path as the power infrastructure could not be assessed as a 2km width has been provided in the line alignment, to allow for flexibility when siting the towers and the 55 metre servitude required for the infrastructure. It is not possible to quantify the impacts on agriculture and tourism unless the exact alignment and position of the tower structures are known. When that information is available it will have to be combined on a micro level for each farm, type of farming activity and potential impact per farm. It will have to determine what activities can and cannot continue under the lines, and whether current economic activities can be replaced with other activities that can also have an economic contribution. The current scope of the study does not allow for such a detailed study.
- The impact on tangible heritage resources could not be accurately predicted, as many of the objects are obscured along the route and may only be uncovered during construction. Intangible resources are even more problematic to identify, as are traditional areas that have not yet been documented for protection.
- Another potential impact that could not be assessed is the health impacts from electromagnetic fields (EMFs). This study however acknowledges that was raised as a concern for stakeholders.
- The specialists could only work with the information that was available at the time of their appointment and within the time frame for the EIA phase of the project.

7 ASSESSMENT

7.1 Description of the Need and Desirability

The Guideline On Need And Desirability published by the Western Cape Department of Environmental Affairs & Development Planning[13] (DEA&DP), lists 14 questions to determine the need and desirability. In **Table 11** below, this includes answers relevant to the proposed project.

Table 11. Need and Desirability

NEED ('Timing'):
Question 1: Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (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). **Answer: Yes** The IDP documents for George and Mossel Bay make mention of further job creation (Local Economic Development) in the region. The project will provide jobs to local communities.
Question 2: Should development, or if applicable, expansion of the town/area concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time? Answer: **No**, the infrastructure is mostly located outside of the town areas.
Question 3: 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) **Answer: Yes** On local level, the project has potential socio-economic benefits, such as jobs. On a national level the project will contribute to strengthen the transmission network of the Western and a Southern Cape areas.
Question 4: 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? **Answer: Yes** The existing infrastructure will be used by the proponent for the proposed project. The Traffic Impact Assessment was done in EIA phase, but detail design phase will determine if and where additional roads will be require for the development.
Question 5: 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)? **Answer: No** No negative impact is anticipated on municipal infrastructure planning. The infrastructure of the proposed activity would be provided and maintained by the proponent of the project (Eskom).
Question 6: Is this project part of a national programme to address an issue of national concern or importance? **Answer: Yes** The project will enable the transmission of generated electricity to the national grid.

[13] *DEA&DP (2010) Guideline on Need and Desirability, EIA Guideline and Information Document Series. Western Cape Department of Environmental Affairs & Development Planning (DEA&DP).*

DESIRABILITY ('placing'):
Question 7: Is the development the best practicable environmental option for this land/site? **Answer: To be determined by EIR** The specialist studies of the EIR phase of the project give a clear indication of environmental options.
Question 8: Would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF as agreed to by the relevant authorities. **Answer: No** The project will enable the transmission of generated electricity to the national grid, which will support the IDPs[14] and SDFs in terms of surety (reliability) of supply.
Question 9: Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations? **Answer: No** The proposed project will require mitigation of potential negative environmental impacts during the construction phase of the project. During the operational phase of the project, livestock and game grazing and wild animals will continue in the power line servitude.
Question 10: 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 the footprint area within its broader context). **Answer: Yes** The objective of this project is to connect the Gourikwa Main Transmission Substation to the proposed NARINA (BLANCO) Transmission Substation and the National electricity grid. Specialist studies, such as a Visual Impact Assessment were conducted during the EIR phase, to determine the most practical and environmentally preferable placement of the lines.
Question 11: How will the activities or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)? **Answer:** This EIR process has determined the potential impact on the environment and if negative impacts are identified, mitigation measures will be proposed.
Question 12: How will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc)? **Answer:** No negative impacts are anticipated regarding noise or odours during the operational phase of the project. Visual character and sense of place impacts are anticipated and the EIAR will determine the extent of impacts and propose mitigation measures if required. Socio-economic benefits are likely to result from the proposed project and might include job creation. Impact on tourism facilities is an issue that has been raised during the PP process and was investigated during the EIA phase of the project.
Question 13: Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs? **Answer: No**

[14] *Eden District Municipality 2014/2015 First Draft Reviewed IDP and the George Municipality's 2014/2015 Reviewed IDP, and the Mossel Bay Integrated Development Plan 2012/2013 – 2016/2017*

DESIRABILITY ('placing'):
The project area is of linear nature and the primary land use will continue as is.
Question 14: Will the proposed land use result in unacceptable cumulative impacts? **Answer:** The EIAR has determined the full extent of impacts and propose mitigation measures if required.

At the end of the review period of the Final EIA Report, all comments/input from stakeholders and I&AP's were captured in the Issues and Response Report (IRR) that now forms part of this final EIA Report.

7.2 Route Alternative Evaluation

Alternative 1, Alternative 2 and Alternative 3 will create impacts that might be negative to the receiving environment. An Alternative 4 has been proposed to overcome some of the negative impacts through avoidance, but not all impacts will be minimised. However, this alternative has been excluded from the recommendations, as it did not form part of the initial application and also since the Alternative 1 has been found to be environmentally the best option.

The magnitude of the impacts and the type of environment that will be influenced must be comparatively evaluated in order to recommend an option and focus the specialist studies. The specialist studies' focus during Scoping and EIA phases was to assist the EAP to understand the nature of the impacts and develop mitigation options for the recommended route.

A comparative table has been drawn up where the various environments as well as the impact of the activity on those environments where classified in a simplistic way in order to establish an option with

a) the least possible impacts
b) avoidance of impacts
c) manageable impacts
d) mitigation possibility

The Public Participation has indicated that the three routes present aesthetic and practical impacts that are unacceptable to land owners and inhabitants of various properties. However, as impacts are unavoidable with all three alternatives (and the fourth which is a combination of sections of these 3 alternatives), unpopular choices need to be established in order for the national energy supply grid to function in a developmental society. These choices need to be influenced by empirical evaluation and not emotional or singular individual objections. The choices need also be influenced by the mitigation hierarchy that applies to environmental impact assessments methodology. The rationale behind the scoring method for the Table is that avoidance takes precedent followed by minimisation, management and mitigation.

A further empirical evaluation must be influenced by the type of environment that is being impacted upon e.g. wetlands are heavier weighted environments with more sensitive elements than some other land uses. However if avoidance can be implemented in a wetland then the impact value is zero. Similarly avoidance of high density residential areas or agricultural lands are weighted as zero but crossing of the sites will have an impact that is heavier weighted apart from the impacts that will occur on the bio-physical environment. Visual impacts in a touristic area will also have heavier consideration so the option should be located on the route less travelled or near conservation areas such as Game Ranches and holiday homes.

7.3 Impact Evaluation methodology

Direct, indirect and cumulative impacts of the issues identified through the scoping study, as well as all other issues identified in the EIA phase must be assessed in terms of the following criteria:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The **duration**, wherein it will be indicated whether:
    - very short duration (0–1 years) – assigned a score of 1;
    - short duration (2-5 years) - assigned a score of 2;
    - medium-term (5–15 years) – assigned a score of 3;
    - long term (> 15 years) - assigned a score of 4; or
    - permanent - assigned a score of 5

- The **consequences (magnitude)**, quantified on a scale from 0-10, where 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability** *of occurrence*, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1–5, where:

  1 is very improbable (probably will not happen),
  2 is improbable (some possibility, but low likelihood),
  3 is probable (distinct possibility),
  4 is highly probable (most likely) and
  5 is definite (impact will occur regardless of any prevention measures).

- the **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- the **status**, which will be described as either positive, negative or neutral.
- the degree to which the impact can be **reversed** (low, moderate, high).
- Whether the impact may cause ***irreplaceable*** **loss of resources** (Yes/No).
- Whether the impact can be ***mitigated.***

The **significance** is calculated by combining the criteria in the following formula:

S=(E+D+M) x P
S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The **significance weightings** for each potential impact are as follows:

< 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
> 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

7.4 Assessment Tables

The most important issues below can be categorised into the following:

- Visual impact – Tourism, Game Lodges, Wedding Venues, Eco estates
- Disturbance of natural areas - impact on rare plants (Yellow wood trees, fungi, aloe), birds and animals
- Maintenance and rehabilitation
- Economic issues - loss of farming infrastructure and land, disturbance of current activities (e.g. pivot points)
- Cumulative impact of lines, “too many on farms already”

These particular issues were investigated in more detail during the EIA Phase (July- September 2016). Specialist studies included an assessment of the issues that have been raised by the public and stakeholders during the Scoping Phase. The public participation process was continued and comments received on the Final EIA Report were responded to and included in the Final EIA Report.

7.4.1 Vegetation Impact Assessment:

The four alternative powerline do not differ in any significant way as far as the impacts on socio-economic & tourism is concerned. In most part the three alternatives are not comparatively assessed in the assessment tables below. Where applicable, the differences in impacts are highlighted in red for Alternative 2, in green for Alternative 3 and orange for Alternative 4

1. Activity: Construction and operation of power line in Critical Biodiversity Areas (CBAs), Ecological support areas (ESAs) and protected areas (PAs)		
Environmental Aspect: Removal of / or excessive damage to vegetation in CBAs, ESAs and Protected Areas.		
Environmental impact: CBAs & ESAs are sensitive areas which support ecosystems and unique habitats. The loss of vegetation and/or species of conservation concern, loss of and alteration of microhabitats, altered vegetation cover, site-specific altered distribution of rainfall and resultant runoff patterns, general increase in runoff from hard surfaces and/or bare areas and associated accelerated erosion, reduction of habitat and resource availability for terrestrial fauna, possible increase of detrimental effects during periods of extreme weather events, e.g. increased flooding, severe erosion or dust due to lower buffering capacity of sparser vegetation		
	Without mitigation	**With mitigation**
Extent (E)	Local (2)	Local (1)
Duration (D)	Long-term (5)	Long-term (3)
Magnitude (M)	Moderate (8) Moderate (7) alt 2 Moderate (6) alt 3 Moderate (4) alt 4	Low (4)
Probability (P)	Definite (5)	Definite (5)
Significance ***(S = E+D+M)*P***	**High (75)** **High (70) alt 2** **High (65) alt 3** **Medium (55) alt 4**	**Medium (40)**

Status (positive, neutral or negative)	Positive	Positive
Reversibility	Non-reversible	Non-reversible
Irreplaceable loss of resources?	Highly Probable	Highly Probability
Can impacts be mitigated?	Reasonably	

Mitigation:

- After the final layout has been approved, conduct a thorough footprint investigation to detect and map (by GPS) any protected plant species and active animal burrows.
- Protected plant species must be relocated if possible.
- Animal burrows must be monitored by the ECO prior to construction for activity/presence of animal species. If detected, such animals must be removed and relocated by a qualified professional/contractor.
- Keep areas affected to a minimum, strictly prohibit any disturbance outside the demarcated footprint area.
- Clear as little indigenous vegetation as possible, aim to maintain vegetation where it will not interfere with the construction or operation of the development, rehabilitate an acceptable vegetation layer according to rehabilitation recommendations of the relevant EMPr, if possible.
- Remove all invasive vegetation before and after construction and continuously up to decommissioning.
- If filling material is to be used, this should be sourced from areas free of invasive species.
- Topsoil (the upper 25 cm of soil) is an important natural resource; where it must be stripped, never mix it with subsoil or any other material, store and protect it separately until it can be re-applied, minimise the handling of topsoil.
- Temporarily stored topsoil must be re-applied within 6 months, topsoil stored for longer need to be managed according to a detailed topsoil management plan.
- Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly.
- Prevent leakage of oil or other chemicals, and strictly prohibit littering of any kind.
- Monitor the establishment of all invasive species and remove as soon as detected, whenever possible before regenerative material can be formed

Cumulative impacts:

If mitigation measures are not strictly followed the following could occur:

- erosion of areas and continued erosion of the development area with associated siltation and/or erosion of lower-lying wetlands located outside of the project site.
- contamination of drainage lines, lower-lying rivers or wetlands located outside of the project site.
- alteration of occupancy by terrestrial fauna beyond the project site, possible reduction of available habitat and food availability to terrestrial fauna.
- spread and establishment of invasive species.

Residual impacts:

- Altered topsoil characteristics.
- Altered vegetation composition.

2. Activity: Construction and operation of power line

Environmental Aspect: Removal of / or excessive damage to vegetation, compaction of topsoil, creation of runoff zone, redistribution and concentration of runoff from surfaces, displacement of terrestrial vertebrates, reduced buffering capacities of the landscapes during extreme weather events.

Environmental impact: Loss of vegetation and/or species of conservation concern, loss of and alteration of microhabitats, altered vegetation cover, site-specific altered distribution of rainfall and resultant runoff patterns, general

increase in runoff from hard surfaces and/or bare areas and associated accelerated erosion, reduction of habitat and resource availability for terrestrial fauna, possible increase of detrimental effects during periods of extreme weather events, e.g. increased flooding, severe erosion or dust due to lower buffering capacity of sparser vegetation

	Without mitigation	**With mitigation**
Extent (E)	Local (1)	Local (1)
Duration (D)	Long-term (5)	Long-term (5)
Magnitude (M)	Moderate (4)	Low (4)
Probability (P)	Definite (5)	Definite (5)
Significance (S = E+D+M)*P	**Medium (55)**	**Medium (50)**
Status (positive, neutral or negative)	Positive	Positive
Reversibility	Non-reversible	Non-reversible
Irreplaceable loss of resources?	Highly Probable	Highly Probability
Can impacts be mitigated?	Reasonably	

Mitigation:

- After the final layout has been approved, conduct a thorough footprint investigation to detect and map (by GPS) any protected plant species and active animal burrows.
- Protected plant species must be relocated if possible.
- Animal burrows must be monitored by the ECO prior to construction for activity/presence of animal species. If detected, such animals must be removed and relocated by a qualified professional/contractor.
- Keep areas affected to a minimum, strictly prohibit any disturbance outside the demarcated footprint area.
- Clear as little indigenous vegetation as possible, aim to maintain vegetation where it will not interfere with the construction or operation of the development, rehabilitate an acceptable vegetation layer according to rehabilitation recommendations of the relevant EMPr, if possible.
- Remove all invasive vegetation before and after construction and continuously up to decommissioning.
- If filling material is to be used, this should be sourced from areas free of invasive species.
- Topsoil (the upper 25 cm of soil) is an important natural resource; where it must be stripped, never mix it with subsoil or any other material, store and protect it separately until it can be re-applied, minimise the handling of topsoil.
- Temporarily stored topsoil must be re-applied within 6 months, topsoil stored for longer need to be managed according to a detailed topsoil management plan.
- Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly.
- Prevent leakage of oil or other chemicals, and strictly prohibit littering of any kind.
- Monitor the establishment of all invasive species and remove as soon as detected, whenever possible before regenerative material can be formed

Cumulative impacts:

If mitigation measures are not strictly followed the following could occur:

- erosion of areas and continued erosion of the development area with associated siltation and/or erosion of lower-lying wetlands located outside of the project site.
- contamination of drainage lines, lower-lying rivers or wetlands located outside of the project site.
- alteration of occupancy by terrestrial fauna beyond the project site, possible reduction of available habitat and food availability to terrestrial fauna.
- spread and establishment of invasive species.

Residual impacts:

- Altered topsoil characteristics.
- Altered vegetation composition.

3. Activity: Transport of materials to site, movement of vehicles on site during construction and operation.

Environmental Aspect: Compaction of soils, possible contamination by oils or fuels, possible introduction and spread of weeds and alien invasive species, temporary disturbance of terrestrial fauna.

Environmental impact: Loss of vegetation, increase in runoff and erosion, disturbance or possible mortality incidents of terrestrial fauna, possible contamination of soil and groundwater by oil- or fuel spillages, possible establishment and spread of undesirable weeds and alien invasive species that could further damage ecosystem functionality.

	Without mitigation	**With mitigation**
Extent (E)	Regional (1)	Local (1)
Duration (D)	Long-term (5)	Short term (2)
Magnitude (M)	Moderate (6)	Small (4)
Probability (P)	Definite (5)	Highly Probable (4)
Significance (S = E+D+M)*P	**High (60)**	**Low (28)**
Status (positive, neutral or negative)	positive	neutral
Reversibility	Partially reversible	Reversible
Irreplaceable loss of resources?	Probable	Not likely
Can impacts be mitigated?	Reasonably	

Mitigation:

- Restrict all movement of vehicles and heavy machinery to permissible areas, these being designated access roads, maintenance roads, turning points and parking areas. No off-road driving beyond designated areas may be allowed.
- Parking areas should be regularly inspected for oil spills and covered with an impermeable or absorbent layer (with the necessary storm water control) if oil and fuel spillages are highly likely to occur.
- Strict speed limits must be set and adhered to.
- Driving between dusk and dawn should be permissible to emergency situations only.
- Prevent spillage of any, oils or other chemicals, strictly prohibit other pollution.
- Monitor the establishment of invasive species and remove as soon as detected, whenever possible before regenerative material can be formed, destroy all material to prevent re-establishment.

Cumulative impacts:

- Possible pollution of surrounding areas if no mitigation is implemented.
- Compaction of soil
- Contamination of groundwater which is an extremely important source of water supply for the region.
- Possible spread of alien invasive species beyond the site if no mitigation is implemented.

Residual impacts:

- Related to access roads and internal maintenance tracks only.

4. Activity: Impacts on natural vegetation and ecosystems by invasive alien species.

Environmental Aspect: Compaction of soils, possible contamination by oils or fuels, possible introduction and spread of weeds and alien invasive species, temporary disturbance of terrestrial fauna.

