environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

	(For official use only)
File Reference Number:	
Application Number:	
Date Received:	

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

Kindly note that:

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

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

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section? YES NO

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

1. PROJECT DESCRIPTION

a) Describe the project associated with the listed activities applied for

Project Background:

BioTherm Energy (Pty) Ltd (BioTherm) is the proponent and applicant for the Environmental Authorisation (EA) for the transmission lines associated with proposed Esizayo Wind Energy Facility (WEF). BioTherm is a leading renewable energy project development and financing company that owns, develops, constructs and operates solar and wind projects in South Africa and Sub-Saharan Africa.

BioTherm has proposed the development of three Wind Energy Facilities within the Western Cape and a portion of the Northern Cape, namely Maralla East, Maralla West and Esizayo Wind Energy projects. The wind energy developments will consist of 3 x 140 MW facilities. A Scoping and EIA process is currently being undertaken for the proposed Maralla East, Maralla West and Esizayo WEF (DEA reference numbers: 14/12/16/3/3/2/962, 14/12/16/3/3/2/963 and 14/12/16/3/3/2/967 respectively). It is important to note that this report is for the Transmission lines associated with the proposed Esizayo WEF only. The Transmission lines for the Maralla projects are being undertaken as a separate Basic Assessment process.

It must be stressed that the fact that there are several approved EAs surrounding the site however, these EAs do not equate to actual 'development'. The surrounding projects, except for the Preferred Bidders, are still subject to the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) bidding process like the Esizayo project. Depending on the next bid window Esizayo due to its competitive nature may actually be selected as the next Preferred Bidder and commence with construction prior to other facilities with existing EA approvals. Some of the other proposed Wind Energy facilities received their EA several years ago, but have not yet secured Preferred Bidder status. Refer to Appendix A3 for a map showing the surrounding Environmental Authorisations (EA) within the area surrounding the proposed project.

Site Location:

The proposed Esizayo WEF is to be developed approximately 30km Northeast of Laingsburg in the Western Cape and will comprise of a single site located on farms:

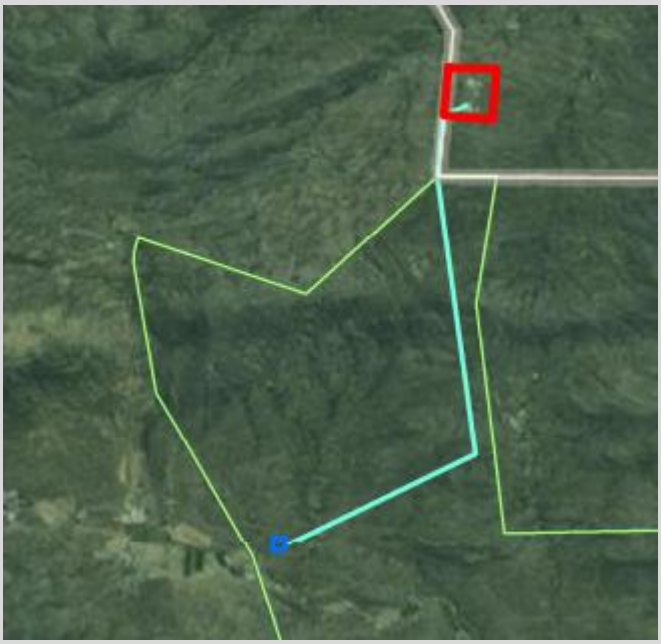
Farm Name & Number	21 Digit SG Code	Province	Farm size (Ha)
Portion 1 of Aanstoot Farm No. 72	C04300000000007200001	Western Cape	762.42
Annex Joseph's Kraal Farm No.84	C04300000000008400000	Western Cape	913.32
Aurora Farm No. 285	C04300000000028500000	Western Cape	4385.29

The Esizayo WEF will be designed to produce 140 MW with 56 turbines onsite.

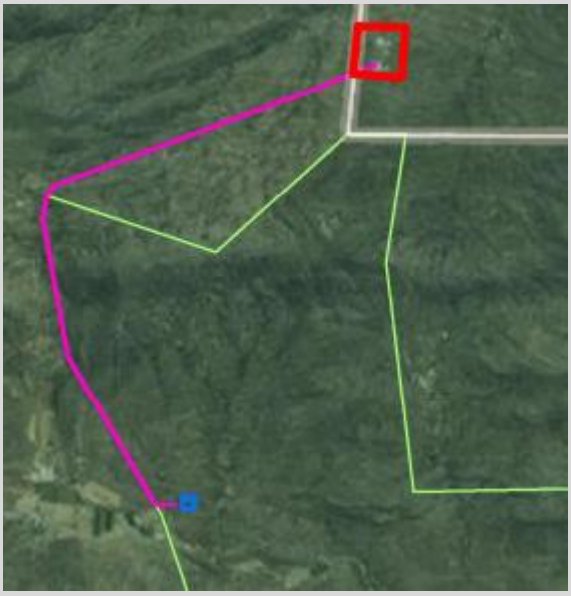
Project Description:

The proposed transmission integration project entails the construction of a 132 kV transmission line from the common substation at the proposed Esizayo WEF to connect to the existing Komsberg substation. The preferred transmission line route will then run adjacent to an existing road (R354) before running in a north-easterly direction to the existing Komsberg MTS Substation located approximately 2 km north of the facility. Two sites for the onsite substation and four transmission line routes have been assessed as part of this application. The alternatives assessed are:

Alternative 1: Substation 1 and powerline route option 1 to Komsberg Substation (Red block)

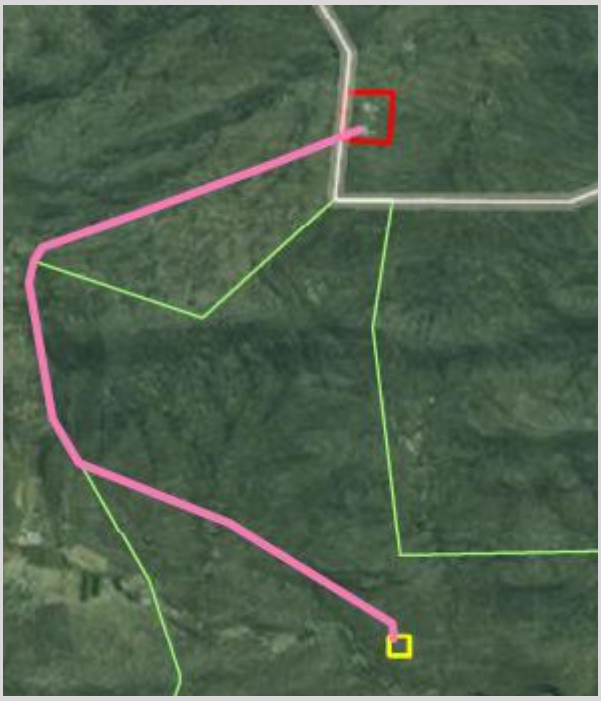


Alternative 2 (preferred Alternative): Substation 1 and powerline route option 2 to Komsberg Substation (Red Block)



Alternative 3: Substation 2 and powerline route option 3 to Komsberg Substation (Red block)

Alternative 4: Substation 2 and powerline route option 4 to Komsberg Substation (Red block)



These options are described in more detail in Section 2.

The proposed project will include the investigations and application for the extension of the existing Komsberg substation to allow for the proposed 132 kV line.

The full scope of works includes:

- Construction of a 132 kV transmission line (single or double circuit) between the Esizayo WEF and the Komsberg substation.
- Establishment of the common substation at the wind energy development which includes but not limited to
  - A high voltage substation yard to allow for multiple 132 kV feeder bays and transformers.
  - The control building, telecommunication infrastructure, oil dams(s) etc.
  - All the access road infrasturcture to and within the substation.
- Expansion of the Komsberg substation will be required to accommodate the proposed feed.

Construction of the 132 kV Single or Double Circuit overhead transmission line:

A brief overview of the physical/ technical requirements of the project are as follows:

- 132 kV single or double circuit transmission line between Esizayo WEF and the Komsberg substation.
- Straight line distance between the WEF and the Komsberg substation is approximately 2km.
- Servitude width for the 132 kV transmission line (single and double circuit) is between 36 and 40m.
- Height of the 132 kV transmission line is approximately 14m.
- Minimum conductor clearance is between 7 and 10m.
- Span length between structures is between 200 and 375m.

The design of the 132 kV structure is unknown at present as the choice is dependent on the conditions of the exact position of the transmission structures on the chosen line route. A description of the various structure alternatives has been included in Section 2. The actual number of structures required will vary according to the final route alignment determined.

A working area approximately 100m x 100m is needed for each of the proposed structures to be constructed.

Clearance requirements for transmission lines

For safety reasons, the transmission lines require certain minimum clearance distances. These are as follows:

- The minimum vertical clearance distance between the ground and the transmission line is 6.7m.
- The minimum vertical clearance to any fixed structure that does not form part of the transmission line is 3.8 - 11m.
- The minimum distance between a 132 kV transmission line and an existing road is 60m-120m (depending on the type of road).
- Any farming activity can be practiced under the conductors provided that safe working clearance and buildings restrictions are adhered to.
- Minimum servitude to other parallel lines.

Proposed Associated Infrastructure:

The proposed transmission integration project will require the following with respect to the permanent infrastructure;

- Where the transmission line crosses a fence between the neighbouring landowners and there

is no suitable gate will be erected in consultation with the landowner. These gates are necessary in order to ensure access to the line for maintenance and repair purposes.

- § Existing road infrastructure will be used as far as possible to provide access for construction vehicles during the construction of the line. Thereafter, the roads are used for inspection and maintenance purposes. Where appropriate roads may be upgraded to access transmission lines and substations.
- § Komsberg substation extension.
- § Fibre Optic cable could be strung on the earth cable if required for telecommunication.

Proposed Project Development Activities:
The typical steps involved in the construction and operation of a transmission line is summarised below:

Step 1: Surveying of the development area and negotiation with affected landowners;
Step 2: final design and micro-siting of the infrastructure based on geotechnical, topographical conditions and potential environmental sensitivities;
Step 3: Vegetation clearing and construction of access roads/tracks (where required);
Step 4: Construction of tower structure foundations;
Step 5: assembly and erection of infrastructure on site;
Step 6: Stringing of conductors;
Step 7: Rehabilitation of disturbed areas and protection of erosion sensitive areas; and
Step 8: Continued maintenance.

The Basic Assessment process has concluded that Alternative 2 is the option that presents the least negative impacts that can be suitably mitigated. The most significant negative impacts associated with this project is the impact on avifauna, natural vegetation and animal life and cultural and heritage aspects. The powerline route option associated with Alternative 2 runs along the existing R354 and parallel to existing Eskom transmission lines, which has existing service roads. The road and powerlines already constitute utility corridors and by placing it along these linear features reduces the impact on vegetation and also reduces the risk of avifaunal species colliding with the powerlines.

Whilst undertaking the Heritage Impact Assessment, 20th century colonel ruins were found on the proposed substation 1 site. In order to ensure that these ruins are not destroyed as a result of construction, the substation will be slightly shifted and a 20m buffer implemented around the ruins and deemed a no-go area.

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

Listed activity as described in GN 327 and 324	Description of project activity
GNR 327 Activity 11(i): *The development of facilities or infrastructure for the transmission and distribution of electricity-* *(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.*	The 132 kV transmission lines will connect the Esizayo WEF to the national grid. The WEF and the transmission lines are outside of the urban edge. This activity is therefore triggered by the proposed construction of the transmission infrastructure.

GNR 983 Activity 12 (ii) (a&c): *The development of-* *(ii) infrastructure or structures with a physical footprint of 100 square metres or more;* *where such development occurs-* *(a) within a watercourse;* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; -*	The powerlines will require the erection of tower structures, which may require a construction area of approximately 100m^2. There is the potential that a tower structure or access road will transverse a watercourse (or drainage line). This activity will potentially be triggered by the proposed construction of the transmission infrastructure.
GNR 327 Activity (19) *The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.*	The powerlines will require the erection of tower structures and access roads. There is the potential that a tower structure or access road will transverse a watercourse (or drainage line) which will require excavation of removal of soil or sand from the watercourse. This activity will potentially be triggered by the proposed construction of the transmission infrastructure.
GNR 327 Activity 27 *The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-* *(i) the undertaking of a linear activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan.*	The powerlines are considered a linear activity and therefore this activity is not triggered by the proposed construction of the transmission lines. However, the construction of the common 132 kV on-site substation will require the clearance of indigenous vegetation of more than 1ha but less than 20 ha.
GNR 327 Activity 30 *Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).*	The transmission line route traverses a Critical Biodiversity Area and falls within a National Protected Areas Expansion Strategy (NPAES) Focus Area. This activity is therefore triggered by the proposed construction of the transmission infrastructure.
GNR 324 Activity 4 *The development of a road wider than 4 metres with a reserve less than 13,5 metres.* *i. Western Cape-* *ii. areas outside urban areas* *(aa) Areas containing indigenous vegetation*	The transmission line route traverses areas which contain natural vegetation. However, the transmission line may require an access road (of approximately 4 m in width) although it will likely be a two-track road. This activity is potentially triggered by the proposed construction of the transmission infrastructure.
GNR 324 Activity 12 *The clearance of 300 square meters or more of*	The transmission line route traverses a Critical Biodiversity Area and falls within an NPAES Focus Area. The construction of the common 132

indigenous vegetation except where such clearances of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. *i. Western Cape -* *ii. Within critical biodiversity areas identified in bioregional plans*	kV on-site substation will require the clearance of more than 300 m^2 of indigenous vegetation. This activity is therefore triggered by the proposed construction of the transmission infrastructure.
GNR 324 Activity 14 *The development of-* *(ii) infrastructure or structures with a physical footprint of 10 square metres or more;* *where such development occurs-* *(a) within a watercourse;* *(b) if no development setback has been adapted, within 32 metres of a watercourse, measured from the edge of a watercourse.* *i. Western Cape* *(i) Outside urban areas:* *(bb) National Protected Area Expansion Strategy Focus Areas* *(ff) Critical Biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;*	The transmission line route traverses a Critical Biodiversity Area and the area is identified as a NPAES focus area. The powerlines will require the erection of tower structures, which may require a construction area of approximately 100m^2. There is the potential that a tower structure or access road will transverse a watercourse (or drainage line). This activity is therefore triggered by the proposed construction of the transmission infrastructure

2. FEASIBLE AND REASONABLE ALTERNATIVES

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

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

Describe alternatives that are considered in this application as required by Appendix 1 (3)(h), Regulation 2014. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific

instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

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

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

a) Site alternatives

Alternative 1		
Description	Lat (DDMMSS)	Long (DDMMSS)
The on-site Substation Option 1 is located on Farm 285 Aurora (32°59'5.79"S; 20°34'4.24"E). The power lines will start at the on-site Substation and run in a north easterly direction for approximately 2.7 km before running north for approximately 4.3 km to the Komsberg Substation located north of the site. The route will cross a number of hills between the on-site Substation and the Komsberg Substation. Refer to Appendix A4 for a layout map.	32°59'5.79"S	20°34'4.24"E
Alternative 2 (Preferred Alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
On-site Substation Option 1 (32°59'5.79"S; 20°34'4.24"E) will be located on Farm 285 Aurora Farm. The transmission line will run in a north easterly direction, adjacent to the R354, for approximately 4.5 km before running north for approximately 4.3 km to the Komsberg Substation. This route is deemed the most viable option as a portion of the route will run along the R354, which, from an ecological point of view is deemed less sensitive. Refer to Appendix A5 for a layout map.	32°59'5.79"S	20°34'4.24"E
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)
The transmission lines will start at the on-site Substation Option 2 on Farm 285 Aurora (32°59'39.07"S; 20°35'54.90"E) where they will run in a northerly direction for approximately 6.1 km before turning and running in an easterly direction for 0.4km to the Komberg Substation. Although this route appears shorter, the route will cross a number of hills between the on-site Substation and the Komsberg Substation. Refer to Appendix A6	32°59'39.07"S	20°35'54.90"E

for a layout map.		
Alternative 4		
Description	Lat (DDMMSS)	Long (DDMMSS)
The power lines will start at the on-site Substation Option 2 on Farm 285 Aurora (32°59'39.07"S; 20°35'54.90"E) where they will run in a northerly westerly direction for approximately 4.4km before turning and running in a northerly direction for 3km and finally running in a north easterly direction for approximately 4.3km to the Komberg substation. Refer to Appendix A7 for a layout map.	32°59'39.07"S	20°35'54.90"E

In the case of linear activities:

Alternative:	Latitude (S):	Longitude (E):
Alternative S1 (preferred): Route Option 1		
· Starting point of the activity	32°59'5.79"S	20°34'4.24"E
· Middle/Additional point of the activity	32°58'28.77"S	20°35'41.39"E
· End point of the activity	32°56'4.24"S	20°35'39.86"E
Alternative S2 (if any)		
· Starting point of the activity	32°59'5.79"S	20°34'4.24"E
· Middle/Additional point of the activity	32°57'1.02"S	20°32'59.11"E
· End point of the activity	32°56'4.24"S	20°35'39.86"E
Alternative S3 (if any)		
· Starting point of the activity	32°59'39.07"S	20°35'54.90"E
· Middle/Additional point of the activity	32°58'17.08"S	20°35'40.46"E
· End point of the activity	32°56'4.24"S	20°35'39.86"E
Alternative S4 (if any)		
· Starting point of the activity	32°59'39.07"S	20°35'54.90"E
· Middle/Additional point of the activity	32°58'6.37"S	20°33'8.26"E
· End point of the activity	32°56'4.24"S	20°35'39.86"E

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

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

b) Lay-out alternatives

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
Option 1 for the proposed on-site Substation is located approximately 300m from the R354 on the eastern boundary of the site. There are no sensitive features within the footprint area, but it is fairly close to a number of drainage lines. These are however more than 200m from the footprint and should not be impacted by the development. This is considered to be a favourable location for the substation due to the low abundance of species of conservation concern in this area and	32°59'5.79"S	20°34'4.24"E

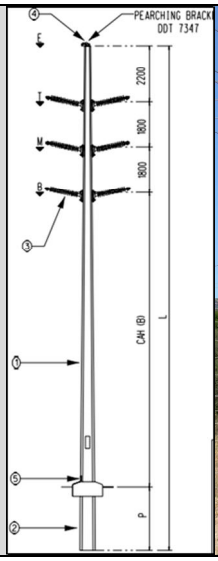
also because of its' proximity to the R354 which would lower the overall extent of disturbance and habitat loss resulting from the development.		
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
Option 2 for the proposed on-site Substation is located approximately 3km south west of preferred option and is therefore more centrally located. Although the vicinity of the Roggeveld River is considered sensitive and best avoided, the substation is more than 200m away from the river, which would reduce the potential for any direct impacts. The site itself is very homogenous and there are no significant features in the immediate vicinity of the substation location that might be affected by the development. Due to the lack of other disturbance in the area, it is not considered as favourable as Option 1 for the development. The abundance of species and features of concern within the footprint is however low and as a result, it still considered a potentially viable location for the substation.	32°59'38.53"S	20°35'56.05"E
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)
N/A		

c) Technology alternatives

Alternative 1 (preferred alternative)
N/A
Alternative 2
Alternative 3

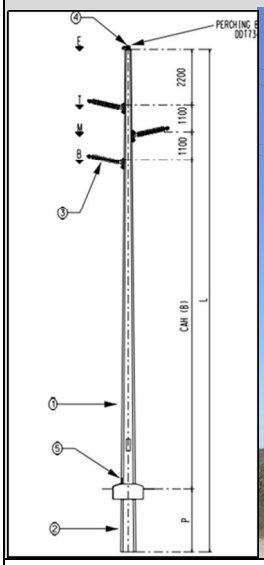
d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)

Alternative 1 (preferred alternative)
Monopole Double Circuit Structure:



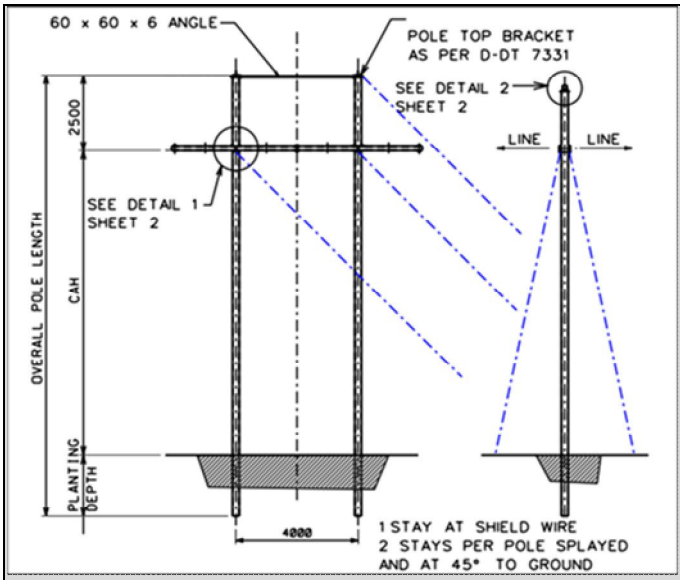
Alternative 2

Monopole Single Circuit Structures:



Alternative 3

H-Pole Structure



e) No-go alternative

The 'do-nothing' alternative is the option of not implementing the proposed project.