Environmental impact: : A decline in ecosystem functionality of natural vegetation could be the result of disturbance of the natural vegetation which create opportunities for alien invasive species to invade because of the lack of competition

Direct and Indirect impacts on the se natural ecosystems may include the following:

» Once established the invasion of alien species could spread and put the natural vegetation under pressure
» Alien invasive species could alter the habitat to suit them better than the natural species
» Alien invasives produce high amounts of seed and these seeds could stay for long in the seedbank and when conditions are suitable they will germinated in high numbers
» disturbance to processes maintaining biodiversity and ecosystem goods and services, and;
» a local loss of ecosystem goods and services

	Without mitigation	**With mitigation**
Extent (E)	Local (1)	Local (1)
Duration (D)	Long-term (4)	medium-term (2)
Magnitude (M)	Moderate (5)	Low (4)
Probability (P)	Definite (5)	Highly Probable (4)
Significance (S = E+D+M)*P	**Medium (50)**	**Low (28)**
Status (positive, neutral or negative)	positive	positive
Reversibility	Partially reversible	Reversible
Irreplaceable loss of resources?	Probable	Not likely
Can impacts be mitigated?	Reasonably	

***Mitigation*:**

- Do regular monitoring for alien species infestations
- Determine the best practice to eradicate alien species
- Restrict the spread of alien species by eradicate them before they form seed

Cumulative impacts:

- There could be some areas where alien invasives already occur and when the corridor under the conductors are being cleared it could create an ideal habitat for the invaders to spread
- Possible damage to indigenous species by the incorrect use of herbicides.

Residual impacts:

- Herbicide may remain in the soil and prevent the colonization of indigenous species

5. Activity: Impacts on ephemeral streams and drainage lines.

Environmental Aspect: The power line route cross many streams and wetlands. An accociated access road could cause impacts to these streams. Compaction of soils, possible contamination by oils or fuels, possible introduction and spread of weeds and alien invasive species, temporary disturbance of terrestrial fauna.

Environmental impact: Loss of vegetation (bush clearing), increase in runoff and erosion, possible contamination

of surface and groundwater by oil- or fuel spillages, possible establishment and spread of undesirable weeds and alien invasive species that could further damage ecosystem functionality.		
	Without mitigation	**With mitigation**
Extent (E)	Local (1)	Local (1)
Duration (D)	Long-term (4)	Medium-term (2)
Magnitude (M)	Moderate (6)	Low (4)
Probability (P)	Definite (5)	Highly Probable (4)
Significance (S = E+D+M)*P	**Medium (55)**	**Low (28)**
Status (positive, neutral or negative)	positive	positive
Reversibility	Partially reversible	Reversible
Irreplaceable loss of resources?	Probable	Not likely
Can impacts be mitigated?	Reasonably	
Mitigation: • Restrict all movement of vehicles and heavy machinery to permissible areas, these being designated access roads, maintenance roads, turning points and parking areas. No off-road driving beyond designated areas may be allowed. • Avoid pylon positions within streams or on stream banks • Stream crossings must be constructed in such a way that not bank erosion occur. • Prevent spillage of any, oils or other chemicals, strictly prohibit other pollution. • Monitor the establishment of invasive species and remove as soon as detected, whenever possible before regenerative material can be formed, destroy all material to prevent re-establishment.		
Cumulative impacts: • Possible pollution of surrounding areas if no mitigation is implemented. • Compaction of soil • Contamination of surface and/or groundwater which is an extremely important source of water supply for the region. • Possible spread of alien invasive species beyond the site if no mitigation is implemented.		
Residual impacts: • Related to access roads and internal maintenance tracks only.		

Assessment of Cumulative Impacts

1. Nature: Reduced ability to meet conservation targets		
Environmental Aspect: Reduced ability to meet conservation targets of the province		
Environmental impact: The loss of unprotected vegetation types on a cumulative basis from the broad area may impact the countries' ability to meet its conservation targets. The area is not included within a National Protected Areas Expansion Strategy focus area, and falls outside any threatened and or endangered ecosystem type / vegetation type. Although the vegetation type in the study area are classified as Least Threatened, it is poorly protected and certain habitats or communities may be subsequently affected.		
	Overall impact of the proposed project considered in isolation	**Cumulative Impact of the project and other projects in the area**

Extent (E)	Local (1)	Local (1)
Duration (D)	Long-term (4)	Long-term (4)
Magnitude (M)	Medium (5)	Low (5)
Probability (P)	Probable (3)	Probable (3)
Significance (S = E+D+M)*P	**Low (30)**	**Low (30)**
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Partially reversible	Low reversibility
Irreplaceable loss of resources?	Not Likely	Probable
Confidence in finding	High	

Mitigation:

- Implementation of the required mitigation measures for all developments within the area.
- Preconstruction walk-through to ensure that sensitive habitats are avoided.
- Minimise the development footprint as far as possible.

7.4.2 Fauna Impact Assessment

The development area of the four alternative powerline consists of the same type of faunal environment, and do not differ in any significant way as far as the impacts on fauna is concerned. Therefore, there is no significant difference in the potential impacts associated with the alternatives, and the impacts for the four alternatives are not comparatively assessed in the assessment tables below.

Nature: **Habitat loss and fragmentation**		
Construction: There will be some loss of faunal habitats through the clearing of vegetation for service/access roads and the construction of pylon bases. The extent of habitat loss will be dependent on how many new service/access roads need to be made and the number of pylon bases. This is usually a loss of vegetation (plant communities) that supply food or shelter, but may include abiotic features such as the loss of temporary wetlands, caves or a rocky outcrop. All routes will pass through numerous private game reserves (Gondwana, Hertenbos, Nyaru, Botlierskop) and CBAs at certain sections of the respective routes. The survey found that alternative 1 will pass through the most 'intact' habitats of all of the proposed route options. Alternative 1 is also the closest route to the Outeniqua Mountains IBA. Various pristine rivers and drainage lines fed by the Outeniqua Mountains will need to be traversed along this route option. Construction of pylon hardstands and road infrastructures through these habitats could have a significant impact on species populations which are already fragmented by numerous game fences and existing powerline. Habitat loss and fragmentation will definitely occur for all 4 route options Operation: During operation there will be the need to keep the area beneath the power lines clear which will involve grass cutting and shrub clearance where necessary. The creation of new roads may provide access to previously inaccessible areas which may increase poaching rates or natural resource use..		
CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Definite (5)	Definite (5)
Duration	Very Short (1)	Very Short (1)

Extent	Local (2)	Site (1)
Magnitude	Low (4)	Low (4)
Significance	**35 (moderate)**	**30 (moderate)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Probable (3)	Probable (3)
Duration	Permanent (5)	Permanent (5)
Extent	Site (1)	Site (1)
Magnitude	small (0)	small (0)
Significance	**18 (moderate)**	**18 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	

Mitigation:

Construction Phase:

- Where possible access/service roads and pylon bases should be planned and constructed to avoid being located in highly sensitive areas or areas which have been described as valuable habitats for protected faunal species.
- Where access roads and/or pylon bases do need to be located within any of highly sensitive areas identified above then there should be further ground-truthing to determine exact road routes and pylon base locations so to, where possible, avoid site specific sensitive areas.
- Rivers and drainage lines areas should be treated as "No-Go" areas for any pylon hardstands or the construction of access roads.
- Wherever possible existing service/access roads should be used. Clearing of vegetation should be kept to a minimum and all rocky outcrops and wetlands must be avoided.
- Construction areas should be demarcated with hazard tape and no clearing to occur outside of these areas. Laydown areas and construction camps must be located in areas of low sensitivity. Where this is not feasible then in areas of moderate sensitivity.
- An ECO must be employed to monitor the clearing for roads and hardstands.
- Maintain habitat connectivity, particularly to intact habitats, via habitat corridors.

Operation Phase:

- Clearing of vegetation for maintenance of the servitude should be kept to the authorised servitude of 62m
- Access to all access/service roads should be limited by having locked gates

Cumulative impacts: The erection of addition power lines will further increase the chances of bird collisions in the area.

Residual Risks: Maintenance of new service/access roads will prevent habitat regeneration.

Nature: **Loss of Reptile Diversity.**

Construction: There is the potential for some reptile species to be disturbed and possibly killed by the construction activities where service/access roads and pylon bases impact reptile habitats. The highest abundance of reptiles is likely to be found along alternative 1 due to the amount of forest and taller vegetation types found along this route. The highest abundance of the highly endemic Knysna Dwarf Chameleon is also likely to be found along Alternative 1. The vulnerable FitzSimon's Long-tailed Seps (*Tetradactylus fitzsimonsi*) may be encountered along any of the proposed route options due to the widespread presence of the species preferred habitats.

Operation: There will be a continued risk to reptiles as a result of road kills on the service/access roads.

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**

Probability	Highly Probable (4)	Probable (3)
Duration	Very Short (1(	Very Short (1)
Extent	Local (2)	Site (1)
Magnitude	Low (4)	Minor (2)
Significance	**28 (low)**	**12 (low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Probable (3)	Improbable (2)
Duration	Permanent (5)	Permanent (5)
Extent	Local (2)	Site (1)
Magnitude	small (0)	small (0)
Significance	**21 (low)**	**12 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Moderate
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	

Mitigation:

- All lizards and tortoises are listed as a Schedule II species on the PNCO list for the Western Province, and it is therefore illegal for any construction staff to remove them. It will be difficult to avoid all areas where reptiles may exist but it is recommended that construction staff are educated with regard to reptile conservation and ensure that any reptiles encountered are not killed. Any reptiles encountered should be allowed to move away from the area but any that do need to be moved should be done so in accordance with local legislation.
- No reptiles will be allowed to be removed from site. A rescue plan should be developed for reptiles which could fall into construction pits.
- Avoid the construction of pylon hardstand on rocky outcrops.
- Speed restrictions for all project vehicles (40km/h is recommended) during the construction and operation phases should be in place to reduce the impact of reptiles being killed on the project roads.
- Driving should be restricted to day-light hour. Driving before sunrise and after sunset should be restricted to emergencies only.
- Wherever possible existing service/access roads should be used.
- Access to all access/service roads should be limited by having locked gates.
- It is recommended that construction staffs are educated with regard to poaching and any such activities must be strictly prohibited.

Cumulative impacts: Any new service/access roads will add to the chances of amphibians being killed on the roads so driving habits and times should be closely adhered to.

Residual Risks: Service/access roads will remain a risk to amphibian diversity and speed restrictions for project vehicles should be maintained to reduce risks of road kills.

Nature: **Loss of Amphibian Diversity.**

Construction: There is the potential for some amphibian species to be disturbed and possibly killed by the construction activities where service/access roads and pylon bases impact amphibian habitats. The majority of amphibians are associated with wetland and/or river habitats which are abundant along all of the proposed route alternatives. Alternative 1 has the most pristine watercourses of all the route options. The Endangered Knysna Leaf-Folding Frog (*Afrixalus knysnae*) inhabits a coastal mosaic of vegetation types, including mountain fynbos heathland, and forest. These vegetation types are most abundant along alternative route option 1.

Operation: There should be fewer chances of additional loss of amphibian diversity once operational although the use of service/access roads may cause some amphibians to be killed, and pollution of wetlands and/or rivers may affect amphibian populations.

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Highly Probable (4)	Probable (3)
Duration	Very Short (1)	Very Short (1)
Extent	Site (1)	Site (1)
Magnitude	Low (4)	Minor (2)
Significance	**24 (low)**	**12 (low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Improbable (2)	Improbable (2)
Duration	Permanent (5)	Permanent (5)
Extent	Site (1)	Site (1)
Magnitude	Minor (2)	small (0)
Significance	**16 (low)**	**12 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	

Mitigation:

- All frogs and toads are listed as schedule 2 species on the PNCO list and it is therefore illegal to remove them.
- Where possible pylon bases should not be located in sensitive areas or areas which have been described as valuable habitats for protected amphibian species (e.g. all aquatic habitats).
- In the event that amphibians are encountered during construction works, all construction staff should be educated with regard to amphibian conservation to ensure that they are not killed. Any amphibians encountered should be allowed to move away from the area or moved to an area within the same catchment they will not be disturbed.
- No amphibians will be allowed to be removed from site
- Avoid the construction of pylon hardstand in wetland areas.
- Speed restrictions for all project vehicles (40km/h is recommended) during the construction and operation phases should be in place to reduce the impact of amphibians being killed on the project roads.
- Driving should be restricted to day-light hour. Driving before sunrise and after sunset should be restricted to emergencies only.
- Vehicles should be well maintained so as not to leak oils and fuels which may pollute nearby wetlands or waterways.
- There must be proper storage of all oils and fuels at all construction sites and operational substations so as not to pollute nearby wetlands or waterways.
- Wherever possible existing service/access roads should be used.
- Access to all access/service roads should be limited by having locked gates.
- It is recommended that construction staff are educated with regard to poaching and any such activities must be strictly prohibited.

Cumulative impacts: Any new service/access roads will add to the chances of amphibians being killed on the roads so driving habits and times should be closely adhered to..

Residual Risks: Service/access roads will remain a risk to amphibian diversity and speed restrictions for project vehicles should be maintained to reduce risks of road kills.

Nature: **Loss of Mammal Diversity.**

Construction: There is a possibility that some mammal species may be impacted as a result of the clearing of vegetation for service/access roads and the construction of pylon bases. Nocturnal mammal species may be killed on the roads if there is an increase in the number of project vehicles using roads at night. The golden moles, which live underground, are likely to be impacted on the most during the construction phase if the powerline crosses through areas inhabited by them.

Operation: There should be few chances of additional loss of mammal diversity once operational although the use of service/access roads may cause some mammals to be killed. The creation of new roads may provide access to new areas which may increase poaching of some mammal species.

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Probable (3)	Improbable (2)
Duration	Very Short (1)	Very Short (1)
Extent	Local (2)	Local (2)
Magnitude	Low (4)	Low (4)
Significance	**21 (low)**	**14 (low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Very Improbable (1)	Very Improbable (1)
Duration	Permanent (5)	Permanent (5)
Extent	Site (1)	Site (1)
Magnitude	Minor (2)	Minor (2)
Significance	**8 (Low)**	**8 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	

Mitigation:

- The proposed route options traverse extensive areas of land which contain numerous large and small mammal species. Most of these, including almost all of the SCC species listed above will tend to avoid areas disturbed during the construction phase. However, there is the possibility that other smaller and more fossorial mammal SCC species such as the Fynbos Golden Mole (*Amblysomus corriae*) and Duthie's Golden Mole (*Chlorotalpa duthieae*) may be unearthed during construction. In this event all construction staff should be educated with regard to mammal conservation to ensure they are not killed and any mammals encountered should be allowed to move away from the area or carefully moved to an area outside of the project activities.allowed to move away from the area or carefully moved to an area outside of the project activities.
- Speed restrictions for all project vehicles (40km/h is recommended) during the construction and operation phases should be in place to reduce the impact of mammals being killed on the project roads.
- Driving should be restricted to day-light hour. Driving before sunrise and after sunset should be restricted to emergencies only.
- Wherever possible existing service/access roads should be used.
- Access to all access/service roads should be limited by having locked gates.
- It is recommended that construction staff are educated with regard to poaching and any such activities must be strictly prohibited.

Cumulative impacts: The erection of numerous pylons can provide additional perching sites which raptor can use to spot small prey mammals. This may lead to higher predation rates in areas where there were previously few perching sites.

Residual Risks: Service/access roads will remain a risk to amphibian diversity and speed restrictions for project vehicles should be maintained to reduce risks of road kills.

Nature: Impact of Dust and Noise.

Construction: The impacts of noise and dust are likely to result from the construction of the various components of the power lines. Roads especially are known to alter physical characteristics of the environment and it is likely that all species may be affected to some extent. Amphibians are likely to be the most impacted by an increase in dust levels. Unmitigated dust can increase the turbidity of streams and wetlands which may in turn inhibit amphibian's ability to feed and breed.
Construction and associated vehicle traffic will create noise pollution that can depress local populations of sensitive faunal groups. Animals differ in the degree to which they tolerate such disturbance, and can be expected to have potentially negative and positive impacts on various faunal groups. Large breeding birds do not usually tolerate continuous disturbance. Increased noise and motor vibrations in wetlands may also impact amphibian breeding choruses, but these impacts will be localised and many amphibian species are surprisingly tolerant of vehicle noise. Noise pollution will occur during all phases (construction, operational, and decommissioning/closure). Little mitigation is possible.

Operation: While the number of vehicles using the service/access roads during the operation phase will be greatly reduced they will still create dust and noise which could impact faunal populations in the area.

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Definite (5)	Highly Probable (4)
Duration	Very Short (1)	Very Short (1)
Extent	Local (2)	Local (2)
Magnitude	Low (4)	Minor (2)
Significance	**35 (moderate)**	**20 (low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Highly Probable (4)	Probable (3)
Duration	Permanent (5)	Permanent (5)
Extent	Local (2)	Local (2)
Magnitude	Minor (2)	Minor (2)
Significance	**35 (moderate)**	**20 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	

Mitigation:

- The impact will be most effectively mitigated by hard paving the main roads, but it is unlikely that the road will be paved. For this reason it is suggested that the area is watered down during dry and/or high wind conditions.
- Road speeds in sensitive regions e.g. near wetlands, across drainage lines, and during extreme dry climatic conditions, should be limited to curtail dust production.
- Vehicle speed should be limited to the lowest possible, and should not exceed 40km/h.
- Where possible any material to be transported should be in covered trucks or containers to avoid contamination to the surrounding area.

Cumulative impacts: The construction of new roads in the area could cause an increase in traffic from non-project related vehicles which will also produce noise and dust pollution.

Residual Risks: Any vehicles using unpaved roads in the area are likely to produce dust and noise.

7.4.3 Avifauna Impact Assessment

The nature and significance of impacts that were identified in the specialist study (2016), are shown in the table below, please note that three of the alternative powerline (Alternative 2-4) do not differ in any significant way as far as the impacts on avifauna is concerned. Where applicable, the differences in impacts of these three alternatives (alternative 2-4) are highlighted in red in the assessment table below.

Nature: Loss of Bird Habitat

Construction: There will be some loss of bird habitat through the clearing of vegetation for service/access roads and the construction of pylon bases. The extent of habitat loss will be dependent on how many new service/access roads need to be made and the number of pylon bases required. This is usually a loss of vegetation (plant communities) that supply food and shelter, but may include abiotic features such as the loss of temporary wetlands, caves or rocky outcrops, which provide suitable nesting or roosting sites.

All routes will pass through numerous private game reserves (Gondwana, Hertenbos, Nyaru, Botlierskop) and CBAs at certain sections of the respective routes. Alternative 1: The survey found that alternative 1 will pass through the most 'intact' habitats of all of the proposed route options. Alternative 1 is also the closest route to the Outeniqua Mountains IBA. A substantial portion of this route option falls within the 5km buffer around the Outeniqua IBA. Various pristine rivers and drainage lines fed by the Outeniqua Mountains will need to be traversed along this route option. Construction of pylon hardstands and road infrastructures through these areas will fragment and destroy habitats utilised by numerous bird species. Alternative 2-3: The survey found that alternatives 2, 3 & 4 pass through more degraded habitats than Alternative 1. These three options are further away from the Outeniqua Mountains IBA. However, the routes will pass through numerous private game reserves and CBAs, as well as large wetland systems which provide suitable habitat for waterbird guilds. Construction of pylon hardstands and road infrastructures through these habitats will have an impact on available bird habitat.