It is noted that the scope of this application includes the establishment of a 132 kV transmission line and associated substation for the integration of the power generated at the proposed Esizayo WEF to the National Grid. The proposed transmission line and onsite substation is essential supporting infrastructure to the solar energy development, which, once developed, will generate power from renewable energy resources.

In 2010 South Africa had 44,157MW of power generation capacity installed. Current forecasts indicate that by 2025 the expected growth in demand will require the current installed power generation capacity to be almost doubled to approximately 74,000MW (SAWEA: 2010).

This growing demand, fuelled by increasing economic growth and social development within Southern Africa, is placing increasing pressure on South Africa's existing power generation capacity. Coupled with this, is the growing awareness of environmental impact, climate change and the need for sustainable development. Despite the worldwide concern regarding GHG emissions and climate change, South Africa continues to rely heavily on coal as its primary source of energy.

The use of renewable energy technologies, as one of a mix of technologies needed to meet future energy consumption requirements is being investigated as part of Eskom's long-term strategic planning and research process. It must be remembered that solar energy is plentiful, renewable, widely distributed, clean and reduces greenhouse gas emissions when it displaces fossil-fuel derived from electricity. In this light, renewable solar energy can be seen as desirable.

The South African Government, through the promulgation of the IRP 2010, and incorporated into the REIPPPP implemented by the DoE, has committed to a target of 17.8 GW of renewables by 2030. This means that by 2030 approximately 42% of all new power generation will be derived from renewable energy forms. Currently South Africa is heavily dependent on coal as its primary source of energy. In addition, it contributes towards socio-economic and environmentally sustainable growth, while stimulating the renewable industry in South Africa.

The REIPPPP has contributed to stimulating local manufacturing and job creation and has led to significant investments in social development in the communities surrounding renewable energy projects.

Without the implementation of this project, the development of the Esizayo WEF the project cannot be moved forward into the REIPPP bidding rounds to be considered for preferred bidder status, as power integration is an essential part of the public.

The no-go option is a feasible option; however, this would prevent BioTherm from contributing to the significant environmental, social and economic benefits associated with the development of the renewables sector. Accordingly, the no-go option is not the preferred option.

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

3. PHYSICAL SIZE OF THE ACTIVITY

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

Substation Alternative:		Size of the activity:
Alternative A1[1] (preferred activity alternative)	150m x 150m =	22 500m^2
Alternative A2 (if any)	150m x 150m=	22 500m^2
Alternative A3 (if any)		m^2
Alternative A4 (if any)		m^2

or, for linear activities:

Route Alternative:	Length of the activity:
Alternative A1	7000m
Alternative A2 (Preferred Alternative)	8800m
Alternative A3 (if any)	6500m
Alternative A4 (if any)	11700m

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

Alternative:		Size of the site/servitude:
Alternative A1	Length x 40m =	385 000m^2
Alternative A2 (preferred activity alternative)	Length x 40m =	484 000m^2
Alternative A3 (if any)	Length x 40m=	357 000m^2
Alternative A4 (if any)	Length x 40m=	643 500m^2

4. SITE ACCESS

Does ready access to the site exist?	YES	NO

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

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

Describe the type of access road planned:

N/A- The Esizayo site and surrounding areas are already easily accessible. The preferred powerline route is accessible via the service roads associated with the existing Eskom powerlines. In addition, the preferred powerline route option is accessible from the R354 for maintenance. It is therefore not anticipated that additional service routes will be required.

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

5. LOCALITY MAP

An A3 locality map must be attached to the back of this document, as Appendix A1 and Appendix A2. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.). The map must indicate the following:

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

6. LAYOUT/ROUTE PLAN

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

The site or route plans must indicate the following:

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

7. SENSITIVITY MAP

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

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

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

8. SITE PHOTOGRAPHS

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

9. FACILITY ILLUSTRATION

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

10. ACTIVITY MOTIVATION

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

1. Is the activity permitted in terms of the property's existing land use rights?	YES	NO	Please explain
The land on which the transmission lines will be constructed is located between the Esizayo WEF and the existing Komsberg substation. The land is all privately owned agricultural land, which is zoned for agriculture. It is not necessary for the each of the properties to be rezoned as the land will continue to be used for agriculture.			

2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES	NO	Please explain

The Western Cape Provincial Spatial Development Framework (PSDF) is a long-term spatial framework from which various plans will be implemented. It is informed by the National Development Plan (NDP) and related spatial policies, and takes its strategic direction from the Western Cape's development strategy and related policy frameworks. The national and provincial policy informants to the PSDF are:

- The National Development Plan (2012)
- ONECAPE 2040
- Western Cape Infrastructure Framework (2013)
- Western Cape Provincial Land Transport Framework (2013)
- Western Cape Green Economy Strategic Framework (2013)

In taking these agendas forward, the PSDF applies the following spatial Principals:

- Spatial Justice
- Sustainability and Resilience
- Spatial Efficiency
- Accessibility
- Quality and Liveability

The PSDF outlines in Policy R4- Recycle and recover waste, deliver clean resources of energy to urban consumers, shift from private to public transport, and adapt to and mitigate against climate change;

- Pursue energy diversification and energy efficiency in order for the Western Cape to transition to a low carbon, sustainable energy future, and delink economic growth from energy use.
- Support emergent Independent Power Producers (IPPs) and sustainable energy producers (wind, solar, biomass and waste conservation initiatives) in sustainable rural locations (as per recommendations of the strategic Environmental Assessment for wind energy.

The proposed project will facilitate the connection of the proposed Esizayo WEF to the electricity grid, which will contribute to the spatial objectives.

(b) Urban edge / Edge of Built environment for the area	YES	NO	Please explain

The proposed project falls outside of the urban edge.

(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	YES	NO	Please explain

<u>Central Karoo District Municipality 3rd Generation Integrated Development Plan:</u>

The Central Karoo District Municipality 3rd Generation Integrated Development Plan (IDP) 2012-2017 aims to create a platform to inform decision making; create an environment for robust economic development; building social cohesion and further ensuring that the Central Karoo's vision of working together in development and growth is realised. The IDP highlights the following strategic objectives:

1. To improve and maintain our roads and promote effective and save transport for all;

2. To deliver sound administrative and financial services, to ensure good governance and viability;
3. To effectively plan to minimise the impact of disasters on the community, visitors, infrastructure and environment;
4. To promote a safe, healthy environment and social viability of residents through the delivery of a responsible environmental health service;
5. To establish an inclusive tourism industry through sustainable development and marketing which is public sector led, private sector driven and community based;
6. To ensure a united integrated development path in a safe and sustainable environment;
7. To pursue economic growth opportunities that will create descent work; and
8. To facilitate effective stakeholder participation.

In terms of Strategic Objective 6 '*to ensure a united integrated development path in a safe and sustainable environment*' the priority has been placed on green energy. The proposal to construct wind energy facilities is in line with the Municipalities goal to achieve the required outcome of enhanced service delivery, decrease in crime statistics and increase in job opportunities.

The Central Karoo Growth and Development Strategy (GDS) 2007-2022 was conducted in 2007 after the Summit on the 9th March 2007. It reflected sixteen major catalytic projects as the outcomes for economic growth in the region. These have been mapped spatially in order to align with the SDF Review and include wind generation farms.

Laingsburg Local Municipality Integrated Development Plan:

The Laingsburg Integrated Development Plan (IDP) provides policies and guidelines to assist in the Municipalities vision to "*improve as a desirable place, invest and visit based on its potential as the Oasis Gateway to the Great Karoo, Moordenaars Karoo and Klein Swartberg, so that all of its residents may enjoy a sustainable way of life*" (IDP 2014/15). The goals of the Municipality include:

- To improve the quality and knowledge of the tourism attractions in the municipality;
- To integrate the municipality's settlements through appropriate rural and urban development;
- To conserve and extend the municipality's agricultural resources and promote wider access to them;
- To strengthen Laingsburg Town's role as a transport support, refreshment and emergency service centre straddling on the National Capet Town transport corridor;
- To deliver sustainable affordable services;
- Create an environment conducive to economic growth; and
- To illuminate social illness in the municipal area.

The main focus of the IDP is on job creation and economic development. The construction and operation of the wind energy facility within this region aids in job creation and the promotion of the local economy.

The transmission integration is an essential part of the project and without it the Esizayo WEF will not

be deemed a viable or feasible development.			
(d) Approved Structure Plan of the Municipality	YES	NO	Please explain
The municipality is aware of the proposed Esizayo WEF. The proposed project supports this WEF development and does not compromise the structure plan for the municipality.			
(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	YES	NO	Please explain
The approval of this application will not compromise the Central Karoo District Municipality Environmental Management Framework. The proposed project will support the Esizayo WEF and will directly contribute to clean energy generation as a sustainable resource and holds significant benefits for the local region and the country as a whole. Renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute to a long-term sustainable energy future. The project aims at achieving the set goals for the Plan through addressing all possible environmental issues associated with the development and addressing measures to mitigate environmental issues.			
(f) Any other Plans (e.g. Guide Plan)	YES	NO	Please explain
N/A			
3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	YES	NO	Please explain
The main purpose of this project is to enable the connection of the proposed Esizayo WEF to the National Eskom Grid. This project will support the objectives related to socio-economic development contemplated within the timelines of the Municipality's IDP. In addition, the DEA, in consultation with DoE, has been mandated to undertake a Strategic Environmental Assessment (SEA), to identify geographical areas most suitable for the rollout of wind and solar PV energy projects and the supporting electricity grid network. These concentrated development zones are referred to as REDZs. The area in which the Esizayo WEF is to be located is within the Komsberg Wind REDZ, within the Laingsberg area of the Western Cape.			

4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	YES	NO	Please explain

This report forms part of the proposed Esizayo WEF, which, if Environmental Authorisation is successfully issued, will be submitted as part of the REIPPPP future bidding windows. The transmission lines are essential infrastructure associated with the Esizayo WEF.

The proposed site falls within the Laingsburg Municipality, which is located within the Central Karoo District Municipality. According to the REIPPPP Focus on Western Cape, Provincial Report 2016, the Western Cape has a lower unemployment rate relative to the overall official unemployment rate of South Africa. However, the provincial unemployment rate has been steadily rising each year from the 18.8% y/y recorded in 2007. Nonetheless, approximately 4 out of 5 people in the province's economically active population are employed. The Western Cape has attracted 10% of the IPPPP projects to date. The electrical energy that will become available from the investments in Bidding Window 1, 2, 3, 3.5, 4 and 1S2 will equate to roughly 7.8% of the Western Cape's own energy needs. The Western Cape has attracted 14% of the total wind capacity procured in BW1 to BW4 and 1S2 under the REIPPPP in South Africa, contributing 467 MW of the national total 3 366 MW wind power. Of the 14 renewable energy IPPs in the province, wind has the dominant share with 8 IPPs or 77% of total provincial capacity.

The Laingsburg Local Municipality has a total population of 8 889 people, with an unemployment rate of 17.9 %. Currently there are no REIPPPP projects under construction or operational within the area and therefore no data is available. However, based on the data received on the Northern Cape the positive socio-economic impacts on the local community are anticipated to assist in economic growth within the Municipality and the province as a whole.

A percentage of revenue generated will also be spent on Economic upliftment and development in the local communities.

5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	YES	NO	Please explain

All the services needed for the project have been adequately provided for and should any additional services arise the relevant authority will be communicated with.

It is anticipated that only minimal amounts of solid waste will be disposed of during both the construction and operational phase. Solid waste generated through the construction and operational phase maybe disposed of at a municipal solid waste facility, if necessary.

No additional municipal services (i.e. water, sewage, electricity) are expected to be required for the proposed development, as the construction contractor will be responsible for providing the necessary services to the site.

6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	YES	NO	Please explain
The proposed project is the construction of a 132 kV transmission line. It will not require any capacity for services such as water and sanitation from relevant municipalities.			
7. Is this project part of a national programme to address an issue of national concern or importance?	YES	NO	Please explain

In 2010 South Africa had 44,157MW of power generation capacity installed. Current forecasts indicate that by 2025, the expected growth in demand will require the current installed power generation capacity to be almost doubled to approximately 74,000MW (SAWEA: 2010).

This growing demand, fuelled by increasing economic growth and social development within Southern Africa, is placing increasing pressure on South Africa's existing power generation capacity. Coupled with this, is the growing awareness of environmental impact, climate change and the need for sustainable development. Despite the worldwide concern regarding GHG emissions and climate change, South Africa continues to rely heavily on coal as its primary source of energy. Issues associated with the dependence on coal include:

- The fact that the resource is non-renewable;
- Consumption of coal for use in power generation reduces the availability of coal for other uses; and
- Burning of coal is one of the major producers of carbon dioxide (CO_2), which is commonly accepted as a contributor to climate change, deterioration in urban and rural air pollution and acid rain (Banks and Schaffler, 2006).

These issues associated with the burning of coal as well as the rising prices for other fossil-fuels (such as oil), geopolitical developments and environmental concerns have led to growing demand for renewable energy sources. There is therefore an increasing need to establish a new source of generating power in SA within the next decade.

The use of renewable energy technologies, as one of a mix of technologies needed to meet future energy consumption requirements is being investigated as part of Eskom's long-term strategic planning and research process. It must be remembered that wind energy is plentiful, renewable, widely distributed, clean and reduces greenhouse gas emissions when it displaces fossil-fuel derived from electricity. In this light, renewable wind energy can be seen as desirable.

The South African Government, through the promulgation of the IRP 2010, and incorporated into the REIPPPP implemented by the DoE, has committed to a target of 17.8 GW of renewables by 2030. This means that by 2030 approximately 42% of all new power generation will be derived from renewable energy forms. Currently South Africa is heavily dependent on coal as its primary source of energy. In addition, it contributes towards socio-economic and environmentally sustainable growth, while stimulating the renewable industry in South Africa.

The REIPPPP has contributed to stimulating local manufacturing and job creation and has led to significant investments in social development in the communities surrounding renewable energy

projects. Former, South African Wind Energy Association (SAWEA) Chief Executive Officer (CEO), Johan van den Berg, stated that:

"Approximately R19.3bn will be ploughed into social development and a further R6bn will go into enterprise development over the twenty-year lives of the projects. Local communities will earn a further R29.2bn through their direct shareholding in the projects. By March 2016 over R30bn had been spent on local content and a further R65.7bn is expected to be spent by projects that have yet to commence construction. Twelve new industrial facilities have been established as a direct result of the programme. Since 2013, the construction and operation of renewable energy projects has already created 111 835 job years for South African citizens."

The proposed transmission line is an essential part of the Esizayo WEF.

8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	YES	NO	Please explain

The transmission line is in close proximity to existing Eskom power lines in the area. The servitude underneath the proposed transmission line will still be used for farming and small holding agriculture activities.

In addition, the DEA, in consultation with DoE, has been mandated to undertake a SEA, to identify geographical areas most suitable for the rollout of wind and solar PV energy projects and the supporting electricity grid network. These concentrated development zones are referred to as REDZs. The area in which the Esizayo WEF is to be located is within the Komsberg Wind REDZ, within the Laingsberg area of the Western Cape.

9. Is the development the best practicable environmental option for this land/site?	YES	NO	Please explain

The Esizayo WEF is to be bid in terms of the REIPPPP. The location of the proposed project is considered to be the most favourable options for the location of the infrastructure, taking technical (nearest suitable grid connection point) and environmental (social and biophysical) issues into consideration. The proposed location of the infrastructure is considered the best practicable option to minimise environmental impacts while also taking technical requirements into account. Where possible, the proposed transmission line will be aligned to follow the existing roads, in order to make use of existing disturbance corridors in the landscape, thus minimising the environmental impact of the project.

The specialist studies undertaken as part of this Basic Assessment conclude that the development of the 132 kV transmission line within the preferred corridor investigated will have environmental impacts of Low- Medium overall significance with the implementation of mitigation and management measures.