Operation: During operation there will be the need to keep the area beneath the power lines clear which will involve grass cutting and shrub clearance where necessary.

The creation of new roads may provide access to previously inaccessible areas which may increase poaching rates or natural resource use.

	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	5 - Definite (regardless of measures to prevent)	5 - Definite (regardless of measures to prevent)
Duration	2 – Short Duration (1-2 years) 1 - Very Short Duration (0 -1 year)	1 - Very Short Duration (0 -1 year) 1 - Very Short Duration (0 -1 year)
Extent	2 - Limited to the local area	1 - Limited to the site
Magnitude	4 – Low , with slight impact on processes	4 - Low , with slight impact on processes
Significance	**40 (Medium)** **35 (Medium)**	**30 (Medium)**
Status (positive or negative)	Negative	Negative
OPERATION PHASE		
Probability	3 - Probable (distinct possibility)	3 - Probable (distinct possibility)
Duration	5 - Permanent (ongoing during lifetime)	5 - Permanent (ongoing during lifetime)
Extent	1 - Limited to the site	1 - Limited to the site
Magnitude	0 - Small or no effect	0 - Small or no effect
Significance	**18 (Low)**	**18 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Moderate

Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	YES	-
Mitigation: ***Construction:*** • Where access roads and/or pylon bases do need to be located within any of the sensitive areas identified above then there should be further ground-truthing by an avifaunal specialist to determine exact road routes and pylon base locations so to, where possible, avoid site specific sensitive areas such as nests and roosts • All bird nest/roost sites encountered should be considered **"No-Go"** areas for any pylon hardstands or the construction of access roads. • Wherever possible existing service/access roads should be used. • Construction areas should be demarcated with hazard tape and no clearing must occur outside of these areas. Laydown areas and construction camps must be located in areas of low sensitivity. Where this is not feasible then in areas of medium sensitivity. • An ECO must be employed to monitor the clearing for roads and hardstands. ***Operation:*** • Clearing of vegetation for maintenance of the servitude should be kept to the authorised servitude of 62m • Access to all access/service roads should be limited by having locked gates.		
Cumulative impacts: The erection of addition power lines will further fragment natural habitats along the route option		
Residual Risks: Maintenance of new service/access roads will prevent habitat regeneration.		

Nature: Disturbance and Displacement of Birds

Construction: Birds will be disturbed by the powerline construction activities (e.g. noise, dust, operation of heavy machinery, anthropogenic activities). There is the potential for some nesting birds to be displaced during construction activities where service/access roads and pylon bases are located within a close proximity to nesting sites. Alternative 1: This impact will be greater for Alternative 1 compared to the other route options as alternative 1 will pass through the most 'intact' habitats of all of the proposed route options. Alternative 1 is also the closest route to the Outeniqua Mountains IBA.

Operation: Birds will utilise pylons to construct nests or to use as roosts. There will be continued disturbance during the operation of the powerline due to maintenance activities. The powerline infrastructures can also act as a barrier for birds in flight, and can influence flight paths of migratory species.

	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	4 - Highly Probable (most likely)	3 - Probable (distinct possibility)
Duration	2 - Short Duration (2-5 year)	1 - Very Short Duration (0 -1 year)
Extent	2 - Limited to local area	2 - Limited to local area
Magnitude	4 - Low , with slight impact on processes 2 – Minor or no impact on processes	2 – Minor or no impact on processes
Significance	**32 (Medium)** **24 (Low)**	**15 (Low)**
Status (positive or negative)	Negative	Negative
OPERATION PHASE		
Probability	3 - Probable (distinct possibility)	3 – Probable (distinct possibility)
Duration	5 - Permanent (ongoing during lifetime)	5 - Permanent (ongoing during lifetime)
Extent	2 - Limited to local area	2 - Limited to local area
Magnitude	2 - minor and will not result in an impact on processes	2 - minor and will not result in an impact on processes

Significance	**27 (Low)**	**27 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	YES	YES

Mitigation:

- All bird nest/roost sites encountered should be considered **"No-Go"** areas for any pylon hardstands or the construction of access roads.
- An avifaunal specialist should be employed during the pre-construction and construction phases to ground-truth the proposed pylon hardstand areas.
- Any nests of raptors of SCC encountered during ground-truthing should be avoided – no construction activities must take place within a 500m radius of these areas.
- Any birds encountered should be allowed to move away from the construction area.
- Driving should be restricted to day-light hour. Driving before sunrise and after sunset should be restricted to emergencies only.
- Wherever possible existing service/access roads should be used.
- Bird friendly line and pole design must be used – along with industry standard insulation of all conductors and line-pylon attachment infrastructures.
- Bird nests on pylon infrastructures must not be removed during the breeding season.

***Cumulative impacts*:** There will be a cumulative disturbance due to the additional anthropogenic activities associated with constructing and maintaining an additional powerline along the route. There will be an additional barrier for birds in flight/migratory species.

Residual Risks: The presence of power lines will remain a risk to birds.

Nature: Loss of Bird Diversity and SCC

Construction: There may be some disturbance of bird species during construction phase but this will probably be limited to very local and short-term disturbance. Some birds, particularly nocturnal species such as owls and night-jars may be killed on the roads if there is an increase in the number of project vehicles using roads at night.

Operation: The main issue during the operation phase is the possibility of bird species colliding with the power lines while in flight or being electrocuted by contacting live parts of the system. As there are numerous bird species of conservation concern which inhabit the project area, the likelihood of collision is high and the potential impact is significant. The length of the power line and the abundance of habitats associated to different bird species compositions further exacerbate the potential impact. Alternative 1: Alternative 1 runs parallel to the Outeniqua Mountains and is the closest route option to the Outeniqua IBA. A substantial portion of this route option falls within the 5km buffer around the Outeniqua IBA. For this reason collisions/impact with foraging bird species are more likely than the other alternatives. During the survey, the majority of flights recorded by large-bodied birds occurred closest to the proposed alternative 1. Alternative 2-3: The route options (2, 3 & 4) will pass through numerous private game reserves and CBAs, as well as large wetland systems which provide suitable habitat for waterbird guilds which are likely to migrate between water bodies. All of the route options enter the 5 km IBA buffer in the eastern part of the project area, close to the proposed substation locations.

	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	3 - Probable (distinct possibility)	2 - Improbable (low likelihood)
Duration	1 - Very Short Duration (0 -1 year)	1 - Very Short Duration (0 -1 year)
Extent	2 - Limited to the local area	2 - Limited to the local area
Magnitude	4 - Low , with slight impact on processes	4 - Low , with slight impact on processes
Significance	**21 (Low)**	**14 (Low)**
Status (positive or negative)	Negative	Negative

OPERATION PHASE		
Probability	5 - Definite (regardless of measures to prevent)	5 - Definite (regardless of measures to prevent) 4 - Highly Probable (most likely)
Duration	5 - Permanent (ongoing during lifetime)	5 - Permanent (ongoing during lifetime)
Extent	3 - Limited to the region	2 - Limited to the local area
Magnitude	6 – Moderate (processes continue but modified) 4 – Low, with slight impact on processes	4 – Low, with slight impact on processes
Significance	**70 (High)** **60 (Medium/High)**	**55 (Medium)** **44 (Medium)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	YES	-
Mitigation: • During the construction phase there should no construction during the hours of darkness. • Speed restrictions for all project vehicles (40km/h is recommended) should be in place to reduce the impact of birds being killed on the project roads. • Wherever possible existing service/access roads should be used. • Bird flight diverters should be attached to power lines from Gondwana Private Game Reserve to the proposed Blanco Substation. This is due to the proximately of the alternative to the Outeniqua Mountain IBAs - the spacing intervals must be a **minimum of 5m** apart in these areas. • The power line should be constructed in close proximity to the existing power line as many birds will be aware of the existing infrastructure which may reduce collisions in low visibility conditions. • All areas defined as having a medium avifaunal sensitivity must have bird diverters installed (spacing to be determined following ground-truthing). These areas include suitable habitat for numerous powerline priority species (e.g. cranes, bustards, and storks).		
Cumulative impacts: This additional power line adds to the already existing power lines in the area and therefore increases the risk of bird collisions and deaths.		
Residual Risks: The presence of power lines will remain a risk to flying birds.		

7.4.4 Freshwater Resources (Wetlands and River courses) Impact Assessment:

The nature and significance of impacts that were identified in the specialist study (2016), are shown in the table below for each alternative

Alternative 1	**Without mitigation**	**With mitigation**
CONSTRUCTION PHASE		
Nature: Limited modification of freshwater habitat, water quality impacts and possibly impedance of flow at river crossings associated with the construction of the transmission line and any access roads required Construction phase: Approximately 60km of 400kV power line is being considered from the Gourikwa Substation to the proposed new Blanco Substation. Activities that would be associated with the construction activities would include the		

installation of foundations and pylons. The impacts will also include the construction of the new substation at Blanco. Activities during the construction phase of the project could be expected to result in some shorter term disturbance of stream/riverine and wetland associated vegetation cover and to the bed and banks of the freshwater features where access for the construction works associated with the line may need to cross freshwater features. Operation phase: Some disturbance of the freshwater features in the area of the constructed power line could be expected over the longer term that would be associated with the maintenance activities for the project.		
Extent	Local (2)	Local (1)
Duration	Medium to Short-term (2)	Short-term (1)
Magnitude	Low (4)	Very Low (2)
Probability	Probable (3)	Probable to improbable (2)
Significance	**24 (Low)**	**8 (Very Low)**
Status (positive or negative)	Negative	Negative
OPERATION PHASE		
Nature: Limited long term disturbance of aquatic habitat and the facilitation for invasive alien plant growth associated with maintenance of the transmission lines		
	Without mitigation	**With mitigation**
Extent	Local (2)	Local (1)
Duration	Long-term (4)	Long-term (4)
Magnitude	Very low (2)	Very Low (1)
Probability	Probable to improbable (2)	Probable to improbable (2)
Significance	**16 (Low)**	**12 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Medium	High (Fully reversible)
Irreplaceable loss of resources?	Medium to low	Low
Can impacts be mitigated? Impacts can be mitigated during the construction phase, but little mitigation is possible during the operational phase. The impacts during this phase are however also minimal.		
Mitigation: See Section 9.1 for more detailed description of potential impacts and the associated recommended mitigation measures.		
Cumulative impacts: The freshwater features within the proposed corridors are already in a moderately to seriously modified ecological state as a result of the existing land use activities. The proposed lines are in general proposed along routes where there are already power lines in place. Provided the new lines are constructed close to these lines such that the associated access roads can be shared, the cumulative impacts are likely to be low. Erosion and sedimentation from the project activities, together with invasive alien plant growth and the possible modification of surface water runoff and water quality may lead to additional impacts on the freshwater habitats within the study area. In general, by selecting the route with the least impact, one can prevent any unacceptable impacts, particularly over the longer term, from taking place within the freshwater features within the study area. These impacts are likely to be of a low significance and can be monitored and easily mitigated. The proposed mitigation measures are largely intended to minimise the impacts that may occur within the construction phase when the potential impact is the greatest.		
Residual Risks: Residual risks are associated with the need to access and maintain the power lines that require ongoing disturbance to aquatic features along the transmission line route that will need to take place for the lifetime of the project.		
Alternative 2	**Without mitigation**	**With mitigation**
CONSTRUCTION PHASE		
Nature: Limited modification of freshwater habitat, water quality impacts and possibly impedance of flow at river crossings associated with the construction of the transmission line and any access roads required		
Extent	Local (2)	Local (2)
Duration	Medium to Short-term (2)	Short-term (1)
Magnitude	Medium to Low (5)	Low (3)
Probability	Highly Probable (4)	Probable (3)
Significance	**38 (Medium)**	**18 (Low)**
Status (positive or negative)	Negative	Negative

OPERATION PHASE		
Nature: Limited long term disturbance of aquatic habitat and the facilitation for invasive alien plant growth associated with maintenance of the transmission lines		
	Without mitigation	**With mitigation**
Extent	Local (2)	Local (2)
Duration	Long-term (4)	Long-term (4)
Magnitude	Very low (2)	Very Low (1)
Probability	Highly Probable (4)	Probable (3)
Significance	**32 (Medium to Low)**	**21 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Medium	Medium (Partially reversible)
Irreplaceable loss of resources?	Medium to low	Low
Can impacts be mitigated? Impacts can be mitigated to a certain extent during the construction phase, but due to the fact that the line will need to cross the lower reaches of the rivers with their wide associated floodplain wetlands, the probability that there will be some loss or modification of aquatic habitat that is more sensitive is greater. Little mitigation is possible during the operational phase. The impacts during this phase are however also minimal.		
Mitigation: Described under alternative 1 table above.		
Cumulative impacts: Cumulative Impacts are as described under alternative 1 table above		
Residual Risks: Residual risks are associated with the need to access and maintain the power lines that require ongoing disturbance to aquatic features along the transmission line route that will need to take place for the lifetime of the project.		

Alternative 3 and Alternative 4	**Without mitigation**	**With mitigation**
CONSTRUCTION PHASE		
Nature: Limited modification of freshwater habitat, water quality impacts and possibly impedance of flow at river crossings associated with the construction of the transmission line and any access roads required		
Extent	Local (2)	Local (2)
Duration	Medium to Short-term (2)	Short-term (1)
Magnitude	Medium to Low (6)	Low (4)
Probability	Highly Probable (4)	Probable (3)
Significance	**42 (Medium)**	**21 (Low)**
Status (positive or negative)	Negative	Negative
OPERATION PHASE		
Nature: Limited long term disturbance of aquatic habitat and the facilitation for invasive alien plant growth associated with maintenance of the transmission lines		
	Without mitigation	**With mitigation**
Extent	Local (2)	Local (2)
Duration	Long-term (4)	Long-term (4)
Magnitude	Very low (2)	Very Low (1)
Probability	Highly Probable (4)	Probable (3)
Significance	**32 (Medium to Low)**	**21 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Medium	Medium (Partially reversible)
Irreplaceable loss of resources?	Medium to low	Low
Can impacts be mitigated? Impacts can be mitigated to a certain extent during the construction phase, but due to the fact that the line will need to cross the lower reaches of the rivers with their wide associated floodplain wetlands, the probability that there will be some loss or modification of aquatic habitat that is more sensitive is greater. Little mitigation is possible during the operational phase. The impacts during this phase are however also minimal.		
Mitigation: Described under alternative 1 table above.		
Cumulative impacts: Cumulative Impacts are as described under alternative 1 table above		
Residual Risks: Residual risks are associated with the need to access and maintain the power lines that require		

ongoing disturbance to aquatic features along the transmission line route that will need to take place for the lifetime of the project.

7.4.5 Heritage & Archaeology Impacts Assessment

The four alternative powerline do not differ in any significant way as far as the impacts on heritage is concerned. In most part the four alternatives are not comparatively assessed in the assessment tables below. Where applicable, the differences in impacts are highlighted in red.

Potential impacts to Pre-colonial Archaeology

Nature: Negative impacts to archaeological material which may include caves with archaeological deposit and scatters of archaeological material.

Since heritage sites, such as archaeological sites, are non-renewable, it is important that they are identified and their significance assessed prior to development. The main cause of impacts to archaeological sites is direct, physical disturbance of the material itself and its context. The significance of an archaeological site is highly dependent on its geological and spatial context. This means that even though, for example a deep excavation may expose buried archaeological sites and artefacts, the artefacts are relatively meaningless once removed from the area in which they were found. The impacts are likely to be most severe during the construction period although indirect impacts may occur during the operational phase of the project.

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Probable (3)	Improbable (2)
Duration	Long-term (4)	Long-term (4)
Extent	Local (2)	Site (1)
Magnitude	Low (4)	Minor (2)
Significance	**30 (Moderate)**	**14 (low)**
Status (positive or negative)	Negative	Neutral
OPERATIONAL PHASE		
Probability	Probable (3)	Improbable (2)
Duration	Long-term (4)	Long-term (4)
Extent	Local (2)	Site (1)
Magnitude	Minor (2)	Minor (2)
Significance	**24 (Low)**	**14 (low)**
Status (positive or negative)	Neutral	Neutral
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	

Mitigation:

- Walk down of certain areas along the selected route, targeting koppies, river banks and rugged topography where the possibility of caves/rock shelters may exist. Micro-siting of pylons to avoid impacts.
- Since the powerline corridors are 1 km wide, and the actual servitude will be only 62 m wide, there is plenty of space within the corridors to adjust the position of the towers to avoid negative impacts to archaeological sites.

Cumulative impacts: Low

Residual Risks: None anticipated

Impact on Colonial Period

Nature: The construction of pylons in close proximity to farmsteads may result in the destruction of historic rubbish dumps (middens), old kraals or the ruins of old dwellings.

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Probable (3)	Improbable (2)
Duration	Long-term (4)	Long-term (4)
Extent	Local (2)	Site (1)
Magnitude	Low (4)	Minor (2)
Significance	**30 (Moderate)**	**14 (low)**
Status (positive or negative)	Negative	Neutral
OPERATIONAL PHASE		
Probability	Probable (3)	Improbable (2)
Duration	Long-term (4)	Long-term (4)
Extent	Local (2)	Site (1)
Magnitude	Minor (2)	Minor (2)
Significance	**24 (Low)**	**14 (low)**
Status (positive or negative)	Neutral	Neutral
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	

Mitigation: A targeted walk-down of the line will be required after the final powerline route has been decided. The walk down would concentrate on areas immediately around farm buildings and structures.

Cumulative impacts: Low

Residual Risks: None anticipated

Impact on Graves

Nature: Impacts will be through possible direct impacts on local historic cemeteries (near settlements and farms) as well as individual graves.

Human remains are the most complicated aspects of heritage to mitigate since they require their own public participation process (See Section 36 of the NHRA) before they can be exhumed. Human remains are protected by a plethora of legislation including the Human Tissues Act (Act No 65 of 1983), the Exhumation Ordinance of 1980 and the National Heritage Resources Act (Act No 25 of 1999). In the event of human bones being found on site, HWC must be informed immediately and the remains removed by an archaeologist under an emergency permit. This process will incur some expense as removal of human remains is at the cost of the developer. Time delays may result while application is made to the authorities and an archaeologist is appointed to do the work.

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Probable (3)	Improbable (2)
Duration	Long-term (4)	Short-term (1)
Extent	Regional (3)	Local (2)
Magnitude	Moderate (6)	Low (4)
Significance	**39 (Moderate)**	**14 (low)**
Status (positive or negative)	Negative	Neutral
OPERATIONAL PHASE		
Probability	Probable (3)	Improbable (2)
Duration	Long-term (4)	Long-term (4)

Extent	Local (2)	Site (1)
Magnitude	Low (3)	Minor (2)
Significance	**27 (Low)**	**14 (low)**
Status (positive or negative)	Neutral	Neutral
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	No	Yes

Mitigation:

- The towers may be constructed on/or in close proximity to farm graveyards. If graveyards are discovered during the walk down phase, a buffer of at least 15 m should be employed around them;
- A survey should be conducted during the walk-down phase around farmsteads in order to ensure that graves area avoided;
- If unmarked graves are uncovered during the construction of the tower footings, all work in that area should cease immediately, and HWC must be contacted.

Cumulative impacts: None anticipated

Residual Risks: None anticipated

Potential impact to Cultural Landscape elements

Nature: Visual and physical impacts associated with installation of overhead powerlines and related infrastructure

Anticipated impacts associated with proposed route alignments through the Mossel Bay rural cultural landscape would need to be considered within the context of its proposed grading (ungradable), which is partly informed by the pattern of existing and permitted development within this area. Notwithstanding, taken within the alignment of existing (similar) infrastructure through this area, it is suggested that proposed Alternative alignment 3 be preferred. Other anticipated impacts associated with this alignment on for example the Aalwyndal smallholding complex and Mossel Bay Airport would however have to be taken into consideration.

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Probable (3) Improbable (2)	Improbable (2)
Duration	Long-term (4) Short-term (1)	Short-term (1)
Extent	Regional (3) Local (2)	Local (2)
Magnitude	Moderate (6) Low (4)	Low (4)
Significance	**39 (Moderate)** **14 (Low) for Alternative 2 & 3**	**14 (low)**
Status (positive or negative)	Negative	Neutral
OPERATIONAL PHASE		
Probability	Probable (3)	Improbable (2)
Duration	Long-term (4)	Long-term (4)
Extent	Local (2)	Site (1)
Magnitude	Low (3)	Minor (2)
Significance	**27 (Low)**	**14 (low)**
Status (positive or negative)	Neutral	Neutral
Reversibility	No	No
Irreplaceable loss of	Yes	Yes

resources?		
Can impacts be mitigated?	NO – physical heritage resources are generally non-renewable	
Mitigation: • Follow alignment of existing overhead powerlines where possible		
Cumulative impacts: Loss of physical heritage resources within the region		
Residual Risks: Loss of physical heritage resources		

7.4.6 Soil, Land Use & Agricultural Impacts Assessment

The development areas of the four alternative powerline do not differ in any significant way as far as the impacts soil and agricultural potential is concerned. Therefore, there is no significant difference in the potential impacts associated with the alternatives, and the impacts for the alternatives are not comparatively assessed in the assessment tables below.

Nature: Construction activities (pylons / power lines, Vehicle operation on site, Dust generation) and Loss of agricultural land in areas of **LOW** intensity agriculture or land use pylon footprint		
CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Definite (5)	Definite (5)
Duration	Short-term (2)	Short-term (2)
Extent	Site (2)	Site (2)
Magnitude	Minor (2)	Minor (2)
Significance	**16 (Low)**	**16 (Low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Definite (5)	Definite (5)
Duration	Short-term (2)	Short-term (2)
Extent	Site (2)	Site (2)
Magnitude	Minor (2)	Minor (2)
Significance	**16 (Low)**	**16 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	No	
Mitigation: • Pylon footprints and infrastructure are permanent and the pylons cannot be mitigated		
Cumulative impacts: Pylon footprints are limited in spatial extent and once in place do not lead to additional spatial or land use impacts.		
Residual Risks: None anticipated		

Nature: Construction activities (pylons/power lines, Vehicle operation on site, Dust generation) and Loss of agricultural land in areas **HIGH** intensity agriculture or land use pylon footprint		
CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Definite (5)	Definite (5)

Duration	Short-term (2)	Short-term (2)
Extent	Site (1)	Site (1)
Magnitude	Very High (10)	Very High (10)
Significance	**80 (high)**	**80 (high)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Definite (5)	Definite (5)
Duration	Short-term (2)	Short-term (2)
Extent	Site (1)	Site (1)
Magnitude	Very High (10)	Very High (10)
Significance	**80 (high)**	**80 (high)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	No	
Mitigation: • Pylon footprints and infrastructure are permanent and the pylons cannot be mitigated		
Cumulative impacts: Pylon footprints are limited in spatial extent and once in place do not lead to additional spatial or land use impacts.		
Residual Risks: None anticipated		

7.4.7 Visual Impacts Assessment

Impacts are perceived differently for towns that are located close to the coast than for inland areas. The nature and significance of impacts that were identified in the specialist study (2016), are shown in the table below for each alternative

Coastal Towns Landscape Type

ALTERNATIVE 3 and ALTERNATIVE 4 COASTAL TOWNS LANDSCAPE TYPE - OBSERVERS		
Nature of impact: The construction activity will cause a negative effect on observers in the ZMVE during the initial construction activity that will be limited to surface disturbances. As the towers gain height, the visibility and visual exposure will increase progressively. Viewer incidence is expected to be high due to the proximity to an urban area and the crossing of the R328. A visual change will occur and will become progressively more substantial as the project nears completion. It will cause a visual intrusion as a result of disturbances to the natural and semi-natural vegetation that relates to tower construction and servitude clearance. The construction activity is considered an uncharacteristic event in the study area that may impact on scenic views.		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	Highly probable (4)	Highly probable (4)
Duration	Very short term (1)	Very short term (1)
Extent	Local, but over long linear distance (3)	Contained on site, but over long linear distance (2)
Magnitude	Low (5)	Low (4)
Severity	Medium (36)	Low (28)
Status (Positive/Negative)	Negative	Negative

OPERATIONAL PHASE		
Nature of impact: A new transmission line will be added to the visual environment. It is expected to be partially visible due to the varied topography, although those within the ZMVE will be most severely affected as a result of their proximity. Viewer incidence is expected to be high due to the proximity to urbanised areas and the crossing of the R328, a major transport route. A visual change will occur as a result of the new transmission line and the increased dominance of electrical infrastructure in the study area. The industrial character will contrast with the rural character of the western outskirts. It will interfere with pleasant views of the natural and semi-natural landscape and will intrude on the observer's visual experience.		
Probability	Definite (5)	Definite (5)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Medium (6)
Severity	High (75)	High (70)
Status (Positive/Negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Medium	Medium
Can impacts be mitigated: Impacts can be mitigated during the construction phase, but little can be done to mitigate the impacts during the operational phase unless major layout or design changes are made to avoid the potential impacts.		
Mitigation: • Avoidance: Complete avoidance of the impacts is a function of either not proceeding with the proposed project or relocating the project to an alternative site. This is often the most effective mitigation strategies but within the constraints of economics and available land it is not necessarily possible or feasible. • Reduction: Where negative impacts cannot be avoided it should be considered how to reduce the impact as much as possible. Different projects require different solutions but scaling down or limiting disturbances are some of the options. • Remediation: Remediation mitigation relies on add-on or cosmetic measures to "soften" the impact to a degree. This is often associated with screening or camouflage treatment to avoid or limit intrusive views. • Compensation: Where a negative impact cannot be mitigated adequately, other compensatory measures may offset the residual effects. This requires a thorough understanding and assessment of the environment in order to provide equivalent compensation. This may require extensive public consultation, especially if the impacts lean towards sentimental issues or personal values and perceptions. • Enhancement: Enhancement aims to manage certain changes and impacts by enhancing the quality of the environment for local people. This requires the exploring of opportunities in the proposed project to contribute positively to the landscape and its experience. Enhancement may take many forms but could include preservation of ecosystems, proper land management, and restoration of habitats or historic landscapes.		
Cumulative impacts: Cumulative impacts are highly likely due to the existing distribution line that follows a similar corridor as Alternative 3 and an existing substation next to the R328. The prominent scale of the new 400kV transmission line is a large addition to electrical infrastructure in the area. A significant increase (more than double) in visual dominance of electrical infrastructure can be expected which contrasts with the rural character of the urban outskirts, thereby causing a visual intrusion.		
Residual Risks: Residual risks will occur as the visibility of the power line cannot be effectively reduced and therefore visual intrusion will remain an impact for the lifetime of the project.		

ALTERNATIVE 3 and ALTERNATIVE 4 COASTAL TOWNS LANDSCAPE TYPE – VISUAL RESOURCE		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Nature of impact: The construction activity will cause a negative effect, primarily on the rural character of the outskirt development. For the duration of the construction phase, machinery, material and workforce will be uncharacteristic to the visual resource and will contrast with the semi-natural or farming practices along the urban outskirts. The construction activity is considered incompatible with the prevailing character and will blemish the visual value and scenic quality of the rural landscape.		
Probability	Definite (5)	Highly probable (4)

Duration	Very short term (1)	Very short term (1)
Extent	Local (2)	Local (2)
Magnitude	Moderate (6)	Low (4)
Severity	Medium (45)	Low (28)
Status (Positive/Negative)	Negative	Negative

OPERATIONAL PHASE

Nature of impact: A new transmission line will be a prominent addition to the baseline environment. The complex, industrial character and enormous scale of the towers, will contrast with the rural and semi-natural environment along the outskirts of the urban areas. Pleasant views of the surrounding landscape will be blemished which will reduce the scenic quality of the visual resource.

Probability	Definite (5)	Highly probable (4)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Medium (6)
Severity	High (75)	Medium (52)
Status (Positive/Negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Medium	Medium

Can impacts be mitigated: Impacts can be mitigated with limited success unless major design changes are considered.

Mitigation:

- Avoidance: Complete avoidance of the impacts is a function of either not proceeding with the proposed project or relocating the project to an alternative site. This is often the most effective mitigation strategies but within the constraints of economics and available land it is not necessarily possible or feasible.
- Reduction: Where negative impacts cannot be avoided it should be considered how to reduce the impact as much as possible. Different projects require different solutions but scaling down or limiting disturbances are some of the options.
- Remediation: Remediation mitigation relies on add-on or cosmetic measures to "soften" the impact to a degree. This is often associated with screening or camouflage treatment to avoid or limit intrusive views.
- Compensation: Where a negative impact cannot be mitigated adequately, other compensatory measures may offset the residual effects. This requires a thorough understanding and assessment of the environment in order to provide equivalent compensation. This may require extensive public consultation, especially if the impacts lean towards sentimental issues or personal values and perceptions.
- Enhancement: Enhancement aims to manage certain changes and impacts by enhancing the quality of the environment for local people. This requires the exploring of opportunities in the proposed project to contribute positively to the landscape and its experience. Enhancement may take many forms but could include preservation of ecosystems, proper land management, and restoration of habitats or historic landscapes.

Cumulative impacts: Cumulative impacts are highly likely due to the existing distribution line that follows a similar corridor as Alternative 3 and an existing substation next to the R328. The prominent scale of the new 400kV transmission line is a large addition to electrical infrastructure in the area. A significant increase (more than double) in visual dominance of electrical infrastructure can be expected which contrasts with the rural character of the urban outskirts, thereby causing a reduction in the scenic quality of the visual resource.

Residual Risks: Residual risks will occur as the impact of the power line on the character of the study area, cannot be effectively mitigated over the lifetime of the project.

Inland Rural Landscape Type

ALTERNATIVE 1: INLAND RURAL LANDSCAPE TYPE - OBSERVERS		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		

Nature of impact: The construction activity will cause a negative effect on observers in the ZMVE during the initial construction activity that will be limited to surface disturbances. As the towers gain height, the visibility and visual exposure will increase progressively. Viewer incidence is generally expected to be medium due to the route passing through rural areas that has a low to medium population density. Areas/points where higher viewer incidences are

expected, are near major transport routes and at popular tourist attractions. A visual change will occur and will become progressively more substantial as the project nears completion. It will cause a visual intrusion as a result of disturbances to the natural vegetation and agricultural land uses that relates to tower construction and servitude clearance. The construction activity is considered an uncharacteristic event in the study area that may impact on scenic views.

Probability	Highly probable (4)	Highly probable (4)
Duration	Very short term (1)	Very short term (1)
Extent	Local, but over long linear distance (3)	Contained on site, but over long linear distance (2)
Magnitude	Low (5)	Low (4)
Severity	Medium (36)	Low (28)
Status (Positive/Negative)	Negative	Negative

OPERATIONAL PHASE

Nature of impact: A new transmission line will be added to the visual environment. It will be highly visible on the level regions, but partially visible in the more mountainous regions. Viewer incidence is generally expected to be medium due to the route passing through rural areas that has a low to medium population density. Areas/points where higher viewer incidences are expected, are near major transport routes and at popular tourist attractions. Generally, the observers within the ZMVE will be most severely affected. A visual change will occur as a result of the new transmission line and the increased dominance of electrical infrastructure in the study area. The industrial character will contrast with the natural and semi-natural character of the western and central regions, and with the intensely cultivated farmland of the eastern region. It will interfere with pleasant views of the natural landscape in the fore- and middle ground and the highly scenic Outeniqua Mountains in the background. The transmission line will intrude on the observer's visual experience.

Probability	Definite (5)	Definite (5)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Medium (7)
Severity	High (75)	High (70)
Status (Positive/Negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Medium	Medium

Can impacts be mitigated: Impacts can be mitigated during the construction phase, but little can be done to mitigate the impacts during the operational phase unless major layout or design changes are made to avoid the potential impacts.

Mitigation:

- Avoidance: Complete avoidance of the impacts is a function of either not proceeding with the proposed project or relocating the project to an alternative site. This is often the most effective mitigation strategies but within the constraints of economics and available land it is not necessarily possible or feasible.
- Reduction: Where negative impacts cannot be avoided it should be considered how to reduce the impact as much as possible. Different projects require different solutions but scaling down or limiting disturbances are some of the options.
- Remediation: Remediation mitigation relies on add-on or cosmetic measures to "soften" the impact to a degree. This is often associated with screening or camouflage treatment to avoid or limit intrusive views.
- Compensation: Where a negative impact cannot be mitigated adequately, other compensatory measures may offset the residual effects. This requires a thorough understanding and assessment of the environment in order to provide equivalent compensation. This may require extensive public consultation, especially if the impacts lean towards sentimental issues or personal values and perceptions.
- Enhancement: Enhancement aims to manage certain changes and impacts by enhancing the quality of the environment for local people. This requires the exploring of opportunities in the proposed project to contribute positively to the landscape and its experience. Enhancement may take many forms but could include preservation of ecosystems, proper land management, and restoration of habitats or historic landscapes.

Cumulative impacts: Cumulative impacts are highly likely due to the existing Proteus – Droërivier 400kV

transmission line in the same route. The new 400kV transmission line will theoretically double the visual prominence of electrical infrastructure through the study area. It is expected to contrast with the natural, semi natural and agricultural characters of the study area, thereby causing visual intrusions along its linear length.

Residual Risks: Residual risks will occur as the visibility of the towers cannot be effectively reduced and therefore visual intrusion will remain an impact for the lifetime of the project.

ALTERNATIVE 1: INLAND RURAL LANDSCAPE TYPE – VISUAL RESOURCE		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Nature of impact: The construction activity will cause a negative effect, primarily on the natural and semi-natural environment of the western and central regions, and the agricultural land use of the eastern region. For the duration of the construction phase, machinery, material and workforce will be uncharacteristic to the visual resource and will contrast with the natural, semi-natural or farming practices. The construction activity is considered incompatible with the prevailing character and will blemish the visual value and scenic quality of the study area.		
Probability	Definite (5)	Definite (5)
Duration	Very short term (1)	Very short term (1)
Extent	Local, but over long linear distance (3)	Contained on site, but over long linear distance (2)
Magnitude	Moderate (6)	Low (4)
Severity	Medium (50)	Medium (35)
Status (Positive/Negative)	Negative	Negative
OPERATIONAL PHASE		
Nature of impact: A new transmission line will be a prominent addition to the baseline environment. The complex, industrial character and enormous scale of the towers, will contrast with the natural, semi-natural or farming land uses. Pleasant views of the natural and semi-natural visual resource will be blemished and distant views of the Outeniqua Mountains will be negatively affected. This will cause a reduction in scenic quality of the visual resource.		
Probability	Definite (5)	Definite (5)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Medium (6)
Severity	High (75)	High (65)
Status (Positive/Negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Medium	Medium
Can impacts be mitigated: Impacts can be mitigated during the construction phase, but little can be done to mitigate the impacts during the operational phase unless major layout or design changes are made to avoid the potential impacts.		

Mitigation:

- Avoidance: Complete avoidance of the impacts is a function of either not proceeding with the proposed project or relocating the project to an alternative site. This is often the most effective mitigation strategies but within the constraints of economics and available land it is not necessarily possible or feasible.
- Reduction: Where negative impacts cannot be avoided it should be considered how to reduce the impact as much as possible. Different projects require different solutions but scaling down or limiting disturbances are some of the options.
- Remediation: Remediation mitigation relies on add-on or cosmetic measures to “soften” the impact to a degree. This is often associated with screening or camouflage treatment to avoid or limit intrusive views.
- Compensation: Where a negative impact cannot be mitigated adequately, other compensatory measures may offset the residual effects. This requires a thorough understanding and assessment of the environment in order to provide equivalent compensation. This may require extensive public consultation, especially if the impacts lean towards sentimental issues or personal values and perceptions.
- Enhancement: Enhancement aims to manage certain changes and impacts by enhancing the quality of the environment for local people. This requires the exploring of opportunities in the proposed project to contribute positively to the landscape and its experience. Enhancement may take many forms but could include preservation of ecosystems, proper land management, and restoration of habitats or historic landscapes.