It must be noted that the DEA, in consultation with the DoE, has been mandated to undertake a SEA,

to identify geographical areas most suitable for the rollout of wind and solar PV energy projects and the supporting electricity grid network. These concentrated development zones are referred to as REDZs. The area in which the Esizayo WEF is to be located is within the Komsberg Wind REDZ, within the Laingsberg area of the Western Cape.			
10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES	NO	Please explain
The specialist studies undertaken as part of this Basic Assessment conclude that the development of the proposed project will have low to medium environmental impacts which can be mitigated to acceptable levels. The proposed project will facilitate the connection of the Esizayo WEF to the National Eskom electricity grid thereby facilitating the distribution of renewable energy nationally. This will have a positive impact at a local level, regional and national level and concur with various national policies. The benefits of the project are considered to outweigh the negative impacts (none of which are considered fatal flaws to the Project). Further direct and indirect benefits in the form of job creation and direct and indirect economic benefits will also be raised.			
11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?	YES	NO	Please explain
The DEA, in consultation with DoE, has been mandated to undertake an SEA, to identify geographical areas most suitable for the rollout of wind and solar PV energy projects and the supporting electricity grid network. These concentrated development zones are referred to as REDZs. The area in which the Esizayo WEF is to be located is within the Komsberg Wind REDZ, within the Laingsberg area of the Western Cape. There are a number of Environmental Authorisations (either issued or in process) in the area surrounding the proposed project site. It must be stressed that the fact that there are several approved EAs surrounding the site does not equate to actual 'development'. The surrounding projects, except for the Preferred Bidders, are still subject to the REIPPPP bidding process like the Esizayo project. Depending on the next bid window Esizayo due to its competitive nature may actually be selected as the next Preferred Bidder and commence with construction prior to other facilities with existing EA approvals. The EAs surrounding the Esizayo facility are illustrated in Appendix A3. The precedent has therefore already been set with respect to approved projects in the area and the formalisation of the REDZ.			
12. Will any person's rights be negatively affected by the proposed activity/ies?	YES	NO	Please explain
Private landowners will be affected by the proposed project. These landowners are participant landowners within the proposed Esizayo WEF and have been consulted with by the proponent and the EAP, and are well aware and supportive of the proposed project. It must be noted that once the transmission structures have been erected and are operational the land will continue to be used for agriculture.			

13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?	YES	NO	Please explain
The proposed project falls outside of the urban edge and does not impact upon the urban edge.			
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	YES	NO	Please explain

SIPs 8 and 9 of the energy SIPs supports the development of the Esizayo wind energy facility which is as follows:

- SIP 8: Green energy in support of the South African economy: Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options envisaged in the Integrated Resource Plan (IRP 2010) and supports bio-fuel production facilities.
- SIP 9: Electricity generation to support socio-economic development: Accelerate the construction of new electricity generation capacity in accordance with the IRP 2010 to meet the needs of the economy and address historical imbalances. Monitor implementation of major projects such as new power stations: Medupi, Kusile and Ingula.

15. What will the benefits be to society in general and to the local communities?	Please explain

Socio-economics:

The unemployment levels within the Laingsburg Local Municipality are fairly high, with 28.3% of the potential labour force being unemployed, compared to South African national unemployment rate of 25.4% (Statistics South Africa, 2012 and 2016). There are a number of constraints to Local Economic Development (LED), including low education levels, and a lack of services and infrastructure.

ONECAPE 2040 is a vision and strategy drafted by the Western Cape Government, which sets out an agenda for joint action on economic development. One of the goals set out within the ONECAPE 2040 is '*The western Cape is a recognised leader and innovator in the Green Economy*.' The idea of a Green Cape is phased with the following outcomes:

- 2013-2019: Renewable and natural gas energy investments including linking with off shore gas;
- 2020-2026: Bring gas into the Western Cape domestic market;
- 2027-2033: 40% of Western Cape energy from renewable sources; and
- 2034-2040: Sustainable, low carbon, zero waste region where the environment is one of the cornerstones of the economy.

The proposed Esizayo wind energy facility will contribute towards the overall move towards renewable energy sources in the province. The transmission lines are an essential part of the project as the Esizayo facility will only be viable for the REIPPPP if connection to the national grid is possible.

Employment:

According to the REIPPPP Focus on Western Cape, Provincial Report 2016, the Western Cape has a lower unemployment rate relative to the overall official unemployment rate of South Africa. However, the provincial unemployment rate has been steadily rising each year from the 18.8% y/y recorded in 2007. Nonetheless, approximately 4 out of 5 people in the province's economically active population

are employed. The Western Cape has attracted 10% of the IPPPP projects to date. The electrical energy that will become available from the investments in Bidding Window 1, 2, 3, 3.5, 4 and 1S2 will equate to roughly 7.8% of the Western Cape's own energy needs. The Western Cape has attracted 14% of the total wind capacity procured in BW1 to BW4 and 1S2 under the REIPPPP in South Africa, contributing 467 MW of the national total 3 366 MW wind power. Of the 14 renewable energy IPPs in the province, wind has the dominant share with 8 IPPs or 77% of total provincial capacity.

The Laingsburg Local Municipality has a total population of 8 889 people, with an unemployment rate of 17.9 %. Currently there are no REIPPP projects under construction or operational within the area and therefore no data is available. However, based on the data received on the Northern Cape the positive socio-economic impacts on the local community are anticipated to assist in economic growth within the Municipality and the province as a whole.

A percentage of revenue generated will also be spent on Economic upliftment and development in the local communities.

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

Wind Energy has been successful in a number of Provinces across South Africa, especially along the Western Cape's West Coast. According to the March 2016 IPPPP an Overview, by March 2016:

- 31% of the 20207GW capacity target and 12% of the 2030 17.8GW target had been procured.
- 6.4GW had been procured from 102 IPPs in Bidding Window 1 to Bidding Window 4, with 2.2GW of the procured capacity already constructed and fully operational.
- Of the total 6 360 MW determined for wind energy, 3 357 MW or 53% of the determined capacity has already been procured and 970 MW already operational.

17. How does the project fit into the National Development Plan for 2030?	Please explain

Renewable Energy projects form a key part of the NDP which aims to expand renewable energy generation in order to facilitate the transition of a low-carbon economy. The NDP aims to eliminate poverty and reduce inequality by 2030. In order to accelerate these goals, the NDP identifies 9 key challenges and associated remedial plans. Managing the transition towards a low carbon national economy is identified as one of the 9 key national challenges. Expansion and acceleration of commercial renewable energy is identified as a key intervention strategy.

The proposed Esizayo WEF and associated infrastructure (i.e. the transmission lines) aid and support in the meeting of the NDP objectives especially;

- Creation of 11 million jobs by 2030; and
- Procuring about 20 000MW of renewable electricity by 2030.

18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.

23	Relevant Objective	Incorporation
a)	Promote the integration of the principles of environmental management set out in section 2 into the making of all decisions which may have a significant effect on the environment.	The general objectives of Integrated Environmental Management were taken into account by considering and evaluating all potential negative and positive impacts of the proposed construction and operation of the WEF on the physical environment, fauna and flora, socio-economic conditions and cultural heritage.
b)	Identify, predict and evaluate the actual and potential impact on the environment, socioeconomic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management set out in section 2.	
c)	Ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them.	Refer to the EMPr (Appendix G) for detailed mitigation measures that aim to limit the impact that the project will have on the sensitive environments identified.
d)	Ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment.	The stakeholder consultation processes has been undertaken in a comprehensive, transparent, diligent and independent manner in accordance with Regulation 40 and 41 of GNR 326. Refer to Appendix E for the Public Participation Report.
e)	Ensure the consideration of environmental attributes in management and decision making which may have a significant effect on the environment; and	This BAR outlines the project detail and assesses the significance of anticipated impacts (Section D) in order to assist the authority in the decision making process.
f)	Identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section 2.	A summary of the relevant Principles and how they have been taken into account are contained in the table below (Item 18). Refer to the EMPr (Appendix G) for detailed mitigation measures that aim to limit the impact that the project will have on the sensitive environments identified.

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

	Relevant Objective	Incorporation
4 (a)	Sustainable development requires the consideration of all relevant factors including the following:	
(i)	That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided,	This BAR identifies potential impacts and provides mitigation measures to avoid/ reduce /minimise environmental impacts and

	are minimised and remedied;	disturbance to the surrounding environment. See Section D of this BAR and EMPr (Appendix G).
(ii)	that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;	
(iii)	that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;	
(iv)	that waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;	The proposed construction of the transmission lines includes minor trenching, and construction activities. Any soil removed during trenching will be used to backfill the trenches. Waste streams likely to be produced as a result of the construction of the transmission lines are cement, general waste, wood, plastic and very limited amounts of hazardous waste (if any). Once the transmissions line is operational it is anticipated that waste streams will be minimal and will be limited to periods of maintenance. Measures regarding the handling of waste generated during the construction and operation are included in the EMPr (Appendix G).
(vii)	that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and	The BAR includes uncertainties and assumptions which will be considered by the applicant in order to ensure that a cautious and conservative approach is adopted.
(viii)	that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.	This BAR identifies potential impacts and provides mitigation measures to avoid/ reduce /minimise environmental impacts and disturbance to the surrounding environment. See Section D of the BAR and EMPr (Appendix G).
(c)	Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.	The public participation process has been conducted in line with the requirements of the Public Participation Process outlined in Chapter 6 of the GN. R. 327.
(e)	Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.	An EMPr (Appendix G) has been compiled as part of the Basic Assessment Process. The EMPr must be formally updated to ensure that the Applicant takes responsibility for the consequences of the decommissioning and any unforeseen

		impacts that result from the construction and operational activities.
(f)	The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured.	The Basic Assessment Process provides for the participation of potential I&AP's. A detailed summary of the Public Participation undertaken to date is attached as Appendix E. The Public Participation Process is undertaken to ensure that the public are provided with an opportunity to play an active role in the decision-making process. The public participation process has been and will continue to be fair, transparent and inclusive.
(g)	Decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognizing all forms of knowledge, including traditional and ordinary knowledge.	
(h)	Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means	The proposed project promotes the use of sustainable renewable resources. As part of the REIPPP the preferred bidder is required to meet certain requirements which benefit the local communities focusing on Socio-Economic Development and Enterprise Development. In addition, the introduction of renewable energy generation technology into the area promotes environmental awareness to both the local and regional communities.
(i)	The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.	This BAR identifies potential impacts and provides mitigation measures to avoid/ reduce /minimise environmental impacts and disturbance to the surrounding environment. See Section D of the BAR.
(j)	The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.	The EMPr (Appendix G) makes provision for on-site training of staff so that they perform their work with all the necessary skills and training. All the necessary training, personal protective equipment and safety signage will be provided to employees and contractors during the construction and operational activities.
(k)	Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.	The Basic Assessment Process provides for the participation of potential I&AP's. The Public Participation undertaken to date is attached as (Appendix G).
(l)	There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.	Section 11 of the BAR identifies the policies, and laws (at all levels of government) which were considered during the preparation of the Assessment

		report/process.
(m)	Actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures.	The Draft BAR has been made available for comment to all stakeholders, including organs of state. All comments received on the Draft BAR will be included in the Final BAR.
(p)	The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.	The applicant, BioTherm, have been made aware of this principle.
(q)	The vital role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted.	The public participation process has been and will continue to be fair, transparent and inclusive allowing all potential I&AP's to raise concerns related to the proposed project.
(r)	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.	As the proposed project is being planned on undeveloped agricultural land, which is home to a number of indigenous fauna and flora including avifauna, the following specialist studies have been undertaken: · Land Capacity (Appendix D1) · Wetland Assessment (Appendix D2) · Biodiversity Impact Assessment (Appendix D3) · Avifaunal Impact Assessment (Appendix D4); · Heritage Impact Assessment (Appendix D5); · Palaeontological Impact Assessment (Appendix D6) · Visual Impact Assessment (Appendix D7); and · Socio- Economic Impact Assessment (Appendix D8). These studies will determine the possible impacts and mitigation measures associated with the proposed project. Refer to the EMPr (Appendix G) for detailed mitigation measures that aim to limit the impact that the project will have on the environment.

11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Legislation			
National Environmental Management Act (Act No. 107 of 1998)	The EIA regulations have been promulgated in terms of Chapter 5 of NEMA. The amended 2014 EIA Regulations contain three listing notices (GNR 983, 984 and 985) which identify activities that are subject to either a Basic Assessment (GNR 983 and 985) or Scoping and EIA (GNR 984) in order to obtain an EA. The proposed project triggers activities listed under GNR 983 and 985 and therefore a Basic Assessment Process must be undertaken for the proposed project.	Department of Environmental Affairs (DEA) Department of Environmental Affairs and Development Planning (DEADP) (Commenting Authority)	In Progress
National Environmental Management Act (Act No. 107 of 1998)	In terms of the Duty of Care provision in S28(1) the project proponent, and any other individual associated with the proposed project, must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that they any pollution or degradation of the environment associated with the project is avoided, stopped or minimised. While there is no licensing or permit requirements, the EIA process considers potential impacts and identifies potential management and mitigation measures, which are included within the EMPr. The implementation of the EMPr will continue to apply throughout the project life cycle.	DEA DEADP (Commenting Authority)	N/A
National Environmental Management: Waste Act (No. 59 of 2008)	GNR 921,promulgated in terms of the NEM:WA, contains a list of waste management activities that if triggered require a Waste Management License (WML) and in turn a Basic Assessment (Category A activities) or Scoping and EIA (Category B activities) process to be undertaken in terms of the NEMA EIA Regulations. Category C activities are required to comply with the Norms and Standards for Storage of Waste 2013 (GN. 926) and do not require authorisation.	§ DEA § DEADP	N/A

	It is anticipated that activities on the site will not trigger the NEM:WA. However, waste handling, storage and disposal during the construction and operational phase of the project must be undertaken in accordance with the requirements of this Act and the Best Practicable Environmental Option which will be incorporated into the site specific Environmental Management Programme (EMPr).		
National Environmental Management: Air Quality Act (No. 39 of 2004)	The NEM:AQA aims to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air in South Africa, to prevent air pollution and ecological degradation and to secure ecological sustainable development while promoting justifiable economic and social development. In line with Section 21 of NEM:AQA, GNR 893 of 2013 provides the listed activities for which an AEL is required and the associated minimum emission standards (MES) by emission category. In terms of Section 32 of the NEM:AQA The National Dust Control Regulations (GNR 827) were promulgated, which aim at prescribing general measures for the control of dust in both residential and non-residential areas. Although no AEL will be required for the construction or operation of the transmission lines, the dust control regulations will be applicable during construction.	§ DEA	N/A
National Water Act (Act No. 36 of 1998)	Section 21 of the NWA lists activities which require a the water user to apply for a Water Use Licence and Section 22 requires water users to apply for a General Authorisation (GA) with the Department of Water and Sanitation (DWS) if they are under certain thresholds or meet certain criteria.	DWS	N/A

	It is anticipated that a WUL will be needed in the event that the final transmission line corridor crosses a watercourse. Crossing of a watercourse will result in the impeding or diverting the flow of water in a watercourse and the altering of bed, banks, course or characteristics of a watercourse under Section 21(c) and (i). It should be noted that the WUL will only be processed by the DWS once should the project be selected as a preferred bidder.		
National Environmental Management Biodiversity Act (No. 10 of 2004)	The NEMBA's primary aims are for the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources. SANBI was established by the NEMBA with the primary purpose to report on the status of the country's biodiversity and conservation status of all listed threatened or protected species and ecosystems. The construction of the project, including the associated infrastructure may negatively impact on the biodiversity of the area, even though the transmission line corridor is within one of the Electricity Grid Infrastructure (EGI) strategic corridors and one of the Renewable Energy Development Zones (REDZ). As such, SANBI will be invited to provide comment on the proposed project and any licenses or permits that maybe applicable will be obtained. Portions of the Esizayo WEF will be located within the Biodiversity Assessment of the Central Karoo District Municipality. This biodiversity assessment identifies Critical Biodiversity Areas (CBAs) which represent biodiversity priority	§ DEA	N/A

	areas which should be maintained in a natural to near natural state. The CBA maps indicate the most efficient selection and classification of land portions requiring safeguarding in order to meet national biodiversity objectives. As such an ecological assessment has been undertaken as part of the Basic Assessment Process. The Conservation of Agricultural Resources Act (No. 43 of 1993) (CARA) Regulations with regards to alien and invasive species have been superseded by the NEMBA- Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014.		
Conservation of Agricultural Resources Act (No. 43 of 1983)	The CARA includes the use and protection of land, soil, wetlands and vegetation and the control of weeds and invader plants. This is the only legislation that is directly aimed at conservation of wetlands in agriculture. In terms of the amendments to the regulations under the CARA, landowners are legally responsible for the control of alien species on their properties. Various Acts administered by the DEA and DWS, as well as other laws (including local by-laws), spell out the fines, terms of imprisonment and other penalties for contravening the law. Specific management measures for the conservation of agricultural resources, will be included in the EMPr.	DEA	
National Heritage Resources Act (No. 25 of 1999)	In terms of the Section 38 of NHRA, any person who intends to undertake a linear development exceeding 300m in length or a development that exceeds 5000m^2 must notify the heritage resources authority and undertake the necessary assessment requested by that authority.	South African Heritage Resources Agency (SAHRA)	In Progress

	In the case of the transmission integration project, a Heritage Impact Assessment (HIA) has been undertaken looking at archaeology, heritage and palaeontology. The proposed project will be brought to the attention of SAHRA and Heritage Western Cape (HWC) who will provide comment, and provide the required approval.		
Civil Aviation Act (No. 13 of 2009)	Civil aviation in South Africa is governed by the Civil Aviation Act, 2009 (No. 13 of 2009). This Act provides for the establishment of a stand-alone authority mandated with controlling, promoting, regulating, supporting, developing, enforcing and continuously improving levels of safety and security throughout the civil aviation industry. The Obstacle Evaluation Committee (OEC) which consists of members from both the South African Civil Aviation Authority SA CAA and South African Air Force (SAAF) fulfils the role of streamlining and coordinating the assessment and approvals of proposed developments or activities that have the potential to affect civil aviation, military aviation, or military areas of interest. With both being national and international priorities, the OEC is responsible for facilitating the coexistence of aviation and renewable energy development, without compromising aviation safety. The details of the project will be provided to the SA CAA, which will be required to provide comment and approval of the proposed location and development of transmission line corridor.	SACAA	N/A
Astronomy Geographic Act (Act No. 21 of 2007)	In terms of section 7(1) and 7(2) of this Act, national government established core astronomy advantage areas. As such, all land within a 3 kilometre radius of the centre of the Southern African Large Telescope (SALT) dome located in the	N/A	N/A

	Northern Cape Province falls under the Sutherland Core Astronomy Advantage Area. The declaration also applies to core astronomy advantage area containing the MeerKAT radio telescope and the core of the planned Square Kilometre Array (SKA) telescope. Under section 22(1) of the Act the national government has the authority to protect the radio frequency spectrum for astronomy observations within a core or central astronomy advantage area. As such no person may undertake certain activities within a core or central astronomy advantage area. These activities prohibited include the construction, expansion or operation; of any fixed radio frequency interference source, facilities for the generation, transmission or distribution of electricity, or any activity capable of causing radio frequency interference or which may detrimentally influence the astronomy and scientific endeavours. Although the proposed project is not within the Core SKA area, any renewable energy project being proposed within the Northern Cape should receive comment from SKA, regardless of the proposed technology.		
National Strategic Energy Planning			
National Energy Act (No. 34 of 2008)	The National Energy Act aims to ensure that diverse energy resources are available, in sustainable quantitates, and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, taking into account environmental management requirements and interactions amongst economic sectors. The Act provides the legal framework which supports the development of renewable energy facilities for the greater environmental and social good.	Department of Energy (DoE)	N/A
Electricity Regulation Act (No. 4 of	In 2011, the electricity regulation on new generation capacity	§ National Energy Regulator of	N/A

2006)	was published under Section 35(4) of the Electricity Regulation Act (No. 4 of 2006). These regulations apply to the procurement of new generation capacity by organs of state. The Act establishes a National Energy Regulator as the custodian and enforcer of the National Electricity Regulatory Framework. The Act also provides for licenses and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated.	South Africa (NERSA) § DoE	
Integrated Resource Plan 2010-2030	The Department of Energy published the Integrated Resource Plan (IRP) in March 2011 to cover the period of 2010 - 2030. The IRP is a medium-long term plan which is aimed at providing help and support for the direct expansion of electricity supply including private and own generation and power purchases from regional projects. This plan identifies the need for 400MW of additional wind capacity to be added every year from 2013 until 2023 with a further 4400MW to be added in the years thereafter up to 2030. This amounts to a total of 8.4GWp by 2030. The overall objectives of the IRP are to evaluate the security of supply, and determine the least-cost supply option through the consideration of various demand side management and supply-side options. In addition, the IRP aims to provide information on the opportunities for investment into new power generating projects.	DoE	N/A
Strategic Integrated Projects (SIPS)	Under the guidance of the PICC, 18 Strategic Infrastructure Projects (SIPs) have been developed through the integration of more than 150 of the individual Infrastructure Plans into one coherent package. The SIPs present five core functions namely to unlock opportunity, transform the economic landscape, create new jobs, strengthen the delivery of basic services, and support the integration of African Economies.		