Cumulative impacts: Cumulative impacts are highly likely due to the existing 400kV transmission line in the same route. The new 400kV transmission line will theoretically double the visual prominence of electrical infrastructure through the study area. It is expected to contrast with the natural, semi natural and agricultural characters of the study area, thereby causing a reduction in scenic quality of the visual resource.
Residual Risks: Residual risks will occur as the impact of the power line on the character of the study area, cannot be effectively mitigated over the lifetime of the project.

ALTERNATIVE 2: INLAND RURAL LANDSCAPE TYPE - OBSERVERS		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Nature of impact: The construction activity will cause a negative effect on observers in the ZMVE during the initial construction activity that will be limited to surface disturbances. As the towers gain height, the visibility and visual exposure will increase progressively. Viewer incidence is generally expected to be medium due to the route passing through rural areas that has a low to medium population density. Areas/points where higher viewer incidences are expected, are near major transport routes and at popular tourist attractions. A visual change will occur and will become progressively more substantial as the project nears completion. It will cause a visual intrusion as a result of disturbances to the natural vegetation and agricultural land uses that relates to tower construction and servitude clearance. The construction activity is considered an uncharacteristic event in the study area that may impact on scenic views.		
Probability	Highly probable (4)	Highly probable (4)
Duration	Very short term (1)	Very short term (1)
Extent	Local, but over long linear distance (3)	Contained on site, but over long linear distance (2)
Magnitude	Low (5)	Low (4)
Severity	Medium (36)	Low (28)
Status (Positive/Negative)	Negative	Negative
OPERATIONAL PHASE		
Nature of impact: A new transmission line will be added to the visual environment. It will be highly visible on the level regions, but partially visible in the more mountainous regions. Viewer incidence is generally expected to be medium due to the route passing through rural areas that has a low to medium population density. Areas/points where higher viewer incidences are expected, are near major transport routes and at popular tourist attractions. Generally, the observers within the ZMVE will be most severely affected. A visual change will occur as a result of the new transmission line and the increased dominance of electrical infrastructure in the study area. The industrial character will contrast with the natural and semi-natural character of the western and central regions, and with the intensely cultivated farmland of the eastern region. It will interfere with pleasant views of the natural landscape in the fore- and middle ground and the highly scenic Outeniqua Mountains in the background. The transmission line will intrude on the observer's visual experience.		
Probability	Definite (5)	Definite (5)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Medium (7)
Severity	High (75)	High (70)
Status (Positive/Negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Medium	Medium
Can impacts be mitigated: Impacts can be mitigated during the construction phase, but little can be done to mitigate the impacts during the operational phase unless major layout or design changes are made to avoid the potential impacts.		
Mitigation:		
• Avoidance: Complete avoidance of the impacts is a function of either not proceeding with the proposed project or relocating the project to an alternative site. This is often the most effective mitigation strategies but within the constraints of economics and available land it is not necessarily possible or feasible.		
• Reduction: Where negative impacts cannot be avoided it should be considered how to reduce the impact as much as possible. Different projects require different solutions but scaling down or limiting disturbances are		

some of the options.

- Remediation: Remediation mitigation relies on add-on or cosmetic measures to "soften" the impact to a degree. This is often associated with screening or camouflage treatment to avoid or limit intrusive views.
- Compensation: Where a negative impact cannot be mitigated adequately, other compensatory measures may offset the residual effects. This requires a thorough understanding and assessment of the environment in order to provide equivalent compensation. This may require extensive public consultation, especially if the impacts lean towards sentimental issues or personal values and perceptions.
- Enhancement: Enhancement aims to manage certain changes and impacts by enhancing the quality of the environment for local people. This requires the exploring of opportunities in the proposed project to contribute positively to the landscape and its experience. Enhancement may take many forms but could include preservation of ecosystems, proper land management, and restoration of habitats or historic landscapes.

Cumulative impacts: Cumulative impacts are highly likely due to the existing 2x Proteus – Blanco 132kV distribution lines in the same route. The prominent scale of the new 400kV transmission line will be a large addition to electrical infrastructure in the area. A significant increase (more than double) in visual dominance of electrical infrastructure can be expected which contrasts with the semi-natural and agricultural land uses, thereby causing visual intrusions along the linear length. Three power lines in one corridor are expected to exceed the visual tolerance threshold. The factor that adds weight to this statement is that each line will consist of a different type of tower that causes major visual incoherence and clutter.

Residual Risks: Residual risks will occur as the visibility of the towers cannot be effectively reduced and therefore visual intrusion will remain an impact for the lifetime of the project.

ALTERNATIVE 2: INLAND RURAL LANDSCAPE TYPE – VISUAL RESOURCE		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Nature of impact: The construction activity will cause a negative effect, primarily on the natural and semi-natural environment of the western and central regions, and the agricultural land use of the eastern region. For the duration of the construction phase, machinery, material and workforce will be uncharacteristic to the visual resource and will contrast with the natural, semi-natural or farming practices. The construction activity is considered incompatible with the prevailing character and will blemish the visual value and scenic quality of the study area.		
Probability	Definite (5)	Definite (5)
Duration	Very short term (1)	Very short term (1)
Extent	Local, but over long linear distance (3)	Contained on site, but over long linear distance (2)
Magnitude	Moderate (6)	Low (4)
Severity	Medium (50)	Medium (35)
Status (Positive/Negative)	Negative	Negative
OPERATIONAL PHASE		
Nature of impact: A new transmission line will be a prominent addition to the baseline environment. The complex, industrial character and enormous scale of the towers, will contrast with the natural, semi-natural or farming land uses. Pleasant views of the natural and semi-natural visual resource will be blemished and distant views of the Outeniqua Mountains will be negatively affected. This will cause a reduction in scenic quality of the visual resource.		
Probability	Definite (5)	Definite (5)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Medium (6)
Severity	High (75)	High (65)
Status (Positive/Negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Medium	Medium
Can impacts be mitigated: Impacts can be mitigated during the construction phase, but little can be done to mitigate the impacts during the operational phase unless major layout or design changes are made to avoid the potential impacts.		
Mitigation:		
• Avoidance: Complete avoidance of the impacts is a function of either not proceeding with the proposed project		

or relocating the project to an alternative site. This is often the most effective mitigation strategies but within the constraints of economics and available land it is not necessarily possible or feasible.

- Reduction: Where negative impacts cannot be avoided it should be considered how to reduce the impact as much as possible. Different projects require different solutions but scaling down or limiting disturbances are some of the options.
- Remediation: Remediation mitigation relies on add-on or cosmetic measures to "soften" the impact to a degree. This is often associated with screening or camouflage treatment to avoid or limit intrusive views.
- Compensation: Where a negative impact cannot be mitigated adequately, other compensatory measures may offset the residual effects. This requires a thorough understanding and assessment of the environment in order to provide equivalent compensation. This may require extensive public consultation, especially if the impacts lean towards sentimental issues or personal values and perceptions.
- Enhancement: Enhancement aims to manage certain changes and impacts by enhancing the quality of the environment for local people. This requires the exploring of opportunities in the proposed project to contribute positively to the landscape and its experience. Enhancement may take many forms but could include preservation of ecosystems, proper land management, and restoration of habitats or historic landscapes.

Cumulative impacts: Cumulative impacts are highly likely due to the existing 2x Proteus – Blanco 132kV distribution lines in the same route. The prominent scale of the new 400kV transmission line will be a large addition to electrical infrastructure in the area. A significant increase (more than double) in visual dominance of electrical infrastructure can be expected which contrasts with the semi-natural and agricultural land uses, thereby causing a reduction in the scenic quality of the visual resource. Three power lines in one corridor are expected to exceed the visual tolerance threshold. The factor that adds weight to this statement is that each line will consist of a different type of tower that causes major visual incoherence and clutter.

Residual Risks: Residual risks will occur as the impact of the power line on the character of the study area, cannot be effectively mitigated over the lifetime of the project.

ALTERNATIVE 3 and ALTERNATIVE 4: INLAND RURAL LANDSCAPE TYPE - OBSERVERS		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Nature of impact: The construction activity will cause a negative effect on observers in the ZMVE during the initial construction activity that will be limited to surface disturbances. As the towers gain height, the visibility and visual exposure will increase progressively. Viewer incidence is generally expected to be medium due to the route passing through rural areas that has a low to medium population density. Areas/points where higher viewer incidences are expected, are near major transport routes and at popular tourist attractions. A visual change will occur and will become progressively more substantial as the project nears completion. It will cause a visual intrusion as a result of disturbances to the natural vegetation and agricultural land uses that relates to tower construction and servitude clearance. The construction activity is considered an uncharacteristic event in the study area that may impact on scenic views.		
Probability	Highly probable (4)	Highly probable (4)
Duration	Very short term (1)	Very short term (1)
Extent	Local, but over long linear distance (3)	Contained on site, but over long linear distance (2)
Magnitude	Low (5)	Low (4)
Severity	Medium (36)	Low (28)
Status (Positive/Negative)	Negative	Negative
OPERATIONAL PHASE		
Nature of impact: A new transmission line will be added to the visual environment. It will be highly visible on the level regions, but partially visible in the more mountainous regions. Viewer incidence is generally expected to be medium due to the route passing through rural areas that has a low to medium population density. Areas/points where higher viewer incidences are expected, are near major transport routes and at popular tourist attractions. Generally, the observers within the ZMVE will be most severely affected. A visual change will occur as a result of the new transmission line and the increased dominance of electrical infrastructure in the study area. The industrial character will contrast with the natural and semi-natural character of the western and central regions, and with the intensely cultivated farmland of the eastern region. It will interfere with pleasant views of the natural landscape in the fore- and middle ground and the highly scenic Outeniqua Mountains in the background. The transmission line will		

intrude on the observer's visual experience.		
Probability	Definite (5)	Definite (5)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Medium (7)
Severity	High (75)	High (70)
Status (Positive/Negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Medium	Medium
Can impacts be mitigated: Impacts can be mitigated during the construction phase, but little can be done to mitigate the impacts during the operational phase unless major layout or design changes are made to avoid the potential impacts.		
Mitigation: • Avoidance: Complete avoidance of the impacts is a function of either not proceeding with the proposed project or relocating the project to an alternative site. This is often the most effective mitigation strategies but within the constraints of economics and available land it is not necessarily possible or feasible. • Reduction: Where negative impacts cannot be avoided it should be considered how to reduce the impact as much as possible. Different projects require different solutions but scaling down or limiting disturbances are some of the options. • Remediation: Remediation mitigation relies on add-on or cosmetic measures to "soften" the impact to a degree. This is often associated with screening or camouflage treatment to avoid or limit intrusive views. • Compensation: Where a negative impact cannot be mitigated adequately, other compensatory measures may offset the residual effects. This requires a thorough understanding and assessment of the environment in order to provide equivalent compensation. This may require extensive public consultation, especially if the impacts lean towards sentimental issues or personal values and perceptions. • Enhancement: Enhancement aims to manage certain changes and impacts by enhancing the quality of the environment for local people. This requires the exploring of opportunities in the proposed project to contribute positively to the landscape and its experience. Enhancement may take many forms but could include preservation of ecosystems, proper land management, and restoration of habitats or historic landscapes.		
Cumulative impacts: Cumulative impacts are highly likely due to existing electrical lines along the route. An inconspicuous low voltage power line, supported by gum pole structures, are present in the corridor between Gourikwa Substation and the distribution substation in Hartenbos. A monopole distribution line extends further towards the merger point with Alternative 2. From here the existing 2x Proteus – Blanco 132kV distribution lines are in the same corridor to Blanco Substation site. The prominent scale of the new 400kV transmission line will be a large addition to electrical infrastructure in the area. A significant increase (more than double) in visual dominance of electrical infrastructure can be expected which contrasts with the semi-natural and agricultural land uses, thereby causing visual intrusions along the linear length. Three power lines in one corridor are expected to exceed the visual tolerance threshold. The factor that adds weight to this statement is that each line will consist of a different type of tower that causes major visual incoherence and clutter.		
Residual Risks: Residual risks will occur as the visibility of the towers cannot be effectively reduced and therefore visual intrusion will remain an impact for the lifetime of the project.		

ALTERNATIVE 3 and ALTERNATIVE 4: INLAND RURAL LANDSCAPE TYPE – VISUAL RESOURCE		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Nature of impact: The construction activity will cause a negative effect, primarily on the natural and semi-natural environment of the western and central regions, and the agricultural land use of the eastern region. For the duration of the construction phase, machinery, material and workforce will be uncharacteristic to the visual resource and will contrast with the natural, semi-natural or farming practices. The construction activity is considered incompatible with the prevailing character and will blemish the visual value and scenic quality of the study area.		
Probability	Definite (5)	Definite (5)
Duration	Very short term (1)	Very short term (1)
Extent	Local, but over long linear	Contained on site, but over long

	distance (3)	linear distance (2)
Magnitude	Moderate (6)	Low (4)
Severity	Medium (50)	Medium (35)
Status (Positive/Negative)	Negative	Negative
OPERATIONAL PHASE		
Nature of impact: A new transmission line will be a prominent addition to the baseline environment. The complex, industrial character and enormous scale of the towers, will contrast with the natural, semi-natural or farming land uses. Pleasant views of the natural and semi-natural visual resource will be blemished and distant views of the Outeniqua Mountains will be negatively affected. This will cause a reduction in scenic quality of the visual resource.		
Probability	Definite (5)	Definite (5)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Medium (6)
Severity	High (75)	High (65)
Status (Positive/Negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Medium	Medium
Can impacts be mitigated: Impacts can be mitigated during the construction phase, but little can be done to mitigate the impacts during the operational phase unless major layout or design changes are made to avoid the potential impacts.		
Mitigation: • Avoidance: Complete avoidance of the impacts is a function of either not proceeding with the proposed project or relocating the project to an alternative site. This is often the most effective mitigation strategies but within the constraints of economics and available land it is not necessarily possible or feasible. • Reduction: Where negative impacts cannot be avoided it should be considered how to reduce the impact as much as possible. Different projects require different solutions but scaling down or limiting disturbances are some of the options. • Remediation: Remediation mitigation relies on add-on or cosmetic measures to "soften" the impact to a degree. This is often associated with screening or camouflage treatment to avoid or limit intrusive views. • Compensation: Where a negative impact cannot be mitigated adequately, other compensatory measures may offset the residual effects. This requires a thorough understanding and assessment of the environment in order to provide equivalent compensation. This may require extensive public consultation, especially if the impacts lean towards sentimental issues or personal values and perceptions. • Enhancement: Enhancement aims to manage certain changes and impacts by enhancing the quality of the environment for local people. This requires the exploring of opportunities in the proposed project to contribute positively to the landscape and its experience. Enhancement may take many forms but could include preservation of ecosystems, proper land management, and restoration of habitats or historic landscapes.		
Cumulative impacts: Cumulative impacts are highly likely due to existing electrical lines along the route. An inconspicuous low voltage power line, supported by gum pole structures, are present in the corridor between Gourikwa Substation and the distribution substation in Hartenbos. A monopole distribution line extends further towards the merger point with Alternative 2. From here the existing 2x Proteus – Blanco 132kV distribution lines are in the same corridor to Blanco Substation site. The prominent scale of the new 400kV transmission line will be a large addition to electrical infrastructure in the area. A significant increase (more than double) in visual dominance of electrical infrastructure can be expected which contrasts with the semi-natural and agricultural land uses, thereby causing a reduction in scenic quality of the visual resource. Three power lines in one corridor are expected to exceed the visual tolerance threshold. The factor that adds weight to this statement is that each line will consist of a different type of tower that causes major visual incoherence and clutter.		
Residual Risks: Residual risks will occur as the impact of the power line on the character of the study area, cannot be effectively mitigated over the lifetime of the project.		

7.4.8 Social Impacts Assessment

The development areas of the four alternative powerline do not differ in any significant way as far as the impacts soil and agricultural potential is concerned. Therefore, there is no significant difference in the

potential impacts associated with the alternatives, and the impacts for the alternatives are not comparatively assessed in the assessment tables below.

IMPACT: Improved quality of life, through creation of jobs (during construction)		
Nature of Impact: It is expected that contractors will bring their own workers and it will also be required by Eskom to employ local people. Jobs therefore will be created for locals and at a national level. Jobs are a source of livelihoods and can therefore improve the quality of life for those who work. Increased procurement during construction will largely create a relatively low number of jobs for unskilled workers (due to the technical nature of the work). There may also be some jobs created during this time if the levels of procurement justify them. Procurement is expected to benefit companies on a national scale, and to a lesser extent, companies locally. It is expected that local employment will be for a short duration at best (2-5 years) and mainly for unskilled positions. The consequence therefore for locals may be low. It could also have a non-cumulative impact at this scale, as jobs are scarce. On a national scale, the impact will be also for a short duration (work mostly done during construction phase) but could be cumulative for contract workers as it may mean continuation of work (during operation, in the sense of maintenance). The consequence for these workers could be high as they will be remunerated for semi-skilled and skilled work. This is expected for both direct project employment and jobs through procurement.		
CONSTRUCTION PHASE:		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Local (3); National (5)	Local (5); National (5)
Duration	Local Short (2); National Short (2)	Local Short (2); National Short (2)
Extent	Local (1); National (4)	Local (3); National (4)
Magnitude/Consequence	Local (4); National (8)	Local (8); National (8)
Significance	**Local 21 (low); National 70 (high)**	**Local 65 (high); National 70 (high)**
OPERATIONAL PHASE		
It is expected that there will be limited opportunities for job creation during the operations phase, including for maintenance activities, at local and national/regional scales. This impact is therefore not assessed for the operations phase.		
Status (positive or negative)	Positive	Positive
Reversibility	Not applicable for this impact	Not applicable for this impact
Irreplaceable loss of resources?	Not applicable for this impact	Not applicable for this impact
Can impacts be mitigated?	This is a positive impact; therefore the impact should be promoted. From a developmental point of view, as far as possible local communities should benefit from the impact. Management measures are directed at increasing the likelihood that more eligible locals are employed.	
Mitigation/ Management: • Eskom has advised that the construction of a 400kV line is highly specialised and there are a limited number of contractors capable of executing the work. Eskom does not have a specialised unit for this work. • Eskom contract conditions should provide for at least unskilled labour to be sourced from the local municipal area affected. Contractors can be required to assess local applicants to identify those with potential to join the skilled and semi-skilled workforce. These workers can be put onto a database (via the Municipalities) for contractors to draw their semi-skilled and skilled labour from, in the future. Where Eskom training schemes make provisions, locals with potential can be offered training opportunities. • Eskom can identify as many procurement opportunities as possible at the local level to support businesses and job creation locally.		
Cumulative impacts: there is a possibility that cumulative impact will be achieved at regional/national scale without management measures. In the respective municipalities, infrastructure projects may have a (temporary) cumulative effect on job opportunities.		
Residual Risks/ Benefits: None, as project work will be on a contract basis.		