	SIPs 8 and 9 of the energy SIPs supports the development of the Esizayo wind energy facility which is as follows: § SIP 8: Green energy in support of the South African economy: Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options envisaged in the Integrated Resource Plan (IRP 2010) and supports bio-fuel production facilities. § SIP 9: Electricity generation to support socio-economic development: Accelerate the construction of new electricity generation capacity in accordance with the IRP 2010 to meet the needs of the economy and address historical imbalances. Monitor implementation of major projects such as new power stations: Medupi, Kusile and Ingula.		
Renewable Energy Development Zones (REDZs)	The DEA, in consultation with DoE, has been mandated to undertake a Strategic Environmental Assessment (SEA), to identify geographical areas most suitable for the rollout of wind and solar PV energy projects and the supporting electricity grid network. These concentrated development zones are referred to as REDZs. The outcome of the gazetting process will mean that wind and solar PV activities within the 8 Renewable Development Zones and electricity grid expansion within the 5 Power Corridors will be subjected to a Basic Assessment and not a full EIA process. The DEA has released a map with focus areas best suited for the roll-out of wind and solar photovoltaics projects in South Africa. The proposed Esizayo project will fall within the Komsberg Wind REDZ, located within the Laingsburg area of the Western Cape	DEA	N/A

Department of Energy Process for Independent Power Producers	The REIPPPP was established in August 2011 and was designed to contribute towards the target of 3 725 megawatts (MW), generated from Renewable Energy sources, and towards socio-economic and environmentally sustainable growth and to stimulate growth in the renewable energy industry in South Africa. The Minister has allocated 100 MW of the 3 725 MW to the procurement of small projects which individually have a maximum contracted capacity of 5 MW (DoE). The projects, with a generation capacity of not less than 1 MW and not more than 5 MW, utilising the following technologies shall be considered for the small projects IPP procurement programme: § Onshore wind; § Solar photovoltaic; § Biomass; § Biogas; and, § Landfill gas.	DoE	N/A

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

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

YES	NO

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

The amount of waste generated per month during the construction phase is currently undetermined. This will be clarified during the preconstruction phase. Minimal amounts of waste will be generated during operational maintenance. Minimal waste is expected to be generated by the activity and can be managed effectively through the management measures included in the EMPr (Appendix G).

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

Solid waste could include the following:

- Conductor off-cuts
- Cable drums (these will be removed for re-use).
- Concrete rubble from structure foundations
- Any vegetation cleared
- General waste produced by onsite workers

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. It is anticipated that minimal hazardous waste will be generated. Further detail on solid waste management is provided in the Environmental Management Plan.

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

In order to comply with legal requirements, should there be excess solid construction waste after recycling options have been exhausted, the waste will be transported to the nearest registered municipal waste disposal facility for appropriate disposal.

Will the activity produce solid waste during its operational phase?

YES	NO

If YES, what estimated quantity will be produced per month? 0m^3

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

N/A

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

N/A

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

N/A

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

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

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

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

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

b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? The only liquid wastes that can be expected are sewage and waste oils during the construction phase only. Temporary ablution facilities will be required during the construction phase (portable chemical toilet facilities). The waste from these facilities will be disposed of at municipal sewerage treatment plant on a regular basis. Waste oils will be stored in sealed drums for disposal at the local municipal waste sites. Further detail on liquid effluent management is provided in the EMPr (Appendix G).	YES	NO
If YES, what estimated quantity will be produced per month?		m^3
Will the activity produce any effluent that will be treated and/or disposed of on site?	YES	NO

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

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

If YES, provide the particulars of the facility:

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

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

N/A

c) Emissions into the atmosphere

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

If YES, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.
If NO, describe the emissions in terms of type and concentration:

During the construction phase, it is anticipated that there will be short-term, localised dust generation and exhaust emissions from vehicles and machinery. However, the dust and emissions will be short term and have limited impact in terms of extent and severity. Appropriate dust suppression measures must be implemented to reduce the impacts. It is recommended construction vehicles be serviced and kept in good working condition. Refer to the EMPr attached as Appendix G.

d) Waste permit

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

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

e) Generation of noise

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

Describe the noise in terms of type and level:

Short term noise impacts are anticipated during the construction phase of the project. It is anticipated that the noise will be localised and contained within the construction area and its immediate surroundings. The operational phase will not generate any noise, with exception of equipment used for maintenance. In this regard, the EMPr (Appendix G) includes the relevant mitigation measures.

13. WATER USE

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

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

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:	N/A	
Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?	YES	~~NO~~

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

14. ENERGY EFFICIENCY

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

N/A - the project is aimed at electricity distribution in the most energy efficient manner. Furthermore, it facilitates the grid connection of a renewable energy facility, which is also inherently energy efficient.

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

N/A

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

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

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

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

3. Has a specialist been consulted to assist with the completion of this section? ~~YES~~ NO

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

Property description/physical address:

Province	Western Cape
District Municipality	Central Karoo District Municipality
Local Municipality	Laingsburg Municipality
Ward Number(s)	2
Farm name and number	§ Aanstoot 72 § Aprils Kraal 105 § Strandvastigheid 210
Portion number	§ Aanstoot 72- No Portion Number § Aprils Kraal 105- No Portion Number § Strandvastigheid 210- No Portion Number
SG Code	§ Aanstood 72: C04300000000028500000 § Aprils Kraal 105: C04300000000010500000 § Strandvastigheid: C07200000000021000000

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above. Refer to Appendix J2

Current land-use zoning as per local municipality IDP/records:

Agricultural

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

Is a change of land-use or a consent use application required? YES ~~NO~~

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

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

Alternative S2 (if any):

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

Alternative S3 (if any):

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

Alternative S4 (if any):

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

2. LOCATION IN LANDSCAPE

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

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

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

	Alternative 1:		Alternative S2		Alternative S3		Alternative 4	
Shallow water table (less than 1.5m deep)	YES	~~NO~~	YES	~~NO~~	YES	~~NO~~	YES	~~NO~~
Dolomite, sinkhole or doline areas	YES	~~NO~~	YES	~~NO~~	YES	~~NO~~	YES	~~NO~~
Seasonally wet soils (often close to water bodies)	~~YES~~	NO	~~YES~~	NO	~~YES~~	NO	~~YES~~	NO
Unstable rocky slopes or steep slopes with loose soil	YES	~~NO~~	YES	~~NO~~	YES	~~NO~~	YES	~~NO~~
Dispersive soils (soils that dissolve in water)	YES	~~NO~~	YES	~~NO~~	YES	~~NO~~	YES	~~NO~~
Soils with high clay content (clay fraction more than 40%)	YES	~~NO~~	YES	~~NO~~	YES	~~NO~~	YES	~~NO~~
Any other unstable soil or geological feature	YES	~~NO~~	YES	~~NO~~	YES	~~NO~~	YES	~~NO~~
An area sensitive to erosion	YES	~~NO~~	YES	~~NO~~	YES	~~NO~~	YES	~~NO~~

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

4. GROUNDCOVER

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

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

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

Refer to the Ecological Report in Appendix D3. Vegetation types identified in the Ecological report are outlined below.

Based on the Mucina and Rutherford (2006) natural vegetation classification map, the majority of the Esizayo Linear Transmission Integration site is located within the Central Mountain Shale Renosterveld, with only the substation being located within the Koedoesberge-Moordenaars Karoo vegetation type.

Central Mountain Shale Renosterveld occurs in the Western and Northern Cape on the southern and southeastern slopes of the Klein Roggeveldberge and Komsberg below the Komsberg section of the Great Escarpment as well as farther east below Besemgoedberg and Suurkop and in the west in the Karookop area. Although no endemic species are known to occur within this vegetation type, little is known about this Renosterveld type and it has been poorly sampled. Experience from this and other projects in the area indicate that this should be considered to be a relatively sensitive vegetation type with a relatively high abundance of species of conservation concern and in context of the site should in fact be considered to have a higher sensitivity than those areas of Koedoesberge-Moordenaars Karoo. Within the site, the sensitivity of the Central Mountain Shale Renosterveld is not homogenous and the abundance of species of concern tends to be concentrated within wet lowland areas as well as high elevation areas, especially above 1300m. The Komsberg area is also a recognized centre of plant diversity and endemism and the majority of this diversity is associated with the high elevation areas of Central Mountain Shale Renosterveld (Clark et al. 2011).

Species of conservation concern that were observed at the Esizayo site include *Eriocephalus grandiflorus* (Rare), *Ehrharta eburnea* (NT), *Pelargonium denticulatum* (Rare), *Drimia altissima* (Declining) and *Adromischus mammillaris* (Endangered).

5. SURFACE WATER

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

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

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

There are several watercourses/ drainage channels present within the proposed (preferred) transmission integration site, the main river being the Roggeved River. A Freshwater Habitat Assessment has been undertaken (refer to Appendix D2). The findings of the report show that the watercourses that were visited within the sites were dry and only the Roggeveld River exhibited small pools of water at intermittent section along the watercourse. Given the arid climatic condition of the region, majority of the watercourses within the site where the proposed powerline and substation are located, are ephemeral and are likely to only convey water during infrequent high rainfall events.

6. LAND USE CHARACTER OF SURROUNDING AREA

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

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

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

N/A

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

N/A

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

N/A

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

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

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

Refer to Appendix A8 for a map of the CBA in relation to the proposed transmission integration and the Esizayo WEF.

7. CULTURAL/HISTORICAL FEATURES

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

A Heritage Impact Assessment (Appendix D5) and Palaeontological Impact Assessment (Appendix D6) was undertaken for the Transmission lines. The HIA identified the following resources:

<u>Palaeontological:</u>

The only fossils recorded form the Waterford Formation in the Esizayo WEF project area are local concentrations of simple horizontal burrows plus disarticulated modules of bony and/ or cartilaginous skeletal elements of probable fish or amphibian affinity (Almond 2016f). Well-preserved silicified wood – including fragments of large logs – as well as low-diversity trace fossil assemblages have been recorded from the Rietkloof and Brandvalley WEF study areas, just to the southwest and west of the Esizayo WEF study area (Almond 2016b, 2016c). No fossils are known from the Waterford beds along the R354 whose outcrop lies close to the western Esizayo powerline corridor.

Sparse fossil remains recorded from the Lower Beaufort Group in the Esizayo WEF study area include low-diversity trace fossil assemblages (invertebrate burrows, casts of reedy plant stems) and

plant compressions, casts and moulds that are probably attributable to horsetail ferns (Almond 2016f). None of the known fossil sites lies within the footprints of the 132 kV powerline and on-site substation sites under consideration, direct impacts on these sites are therefore not anticipated. It is notable that no well-preserved petrified wood or terrestrial vertebrate remains have been recorded from these lowermost beds of the Abrahamskraal Formation in the Esizayo, Karusa and Komsberg Substation study areas. These beds probably belong to the Middle Permian Eodicynodon Assemblage Zone within which vertebrate remains are notoriously rare (Rubidge 2005, Smith et al. 2012). It is therefore of scientific interest that very occasional tetrapod burrows, and even disarticulated skeletal remains, are in fact recorded from this stratigraphic level in the Brandvalley WEF study area (Almond 2016c).

No fossil remains are recorded from the pervasive Late Caenozoic superficial sediments mantling the Karoo Supergroup bedrocks in the broader study region, while the minor dolerite intrusions are unfossiliferous. It is concluded that the overall palaeontological sensitivity of the 400 kV powerline and on-site substation study areas for the Esizayo WEF development is low.

Archaeology:

There were archaeological remains identified within the boundaries of the Esizayo WEF and it is therefore anticipated that similar remains will be found along the route of the powerlines. The following were identified at the Esizayo WEF:

- A few large scatters of LSA stone artefacts were identified within the Esizayo WEF. Two scatters were found on the talus slopes, below the rock art sites. They are of medium significance;
- A few “pastoralist settlements” were identified containing LSA artefacts, ceramics and grindstones along dry river beds in the bottom of valleys. They are of medium significance;
- In addition to the two rock art sites recorded within the boundaries of the WEF, there is also an overhang with paintings next to the R354, in close proximity to the preferred powerline connection to the Komsberg substation. Rock art sites are of high significance because of their scarcity;
- The Nuwerus cemetery is located next to the R354. There are also several other potential graves/cairns within the study area. They are of high significance;
- There is a spread of early 20th century historical material on the lower slopes of two koppies, in association with several stone enclosures (fortifications) on the farm Aanstoot. They may represent the debris from the South African War. The proposed Substation 1 is located on top of this koppie with historic material.
-

Built Environment and Graves:

There are no farmsteads along the powerline routes and it seems unlikely that cemeteries or graves will be impacted. However, a watching brief must be implemented should human remains be uncovered during construction.

Cultural Landscape:

Cultural landscapes may include the portions of the warmer valleys which have historically been occupied and farmed. Klein Roggeveldberg and Komsberg is recommended as a Grade III Local Scenic Landscape in a study on Heritage and Scenic Resources of the Western Cape (Winter and Oberholzer, 2013). The scenic passes through the mountains and sections of the Great Escarpment could also be regarded as cultural landscapes. Historically sensitive areas within the valleys will be considered in the Heritage Impact Assessment.

If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:

N/A- Refer to section above.

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

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

Refer to Appendix J1 for the proof of submission to HWC and SAHRA.

8. SOCIO-ECONOMIC CHARACTER

a) Local Municipality

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

Level of unemployment:

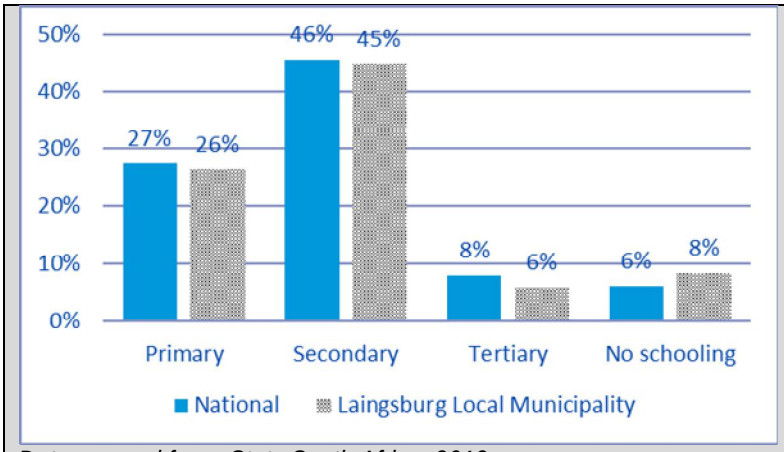
The unemployment levels within the Laingsburg Local Municipality are fairly high, with 28.3% of the potential labour force being unemployed, compared to South African national unemployment rate of 25.4% (Statistics South Africa, 2012 and 2016). There are a number of constraints to Local Economic Development (LED), including low education levels, and a lack of services and infrastructure.

Economic profile of local municipality:

The income levels in the region are low, with 29.6% of the population having no income and 31.9% earning less than R1600 per month. Within the Laingsburg Local Municipality 31.4% of the labour force is employed in the formal sector (Statistics South Africa, 2012), indicating that a large percentage are employed through the informal sector (which is likely to include seasonal work on farms).

Level of education:

Education levels are fair to good compared to the national average.



Data sourced from: Stats South Africa, 2012

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	Unknown at this stage
What is the expected yearly income that will be generated by or as a result of the activity?	The proposed project will allow for the Esizayo WEF to connect to the National Grid should they be the preferred bidders. The local community will benefit indirectly from the socio-economic initiatives that are required under the REIPPP for the Esizayo WEF, as well as job creation. No direct income however will be associated with the transmission integration.
Will the activity contribute to service infrastructure?	~~YES~~ NO
Is the activity a public amenity?	YES ~~NO~~
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	Construction- Unknown at this stage Operation- 0
What is the expected value of the employment opportunities during the development and construction phase?	Unknown at this stage
What percentage of this will accrue to previously disadvantaged individuals?	~60% of the operational employment opportunities will be sourced from local communities (as far as practically possible) for the operation of the Esizayo WEF.
How many permanent new employment opportunities will be created during the operational phase of the activity?	0
What is the expected current value of the employment opportunities during the first 10 years?	R 0
What percentage of this will accrue to previously disadvantaged individuals?	approximately 60%

9. BIODIVERSITY

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

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

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	Other Natural Area (ONA)	No Natural Area Remaining (NNR)	A large proportion of this CBA is related to the fact that is has been identified as a priority area within the National Protected Area Expansion Strategy for South Africa (NPAES). This area was identified as a priority area on the grounds that apart from being an extensive tract of unfragmented natural vegetation, it is also an area of high climate and landscape variation which is likely to be resilient to climate change. Such areas are likely to be more climatically stable over time, providing refugia where plants and animals can persist. Although development in CBA is not desirable, the footprint of the transmission line would be very low and unlikely to compromise the ecological functioning of the CBA.

b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
Natural	0%	N/A
Near Natural	95%	The area on which the transmission integration project is

(includes areas with low to moderate level of alien invasive plants)		planned comprises of natural habitat consisting of shrubland, used for the grazing of sheep.
Degraded (includes areas heavily invaded by alien plants)	2.5%	Portions of the project area is degraded due to agricultural activities on site.
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	2.5%	Portions of the transmission routes are adjacent to and cross roads.

c) Complete the table to indicate:
(i) the type of vegetation, including its ecosystem status, present on the site; and
(ii) whether an aquatic ecosystem is present on site.