IMPACT: increased reliability of energy services (during operations)

Nature of Impact: Improved quality of life from increased reliability of energy services in the Western Cape region. This is a direct impact that will persist in the long term, that is, during operations.
Currently, South Africa is not meeting its electricity demand to support economic growth rates it would like to see. Security of energy supply will therefore positively contribute towards stabilizing and perhaps also stimulating economic activities in the Western Cape. This can improve livelihoods through sustaining and possibly increasing the number of jobs available.

Although the quality of life could be negatively impacted for those that will have visual disturbances, or EMFs or be disrupted during construction, these issues have not been considered in this table, but will be assessed and presented by other specialist studies.

CONSTRUCTION PHASE

This impact is expected to be delivered after the construction phase.

OPERATIONAL PHASE:

Rating of Impacts	Without mitigation	With mitigation
Probability	3	4
Duration	4	5
Extent	3	3
Magnitude/Consequence	8	10
Significance	45 (medium)	72 (high)
Status (positive or negative)	Positive	Positive
Reversibility	Not applicable for this impact	Not applicable for this impact
Irreplaceable loss of resources?	Not applicable for this impact	Not applicable for this impact
Can impacts be mitigated?	This is a positive impact; therefore it should be promoted. If the development benefits many households, businesses and other development units within the municipal areas the infrastructure passes through, this may ease the negative impacts experienced. Management measures are therefore directed at increasing the likelihood that more people benefit from energy provision in these municipalities.	

Mitigation/ Management:

- Infrastructure will have to be maintained on an ongoing basis, to provide a permanent benefit for development. Where infrastructure has to be changed in the long term, for example, if there is a switch to environmentally-friendly energy technology, this should be effected with little disruption.
- A large proportion of households in the area are unable to pay for services. For example, 12% of households in George do not have any income. While it is favourable that households move towards improving their income status so that they are able to pay for services in the long term, this outcome is very much out of the influence of Eskom. It is therefore recommended that Eskom also consider renewable energy sources especially for no and low income households. This can allow energy access at no cost for poor households and support their social and economic development activities. It can also reduce the burden on Eskom and government in the long term to maintain conventional infrastructure and provide free electricity for households unable to pay for services.

Cumulative impacts: Improving security of supply will be cumulative to having access to electricity. For those who are receiving electricity for the first time and have been beneficiaries of other development measures such as the provision of water, the provision of secure electricity will be cumulative by improving their quality of life further.

Residual Risks/ Benefits: Access to secure sources of electricity can lead to many "downstream" development benefits.

IMPACT: Improved community health from the introduction and maintenance of safer sources of energy. (during operations)		
Nature of Impact: Improved quality of life, through improved community health and safety from the introduction and maintenance of safer sources of energy for the communities in the Western Cape. This is an indirect impact that is expected to persist in the long-term during operations.		
CONSTRUCTION PHASE		
This impact is expected to be delivered after the construction phase.		
OPERATIONAL PHASE:		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Probable (3)	Highly Probable (4)
Duration	Long-term (4)	Permanent (5)
Extent	Local (2)	Reginal (3)
Magnitude/Consequence	High (8)	Very High (10)
Significance	42 (medium)	72 (high)
Status (positive or negative)	Positive	Positive
Reversibility	Not applicable for this impact	Not applicable for this impact
Irreplaceable loss of resources?	Not applicable for this impact	Not applicable for this impact
Can impacts be mitigated?	This is a positive impact; therefore it should be promoted. From a developmental point of view, as far as possible communities using energy sources that are unsafe or harmful to their health should be targeted. Management measures are directed at increasing the likelihood that vulnerable populations receive this benefit.	
Mitigation/ Management: • There may be government policies that restrict electricity access for informal residences. As these households are part of the vulnerable population that will potentially benefit from positive health impacts associated with electrification, Eskom should seek to support alternative electrification solutions in these communities, in association with development partners such as local government. For instance, electrified communal cooking facilities can reduce the need to burn wood indoors.		
Cumulative impacts: Benefits will accrue to beneficiaries of the project over the long term, from use of less harmful energy options.		
Residual Risks/ Benefits: Better health has obvious benefits. It will improve the capacity of individuals so that they are able to pursue more development options.		

IMPACT: Increased community safety risks from increased direct exposure to electrical hazards (during operations)		
Nature of Impact: Increased community safety risks from increased direct exposure to electrical hazards, if there is tampering with power infrastructure including sub stations. It is also hazardous to use helicopters in an area with 400kV pylons. This is a direct impact with potential immediate and long term impacts. The impacts will be experienced during the operations phase.		
CONSTRUCTION PHASE		
Impacts will occur after the infrastructure is in place, that is, in the operations phase.		
OPERATIONAL PHASE:		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Improbable (2)	Very Improbable (1)
Duration	Permanent (5)	Short (1)
Extent	Local (1)	Local (1)
Magnitude/Consequence	Permanent (10)	Low (4)
Significance	Medium (32)	Low (6)

Status (positive or negative)	Negative	Negative
Reversibility	Low & Moderate Human injury may be reversible but human fatalities are not	Moderate & High Management measures are aimed at prevention and reversibility of injuries
Irreplaceable loss of resources?	High Human lives can be lost, and some injuries may result in permanent loss of function.	Low Management measures are aimed at preventing the loss of life and body function.
Can impacts be mitigated?	If injury is reversible, then yes. In the case of death, no. Management measures try to prevent the impacts	

Mitigation/ Management:

- Where there is a risk of tampering, access to infrastructure will have to be controlled. Infrastructure will also have to be monitored and maintained especially in populated areas so that people (or animals) are not exposed to hazardous conditions.
- Infrastructure will have to be monitored and maintained especially in populated areas so that people (or animals) are not exposed to hazardous conditions. It is recommended that a rapid and appropriate procedure be put in place for stakeholders to identify report and manage damaged infrastructure. Workers and residents working in the vicinity of the power infrastructure must be informed about how to implement the procedure. They must be made aware of what should be done if someone is injured or killed because of exposure to electrical hazards.

Cumulative impacts: If damaged infrastructure is not repaired timeously, it can continue to be a health hazard.

Residual Risks/ Benefits: If injury is severe, the impact will persist.

IMPACT: Increased community health risks if workers' camps do not have access to basic services such as clean water and adequate sanitation and waste removal. (during construction)

Nature of Impact: Increased community health risks if workers' camps do not have access to basic services such as sanitation and waste removal. This impact can potentially be introduced during construction. This impact could be realized along the construction route of the power line and upgrade (refurbishment) of the Gourikwa MTS. The Narina substation is yet to be constructed, but forms part of another EIA process (Alternative 5 site approved by DEA on 1 September 2016) . Impacts of the works at the proposed Narina substation are therefore excluded from this assessment.

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CONSTRUCTION PHASE:		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Highly probable (4)	Improbable (2)
Duration	Medium (3)	Medium (3)
Extent	Local (3)	Local (1)
Magnitude/Consequence	Permanent (10)	Minor (2)
Significance	**56 (medium)**	**12 (low)**

OPERATIONAL PHASE

If risks are not managed appropriately during construction, hazardous conditions can persist into the operations phase. Risks can be introduced during construction and management measures must manage the risks during that phase

Status (positive or negative)	Negative	Negative
Reversibility	Low	Moderate
Irreplaceable loss of resources?	Moderate	Low
Can impacts be mitigated?	Yes	

Mitigation/ Management:

- Provide appropriate water, sanitation and waste management facilities. Provide education and awareness to workers about the need to keep the environment clean, and how human waste can create health hazards. Monitor the effectiveness of basic service facilities provided and behavior, and correct if necessary.

Cumulative impacts: Can be cumulative if not mitigated, for example, if there is poor waste management at the

workers' camps.
Residual Risks/ Benefits: Minimal if mitigated appropriately.

IMPACT: Increased community and workers' health risks from possible increased exposure to HIV/AIDS (during construction)		
Nature of Impact:: Increased community and workers' health risks from possible increased exposure to HIV/AIDS. This is a direct impact caused by transmission of the disease.		
CONSTRUCTION PHASE:		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Probable (4)	Improbable (2)
Duration	Permanent (5)	Short duration (1)
Extent	National/ Regional (5)	National/ Regional (5)
Magnitude/Consequence	High (8)	Low (4)
Significance	**High (72)**	**Low (20)**
OPERATIONAL PHASE		
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low, as not applicable: Management is aimed at prevention
Irreplaceable loss of resources?	High	Low
Can impacts be mitigated?	Yes.	
Mitigation/ Management: • Contractors must provide health awareness to their workers on the serious impacts of HIV/AIDS. Condoms must be provided to workers, as it is the most effective preventative measure. Contract workers must be allowed time off at regular intervals to visit their families. Workers must have access to recreational activities during their time off. These must be organized with them.		
Cumulative impacts: HIV/AIDS Prevalence rates will increase		
Residual Risks/ Benefits: Once contracted, a person will have to most probably be on a lifelong course of Anti-Retroviral Therapy to manage the HIV/AIDS.		

7.4.9 Socio- economic & Tourism Impacts Assessment

The four alternative powerline do not differ in any significant way as far as the impacts on socio-economic & tourism is concerned. In most part the three alternatives are not comparatively assessed in the assessment tables below. Where applicable, the differences in impacts are highlighted in red for Alternative 2, in green for Alternative 3 and orange for Alternative 4

Impact on agriculture (Socio-economic impact)

Nature:

Alternative 1 Alternative 1 is slightly shorter, implying a smaller footprint, however agriculture will be impacted. A number of concerns were raised by farmers especially in the Uitkyk, area (see study for more detail). This is especially the case with intensive farming like irrigated crops and fruit trees, but also affecting a number of game farms (Gondwana Game Reserve, Hartenbos Private Game Lodge and Nyaru Game lodge).
Mitigation includes detail planning of the exact position of the pylons and transmission lines in co-operation with the farmers to establish the optimal path that will limit losses in current and future agricultural production. Losses in agricultural land can also be as a result of the creation of access roads. Not all farming activities will be lost as activities like cattle, sheep and ostrich farming can continue under the lines. Intensive farming like irrigated crops and fruit trees will be impacted the most. Although it will not impact the game itself it can become dangerous for game capturing if helicopters are used.

Alternative 2 is more or less the same length compared to alternative 3 and slightly longer compared to alternative 1. A slightly longer length implies a slightly larger footprint. The agricultural sector will be impacted; This also includes farmers in the Klein Brak area, the Van Greunen Boerdery, Jonck family farm; Apieskloof Boerdery, etc (see study for more detail). This is especially the case with intensive farming like irrigated crops and fruit trees. Alternative 2 is potentially crossing the Gondwana Game Reserve, Hartenbos Private Game lodge and the Botlierskop Private Game Reserve.

Alternative 3 is more or less the same length compared to alternative 2 and 4 and slightly longer compared to alternative 1. A slightly longer length implies a slightly larger footprint. The agricultural sector will be impacted; This includes property development like the Monte Christo Eco Estate and farmers in the Klein Brak area, the Van Greunen Boerdery, Jonck family farm; Apieskloof Boerdery, etc (see study for more detail). This is especially the case with intensive farming like irrigated crops and fruit trees.

Alternative 4 is more or less the same length compared to alternative 2 and 3 and slightly longer compared to alternative 1. A slightly longer length implies a slightly larger footprint. The agricultural sector will be impacted; This includes property development like the Monte Christo Eco Estate (although slightly more inland compared to option 3) and farmers in the Klein Brak area, the Van Greunen Boerdery, Jonck family farm; Apieskloof Boerdery, etc. This is especially the case with intensive farming like irrigated crops and fruit trees. Alternative 4 is potentially crossing Botlierskop Private Game Reserve.

There is also a risk of increased crime during the construction period. This can be mitigated through increased security during construction.

Rating of Impacts	Without mitigation	With mitigation
CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Definite (5)	Highly probable (4)
Duration	Very short-term (1)	Very short-term (1)
Extent	Local (2)	Local (2)
Magnitude	Moderate (6)	Low (4)
Significance	**45 (Medium)**	**28 (low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Definite (5)	Highly probable (4)
Duration	Permanent (5)	Permanent (5)

Extent	Site (1)	Site (1)
Magnitude	Moderate (6)	Moderate (5) Low (4) Low (4)
Significance	**60 (high)**	**44 (moderate)** **40 (moderate)** **40 (moderate)** **40 (moderate)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Moderate
Irreplaceable loss of resources?	Moderate	Low
Can impacts be mitigated?	Yes to some degree. Not all farming activities are lost, sheep and ostrich farming activities and most dry land farming can continue under the lines. Irrigated fields are at risk, especially pivot irrigation fields. The position of the pylons can carefully be planned to have the least impact.	

Mitigation:

- Detail planning of the exact position of the pylons and transmission lines in co-operation with the farmers to establish the optimal path that will limit losses in current and future agricultural production. Losses in agricultural land can also be as a result of the creation of access roads.
- Not all farming activities will be lost as activities like cattle, sheep and ostrich farming can continue under the lines. Intensive farming like irrigated crops and fruit trees will be impacted the most. Although it will not impact the game itself it can become dangerous for game capturing if helicopters are used.

Cumulative impacts: The overall loss of agricultural land in the region due to other developments

Residual Risks: Overall loss of farmland, income and change in livelihood

Provision of up to 225MW mid-merit electricity from Gourikwa (Economic impact)

Nature:

Economic impact: Provision of up to 225MW mid-merit electricity from Gourikwa to the country by strengthening of existing network. This impact will be the same for Alternative 1 and 2. There will be savings by Eskom if Gourikwa Power Station is converted from a CCGT to an OCGT. Even though it is not exactly clear where the power from this proposed Gourikwa-Blanco transmission line will be used in the economy, it will benefit the economy, especially during peak electricity demand periods. Although additional 75MW additionally is small, it can be argued that if such a line is not built, the upgrade of Gourikwa Power Station will not happen and the generation cost will be higher. The strengthening of the transmission line will also ensure a much lower risk of electricity outages in the local area due to transmission line failure. According to the Department of Energy as input to the IRP 2010, the cost of un-served energy (COUE) is assumed as R75/kWh. This is an implied value to the economy, assuming the COUE value per kWh and 225MW of R16.9 million per hour.

Rating of Impacts	**Without mitigation**	**With mitigation**
CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Not relevant for this phase		
OPERATIONAL PHASE		
Probability	Highly probable (4)	Defintie (5)
Duration	Long-term (4)	Long-term (4)
Extent	Regional (4)	Regional (4)
Magnitude	Minor (2)	Minor (2)
Significance	**40 (moderate)**	**45 (moderate)**
Status (positive or negative)	Positive	Positive
Reversibility	Low	Moderate
Irreplaceable loss of resources?	Moderate	Low
Can impacts be	Yes	

mitigated?	
Mitigation/Enhancements: • None anticipated	
Cumulative impacts: Contribution towards security of electricity supply	
Residual Risks: Contribution towards security of electricity supply	

Contribution to local economy (employment, use of contractors and purchases of local goods and servitudes) (Economic impact)

Nature:

Alternative 1 is slightly shorter compared to alternatives 2, 3 and 4 and has less bends, implying it will cost less. However, overall there will not be much difference between the options.

Alternative 2 is slightly longer compared to alternative 1 and has more bends, implying it will cost slightly more. However, overall there will not be much difference between the options.

Alternative 3 is slightly longer compared to alternative 1 and has more bends, implying it will cost slightly more. However, overall there will not be much difference between the options.

Alternative 4 is slightly longer compared to alternative 1 and has more bends, implying it will cost slightly more. However, overall there will not be much difference between the options.

The majority of the construction material will come from outside the study area. To increase the economic benefits for the local area, a percentage of workers from the local area can be trained and used during the construction period as well as during the operational period (maintenance like clearing under pylons). Other services can also be provided like catering, transport, accommodation and entertainment. Local area employment opportunities are expected to be limited.

According to Eskom (2014, b), the estimated cost of the Gourikwa-Blanco 400kV and Blanco-Droërivier 400kV line is R1.6 billion. Installation of the transmission lines and manufacturing of materials need are capital intensive in nature.

Rating of Impacts	Without mitigation	With mitigation
CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Probable (3)	Highly probable (4)
Duration	Very short-term (1)	Very short-term (1)
Extent	Local (2)	Local (2)
Magnitude	Minor (2)	Low (3)
Significance	**15 (Low)**	**24 (low)**
Status (positive or negative)	Positive	Positive
OPERATIONAL PHASE		
Probability	Probable (3)	Highly probable (4)
Duration	Long-term (4)	Long-term (4)
Extent	Site (1)	Site (1)
Magnitude	Small (1)	Small (1)
Significance	**18 (Low)**	**24 (low)**
Status (positive or negative)	Positive	Positive
Reversibility	Low	Moderate
Irreplaceable loss of resources?	Moderate	Low
Can impacts be mitigated?	Most of the material will come from outside the area; limited economic opportunities will be available for the local area. Such opportunities can be increased by partially utilising domestic skills and providing opportunities to domestic businesses.	

Mitigation:

- The majority of the construction material will come from outside the study area. To increase the economic benefits for the local area, a percentage of workers from the local area can be trained and used during the construction period as well as during the operational period (maintenance like clearing under pylons). Other services can also be provided like catering, transport, accommodation and entertainment. Local area employment opportunities are expected to be limited.

Cumulative impacts: Opportunity to upgrade and improve skills levels in the area and Opportunity for local employment opportunities

Residual Risks: Improved pool of skills and experience in the local area; Economic growth for small-scale entrepreneurs and Temporarily employment during construction phase will result in jobs losses and struggles for construction workers to find new employment opportunities

Tourism impact:

Nature:

Alternative 1 is crossing the Gondwana Game Reserve, the Hartenbos Private Game lodge and could potentially affect the Grace Guest House. Alternative 1 is also affecting the Nyaru Game lodge, and potentially the Botlierskop Private Game Reserve.

Alternative 2 and Alternative 3 are potentially crossing the Gondwana Game Reserve, the Hartenbos Private Game Lodge, Botlierskop Private Game Reserve, Outeniquabosch Lodge and the Wolwedans dam.

Alternative 4 is potentially crossing the Botlierskop Private Game Reserve. There will be negative visual impacts of pylons and transmission lines.

There will be negative visual impacts of pylons and transmission lines.

Rating of Impacts	Without mitigation	With mitigation
CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Definite (5)	Highly probable (4)
Duration	Very short-term (1)	Very short-term (1)
Extent	Site (1)	Site (1)
Magnitude	Low (3) Low (4)	Low (3) Low (3)
Significance	**35 (Medium)** **30 (Moderate)**	**35 (Medium)** Low (20)
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Definite (5)	Definite (5) Highly probable (4)
Duration	Permanent (5) Short-term (1)	Permanent (5) Short-term (1)
Extent	Local (2) Site (1)	Local (2) Site (1)
Magnitude	Moderate (6) Low (3)	Moderate (6) Moderate (5) Moderate (5) Low (3)
Significance	**65 (high)** **55 (Moderate)**	**65 (high)** **60 (high)** **60 (high)** **50 (Moderate)**

Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Moderate	Low
Can impacts be mitigated?	Yes to some extent	
Mitigation: • Working hours should be kept to normal working hours (e.g. 7 am until 5 pm) during the construction phase • Construction sites should be fenced off to limit unauthorised entry and to limit negative visual impacts. • Construction sites should be screened from the property owners and guests where possible. • Stockpiling of soil should be as short as possible and construction debris should be removed as soon as construction activities allow. • Construction sites should be rehabilitated as soon as planning allows • Avoid placing the proposed distribution line in close view of the main activities at the tourism establishments.		
Cumulative impacts: None anticipated		
Residual Risks: Possible visual impact of pylons on properties used for tourism activities and accommodation		

7.4.10 Traffic and local roads impact assessment

The four alternative powerline do not differ in any significant way as far as the impacts on traffic is concerned. In most part the three alternatives are not comparatively assessed in the assessment tables below.

***Nature*: Impact of Access to site for Alternative 1, Alternative 2 and Alternative 3 &4**

Considering the size and extent of the study area as well as details of the exact tower positions are still unknown, it is difficult to estimate exactly which roads will be utilised for the transport and consequently deliver equipment to the site from various centres. It was therefore decided to firstly assess the access roads outside the study area for importing components and consequently site access roads within the study area being utilised during construction.

	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	Improbable (2)	Very Improbable (1)
Duration	Short duration (2)	Short duration (2)
Extent	Limited to Region (3)	Limited to Region (3)
Magnitude	Minor (2)	Minor (2)
Significance	**14 (low)**	**7 (low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Very Improbable (1)	Very Improbable (1)
Duration	Medium term (3)	Medium term (3)
Extent	Limited to Region (3)	Limited to Region (3)
Magnitude	Minor (2)	Minor (2)
Significance	**8 (low)**	**8 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	

Mitigation:
The impact can be mitigated to some extent by managing the traffic to and from site. Mitigation measure can include: Additional traffic control measures at the site access during higher demand periods

Cumulative impacts: N/a, negligible, impact only short term.

Residual Risks: N/a, negligible, impact only short term.

Nature: **Traffic Impact on existing routes during construction and operation for Alternative 1, Alternative 2 and Alternative 3 & 4**		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	Very Improbable (1)	Very Improbable (1)
Duration	Short duration (2)	Short duration (2)
Extent	Limited to Region (3)	Limited to Region (3)
Magnitude	Minor (2)	Minor (2)
Significance	**7 (low)**	**7 (low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Very Improbable (1)	Very Improbable (1)
Duration	Medium term (3)	Medium term (3)
Extent	Limited to Region (3)	Limited to Region (3)
Magnitude	Minor (2)	Minor (2)
Significance	**8 (low)**	**8 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	

Mitigation:

The impact can be mitigated to some extent by managing the traffic to and from site. Mitigation measure can include:

- Additional traffic control measures at the site access during higher demand periods.
- Distributing traffic volume as much as possible.
- Dust control for identified sections.

Cumulative impacts: N/a, negligible impact only short term.

Residual Risks: N/a, negligible impact only short term.

8 CONCLUSION

The previous chapters of this report together with the specialist studies contained within **Appendix 4** provide a detailed assessment of the potential impacts that may result from the proposed project. This chapter concludes the EIA Report for the proposed Gourikwa-Blanco 400kV powerline by providing a summary of the conclusions of the assessment of the proposed powerline. In so doing, it draws on the information gathered as part of the EIA process and the knowledge gained by the environmental specialist consultants and presents an informed opinion of the environmental impacts associated with the proposed project.

From the conclusions of the detailed EIA studies undertaken, sensitive areas within the development 2km corridor were identified and flagged for consideration and avoidance by the final alignment route (refer to **Appendix 1.2**). The **most significant** environmental impacts identified and assessed to be associated with the proposed Gourikwa-Blanco 400kV powerline project include:

- Impacts on ecology mainly through habitat loss and fragmentation
- Impacts on the local soils, land capability and agricultural potential of the site.
- Social impacts (positive)
- Visual impacts during the operational phase

Other impacts which could have an impact on the environment include:

- Impacts on the Wetlands & River Systems
- Impacts on heritage, archaeology and paleontological resources
- Socio-economic impacts
- Tourism
- Impacts on traffic

Potential impacts which could occur as a result of the proposed project are summarised in the sections which follows.

8.1. Summaries of findings

The specialist findings of the EIA phase are summarised as follows:

Vegetation Assessment:

Almost all the vegetation types in the project area between the two distribution centres are listed as Critical Biodiversity Areas (CBAs) and threatened ecosystems. All four route alternatives cut across several Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs). Some sensitive systems are listed as threatened ecosystems. Alternatives 1 and 2 are the only two of the four alternatives that cut across the Swellendam Silcrete Fynbos. Alternative 1 is the only alternative that does not affect the South Outeniqua Sandstone Fynbos. The entire landscape has been transformed. Almost all areas, with arable soil, have been ploughed and subsequently the natural vegetation has been destroyed. Agricultural activities (crop and planted pasture production) have destroyed most of region's natural vegetation. Isolated pockets of natural vegetation (fynbos, renosterveld and riparian vegetation) remain in those areas unsuitable for crop production (rocky outcrops and steep slopes). This is the reason why most of the natural vegetation between Gourikwa and Narina distribution centres are listed as Critical Biodiversity areas (CBAs) and Ecological Support Areas (ESAs).

Fauna Assessment:

From a **faunal perspective it** is recommended that the Gourikwa - Blanco **Alternative 2 is the preferred** route option for the proposed power line. It must be noted that the Brandwagrivier Wetland System bird micro-habitats and the intact vegetation surrounding Wolwedans dam must be treated as "**No-go**" areas for roads or pylon hardstands and access/services roads along this alternative route. Should either Alternative 1 or 4 be chosen, bird diverters should be attached to the powerlines from Gondwana Private Game Reserve to the proposed Blanco Substation.

Avifauna Assessment:

From an avifaunal perspective it is recommended that the Gourikwa - Blanco Alternative 2 is the preferred route option for the proposed power line, providing the recommended mitigation measures are implemented. There are existing powerline infrastructures which mitigate many of the impacts associated with birds and powerlines. The existing service roads will result in less bird habitat being destroyed or fragmented during the construction phase of the project. Should alternative route option 1 be chosen, bird diverters should be attached to the powerlines from Gondwana Private Game Reserve to the proposed Blanco Substation. It is recommended that an avifaunal walkthrough of the final route option is done prior to construction to determine any sensitive areas that need to be avoided. All bird nest/roost sites encountered should be considered "No-Go" areas for any pylon hardstands or the construction of access roads. The power line should be constructed in close proximity to the existing power line as many birds will be aware of the existing infrastructure which may reduce collisions in low visibility conditions. All areas defined as having a medium avifaunal sensitivity must have bird diverters installed (spacing to be determined following ground-truthing).

Freshwater Resources Assessment:

According to the freshwater specialist, wetland areas within the study area consist largely of valley bottom wetlands that are associated with the rivers and are of similar ecological condition and importance. The habitat integrity of the rivers range from being moderately modified (upper reaches of the larger rivers as well as the smaller streams) to being in the seriously modified ecological state (lower reaches of the larger river systems). The riparian habitat of these rivers tends to be more impacted by the direct impact of the surrounding land use activities which has resulted in removal of the natural indigenous vegetation and the subsequent growth of invasive alien plants.

Although the upper reaches of the rivers in the study area are in general in a less modified ecological state, the **alternative corridor with the least potential** impact on the **freshwater features in the area** is likely to be the northern-most route (**Alternative 1**) as it would be more likely to be able to span the river valleys with little to no impact on the rivers and associated wetlands at the valley bottoms, while the southern corridors (Alternative 2 and Alternative 3) will need to cross the wide floodplains of the rivers. The alignment of the route within the corridor could also be determined to minimise the potential impact on the freshwater features within the study area. With mitigation, Alternative 1 is likely to have an impact of a very low significance to insignificant on the freshwater features while Alternative 2 is likely to have an impact of a very low impact. The Alternative 3 and 4 would have the largest potential impact on the freshwater features.

Heritage Assessment:

With respect the potential impacts to **palaeontological resources**, the Baseline assessment produced by Almond (2015) notes: "A substantial proportion of proposed power-line sectors will cross formations that are conservatively regarded as moderate to high sensitivity". "In practice, however, the likelihood of significant **negative impacts** on fossil heritage on the ground is **low** over most sectors of these routes because the bedrocks here are often highly weathered, tectonically- deformed or covered by a substantial thickness of fossil-poor superficial deposits (scree, alluvium, soils, etc)".

Overall, the **heritage studies** found that there are **no anticipated fatal flaws** with regard to the construction of the powerline and Alternative 1 or 2 are considered acceptable from an archaeological perspective. Alternative 3 and 4 may have some impacts on heritage resources because of the relative proximity of the line to the coast, and the higher probability of encountering archaeological sites. Alternative 2, it is more sensitive from an historical archaeological perspective. **Alternative 1** is the **preferred option** because of the lower probability of encountering ruined historical farm buildings. However from a **cultural landscape** perspective, **Alternative 1 is acceptable** but not preferred.

Soil, Land use & Agricultural Potential Assessment:

The agricultural potential of the study area is intimately linked to the availability of rainfall and water and as such the areas south of and immediately north of the Outeniqua Mountains have a high potential – not based on soil properties but rather on water characteristics of the landscape. The climate in this area is conducive to the growing of a range of crops and contributes to the high agricultural potential and intensive agricultural activities.

All the route corridors to the south and immediately within the Outeniqua Mountain area suffer the same limitation in the eastern section in that it **traverses an area of high intensity agriculture**. Regarding agricultural impact, the EIA phase studies have confirmed that all alternatives cross agricultural land with grazing land, central pivot irrigation, fruit trees and/or planted dry lands. A large percentage of agricultural activities can still continue unhindered, but some economic losses could occur. The impacts of power line construction are high and pylon placement will have to be negotiated with landowners on a site-specific basis. In this regard there is no preference for any alignment as the specific alignment to be accepted will depend on the degree and success of negotiation with landowners and users.

Visual Assessment:

Regarding **Visual Impact**, The study area is predominantly rural with an extended farming community, with the exception of the coastal towns in the southern region and George on the eastern perimeter. Numerous tourist attractions are present in the western and central regions in the form of game reserves, offering luxury accommodation, and other outdoor activity areas such as hiking and horse riding. These tourist facilities rely on the scenic quality of the region and game drives are sometimes offered to experience the picturesque outdoors. Overall a medium viewer incidence is expected apart from the areas where major transport routes are crossed or near the coastal towns. Highly sensitive viewers and viewer groups occur all along the proposed routes. Concentrations of highly sensitive viewers and major tourist attractions have been identified at:

- Gondwana-, Hartenbos- and Botlierskop Game Reserve;
- Hartebeeskuil-, Klipheuwel- and Wolwedans Dams;
- Western outskirts of Hartenbos, Monte Christo Estate and Wolwedans; and
- All the tourist attractions and overnight facilities that are within the ZMVE;

It was found that the transmission line will impact on the visual quality of the visual resource by interfering with the prevailing natural semi-natural characters of the study area or interfering with the agricultural land uses. Although all routes have high impacts on both observers and the visual resource. **Alternative 1** is the **most preferred route**. The motivation is that the baseline environment is already impacted by the Proteus – Droërivier 400kV transmission line which lowers the sensitivity of the visual environment to some degree. One can argue that the project is more compatible with the baseline environment along Alternative 1, than the other two alternative routes. It is generally more acceptable to have two power lines of the same design and size, in one corridor and concentrating the impact in that corridor, than to spread the impact over a large area and thereby impacting on other landscapes that are free of transmission lines. Empirical research has indicated that two parallel running power lines are considered below the visual tolerance threshold in most cases, but three or more nears or exceeds the threshold, increasing cumulative impacts to unacceptable

levels. This is especially relevant in landscapes with high scenic value or high tourist potential as can be found in parts of the study area.

In addition, Alternative 1 is the route that impacts on the least number of sensitive landscape features and steers clear of the least number of tourist attractions. Without drastic mitigation measures, the impact on the visual resource and sensitive observers remain high. Alternative 2 is more preferred over Alternative 3. Alternative 3 passes within 1 km of an urban area and the increased viewer incidence makes it less preferable than Alternative 2. Both these alternatives will have significant cumulative impacts due to the existing 2x132kV distribution lines in the same corridor. A significant increase in visual dominance of electrical infrastructure can be expected. Three power lines in one corridor are expected to exceed the visual tolerance threshold. The factor that adds weight to this statement is that each line will consist of a different type of tower that causes major visual incoherence and clutter.

Social Impact Assessment

According to the social impact assessment study that was undertaken, Alternatives 1 and 2 were of concern due to economic loss it will cause from disruption of pivot farming and on the specialised berry farm, losses and disruption in farming, and possible displacement of workers from accommodation. It was found that there was a concentration of pivot irrigation infrastructure in a relatively small proportion of Alternative 1, located south east of Jonkersberg. **If the alignment can avoid this area**, **Alternative 1 is feasible**. As the line can be placed anywhere within a width of 2 km; it is assumed that workers' homes can be avoided. Individual farms with specific needs such as the berry farm will need specific attention so as to avoid significant economic losses. Alternative 2 had a lower concentration of pivot farming and was therefore regarded as more favourable than Alternative 1. Alternative 1, however, has the potential to cause the least visual intrusion (as assessed by the Visual Impact Assessment specialist).Regarding Alternative 3, the negative visual intrusion of towers and lines would be a concern, and the possible negative impact on property values. In this regard, Alternative 2 was therefore considered to be most favourable from a social perspective.

Socio-Economic & Tourism Impact Assessment

The impact of the construction of the transmission lines on the **economy** includes the impact of the construction cost, the operational expenditure and the impact on the broader economy by allowing the power to strengthen the existing grid and limit the impact of power outages in the area. Capital expenditure data could not be obtained to quantify any impacts, but a number of expenditure categories are discussed. A number of components will have to be imported from other provinces into this region, like steel structures, cables, hardware, insulators and cement. This will generate economic activity and employment opportunities in those provinces. A local procurement policy can be considered by Eskom (where possible and if not already standard practice) on activities like site clearance and assembling to maximize the economic and job creation impact on the local municipalities.

From a pure **economic** point of view, with cost savings in mind **Alternative 1 can be recommended** given that this is the option that is shorter with the least number of bends. However, there is only a small marginal difference in cost given only 2km difference. From a **tourism** point of view, **Alternative 4 is recommended** given that this option will have the least amount of negative impact on tourism activities. Alternative 4 also seems to have the relative smallest impact on agricultural activities, although there are still a large number of farmers that will be impacted on. It will be important to work with the farmers to determine the best place for pylons and the lines and with game lodges to minimise the visual impact of these proposed lines and pylons.

Traffic Impact Assessment

According to the traffic specialist findings, construction **traffic** and the post construction traffic would be low without any significant impact on the existing traffic flows on the N2 or provincial roads. It will also have a

negligible impact on the pavement structures. Furthermore, the impact of the traffic on the provincial gravel access roads will also be negligible with respect to service levels. When looking at the impact significance of the various phases, it can be concluded that all impacts will have a “Low” significance. According to the significance rating scale, a low significance can be defined as: “where this (low) impact would not have a direct influence on the decision to develop in the area” From an accessibility and traffic perspective **all alternatives are viable** although a route that is located in closer proximity to the National and larger Provincial roads would be preferable to handle freight vehicles. After construction, the generated site traffic would be limited to maintenance support, with only a few light vehicles accessing the site at regular inspection intervals.

Cumulative Impact Assessment:

Significant cumulative impacts that could result from the proposed line and other power line in the area include:

- Avifauna: Additional power line adds to the already existing power lines in the area and therefore increases the risk of bird collisions and deaths, further fragment natural habitats along the route option
- Vegetation: The loss of unprotected vegetation types on a cumulative basis from the broad area may impact the countries’ ability to meet its conservation targets. The area is not included within a National Protected Areas Expansion Strategy focus area, and falls outside any threatened and or endangered ecosystem type / vegetation type. Although the vegetation types in the study area are classified as Least Threatened, it is poorly protected and certain habitats or communities may be subsequently affected.
- Visual intrusion and change of character of the area;
- destruction of heritage artefacts; and

The proposed line is in general proposed along routes where there are already power lines in place. Provided the new lines are constructed close to these lines such that the associated access roads can be shared, the cumulative impacts are likely to be low. Considering the findings of the specialist assessments undertaken for the project, **cumulative impacts** range from a **low to moderate significance** (on a landscape level in this region of the George and Mossel bay). The use of the EMPr and mitigation measures would assist in mitigating these negative impacts to an acceptable level.