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

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

Biodiversity:

The proposed Esizayo WEF and the corridor for the proposed powerlines falls within CBA as the area has been identified as a priority area within the National Protected Area Expansion Strategy for South Africa (NPAES). This area was identified as a priority area on the grounds that apart from being an extensive tract of unfragmented natural vegetation, it is also an area of high climate and landscape variation which is likely to be resilient to climate change. Such areas are likely to be more climatically stable over time, providing refugia where plants and animals can persist.

There are ten (10) freshwater habitats located within a 500 m radius of the proposed powerlines, the main being the Roggeveld River (Figure 1 and Figure 2). Given the arid climatic condition of the region, majority of the watercourses within the site where the proposed powerline and substation are located, are ephemeral and are likely to only convey water during infrequent high rainfall events.

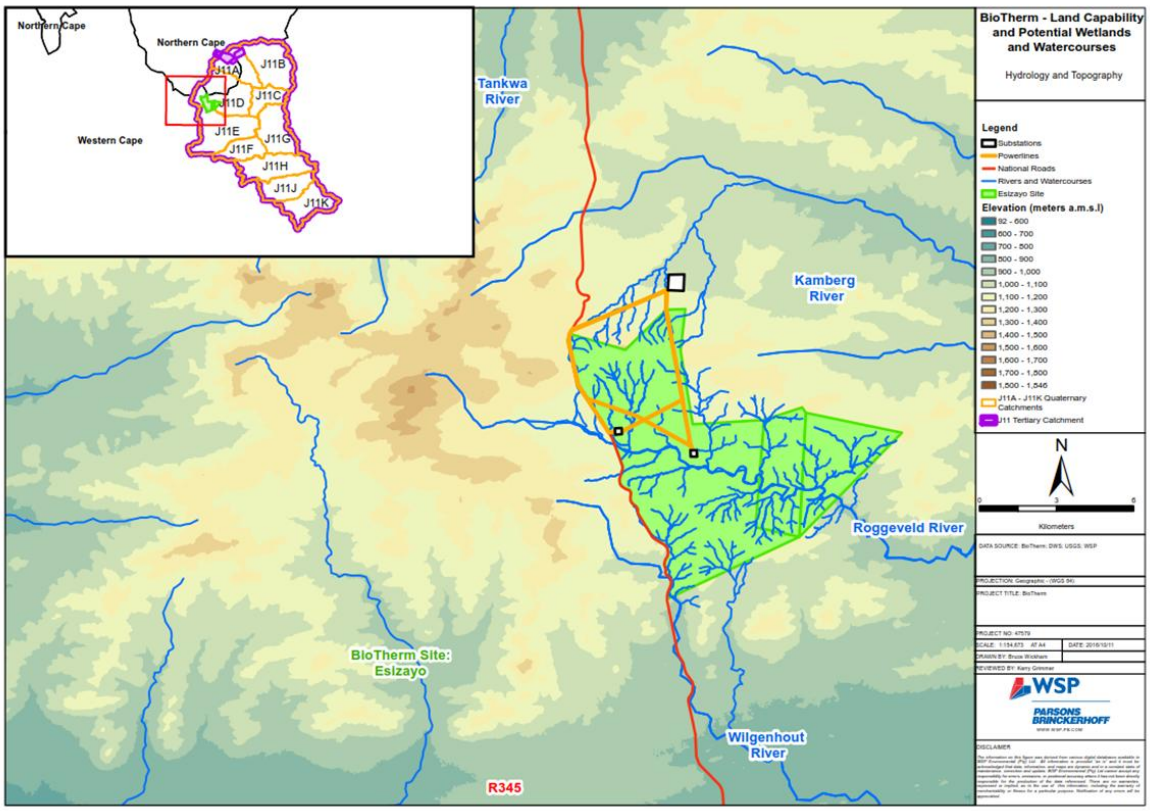


Figure 1: Local Hydrology and Topography of the site

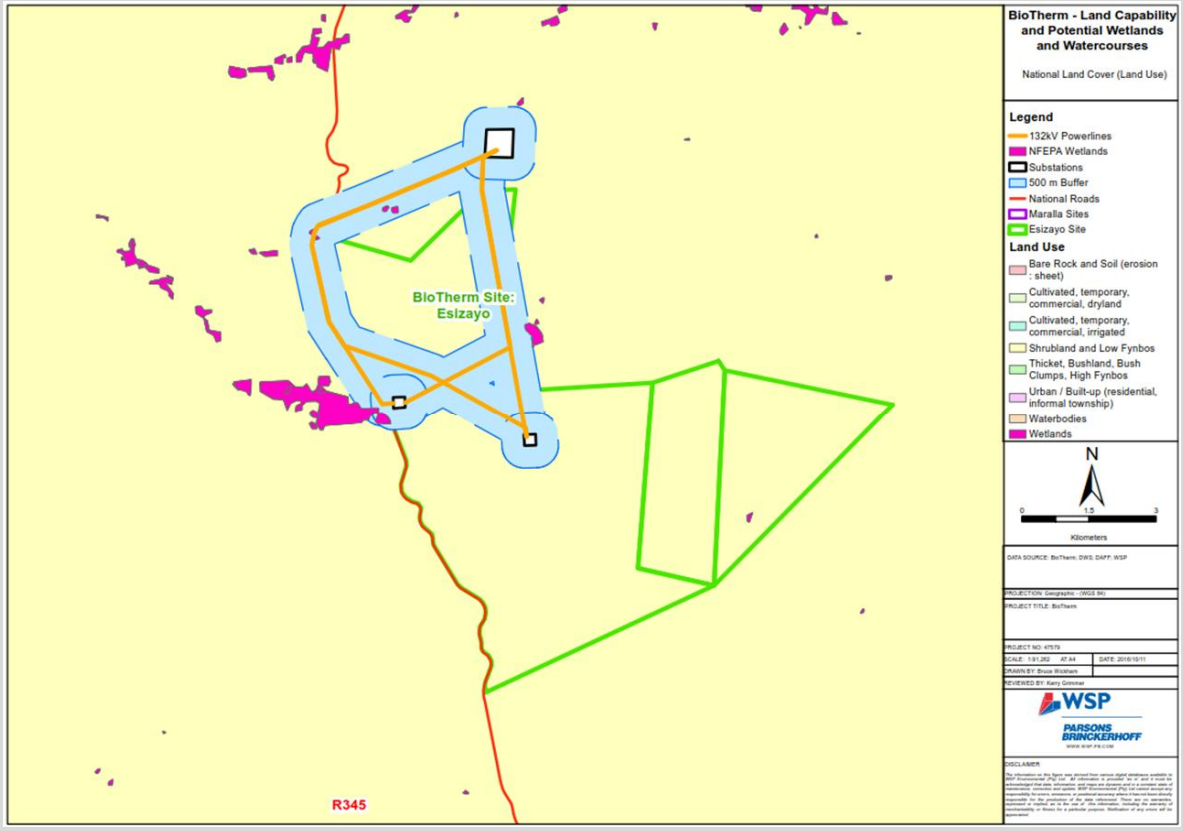


Figure 2: Local Land Cover (Land Use)

The fauna and flora, including Avifauna, is described in detail below.

§ Flora (Terrestrial):

Based on the Mucina and Rutherford (2006) natural vegetation classification map, the majority of the Esizayo Linear Transmission Integration site is located within the Central Mountain Shale Renosterveld, with only the substation being located within the Koedoesberge-Moordenaars Karoo vegetation type.

Central Mountain Shale Renosterveld occurs in the Western and Northern Cape on the southern and southeastern slopes of the Klein Roggeveldberge and Komsberg below the Komsberg section of the Great Escarpment as well as farther east below Besemgoedberg and Suurkop and in the west in the Karookop area. Although no endemic species are known to occur within this vegetation type, little is known about this Renosterveld type and it has been poorly sampled. Experience from this and other projects in the area indicate that this should be considered to be a relatively sensitive vegetation type with a relatively high abundance of species of conservation concern and in context of the site should in fact be considered to have a higher sensitivity than those areas of Koedoesberge-Moordenaars Karoo. Within the site, the sensitivity of the Central Mountain Shale Renosterveld is not homogenous and the abundance of species of concern tends to be concentrated within wet lowland areas as well as high elevation areas, especially above 1300m. The Komsberg area is also a recognized centre of plant diversity and endemism and the majority of this diversity is associated with the high elevation areas of Central Mountain Shale Renosterveld (Clark et al. 2011).

According to Mucina & Rutherford (2006) the Koedoesberge-Moordenaars Karoo vegetation type has an extent of 4714km^2. This unit occurs in the Western and Northern Cape on the Koedesberge and Pienaar se Berg low mountain ranges bordering on the southern Tanqua Karoo and separated by the Klein Roggeveld Mountains from the Moordenaars Karoo in the broad area of Laingsburg and Merweville. This vegetation type is classified as Least Threatened and has not been significantly impacted by transformation. Conservation status is however poor and of the target of 19% only a very small proportion is conserved within the Gamkapoort Nature Reserve (<1%). At least 14 endemic species are known from this vegetation type, which is a high number considering that this vegetation unit occupies less than 5000km^2. In addition, the majority of listed species known from the broader area are associated with this vegetation type. It is however very poorly known and little research has been conducted within this unit.

Species of conservation concern that were observed at the Esizayo site include Eriocephalus grandiflorus (Rare), Ehrharta eburnea (NT), Pelargonium denticulatum (Rare), Drimia altissima (Declining) and Adromischus mammillaris (Endangered).

§ Flora (Aquatic):

Although the main drainage feature of the Esizayo site is the Roggeveld River, it is only the tributaries and upper reaches of the river along the R354 that would be affected by the power line routes. The smaller drainage lines are however important and the presence of several species of conservation concern such as *Brunsvigia josephinae* (VU) can be confirmed present within these areas. Dominant and common species include *Pseudoschoenus inanis*, *Athanasia minuta* subsp*. inermis*, *Felicia filifolia*, *Lycium cinereum*, *Euryops imbricatus*, *Dicerothamnus rhinocerotis*, *Diospyros austro-africana* var. *austro-africana*, *Conyza scabrida*, *Kniphofia sarmentosa*, *Mentha longifolia* subsp. *capensis*,

Artemisia afra. Trees are generally absent in these upper reaches and smaller systems. As the drainage systems present are of small ephemeral systems, it should not be difficult for the power line to traverse these features with low impact.

§ Fauna (Terrestrial):

§ Mammals

At least 50 mammal species potentially occur at the site. Due to the diversity of habitats available, which includes rocky uplands, densely vegetated kloofs and riparian areas, as well as open plains and low shrublands, a large proportion of species with a distribution that includes the site are likely to be present in at least part of the broader site.

Despite trapping and hunting by the local landowners, medium sized carnivores such as jackal and caracal remain relatively common in the area. The ridges, hills and uplands of the site, with rocky outcrops, rocky bluffs and cliffs provide suitable habitat for species which require or prefer rock cover such as Cape Rock Elephant Shrew, *Elephantulus edwardii*, Hewitt's Red Rock Hare *Pronolagus saundersiae*, Namaqua Rock Mouse *Micaelamys namaquensis* and Rock Hyrax, *Procavia capensis*. Although of limited extent, there are also deeper soils along the Roggeveld River and some of the other smaller drainage lines which support a higher vegetation density and support species associated such as Brants's Whistling Rat *Parotomys brantsii*, the Bush Vlei Rat *Otomys unisulcatus*, Hairy-footed Gerbil *Gerbillurus paeba* and Common Duiker *Sylvicapra grimmia*.

The Riverine Rabbit *Bunolagus monticularis* which is listed as Critically Endangered and is regarded as one of the most threatened mammals in South Africa is known to occur within the broad area. Populations of this species occur between Sutherland and Fraserburg to the northeast as well as in the Tanqua Karoo to the west. The drainage systems within the site do not contain wide flood plains or alluvial terraces which are the known favoured habitat of the Riverine Rabbit. As a result, it is unlikely that this species occurs at the site and an impact on this species is therefore not considered likely.

§ Reptiles

There is a wide range of habitats for reptiles present at the site, including rocky uplands and cliffs, open flat and lowlands and riparian areas. As a result the site is likely to have a rich reptile fauna which is potentially composed of 7 tortoise species, 16 snakes, 15 lizards and skinks, two chameleons and 11 geckos. The only currently listed species which may occur at the site is the Karoo Padloper *Homopus boulengeri* which is listed as Near Threatened.

Species observed in the immediate area or on-site include Karoo Girdled Lizard *Cordylus polyzonus*, Southern Rock Agama *Agama atra*, Cape Skink *Mabuya capensis* and Cape Cobra *Naja nivea*, Marsh Terrapin *Pelomedusa subrufa*, Puff Adder *Bitis arietans*. Tortoises are abundant in the area and consist mostly of Angulate Tortoises, *Chersina angulata* with occasional observations of Karoo Tent Tortoises, *Psammobates tentorius tentorius* as well.

§ Amphibians

Amphibian diversity at the site is low, with only 9 species recorded from the broader area. The Roggeveld and other drainage lines and their vicinity are the most important areas for frogs at the

site. Some of the larger drainage systems contain rocky, sheltered pools that contain water on a near-perennial basis and some species which depend on permanent water are present. No species of conservation concern are known from the area and all the species which may be present are quite widespread species of low conservation concern.

The Karoo Dainty Frog, *Cacosternum karooicum* is listed as Data Deficient reflecting the little-known distribution and ecology of this species. To date, the Karoo Dainty Frog has been recorded from a few scattered locations across the Karoo in the Western and Northern Cape, but it is likely that it occurs more widely across the karoo in general. The site also falls within the distribution of two other regional endemic species, the Cape Sand Frog, *Tomopterna delalandii* and the Raucous Toad, *Amietophrynus rangeri*. The Cape Sand Frog occurs in lowlands and valleys in fynbos and Succulent Karoo throughout most of the Western Cape and into Namaqualand. The Raucous Toad is more widely distributed and occurs throughout much of South Africa inland and along the east coast into Gauteng and Mpumalanga. There do not therefore appear to be any range-restricted species which occur at the site which would be vulnerable to population-level impacts.

§ Avifauna:

A total of 143 species could potentially occur in the study area. Of these, 9 are classified as Red Data species. The following Red Data species that could potentially occur in the study area are:

§ Martial Eagle (*Polemaetus bellicosus*)
§ Black Harrier (*Circus maurus*)
§ Southern Black Korhaan (*Afrotis afro*)
§ Verreaux's Eagle (*Aquila Verreauxii*)
§ Lanner Falcon (*Falco biarmicus*)
§ Karoo Korhaan (*Eupodotis vigorsii*)
§ Black Stork (*Ciconia nigra*)
§ Ludwig's Bustard (*Neotis ludwigii*)

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

Publication name (Advert 1)	The Courier and	
Date published	26 May 2017	
Publication name (Advert 2)	Die Noordwester	
Date Published	27 May 2017	
Site notice position	Latitude	Longitude
	To be included within the Final BAR	
Date placed	25 May 2017	

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

2. DETERMINATION OF APPROPRIATE MEASURES

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

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

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
Adrian Tiplady	Square Kilometer Array (SKA) South Africa	atiplady@ska.ac.za
Phindile Nzimande	National Energy Regulator South Africa (NERSA)	info@nersa.org.za
John Geeringh	Eskom Tramission	john.Geeringh@eskom.co.za
Kadri Nassiep	South African National Energy Development Institute (sanedi)	information@sanedi.org.za
Harry Roberts	South African Civil Aviation Authority (CAA)	Robertsh@caa.co.za
Nametshego Gumbi	Astronomy Management Authority	Nametshego.Moleme@dst.gov.za
Ted Williams	South African Astronomical Observatory	Williams@saao.ac.za
Morgan Griffiths	Wildlife and Environment Society of South Africa (WESSA)	morgan.Griffiths@wessa.co.za
Fundisile Mketeni	South African National Parks (SANParks)	fundisilem@sanparks.org
Zaitoon Rabaney	Botanical Society of South Africa	z.rabaney@botanicalsociety.org.za
Simon Gear	BirdLife South Africa	simon.gear@birdlife.org.za
Samantha Ralston	BirdLife South Africa	conservation@birdlife.org.za
Rhett Smart	CapeNature	landuse@capenature.co.za
Constant Hoogstad	Endangered Wildlife Trust	constanth@ewt.org.za
William Botha	Gouritz Cluster Biosphere	-

	Reserve	
Jonathan Deal	Treasure Karoo Action Group	jonathan.deal@treasurethekaroo.co.za

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

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

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

No comments have been received on this proposed project to date. All comments received during the public review period of the Basic Assessment report, as well as responses provided will be captured and recorded within the Comments and Responses Report attached as Appendix E As this project is for the infrastructure associated with the proposed Esizayo WEF, issues raised have been included below and will be updated to include comments received during the public review of the Draft and Final BAR.

Summary of main issues raised by I&APs	Summary of response from EAP
Methods of alien plant control need to be included within the EMPr.	WSP has included methods for alien control within the EMPr, attached as Appendix G.
There are nests of raptors either within or just outside the property (Esizayo) and a roost on the boundary of the property (Maralla). In terms of the Verreaux's Eagle and Martial Eagle, where the exclusion zones are sighted around the nest and roost respectively, CapeNature cautions that it is possible that the foraging areas for these birds may occur inside the properties and that these exclusion zones, may need to be adapted to cater for such instances.	The exclusion zones have since been revised, based on the results of the pre-construction monitoring, which provided a more accurate indication of potential high-risk zones.
The proposed Esizayo WEF (including the powerlines and substations) falls within a National Protected Areas Expansion Strategy and Critical Biodiversity area. There is a concern regarding the development of the site based on its importance for future ecological and climate resilient targets.	These requirements have been included in the Biodiversity Specialist Study.
The proposed development site (including the location of the powerlines and associated infrastructure) includes a key drainage feature namely the Roggeveld River, which has been identified as vulnerable to any form of	This report provides an initial high-level identification of freshwater habitat systems within the site boundary. This is due to the extent of the site, accessibility constraints and lack of information relating to the positioning of

disturbance and development. It is recommended that the establishment of an appropriate ecological and hydrological buffer which will prevent any potential impacts on the system.	operational and road infrastructure. Should Biotherm be recognised as a Preferred Bidder, the required WULA in terms of NWA may commence. This application (WULA) will require detailed functional assessments (i.e. PES, EIS and EcoServices) of freshwater habitats potentially affected. Therefore, a recommendation within this land capability and freshwater identification report is a more in-depth and thorough freshwater functional assessment be conducted should BioTherm be recognised as a Preferred Bidder. Appropriate buffers for the identified systems must then form part of the in-depth assessment report. At this stage design details should be available allowing the freshwater specialist to assess specific areas within the site and determine proximity of the structures to freshwater systems. Another recommendation is that the freshwater specialist be present onsite during the construction phase of the project, and conduct an in-depth site walkover prior to any site work to assess the area for any wetlands and watercourses which may be affected by the actions conducted during the construction phase.
The physical removal of riparian zones and disturbance to any alluvial watercourses and wetlands should be avoided.	Agreed, as far as possible physical removal of riparian zones and disturbance to any alluvial watercourses and wetlands must be avoided.
The ecological assessment must provide a cumulative assessment of the total loss of land within the NPAES and the CBA's.	This is included in the Biodiversity Specialist Study.

4. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to the Final BAR as Appendix E3.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders: - Refer to I&AP database contained in Appendix E.

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
Department of Energy	Ompi Aphane	012 406 7660	-	ompi.aphane@energy.gov.za	Private Bag X96 192 Visagie Street Pretoria Corner Paul Kruger & Visagie Street 0001
	Wolsey Otto Barnard	012 406 7667/7676	-	Wolsey.Barnard@energy.gov.za	
Department of Agriculture, Forestry & Fisheries	Mashudu Marubini	-	-	MashuduMa@daff.gov.za	Private Bag X120, Pretoria, 0001
	Thoko Buthelezi	-	-	ThokoB@daff.gov.za	
Department of Rural Development and Land Reform	Mduduzi Shabane	012 312 8503	-	DGOffice@drdlr.gov.za	Private bag x 833, Pretoria, Gauteng, 0001
	Nozizwe Makgalemele	012 312 4516	012 323 4516	Nozizwe.Makgalemele@drdlr.gov.za	
Department of Water & Sanitation	R. Khan	021 941 6000	021 941 6100	KhanR@dws.gov.za	53 Spectrum Building Voortrekker Road Bellville, 7530
Department of Mineral Resources	Khayalethu Matrose	012 444 3308	-	khayalethu.matrose@dmr.gov.za	Private Bag X59 Arcadia 0007
	Duduzile Kuene	021 427 1000	-	Duduzile.Kunene@dmr.gov.za	Private Bag X 9, ROGGEBAAI, 8012
Department of Public Works	Mziwonke Dlabantu	012 406 1000	-	mziwonke.dlabantu@dpw.gov.za	Private Bag x 65 Pretoria 0001
	Fredrick Johnson	021 402 2338	086 272 6229	Frederick.johnson@dpw.gov.za	Private Bag X9027, Cape Town 8000
Department of Science and Technology	Phil Mjwara	012 843 6000	-	Phil.Mjwara@dst.gov.za	Private Bag X894 Pretoria 0001
South African National Roads Agency (SANRAL)	Nazir Alli	012 843 8000	012 844 8200	-	PO Box 415, Pretoria, 0001
South African National	Kobus van der Walt	021 910 1966	-	-	Private Bag X19,

Roads Agency (SANRAL)					Bellville, 7535
South African Heritage Resource Agency (SAHRA)					
Department of Environmental Affairs and Development Planning	Gavin Benjamin	044 805 8600	044 874 2423	Gavin.Benjamin@westerncape.gov.za	Private Bag X 6509 George, 6530
	Adri La Meyer	021 483 2887	021 483 4185	Adri.LaMeyer@westerncape.gov.za	Utilita Building 1 Dorp Street Cape Town, 8001
Heritage Western Cape	Errol Myburg	021 483 9598	021 483 9845	ceoheritage@westerncape.gov.za	Private Bag X9067, Cape Town, 8000
Central Karoo District Municipality	Stefanus Jooste	023 449 1000	023 415 1253	Manager@skdm.co.za	63 Donkin Street Beafort West, 6970
Lainsberg Local Municipality	Pietie Williams	023 551 1019	086 694 3816	pawilliams@mweb.co.za	Van Riebeeck Street Laingsburg, 6900

Include proof that the Authorities and Organs of State received written notification of the proposed activities as Appendix E4.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

6. CONSULTATION WITH OTHER STAKEHOLDERS

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

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

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

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

SECTION D: IMPACT ASSESSMENT

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

The EIA uses a methodological framework developed by WSP | Parsons Brinckerhoff to meet the combined requirements of international best practice and the NEMA, amended Environmental Impact Assessment Regulations, 2014 (GN No. 326) (the "EIA Regulations"). As required by Appendix 1 of the amended EIA Regulations (2014), the determination and assessment of impacts will be based on the following criteria:

- Nature of the Impact
- Significance of the Impact
- Consequence of the Impact
- Extent of the impact
- Duration of the Impact
- Probability if the impact
- Degree to which the impact:
  - can be reversed;
  - may cause irreplaceable loss of resources; and
  - can be avoided, managed or mitigated.

Following international best practice, additional criteria have been included to determine the significant effects. These include the consideration of the following:

- Magnitude: to what extent environmental resources are going to be affected;
- Sensitivity of the resource or receptor (rated as high, medium and low) by considering the importance of the receiving environment (international, national, regional, district and local), rarity of the receiving environment, benefits or services provided by the environmental resources and perception of the resource or receptor); and
- Severity of the impact, measured by the importance of the consequences of change (high, medium, low, negligible) by considering inter alia magnitude, duration, intensity, likelihood, frequency and reversibility of the change.

It should be noted that the definitions given are for guidance only, and not all the definitions will apply to all of the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

Methodology

Impacts are assessed in terms of the following criteria:

a) The nature, a description of what causes the effect, what will be affected and how it will be affected

NATURE OR TYPE OF IMPACT	DEFINITION
Beneficial / Positive	An impact that is considered to represent an improvement on the baseline or introduces a positive change.
Adverse / Negative	An impact that is considered to represent an adverse change from the baseline, or introduces a new undesirable factor.
Direct	Impacts that arise directly from activities that form an integral part of the Project (e.g. new infrastructure).
Indirect	Impacts that arise indirectly from activities not explicitly forming part of the Project (e.g. noise changes due to changes in road or rail traffic resulting from the operation of Project).
Secondary	Secondary or induced impacts caused by a change in the Project environment (e.g. employment opportunities created by the supply chain requirements).
Cumulative	Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.

b) The physical extent:

SCORE	DESCRIPTION
1	the impact will be limited to the site;
2	the impact will be limited to the local area;
3	the impact will be limited to the region;
4	the impact will be national; or
5	the impact will be international;

c) The duration, wherein it is indicated whether the lifetime of the impact will be:

SCORE	DESCRIPTION
1	of a very short duration (0 to 1 years)
2	of a short duration (2 to 5 years)
3	medium term (5–15 years)
4	long term (> 15 years)
5	permanent

d) The magnitude of impact on ecological processes, quantified on a scale from 0-10, where a score is assigned:

SCORE	DESCRIPTION
0	small and will have no effect on the environment.
2	minor and will not result in an impact on processes.
4	low and will cause a slight impact on processes.
6	moderate and will result in processes continuing but in a modified way.
8	high (processes are altered to the extent that they temporarily cease).
10	very high and results in complete destruction of patterns and permanent cessation of processes.

e) The probability of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale where:

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

f) The significance, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;

g) The status, which is described as either positive, negative or neutral;

h) The degree to which the impact can be reversed;

i) The degree to which the impact may cause irreplaceable loss of resources; and

j) The degree to which the impact can be mitigated.

The significance is determined by combining the criteria in the following formula: S = (E+D+M)*P, where:
S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability
The significance weightings for each potential impact are as follows:

OVERALL SCORE	SIGNIFICANCE RATING	DESCRIPTION
< 30 points	Low	where this impact would not have a direct influence on the decision to develop in the area
31-60 points	Medium	where the impact could influence the decision to develop in the area unless it is effectively mitigated
> 60 points	High	where the impact must have an influence on the decision process to develop in the area

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the Project's actual extent of impact, and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures, and is thus the final level of impact associated with the development of the Project. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this BAR.

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

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational

phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

Table 1: Impact Summary- Construction Phase Power Lines and Substation

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Alternative 1 (Substation 1, Route Option 1)			
Direct Impacts			
Geology	G 1: Disturbance to underlying geology for the construction of the power lines- during the construction phase minor earthworks will be required for the laying of the concrete foundations for the erection of the transmission line structures. Excavation is not anticipated to exceed 2m in depth.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	Due to the low impact significance no mitigation measures are considered to be necessary.
	G 2: Disturbance to underlying geology for the construction of the Substation- during the construction phase minor earthworks will be required for the laying of the concrete foundations for the substation. Excavation is not anticipated to exceed 2m in depth.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	
Soils and Land Capability	SLC 1: Reduction in land available for grazing animals- during the construction phase there will be a reduction in land available for grazing animals due to the occupation of the Transmission line and substation infrastructure within land previously used for grazing.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Areas of construction should be (practically) limited in extent, and activities outside of the site should be kept to a minimum. § Excavated soils should be appropriately stored in stockpiles which are protected from erosion. § Due to the potential for wind erosion, wind-breaks may be required in areas where wind erosion occurs. § Due to the flat topography water erosion is
	SLC 2: Increased potential of soil erosion due to vegetation clearance, soil disturbance and a high traffic movement on site.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	
	SLC 3: Potential land contamination from hazardous substances. This includes spillage of concrete onto soil	Pre-Mitigation: Low (-ve)	

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	surface, as well as oils, fuel, grease (from construction vehicles) and sewage from temporary on-site ablution facilities.	Post Mitigation: Low (-ve)	expected to be limited; however it should be rehabilitated if observed. § All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Cement must be mixed on an impermeable surface and not on the bare ground. § Any spilled or waste concrete onsite must be removed immediately and disposed of appropriately. § Vegetation removal should be kept to a minimum and limited to the area of development.
Surface Water	SW 1: Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed by the powerlines.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Construction activities to be undertake during the drier summer months (i.e. October-February). § Transmission lines to only cross perpendicular to a watercourse and the chosen alignment must endeavour that the span across the watercourse is minimalised to the number of tower structure within a system. § The tower structures should be positioned above the 1:100 floodline of any watercourse.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	SW 2: Temporary degradation of wetland/riparian habitat due to the proposed positioning of the transmission lines and tower structures.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ A more in-depth and thorough freshwater functional assessment should be conducted should BioTherm be recognised as a Preferred Bidder. The detailed freshwater habitat assessment must provide recommendations in terms of tower structures positions in relation to freshwater habitats. § A freshwater habitat specialist must undertaken a site walkover prior to the commencement of construction activities. § A freshwater habitat specialist must be present onsite during the construction phase of the project and conduct an in-depth site walkover prior to any site work to assess the area for any wetlands and watercourses, which may be affected by the actions conducted during the construction phase.
Groundwater	GW 1: Groundwater contamination associated with the spill or loss of containment of chemicals during the construction of the powerlines and the substation.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Cement must be mixed on an impermeable surface and not on the bare ground. § Any spilled or waste concrete onsite must be removed immediately and disposed of appropriately. § Adequate ablution facilities must be placed onsite.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			§ All hazardous chemicals and materials must be stored within a lockable area on an impermeable surface.
Natural Vegetation and Animal Life	BIO 1: Impacts on vegetation and protected plant species will occur due to vegetation clearing and disturbance associated with tower structures, substations, access roads etc.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Preconstruction walk-though of the approved development footprint to ensure that sensitive habitats and species are be avoided where possible. § Ensure that lay-down and other temporary infrastructure is within low sensitivity areas, preferably previously transformed areas if possible. § Minimise the development footprint as far as possible and rehabilitate disturbed areas that are no longer required by the operational phase of the development. § All roads built for construction should have water diversion and erosion control structures present, especially in steep areas. § Preconstruction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness as to no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc. § Demarcate all areas to be cleared with construction tape or similar material. However caution should be exercised to

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			avoid using material that might entangle fauna.
	BIO 2: Faunal impacts due to construction activities- Disturbance, transformation and loss of habitat during construction of the power line and associated infrastructure (including the substation) will have a negative effect on resident fauna, with many species moving away from the area and some individuals of smaller species not able to move away likely to be killed by construction activity. Some mammals or reptiles such as tortoises would be vulnerable to illegal collection or poaching during the construction phase as a result of the large number of construction personnel that are likely to be present.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Preconstruction walk-through of the power line to identify areas of faunal sensitivity. § During construction any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person. § The illegal collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the construction site. § No fires should be allowed within the site as there is a risk of runaway veld fires. § No fuelwood collection should be allowed on-site. § No dogs or cats should be allowed on site apart from that of the landowners. § If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs), which do not attract insects and which should be directed downwards. § All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			manner as related to the nature of the spill. § No unauthorized persons should be allowed onto the site and site access should be strictly controlled and vehicles which need to roam around the site should be accompanied by the ECO or security personnel.
	BIO 3: Increased Soil Erosion risk during construction- During and immediately after construction, the disturbed areas along the power line route will be vulnerable to erosion, especially on the steep slopes which characterise parts of the route. It is a common misconception that erosion in semi-arid environments is a low risk factor, however, this is false as these areas are often exposed to high intensity rainfall events and the vegetation cover is low, leaving the soils exposed and vulnerable to erosion. Erosion results in soil loss and a decline in biodiversity and productive potential from the affected areas and may also result in the siltation and degradation of aquatic systems which receive the eroded soils.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Runoff management and erosion control should be integrated into the project design. § Roads should have runoff control and water management infrastructure present to limit erosion and damage to vegetation. § Disturbance near to drainage lines should be avoided and sensitive drainage areas near to the construction activities should demarcated as no-go areas. § Regular monitoring for erosion problems along the access roads and other cleared areas. § Erosion problems should be rectified on a regular basis. § Sediment traps may be necessary to prevent erosion and soil movement if there are topsoil or other waste heaps present during the wet season. § A low cover of vegetation should be left wherever possible within the construction footprint to bind the soil, prevent erosion and promote post-disturbance recovery of an

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			indigenous ground cover.
Avifauna	AV 1: Displacement of Red Data avifauna due to habitat destruction and disturbances associated with the construction of powerlines.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Measures to control noise and dust should be applied according to current best practice in the industry. § Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. § The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned. § Prior to construction commencing, an inspection should be performed by the avifaunal specialist to record any large raptor nests on the existing Droërivier-Muldersvlei 1 400kV line that could be impacted by the construction of the proposed powerline § Should any nests be recorded, it would require management of the potential impacts on the breeding birds once construction commences, which would necessitate the involvement of the avifaunal specialist, and the Environmental Control Officer. An effective communication strategy should be implemented whereby the avifaunal specialist

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			is provided with a construction schedule which will enable him/her toascertain when and where breeding priority raptors could be impacted by the construction activities. This could then be addressed through the timing of construction activities during critical periods of the breeding cycle, once it has been established that a particular nest is active.
	AV 2: Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the substation.	Pre-Mitigation: Low (-ve)	§ Construction activity should be restricted to the immediate footprint of the infrastructure. § Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. § Measures to control noise and dust should be applied according to current best practice in the industry.
		Post Mitigation: Low (-ve)	§ Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. § The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Heritage	H 1: Physical disturbance of archaeological sites during the construction of the transmission lines.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ A 20m buffer must be placed around the colonel ruins and the ruins declared a "No-Go area. § If any high concentrations of archaeological material such as stone artefacts, are recovered, HWC must be notified. § If any human remains are uncovered during excavations for tower structures, work must stop in that area and HWC must be alerted immediately.
	H 2: Physical disturbance of archaeological sites during the construction of the substation. The construction of substation 1 will result in destruction of early 20th century scatters of historical material and stone structures, possibly from the South African War.	Pre-Mitigation: High (-ve) Post Mitigation: Low (-ve)	§ The proposed location of substation 1 must be shifted away from the colonel ruins. § A 20m buffer must be placed around the colonel ruins and the ruins declared a "No-Go area. § If any high concentrations of archaeological material such as stone artefacts, are recovered, HWC must be notified. § If any human remains are uncovered during excavations for tower structures, work must stop in that area and HWC must be alerted immediately.
Paleontological	P 1: Physical disturbance of palaeontological sites-disturbance, damage or destruction of fossils preserved at or beneath the ground surface within the development footprint during the construction phase, mainly due to surface clearance or excavation activities.	Pre-Mitigation: Low (-ve)	§ Monitoring of all surface clearances and substantial excavations (>1m deep) by the ECO for fossil material (e.g. bones, teeth, fossil wood) on an on-going basis during the construction phase. § Safeguarding of chance fossil finds

Environmental Aspect	Impact summary	Significance	Proposed mitigation
		Post Mitigation: Low (-ve)	(preferably in situ) during the construction phase by the responsible ECO, followed by reporting of finds to Heritage Western Cape. § Recording and judicious sampling of significant chance fossil finds by a qualified palaeontologist, together with the pertinent contextual data. § Curation of fossil material within an approved repository by a qualified palaeontologist.
Visual	V 1: Visual impact during construction due to dust, vehicles and equipment- construction vehicles, dust and equipment will have a visual impact on viewers and general visibility (clarity of the air) within close proximity to the construction areas. The visual impacts during construction are over a limited time period and will be temporary.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ The handling and transportation of materials which may generate dust must be avoided during high wind conditions. § The building site and construction facilities must be well maintained and strictly controlled.
	V 2: Visual impact during construction due to vegetation clearing- loss of vegetation during land clearing increases the visibility of contrasting soils, resulting in changes to the colour and texture of the site. Clearing vegetation will also result in increased windblown dust, reducing visibility of both day and night skies.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ The construction footprint must be kept as small as possible, to avoid unnecessary disruption to the existing vegetation. § No blanket clearing or removal of vegetation outside of the building zone is allowed. § Rehabilitation and restoration of all disturbed areas.
Traffic	T 1: Increased traffic generation around the study area by construction vehicles- the construction phase is expected to generate additional traffic volumes on the local road network due to the transport of raw materials and machinery to site. However, whilst there will be an increase in the traffic flow, it is expected that the road	Pre-Mitigation: Low (-ve) Post Mitigation:	§ The posted speed limit on the R354 in the vicinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	network can accommodate the increase	Low (-ve)	§ intersection warning signs should be erected either side of the access road in accordance with the requirements of the South African Road Traffic Signs Manual. § Construction vehicles should only use the roads during the daylight hours. no construction vehicles should be operational from 6pm- 6am.
Noise	N 1: Acoustic impact on residential receptors- It is anticipated that minor noise disturbances will be generated during the construction and installation of the transmission lines and substation. The noise will be generated through machinery, equipment and vehicles.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	Planning construction activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance. Information regarding construction activities should be provided to all local communities. Such information includes: § Proposed working times; § Anticipated duration of activities; § Explanations on activities to take place and reasons for activities; and § Contact details of a responsible person on site should complaints arise. § When working near (within 500 m) a potential sensitive receptor, limit the number of simultaneous activities to a minimum as far as possible; § Avoiding or minimizing project transportation through community areas;