8.2. Comparison Assessment of Alternatives

8.2.1 Environmental considerations:

In terms of the specialist studies undertaken, **Table 12** summarises the conclusions that were made regarding the four alternative powerline routes

Table 12: Comparative Assessment of the alternatives

Specialists	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Comments
Vegetation	X	X	√	√	In terms of the environmental impacts of the powerline alternatives 1 and 2 cut across larger portions of natural vegetation (CBAs & ESAs). It is therefore recommended that Alternative 3 or 4 be considered as the preferred power line routes.
Fauna	X	√	X	X	Alternative 1 is likely to have the greatest overall impact on fauna in the area due to i) the proximity of the route to the Outeniqua Mountains and protected areas, ii) due the number of privately owned game reserves and CBAs which the route will traverse, and iii) the number of pristine perennial rivers and streams along the route. The overall faunal habitat along proposed alternative 1 is in better condition than the other alternatives. Alternative 2 is the preferred alternative from a faunal perspective. Alternative 2 passes through less sensitively defined habitats than alternative 1. An existing powerline traverses certain moderately defined areas along alternative 2 (Botlierskop Game Reserve and Wolwedans Dam) and therefore service road infrastructures are already in place. Alternative 3 is not chosen as the preferred alternative due to the numerous CBAs and pristine wetlands found in the southern section of the route option. Alternative 4 is also not chosen as the preferred route option as it also traverses CBAs and pristine wetlands found in the southern section of the route option, before moving
Avifauna	X	√	X	X	Alternative 1 is likely to have the greatest overall impact on avifauna in the area due to i) the proximity of the route to the Outeniqua Mountains IBA and protected areas, ii) due the number of privately owned game reserves and CBAs which the route will traverse, and iii) the number of pristine perennial rivers and streams along the route. The overall habitat along proposed alternative 1 is in better condition than the other alternatives. Alternative 2 is the preferred alternative from an avifaunal perspective. Alternative 2 passes through less sensitively defined habitats than alternative 1. An existing powerline traverses certain moderately defined areas along alternative 2 (Botlierskop Game Reserve and Wolwedans Dam) and therefore service road infrastructures are already in place.
Freshwater Resources	√	X	X	X	Although the upper reaches of the rivers in the study are in general in a less modified ecological state, the alternative corridor with the least potential impact on the freshwater features in the area is likely to be the northern-most route (Alternative 1) as it would be more likely to be able to span the river valleys with little to no impact on the rivers and associated wetlands at the valley

					bottoms, while the southern corridors (Alternative 2 and Alternative 3) will need to cross the wide floodplains of the rivers.
Heritage and Palaeontology	√	√	X	X	Alternative 1 or 2 are considered acceptable from an archaeological perspective. Alternative 3 and 4 poses problems because of the relative proximity of the line to the coast, and the higher probability of encountering archaeological sites. Alternative 1, closest to the mountain is, is the preferred option because of the lower probability of encountering ruined historical farm buildings. While there is an existing powerline which follows Alternative 2, it is more sensitive from an historical archaeological perspective. However from a cultural landscape perspective, Alternative 1 is acceptable but not preferred.
Soil and agricultural impacts	√	√	√	√	All the corridors to the south and immediately within the Outeniqua Mountain area suffer the same limitation in the eastern section in that it traverses an area of high intensity agriculture. Regarding agricultural impact, the EIA phase studies have confirmed that all alternatives cross agricultural land with grazing land, central pivot irrigation, fruit trees and/or planted dry lands.
Visual	√	X	X	X	Although all routes have high impacts on both observers and the visual resource. Alternative 1 is the most preferred route. The motivation is that the baseline environment is already impacted by the Proteus – Droërivier 400kV transmission line which lowers the sensitivity of the visual environment to some degree. One can argue that the project is more compatible with the baseline environment along Alternative 1, than the other two alternative routes. In addition, Alternative 1 is the route that impacts on the least number of sensitive landscape features and steers clear of the least number of tourist attractions.
Social	√	√	X	X	Alternatives 1 and 2 were of concern to some I & APs because of the economic loss it will cause from disruption of pivot farming and on the specialised berry farm. There was also a possibility that workers' could be physical displaced from their accommodation on two properties on these alignments. On examination of the Google Earth maps, it was found that there was a concentration of pivot irrigation infrastructure in a relatively small proportion of Alternative 1, located south east of Jonkersberg. If the alignment can avoid this area, Alternative 1 is feasible. Alternative 2 had a lower concentration of pivot farming and was therefore regarded as more favourable than Alternative 1. Alternative 1, however, has the potential to cause the least visual intrusion (as assessed by the Visual Impact Assessment specialist).

Socio-Economic & Tourism	√	X	X	√	From a pure economic point of view, with cost savings in mind Alternative 1 can be recommended given that this is the option that with the least number of bends and seems to be the option that will have the least impact on prime agricultural land. Alternative 4 is recommended from a tourism point of view given that this option will have the least amount of negative impact on tourism activities.
Traffic	√	√	√	√	From an accessibility and traffic perspective all alternatives are viable although a route that is located in closer proximity to the National and larger Provincial roads would be preferable to handle freight vehicles

From the comparative assessment table of alternatives above, it is evident that negative impacts occur for all the alternatives that were proposed for the 400kV Transmission Power Line between Narina SS and Gourikwa MTS. It is deduced that types of impacts that should be avoided would be those that cannot be mitigated with good result. Usually this would be the visual impacts and the heritage. Sensitive ecological features such as vegetation and fauna habitats could be avoided during the detail design phase of the project, by careful placing of tower footprints and can be mitigated by following the measures contained in the EMPr and specialist recommendations.

8.2.2 Technical considerations:

Eskom put together a report (**Appendix 6.4**) that gives a **high level comparison** of all the various routes proposed for the proposed new Droerivier – Narina 400 kV and Gourikwa Narina 400 kV lines from a **technical perspective**. (NB: For more detailed study of the routes, conceptual profiles will be performed during the concept design stage of the project). A summary of the findings of this report are presented in **Appendix 6.4,** according to this report, **Alternate 3 is the most preferred** option from a **technical perspective**. Generally speaking, the longer the line the more the towers to be used. This also increases the length of the conductor to be used. There is not much difference in length between route 2, 3 and 4. Assuming that the terrain is fairly similar on both routes, Route 1 will be the least preferred. (Route 1 is 20 % longer than route 2, 3 and route 4) (Approximately 180 towers vs. 155 towers). Number of bends translates to the use of strain towers (e.g. 518D), which can cost up to 7 times the price of a typical 400 kV suspension tower (529A). In this case both routes are fairly even.

8.3. Environmental Costs of the Project versus Benefits of the Project

Environmental (natural environment, economic and social) costs can be expected to arise from the project proceeding. This could include:

- Direct loss of biodiversity, flora, fauna and soils due to the clearing of land for the construction and operation of the proposed line, the cost of loss of biodiversity has been minimised through the careful location of the powerline tower to avoid key areas supporting biodiversity of particularly high conservation importance.
- The project will result in significant losses in aesthetic value that will cause high levels of visual intrusion in some areas
- The study area is characterised by many agricultural activities, change in land-use and loss of high potential agricultural land can be anticipated
- High impacts on both observers and the visual resource

These costs are expected to occur at a local and site level and are considered acceptable so long as the mitigation measures as outlined in the EMPr are adhered to.

Benefits of the project include the following:

- The project is needed to strengthen the existing transmission network so that it can evacuate the additional power generated at the Gourikwa power stations when they come on line.
- This will promote continuous power supply for the Western Cape region, particularly when there is a unit outage at Koeberg Nuclear Power Station.
- The project is poised to bring about important economic benefit at the local and regional scale through job creation, procurement of materials and provision of services and other associated downstream economic development. These will transpire during the preconstruction/ construction and operational phases.
- New business sales that will be stimulated as a result of the establishment of the project, albeit for a temporary period, will be lost. Some of the positive spin off effects that are to ensue from the project expenditure will be localised in the communities located near the site, such as George and Mossel Bay area.
- The local services sector and specifically the trade, transportation, catering and accommodation, renting services, personal services and business services are expected to benefit the most because of project activities during the construction phase.

The benefits of the project are expected to occur at a national, regional and local level. These benefits partially offset the localised environmental costs of the project.

8.4. Conclusion (Impact Statement)

The project is needed to strengthen the existing transmission network so that it can evacuate the additional power generated at the Gourikwa power stations when they come on line. This will promote continuous power supply for the Western Cape region, particularly when there is a unit outage at Koeberg Nuclear Power Station. The positive impacts, however, must not be undone by the negative impacts associated with establishing and operating the transmission line. The project is intended to strengthen the network. The "No-Go" option was again considered in the EIA phase. The no-go option implies the consequences of not construction of the 400KV Transmission Power Line and the implications on sustainable development. The project will enable the transmission of generated electricity to the national grid, which will support the IDPs and SDFs in terms of surety (reliability) of supply. A No GO Alternative would Socio-economic benefits are likely to result from the proposed project and might include job creation, which cannot be achieved with a No Go Alternative. Although the project might have negative impacts on local and regional level, the benefits of the construction of the power line will stretch wider than the borders of the region and will add to the National Electricity infrastructure that will result in an improved assurance of supply.

During the Public Participation Process, resistance has been given to all alternatives. The negative impacts that were identified in the Scoping Phase were therefore investigated by means of more detailed studies during the EIA Phase. During the Public Participation Process, concerns related to bird collisions were prominent, in particular where water bodies are present on the ground. Most power lines that traverse large tracks of rural land will impact to a certain degree on the production potential of the land. However, to evaluate this loss a perspective on the production capability of the specific farm/vegetation area must be done in order to establish magnitude of loss the farmer. For the particular study area of Gourikwa to Blanco, **visual and agricultural impacts were identified by I&APs as a very prominent concern**. The other issue that was raised was that Eskom is a state-owned utility and the first principle should be that the state uses its own properties over which these linear activities can be undertaken. Properties to the North of the approved Blanco Substation is owned by the state and the preferred alternative for the state and Eskom should be to construct the proposed power lines as well as the incidental infrastructure, over the state owned land and not over private property.

It is clear from the specialist studies (**Appendix 4**) undertaken that there are negative impacts for with all four route alternatives, also all alternatives have sections that would make the choice of that route the preferred alternative. However, none of the routes have an entirely acceptable alignment and would entail extreme management and mitigation measures to be taken on a specific section. Alternative 1 was preferred by some specialists due to the location further from large wetlands and further north of the holiday homes that are located around Klein Brak and Hartenbos. Alternative 1 was not recommended by Vegetation study as it cuts across larger areas of natural vegetation than the other options. This report (refer to **Appendix 4.1**) also noted that the majority of these Red Data plant species present area are bulbs, forbs, succulents and creepers. This means that if the power line corridor will be cleared of shrub vegetation, a relatively large portion of Red Data species would not be destroyed. Therefore, as many of the impacts are also subjectively weighted with impacts being visual of nature or perceived to be of a quality of life diminishing nature, consideration must be given to priority of impacts. It will be impossible to continue with any project if every individual's needs are separately considered and the "diminishing background" and cumulative effect is not mentioned.

Based on the above, the types of impacts that should be avoided would be those that cannot be mitigated with good result. For this project, this would be the visual impacts, the heritage and the impacts on the

Freshwater Resources to some extent. Sensitive ecological features such as vegetation and fauna habitats could be avoided during the detail design phase of the project, by careful placing of tower footprints and following the measures contained in the EMPr (to be finalised after EA). **Technically, alternative 3 is preferred** as explained in section 8.2.2, however the study area along Alternative 3 is characterised by many tourism activity, where land owners and their employees are dependent on the income from this industry. For this reason it is believed that the alternative with the least impacts on the majority of the community as well as the alternative with the least impact on the heritage resources would be the **environmentally** best option, in this case Alternative 1 is therefore the best option. Technical challenges (e.g. mountains) can be overcome in the detail design phase and careful placement of tower structures. Environmentally, those impacts that are unavoidable could still be minimised by environmental management and mitigation during all phases of the project. Environmental constraints can be overcome by the implementation of mitigation measures that can minimise the negative impacts of Alternative 1 as recommended by the specialists in the examples below:

- **Vegetation**: There should be a preconstruction walk-through of the development footprint/project site in order to assess the pylon footprint areas for Red Data species as well as sensitive ecosystems such as streams, wetlands, etc.. In addition, a search and rescue operation should be done to remove plant species which can be successfully transplanted
- **Fauna**: Manipulate the power line alignment to avoid rocky outcrops and steep mountainous areas to mitigate against impacting on reptiles and reptiles of SCC (please refer to section 8.5 for further site specific mitigations meatures to reduce the impacts).
- **Avifauna**: Should alternative 1 be chosen, it is recommended that bird diverters are installed on all powerline infrastructures between Gondwana Private Game Reserve as it is anticipated that numerous bird SCC will utilise these areas for hunting/foraging.(please refer to **section 8.5** for further site specific mitigations measures to reduce the impacts)
- **Social**: Concentration of pivot irrigation infrastructure are located south east of Jonkersberg along Alternative 1, if the alignment can avoid this area, Alternative 1 is feasible. As the line can be placed anywhere within a width of 2 km; it is assumed that workers' homes can be avoided. Individual farms with specific needs such as the berry farm will need specific attention so as to avoid significant economic losses.
- **Landowners**: careful planning and negotiations with land owners will be of crucial importance before finalising the exact placement of the pylons and 55m servitude within the 2 km corridor that was evaluated for this alternative This will minimise the direct (mostly visual) impacts by investigating slight deviations in the route (within the approved corridor) as well as either avoiding impacts on production land or only causing temporary disturbance (during construction). An impact that should be limited is the necessity of creating new access routes (limiting additional bush cutting and clearance of potentially sensitive vegetation). By avoiding the identified sensitive areas, the future maintenance on the chosen route will be easier and create fewer impacts of significance, particularly on those features that have been identified during the Public Participation Process.

This Final EIA Report has been prepared to allow public review and so that comments (and responses thereon) can be included in the Final EIAR, to subsequently allow for informed decision making by the authorities regarding the approval or rejection of the project. It is the opinion **EAP that the project should be authorised**. The findings of the specialist studies undertaken within this EIA to assess both the benefits and potential negative impacts anticipated as a result of the proposed project conclude that there are **no environmental fatal flaws** that should prevent the proposed project from proceeding, provided that the recommended mitigation and management measures are implemented. The significance levels of the majority of identified negative impacts have been reduced by implementing the mitigation measures recommended by the specialist team during the EIA process, and this specifically included the consideration of the facility layout in relation to sensitivities identified. The project has considered constraints, and is considered to meet the requirements of sustainable development. Environmental specifications for the

management of potential impacts are detailed within the draft Environmental Management Programme (EMPr) for the Gourikwa-Blanco 400kV powerline included within **Appendix 7.**

Thus, after assessing all alternatives on EIA phase level, it was concluded that **Alternative 1** would be the option where the "mitigation hierarchy" have be applied through better avoidance and minimisation of major impacts has been achieved and is therefore recommended as the **preferred alternative**.

8.5. Recommendations

The EAP **recommends that the Alternative 1** be considered for EA. Should the project be approved, an important component of the project would be to fine-tune the 55m servitude design (placement of the footprints) in terms of the receiving environment in the approved corridor of 2km wide. This would require a walk-down of the line and subsequent negotiations with all land owners to ascertain how the impacts on their properties can be mitigated, e.g through relocation of infrastructure, compensation or other acceptable measures. Construction will not be possible before agreements have been reached with all land owners along the entire route.

The following conditions would be required to be included within an authorisation issued for the project:

- All mitigation measures detailed within this report and the specialist reports contained within **Appendix 4** to be implemented.
- The draft Environmental Management Programme (EMPr) as contained within **Appendix 7** of this report should form part of the contract with the Contractors appointed to construct and maintain the proposed powerline and substation upgrades and will be used to ensure compliance with environmental specifications and management measures. The implementation of this EMPr for all life cycle phases of the proposed project is considered key in achieving the appropriate environmental management standards as detailed for this project.
- The placement of power line pylon on high intensity agriculture will have to be negotiated with landowners on a site-specific basis.
- Eskom must measure the EMFs where stakeholders have requested it, particularly to address concerns about cumulative impacts of EMFs and impacts on vulnerable populations such as children.
- The relevant Water Use License for water uses to be obtained from DWS.
- Applications for all other relevant and required permits required to be obtained by Eskom must be submitted to the relevant regulating authorities. This includes permits for the transporting of all components (abnormal loads) to site, disturbance to any heritage sites, and disturbance of protected vegetation.
- **Vegetation**: A preconstruction walk-through by an ecologist of the development footprint/project site in order to assess the pylon footprint areas for Red Data species as well as sensitive ecosystems such as streams, wetlands, etc. Where these cannot be totally avoided, a permit to be obtained for removal of protected trees (DAFF) and provincially protected flora that are affected.
- **Fauna**: Where possible access/service roads and pylon bases should be planned and constructed to avoid being located in areas defined as highly sensitive or areas which have been described as valuable habitats for protected faunal species. Where access roads and/or pylon bases do need to be located within any of the defined sensitive areas then ground-truthing to determine exact road routes and pylon base locations should be carried out. It must be noted that the **Brandwagrivier Wetland System** and the intact vegetation surrounding **Wolwedans dam** must be treated as "**No-go**" areas for roads or pylon hardstands and access/services roads.dam must be treated as "No-go" areas for roads or pylon hardstands and access/services roads.
- **Avifauna**: Where access roads and/or pylon bases do need to be located within any of the identified sensitive areas then there should be further ground-truthing by an avifaunal specialist to determine exact

road routes and pylon base locations so to, where possible, avoid site specific sensitive areas such as nests and roosts. **All bird nest/roost** sites encountered should be considered "**No-Go" areas** for any pylon hardstands or the construction of access roads. The power line should be constructed in close proximity to the existing power line as many birds will be aware of the existing infrastructure which may reduce collisions in low visibility conditions. All areas defined as having a medium avifaunal sensitivity must have bird diverters installed (spacing to be determined following ground-truthing). These areas include suitable habitat for numerous powerline priority species (e.g. cranes, bustards, and storks).

- **Freshwater Resources:** It is recommended that a **buffer of 50m from the top of the river banks and/or approximately 100m from the edge of the wetland areas** be allowed for as a development setback for the construction of the pylons.
- **Heritage**: A **walk-down** of the line will be required historical **archaeological material** after the final powerline route has been decided. It would concentrate on areas immediately around farm buildings and structures to ensure that a sufficient buffer has been implemented to avoid impacts to historic kraals, rock arts, old sheds, rubbish dumps and graves.
- **Agriculture:** The placement of power line pylon on high intensity agriculture will have to be negotiated with landowners on a site-specific basis.

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