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			§ Using noise control devices, such as temporary noise barriers and deflectors for impact and blasting activities, and exhaust muffling devices for combustion engines; § Selecting equipment with the lowest possible sound power levels; and § Ensuring equipment is well-maintained to avoid additional noise generation.
Social	SE 1: Increase in employment and business opportunities- Short-term employment opportunities to be recognised at a local, regional and national level (largely contractor labour, limited unskilled local labour).	Pre- Mitigation: Low (+ve) Post Mitigation: Medium (+ve)	§ Appointment of local contractors and use of local suppliers and manufacturers where possible. § Development of a database of local companies for service provision. § Target 40% of the construction labour particularly semi and unskilled opportunities could be sourced locally. § Communication with Laingsburg Local Municipalities and community representatives in respect of employment opportunities.
	SE 2: Nuisance from noise, dust and traffic disturbances- Localised disturbance as a result of dust, noise and traffic.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Implement EMPr conditions in respect of mitigating dust, noise and traffic related impacts. § Establish a grievance mechanism to provide a means for affected stakeholders to communicate.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	SE 3: Increased risk of veld fires- Increased risk of veld fires as a result of construction phase activities	Pre- Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ EMPr to include mitigation in respect of activities that may pose a fire risk: o No open fires allowed for cooking / heating; o Activity that pose a fire risk to be properly managed and confined to a designated area; o Adequate fire-fighting equipment to be provided on site, and appropriate training conducted; etc.
Indirect Impacts			
Social	SE 4: Disruption due to influx of job seekers- Influx of job seekers into towns could lead to social conflict in respect of resources and employment opportunities. Challenges for local municipality include establishment of informal settlements and service provision.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	Communicate employment opportunities to Laingsburg Local Municipality and community representatives to manage employment expectations as far as possible and to allow these parties to manage potential issues associated with influx of people.
	SE 5: Increase in communicable diseases and reduced public health- Presence of an outside labour force, and the influx of job seekers, should potentially affect local public health due to a higher likelihood of a spread of communicable diseases such as TB and HIV/AIDs and other sexually transmitted diseases.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Preparation and implementation of a labour force Health and Safety Plan. § In consultation with local HIV/AIDS organisations and government structures, all contractors must design and implement a proactive and ongoing HIV/AIDS awareness and prevention campaign. § Provide opportunities for workers to go home over the weekends or regularly. The cost of transporting workers home and back should be the responsibility of the contractor. § All workers are to be transported back to their

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			homes within 2 days of completion of the construction contract at the cost of the contractor.
	SE 6: Increase risk to neighbouring land users- Potential increased risk to farmers as a result of the presence of labour force including petty theft, stock theft, damage to infrastructure.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Development of a code of conduct for workers, signed by the contractor, and communicated to work force. § Contractor to be held liable for compensating farmers for any losses / damage that can be linked to workers.
Alternative 2 (Substation 1, Route Option 2) (Preferred Alternative)			
Direct Impacts			
Geology	G 1: Disturbance to underlying geology: during the construction phase minor earthworks will be required for the laying of the concrete foundations for the erection of the transmission line structures. Excavation is not anticipated to exceed 2m in depth.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	Due to the low impact significance no mitigation measures are considered to be necessary.
	G 2; Disturbance to underlying geology for the construction of the Substation- during the construction phase minor earthworks will be required for the laying of the concrete foundations for the substation. Excavation is not anticipated to exceed 2m in depth.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	
Soils and Land Capability	SLC 1: Reduction in land available for grazing animals- during the construction phase there will be a reduction in land available for grazing animals due to the occupation of the Transmission line and substation infrastructure within land previously used for grazing.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Construction activities to be undertake during the drier summer months (i.e. October-February). § Transmission lines to only cross perpendicular to a watercourse and the chosen alignment must endeavour that the span across the watercourse is minimalised to the number of tower structures within a
	SLC 2: Increased potential of soil erosion due to	Pre-Mitigation:	

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	vegetation clearance, soil disturbance and a high traffic movement on site.	Low (-ve) Post Mitigation: Low (-ve)	system. § The tower structures should be positioned above the 1:100 floodline of any watercourse. § A more in-depth and thorough freshwater functional assessment should be conducted should BioTherm be recognised as a Preferred Bidder. The detailed freshwater habitat assessment must provide recommendations in terms of tower structures positions in relation to freshwater habitats. § A freshwater habitat specialist must undertake a site walkover prior to the commencement of construction activities. § A freshwater habitat specialist must be present onsite during the construction phase of the project. § All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Cement must be mixed on an impermeable surface and not on the bare ground. § Any spilled or waste concrete onsite must be removed immediately and disposed of appropriately. § Adequate ablution facilities must be placed onsite. § All hazardous chemicals and materials must
	SLC 3: Potential land contamination from hazardous substances. This includes spillage of concrete onto soil surface, as well as oils, fuel, grease (from construction vehicles) and sewage from temporary on-site ablution facilities.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			be stored within a lockable area on an impermeable surface.
Surface Water	SW 1: Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed by the powerlines.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Construction activities to be undertake during the drier summer months (i.e. October-February). § Transmission lines to only cross perpendicular to a watercourse and the chosen alignment must endeavour that the span across the watercourse is minimalised to the number of tower structures within a system. § The tower structures should be positioned above the 1:100 floodline of any watercourse.
	SW 2: Temporary degradation of wetland/riparian habitat due to the proposed positioning of the transmission lines and tower structures.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ A more in-depth and thorough freshwater functional assessment should be conducted should BioTherm be recognised as a Preferred Bidder. The detailed freshwater habitat assessment must provide recommendations in terms of tower structures positions in relation to freshwater habitats. § A freshwater habitat specialist must undertake a site walkover prior to the commencement of construction activities. § A freshwater habitat specialist must be present onsite during the construction phase of the project and conduct an in-depth site walkover prior to any site work to assess the area for any wetlands and watercourses,

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			which may be affected by the actions conducted during the construction phase.
Groundwater	GW 1: Groundwater contamination associated with the spill or loss of containment of chemicals.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Cement must be mixed on an impermeable surface and not on the bare ground. § Any spilled or waste concrete onsite must be removed immediately and disposed of appropriately. § Adequate ablution facilities must be placed onsite. § All hazardous chemicals and materials must be stored within a lockable area on an impermeable surface.
Natural Vegetation and Animal Life	BIO 1: Impacts on vegetation and protected plant species will occur due to vegetation clearing and disturbance associated with tower structures, substations, access roads etc.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Preconstruction walk-though of the approved development footprint to ensure that sensitive habitats and species are be avoided where possible. § Ensure that lay-down and other temporary infrastructure is within low sensitivity areas, preferably previously transformed areas if possible. § Minimise the development footprint as far as possible and rehabilitate disturbed areas that are no longer required by the operational phase of the development. § All roads built for construction should have

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			water diversion and erosion control structures present, especially in steep areas. § Preconstruction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness as to no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc. § Demarcate all areas to be cleared with construction tape or similar material. However caution should be exercised to avoid using material that might entangle fauna.
	BIO 2: Faunal impacts due to construction activities- Disturbance, transformation and loss of habitat during construction of the power line and associated infrastructure (including the substation) will have a negative effect on resident fauna, with many species moving away from the area and some individuals of smaller species not able to move away likely to be killed by construction activity. Some mammals or reptiles such as tortoises would be vulnerable to illegal collection or poaching during the construction phase as a result of the large number of construction personnel that are likely to be present.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Preconstruction walk-through of the power line to identify areas of faunal sensitivity. § During construction any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person. § The illegal collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the construction site. § No fires should be allowed within the site as there is a risk of runaway veld fires. § No fuelwood collection should be allowed on-site.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			§ No dogs or cats should be allowed on site apart from that of the landowners. § If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs), which do not attract insects and which should be directed downwards. § All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. § No unauthorized persons should be allowed onto the site and site access should be strictly controlled and vehicles which need to roam around the site should be accompanied by the ECO or security personnel.
	BIO 3: Increased Soil Erosion risk during construction- During and immediately after construction, the disturbed areas along the power line route will be vulnerable to erosion, especially on the steep slopes which characterise parts of the route. It is a common misconception that erosion in semi-arid environments is a low risk factor, however, this is false as these areas are often exposed to high intensity rainfall events and the vegetation cover is low, leaving the soils exposed and vulnerable to erosion. Erosion results in soil loss and a decline in biodiversity and productive potential	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Runoff management and erosion control should be integrated into the project design. § Roads should have runoff control and water management infrastructure present to limit erosion and damage to vegetation. § Disturbance near to drainage lines should be avoided and sensitive drainage areas near to the construction activities should demarcated as no-go areas. § Regular monitoring for erosion problems

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	from the affected areas and may also result in the siltation and degradation of aquatic systems which receive the eroded soils.		along the access roads and other cleared areas. § Erosion problems should be rectified on a regular basis. § Sediment traps may be necessary to prevent erosion and soil movement if there are topsoil or other waste heaps present during the wet season. § A low cover of vegetation should be left wherever possible within the construction footprint to bind the soil, prevent erosion and promote post-disturbance recovery of an indigenous ground cover.
Avifauna	AV 1: Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the powerlines.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Measures to control noise and dust should be applied according to current best practice in the industry. § Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. § The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned. § Prior to construction commencing, an inspection should be performed by the avifaunal specialist to record any large raptor nests on the existing Droërivier-Muldersvlei 1

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			400kV line that could be impacted by the construction of the proposed powerline. § Should any nests be recorded, it would require management of the potential impacts on the breeding birds once construction commences, which would necessitate the involvement of the avifaunal specialist, and the Environmental Control Officer. An effective communication strategy should be implemented whereby the avifaunal specialist is provided with a construction schedule which will enable him/her to ascertain when and where breeding priority raptors could be impacted by the construction activities. This could then be addressed through the timing of construction activities during critical periods of the breeding cycle, once it has been established that a particular nest is active.
	AV 2: Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the substation.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Construction activity should be restricted to the immediate footprint of the infrastructure. § Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. § Measures to control noise and dust should be applied according to current best practice in the industry. § Maximum use should be made of existing access roads and the construction of new

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			roads should be kept to a minimum as far as practical. § The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.
Heritage	H 1: Physical disturbance of archaeological sites during the construction of the transmission lines.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ A 20m buffer must be placed around the colonel ruins and the ruins declared a "No-Go area. § If any high concentrations of archaeological material such as stone artefacts, are recovered, HWC must be notified. § If any human remains are uncovered during excavations for tower structures, work must stop in that area and HWC must be alerted immediately.
	H 2: Physical disturbance of archaeological sites during the construction of the substation. The construction of substation 1 will result in destruction of early 20th century scatters of historical material and stone structures, possibly from the South African War.	Pre-Mitigation: High (-ve) Post Mitigation: Low (-ve)	§ The proposed location of substation 1 must be shifted away from the colonel ruins. § A 20m buffer must be placed around the colonel ruins and the ruins declared a "No-Go area. § If any high concentrations of archaeological material such as stone artefacts, are recovered, HWC must be notified. § If any human remains are uncovered during excavations for tower structures, work must stop in that area and HWC must be alerted

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			immediately.
Paleontological	P 1: Physical disturbance of palaeontological sites- disturbance, damage or destruction of fossils preserved at or beneath the ground surface within the development footprint during the construction phase, mainly due to surface clearance or excavation activities.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Monitoring of all surface clearances and substantial excavations (>1m deep) by the ECO for fossil material (e.g. bones, teeth, fossil wood) on an on-going basis during the construction phase. § Safeguarding of chance fossil finds (preferably in situ) during the construction phase by the responsible ECO, followed by reporting of finds to Heritage Western Cape. § Recording and judicious sampling of significant chance fossil finds by a qualified palaeontologist, together with the pertinent contextual data. § Curation of fossil material within an approved repository by a qualified palaeontologist.
Visual	V 1: Visual impact during construction due to dust, vehicles and equipment- construction vehicles, dust and equipment will have a visual impact on viewers and general visibility (clarity of the air) within close proximity to the construction areas. The visual impacts during construction are over a limited time period and will be temporary.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ The handling and transportation of materials which may generate dust must be avoided during high wind conditions. § The building site and construction facilities must be well maintained and strictly controlled. § Dust and Litter control measures must be included in the EMPr.
	V 2: Visual impact during construction due to vegetation clearing- Visual impact during construction due to vegetation clearing- loss of vegetation during land clearing increases the visibility of contrasting soils,	Pre-Mitigation: Low (-ve) Post Mitigation:	§ The construction footprint must be kept as small as possible, to avoid unnecessary disruption to the existing vegetation. § No blanket clearing or removal of vegetation

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	resulting in changes to the colour and texture of the site. Clearing vegetation will also result in increased windblown dust, reducing visibility of both day and night skies.	Low (-ve)	outside of the building zone is allowed. § Rehabilitation and restoration of all disturbed areas.
Traffic	T 1: Increased traffic generation around the study area by construction vehicles- the construction phase is expected to generate additional traffic volumes on the local road network due to the transport of raw materials and machinery to site. However, whilst there will be an increase in the traffic flow, it is expected that the road network can accommodate the increase.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ The posted speed limit on the R354 in the vicinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road. § Intersection warning signs should be erected either side of the access road in accordance with the requirements of the South African Road Traffic Signs Manual. § Construction vehicles should only use the roads during the daylight hours. no construction vehicles should be operational from 6pm- 6am.
Noise	N 1: Acoustic impact on residential receptors- It is anticipated that minor noise disturbances will be generated during the construction and installation of the transmission lines and substation. The noise will be generated through machinery, equipment and vehicles.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	Planning construction activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance. Information regarding construction activities should be provided to all local communities. Such information includes: § Proposed working times; § Anticipated duration of activities; § Explanations on activities to take place and reasons for activities; and § Contact details of a responsible person on

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			site should complaints arise. § When working near (within 500 m) a potential sensitive receptor, limit the number of simultaneous activities to a minimum as far as possible; § Avoiding or minimizing project transportation through community areas; § Using noise control devices, such as temporary noise barriers and deflectors for impact and blasting activities, and exhaust muffling devices for combustion engines; § Selecting equipment with the lowest possible sound power levels; and § Ensuring equipment is well-maintained to avoid additional noise generation.
Social	SE 1: Increase in employment and business opportunities- Short term employment opportunities to be recognised at a local, regional and national level (largely contractor labour, limited unskilled local labour).	Pre- Mitigation: Low (+ve) Post Mitigation: Medium (+ve)	§ Appointment of local contractors and use of local suppliers and manufacturers where possible. § Development of a database of local companies for service provision. § Target 40% of the construction labour particularly semi and unskilled opportunities could be sourced locally. § Communication with Laingsburg Local Municipalities and community representatives in respect of employment opportunities.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	SE 2: Nuisance from noise, dust and traffic disturbances- Localised disturbance as a result of dust, noise and traffic.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Implement EMPr conditions in respect of mitigating dust, noise and traffic related impacts. § Establish a grievance mechanism to provide a means for affected stakeholders to communicate.
	SE 3: Increased risk of veld fires- Increased risk of veld fires as a result of construction phase activities.	Pre- Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ EMPr to include mitigation in respect of activities that may pose a fire risk: o No open fires allowed for cooking / heating; o Activity that pose a fire risk to be properly managed and confined to a designated area; o Adequate fire-fighting equipment to be provided on site, and appropriate training conducted; etc.
Indirect Impacts			
Heritage	H 3: Vandalism of heritage items- the powerline will run in close proximity to a small rock face, which includes a painted shelter. There is the potential for vandalism of the rock art by construction workers.	Pre- Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ The rock art site next to the R354 must be protected from vandalism, either by temporary fence during construction, or else by supervision staff.
Social	SE 4: Disruption due to influx of job seekers- Influx of job seekers into towns could lead to social conflict in respect of resources and employment opportunities. Challenges for local municipality include establishment of informal settlements and service provision.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	Communicate employment opportunities to Laingsburg Local Municipality and community representatives to manage employment expectations as far as possible and to allow these parties to manage potential issues associated with influx of people.
	SE 5: Increase in communicable diseases and reduced public health- Presence of an outside labour force, and	Pre- Mitigation: Low (-ve)	§ Preparation and implementation of a labour

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	the influx of job seekers, should potentially affect local public health due to a higher likelihood of a spread of communicable diseases such as TB and HIV/AIDs and other sexually transmitted diseases.	Post Mitigation: Low (-ve)	force Health and Safety Plan. § In consultation with local HIV/AIDS organisations and government structures, all contractors must design and implement a proactive and ongoing HIV/AIDS awareness and prevention campaign. § Provide opportunities for workers to go home over the weekends or regularly. The cost of transporting workers home and back should be the responsibility of the contractor. § All workers are to be transported back to their homes within 2 days of completion of the construction contract at the cost of the contractor.
	SE 6: Increase risk to neighbouring land users- Potential increased risk to farmers as a result of the presence of labour force including petty theft, stock theft, damage to infrastructure.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Development of a code of conduct for workers, signed by the contractor, and communicated to work force. § Contractor to be held liable for compensating farmers for any losses / damage that can be linked to workers.
Alternative 3 (Substation 2, Route Option 1)			
Direct Impacts			
Geology	G 1: Disturbance to underlying geology: during the construction phase minor earthworks will be required for the laying of the concrete foundations for the erection of the transmission line structures. Excavation is not anticipated to exceed 2m in depth.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	Due to the low impact significance no mitigation measures are considered to be necessary.
	G 2: Disturbance to underlying geology for the construction of the Substation- during the construction	Pre-Mitigation: Low (-ve)	

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	phase minor earthworks will be required for the laying of the concrete foundations for the substation. Excavation is not anticipated to exceed 2m in depth.	Post Mitigation: Low (-ve)	
Soils and Land Capability	SLC 1: Reduction in land available for grazing animals- during the construction phase there will be a reduction in land available for grazing animals due to the occupation of the Transmission line and substation infrastructure within land previously used for grazing.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Construction activities to be undertake during the drier summer months (i.e. October-February). § Transmission lines to only cross perpendicular to a watercourse and the chosen alignment must endeavour that the span across the watercourse is minimalised to the number of tower structures within a system. § The tower structures should be positioned above the 1:100 floodline of any watercourse. § A more in-depth and thorough freshwater functional assessment should be conducted should BioTherm be recognised as a Preferred Bidder. The detailed freshwater habitat assessment must provide recommendations in terms of tower structures positions in relation to freshwater habitats. § A freshwater habitat specialist must undertake a site walkover prior to the commencement of construction activities. § A freshwater habitat specialist must be present onsite during the construction phase of the project. § All equipment that has the potential to spill or
	SLC 2: Increased potential of soil erosion due to vegetation clearance, soil disturbance and a high traffic movement on site.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	
	SLC 3: Potential land contamination from hazardous substances. This includes spillage of concrete onto soil surface, as well as oils, fuel, grease (from construction vehicles) and sewage from temporary on-site ablution facilities.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			leak must have a drip tray underneath at all times. § Cement must be mixed on an impermeable surface and not on the bare ground. § Any spilled or waste concrete onsite must be removed immediately and disposed of appropriately. § Adequate ablution facilities must be placed onsite. § All hazardous chemicals and materials must be stored within a lockable area on an impermeable surface.
Surface Water	SW 1: Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed by the powerlines.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Construction activities to be undertake during the drier summer months (i.e. October-February). § Transmission lines to only cross perpendicular to a watercourse and the chosen alignment must endeavour that the span across the watercourse is minimalised to the number of tower structures within a system. § The tower structures should be positioned above the 1:100 floodline of any watercourse.
	SW 2: Temporary degradation of wetland/riparian habitat due to the proposed positioning of the transmission lines and tower structures.	Pre-Mitigation: Medium (-ve)	§ A more in-depth and thorough freshwater functional assessment should be conducted should BioTherm be recognised as a Preferred Bidder. The detailed freshwater habitat assessment must provide

Environmental Aspect	Impact summary	Significance	Proposed mitigation
		Post Mitigation: Low (-ve)	recommendations in terms of tower structures positions in relation to freshwater habitats. § A freshwater habitat specialist must undertake a site walkover prior to the commencement of construction activities. § A freshwater habitat specialist must be present onsite during the construction phase of the project and conduct an in-depth site walkover prior to any site work to assess the area for any wetlands and watercourses, which may be affected by the actions conducted during the construction phase.
Groundwater	GW 1: Groundwater contamination associated with the spill or loss of containment of chemicals.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Cement must be mixed on an impermeable surface and not on the bare ground. § Any spilled or waste concrete onsite must be removed immediately and disposed of appropriately. § Adequate ablution facilities must be placed onsite. § All hazardous chemicals and materials must be stored within a lockable area on an impermeable surface.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Natural Vegetation and Animal Life	BIO 1: Impacts on vegetation and protected plant species will occur due to vegetation clearing and disturbance associated with tower structures, substations, access roads etc.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Preconstruction walk-though of the approved development footprint to ensure that sensitive habitats and species are be avoided where possible. § Ensure that lay-down and other temporary infrastructure is within low sensitivity areas, preferably previously transformed areas if possible. § Minimise the development footprint as far as possible and rehabilitate disturbed areas that are no longer required by the operational phase of the development. § All roads built for construction should have water diversion and erosion control structures present, especially in steep areas. § Preconstruction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness as to no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc. § Demarcate all areas to be cleared with construction tape or similar material. However caution should be exercised to avoid using material that might entangle fauna.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	BIO 2: Faunal impacts due to construction activities- Disturbance, transformation and loss of habitat during construction of the power line and associated infrastructure (including the substation) will have a negative effect on resident fauna, with many species moving away from the area and some individuals of smaller species not able to move away likely to be killed by construction activity. Some mammals or reptiles such as tortoises would be vulnerable to illegal collection or poaching during the construction phase as a result of the large number of construction personnel that are likely to be present.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Preconstruction walk-through of the power line to identify areas of faunal sensitivity. § During construction any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person. § The illegal collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the construction site. § No fires should be allowed within the site as there is a risk of runaway veld fires. § No fuelwood collection should be allowed on-site. § No dogs or cats should be allowed on site apart from that of the landowners. § If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs), which do not attract insects and which should be directed downwards. § All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. § No unauthorized persons should be allowed

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			onto the site and site access should be strictly controlled and vehicles which need to roam around the site should be accompanied by the ECO or security personnel. § All construction vehicles should adhere to a low speed limit (40km/h for cars and 30km/h for trucks) to avoid collisions with susceptible species such as snakes and tortoises and rabbits or hares. Speed limits should apply within the facility as well as on the public gravel access roads to the site. § All personnel should undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition.
	BIO 3: Increased Soil Erosion risk during construction- During and immediately after construction, the disturbed areas along the power line route will be vulnerable to erosion, especially on the steep slopes which characterise parts of the route. It is a common misconception that erosion in semi-arid environments is a low risk factor, however, this is false as these areas are often exposed to high intensity rainfall events and the vegetation cover is low, leaving the soils exposed and vulnerable to erosion. Erosion results in soil loss and a decline in biodiversity and productive potential from the affected areas and may also result in the siltation and degradation of aquatic systems which	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Runoff management and erosion control should be integrated into the project design. § Roads should have runoff control and water management infrastructure present to limit erosion and damage to vegetation. § Disturbance near to drainage lines should be avoided and sensitive drainage areas near to the construction activities should demarcated as no-go areas. § Regular monitoring for erosion problems along the access roads and other cleared areas.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	receive the eroded soils.		§ Erosion problems should be rectified on a regular basis. § Sediment traps may be necessary to prevent erosion and soil movement if there are topsoil or other waste heaps present during the wet season.
Avifauna	AV 1: Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the powerlines.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Measures to control noise and dust should be applied according to current best practice in the industry. § Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. § The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned. § Prior to construction commencing, an inspection should be performed by the avifaunal specialist to record any large raptor nests on the existing Droërivier-Muldersvlei 1 400kV line that could be impacted by the construction of the proposed powerline. § Should any nests be recorded, it would require management of the potential impacts on the breeding birds once construction commences, which would necessitate the involvement of the avifaunal specialist, and

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			the Environmental Control Officer. An effective communication strategy should be implemented whereby the avifaunal specialist is provided with a construction schedule which will enable him/her to ascertain when and where breeding priority raptors could be impacted by the construction activities. This could then be addressed through the timing of construction activities during critical periods of the breeding cycle, once it has been established that a particular nest is active.
	AV 2: Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the substation.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Construction activity should be restricted to the immediate footprint of the infrastructure. § Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. § Measures to control noise and dust should be applied according to current best practice in the industry. § Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. § The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Heritage	H 1: Physical disturbance of archaeological sites during the construction of the transmission lines.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ If any high concentrations of archaeological material such as stone artefacts, are recovered, HWC must be notified. § If any human remains are uncovered during excavations for tower structures, work must stop in that area and HWC must be alerted immediately.
	H 2: Physical disturbance of archaeological sites.	Pre-Mitigation: Low(-ve) Post Mitigation: Low (-ve)	§ If any high concentrations of archaeological material such as stone artefacts, are recovered, HWC must be notified. § If any human remains are uncovered during excavations for tower structures, work must stop in that area and HWC must be alerted immediately.
Paleontological	P 1: Physical disturbance of palaeontological sites-disturbance, damage or destruction of fossils preserved	Pre-Mitigation: Low (-ve)	§ Monitoring of all surface clearances and substantial excavations (>1m deep) by the

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	at or beneath the ground surface within the development footprint during the construction phase, mainly due to surface clearance or excavation activities.	Post Mitigation: Low (-ve)	ECO for fossil material (e.g. bones, teeth, fossil wood) on an on-going basis during the construction phase. § Safeguarding of chance fossil finds (preferably in situ) during the construction phase by the responsible ECO, followed by reporting of finds to Heritage Western Cape. § Recording and judicious sampling of significant chance fossil finds by a qualified palaeontologist, together with the pertinent contextual data. § Curation of fossil material within an approved repository by a qualified palaeontologist.
Visual	V 1: Visual impact during construction due to dust, vehicles and equipment	Pre-Mitigation: Medium (-ve)	§ The handling and transportation of materials which may generate dust must be avoided during high wind conditions.
		Post Mitigation: Low (-ve)	§ The building site and construction facilities must be well maintained and strictly controlled. § Dust and Litter control measures must be included in the EMPr.
	V 2: Visual impact during construction due to vegetation clearing.	Pre-Mitigation: Low (-ve)	§ The construction footprint must be kept as small as possible, to avoid unnecessary disruption to the existing vegetation.
		Post Mitigation: Low (-ve)	§ No blanket clearing or removal of vegetation outside of the building zone is allowed. § Rehabilitation and restoration of all disturbed

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			areas.
Traffic	T 1: Increased traffic generation around the study area by construction vehicles- the construction phase is expected to generate additional traffic volumes on the local road network due to the transport of raw materials and machinery to site. However, whilst there will be an increase in the traffic flow, it is expected that the road network can accommodate the increase.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ The posted speed limit on the R354 in the vicinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road. § intersection warning signs should be erected either side of the access road in accordance with the requirements of the South African Road Traffic Signs Manual. § Construction vehicles should only use the roads during the daylight hours. no construction vehicles should be operational from 6pm- 6am.
Noise	N 1: Acoustic impact on residential receptors	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	Planning construction activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance. Information regarding construction activities should be provided to all local communities. Such information includes: § Proposed working times; § Anticipated duration of activities; § Explanations on activities to take place and reasons for activities; and § Contact details of a responsible person on site should complaints arise.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			§ When working near (within 500 m) a potential sensitive receptor, limit the number of simultaneous activities to a minimum as far as possible; § Avoiding or minimizing project transportation through community areas; § Using noise control devices, such as temporary noise barriers and deflectors for impact and blasting activities, and exhaust muffling devices for combustion engines; § Selecting equipment with the lowest possible sound power levels; and § Ensuring equipment is well-maintained to avoid additional noise generation.
Social	SE 1: Increase in employment and business opportunities- Short term employment opportunities to be recognised at a local, regional and national level (largely contractor labour, limited unskilled local labour).	Pre- Mitigation: Low (+ve) Post Mitigation: Medium (+ve)	§ Appointment of local contractors and use of local suppliers and manufacturers where possible. § Development of a database of local companies for service provision. § Target 40% of the construction labour particularly semi and unskilled opportunities could be sourced locally. § Communication with Laingsburg Local Municipalities and community representatives in respect of employment opportunities.
	SE 2: Nuisance from noise, dust and traffic disturbances- Localised disturbance as a result of dust, noise and traffic.	Pre- Mitigation: Low (-ve) Post Mitigation:	§ Implement EMPr conditions in respect of mitigating dust, noise and traffic related impacts.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
		Low (-ve)	§ Establish a grievance mechanism to provide a means for affected stakeholders to communicate.
	SE 3: Increased risk of veld fires- Increased risk of veld fires as a result of construction phase activities.	Pre- Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ EMPr to include mitigation in respect of activities that may pose a fire risk: o No open fires allowed for cooking / heating; o Activity that pose a fire risk to be properly managed and confined to a designated area; o Adequate fire-fighting equipment to be provided on site, and appropriate training conducted; etc.
Indirect Impacts			
Social	SE 4: Disruption due to influx of job seekers- Influx of job seekers into towns could lead to social conflict in respect of resources and employment opportunities. Challenges for local municipality include establishment of informal settlements and service provision.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	Communicate employment opportunities to Laingsburg Local Municipality and community representatives to manage employment expectations as far as possible and to allow these parties to manage potential issues associated with influx of people.
	SE 5: Increase in communicable diseases and reduced public health- Presence of an outside labour force, and the influx of job seekers, should potentially affect local public health due to a higher likelihood of a spread of communicable diseases such as TB and HIV/AIDs and other sexually transmitted diseases.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Preparation and implementation of a labour force Health and Safety Plan. § In consultation with local HIV/AIDS organisations and government structures, all contractors must design and implement a proactive and ongoing HIV/AIDS awareness and prevention campaign. § Provide opportunities for workers to go home over the weekends or regularly. The cost of

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			transporting workers home and back should be the responsibility of the contractor. § All workers are to be transported back to their homes within 2 days of completion of the construction contract at the cost of the contractor.
	SE 6: Increase risk to neighbouring land users- Potential increased risk to farmers as a result of the presence of labour force including petty theft, stock theft, damage to infrastructure.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Development of a code of conduct for workers, signed by the contractor, and communicated to work force. § Contractor to be held liable for compensating farmers for any losses / damage that can be linked to workers.
Alternative 4 (Substation 2, Route Option 4)			
Direct Impacts			
Geology	G 1: Disturbance to underlying geology: during the construction phase minor earthworks will be required for the laying of the concrete foundations for the erection of the transmission line structures. Excavation is not anticipated to exceed 2m in depth.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	Due to the low impact significance no mitigation measures are considered to be necessary.
	G 2: Disturbance to underlying geology for the construction of the Substation- during the construction phase minor earthworks will be required for the laying of the concrete foundations for the substation. Excavation is not anticipated to exceed 2m in depth.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	
Soils and Land Capability	SLC 1: Reduction in land available for grazing animals- during the construction phase there will be a reduction in land available for grazing animals due to the occupation of the Transmission line and substation infrastructure within land previously used for grazing.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Construction activities to be undertake during the drier summer months (i.e. October-February). § Transmission lines to only cross

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	SLC 2: Increased potential of soil erosion due to vegetation clearance, soil disturbance and a high traffic movement on site.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	perpendicular to a watercourse and the chosen alignment must endeavour that the span across the watercourse is minimalised to the number of tower structures within a system. § The tower structures should be positioned above the 1:100 floodline of any watercourse. § A more in-depth and thorough freshwater functional assessment should be conducted should BioTherm be recognised as a Preferred Bidder. The detailed freshwater habitat assessment must provide recommendations in terms of tower structures positions in relation to freshwater habitats. § A freshwater habitat specialist must undertaken a site walkover prior to the commencement of construction activities. § A freshwater habitat specialist must be present onsite during the construction phase of the project. § All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Cement must be mixed on an impermeable surface and not on the bare ground. § Any spilled or waste concrete onsite must be removed immediately and disposed of appropriately.
	SLC 3: Potential land contamination from hazardous substances. This includes spillage of concrete onto soil surface, as well as oils, fuel, grease (from construction vehicles) and sewage from temporary on-site ablution facilities.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			§ Adequate ablution facilities must be placed onsite. § All hazardous chemicals and materials must be stored within a lockable area on an impermeable surface.
Surface Water	SW 1: Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed by the powerlines.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Construction activities to be undertake during the drier summer months (i.e. October-February). § Transmission lines to only cross perpendicular to a watercourse and the chosen alignment must endeavour that the span across the watercourse is minimalised to the number of tower structures within a system. § The tower structures should be positioned above the 1:100 floodline of any watercourse.
	SW 2: Temporary degradation of wetland/riparian habitat due to the proposed positioning of the transmission lines and tower structures.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ A more in-depth and thorough freshwater functional assessment should be conducted should BioTherm be recognised as a Preferred Bidder. The detailed freshwater habitat assessment must provide recommendations in terms of tower structure positions in relation to freshwater habitats. § A freshwater habitat specialist must undertake a site walkover prior to the commencement of construction activities. § A freshwater habitat specialist must be present onsite during the construction phase

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			of the project and conduct an in-depth site walkover prior to any site work to assess the area for any wetlands and watercourses, which may be affected by the actions conducted during the construction phase.
Groundwater	GW 1: Groundwater contamination associated with the spill or loss of containment of chemicals.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Cement must be mixed on an impermeable surface and not on the bare ground. § Any spilled or waste concrete onsite must be removed immediately and disposed of appropriately. § Adequate ablution facilities must be placed onsite. § All hazardous chemicals and materials must be stored within a lockable area on an impermeable surface.
Natural Vegetation and Animal Life	BIO 1: Impacts on vegetation and protected plant species will occur due to vegetation clearing and disturbance associated with tower structures, substations, access roads etc.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Preconstruction walk-though of the approved development footprint to ensure that sensitive habitats and species are be avoided where possible. § Ensure that lay-down and other temporary infrastructure is within low sensitivity areas, preferably previously transformed areas if possible. § Minimise the development footprint as far as possible and rehabilitate disturbed areas that

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			are no longer required by the operational phase of the development. § All roads built for construction should have water diversion and erosion control structures present, especially in steep areas. § Preconstruction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness as to no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc. § Demarcate all areas to be cleared with construction tape or similar material. However caution should be exercised to avoid using material that might entangle fauna.
	BIO 2: Faunal impacts due to construction activities- Disturbance, transformation and loss of habitat during construction of the power line and associated infrastructure (including the substation) will have a negative effect on resident fauna, with many species moving away from the area and some individuals of smaller species not able to move away likely to be killed by construction activity. Some mammals or reptiles such as tortoises would be vulnerable to illegal collection or poaching during the	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Preconstruction walk-through of the power line to identify areas of faunal sensitivity. § During construction any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person. § The illegal collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the construction site. § No fires should be allowed within the site as

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	construction phase as a result of the large number of construction personnel that are likely to be present.		there is a risk of runaway veld fires. § No fuelwood collection should be allowed on-site. § No dogs or cats should be allowed on site apart from that of the landowners. § If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs), which do not attract insects and which should be directed downwards. § All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. § No unauthorized persons should be allowed onto the site and site access should be strictly controlled and vehicles which need to roam around the site should be accompanied by the ECO or security personnel. § All construction vehicles should adhere to a low speed limit (40km/h for cars and 30km/h for trucks) to avoid collisions with susceptible species such as snakes and tortoises and rabbits or hares. Speed limits should apply within the facility as well as on the public gravel access roads to the site. § All personnel should undergo environmental

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition.
	BIO 3: Increased Soil Erosion risk during construction- During and immediately after construction, the disturbed areas along the power line route will be vulnerable to erosion, especially on the steep slopes which characterise parts of the route. It is a common misconception that erosion in semi-arid environments is a low risk factor, however, this is false as these areas are often exposed to high intensity rainfall events and the vegetation cover is low, leaving the soils exposed and vulnerable to erosion. Erosion results in soil loss and a decline in biodiversity and productive potential from the affected areas and may also result in the siltation and degradation of aquatic systems which receive the eroded soils.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Runoff management and erosion control should be integrated into the project design. § Roads should have runoff control and water management infrastructure present to limit erosion and damage to vegetation. § Disturbance near to drainage lines should be avoided and sensitive drainage areas near to the construction activities should demarcated as no-go areas. § Regular monitoring for erosion problems along the access roads and other cleared areas. § Erosion problems should be rectified on a regular basis. § Sediment traps may be necessary to prevent erosion and soil movement if there are topsoil or other waste heaps present during the wet season.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Avifauna	AV 1: Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the powerlines.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Measures to control noise and dust should be applied according to current best practice in the industry. § Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. § The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned. § Prior to construction commencing, an inspection should be performed by the avifaunal specialist to record any large raptor nests on the existing Droërivier-Muldersvlei 1 400kV line that could be impacted by the construction of the proposed powerline. § Should any nests be recorded, it would require management of the potential impacts on the breeding birds once construction commences, which would necessitate the involvement of the avifaunal specialist, and the Environmental Control Officer. An effective communication strategy should be implemented whereby the avifaunal specialist is provided with a construction schedule which will enable him/her to ascertain when and where breeding priority raptors could be

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			impacted by the construction activities. This could then be addressed through the timing of construction activities during critical periods of the breeding cycle, once it has been established that a particular nest is active.
	AV 2: Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the substation.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Construction activity should be restricted to the immediate footprint of the infrastructure. § Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. § Measures to control noise and dust should be applied according to current best practice in the industry. § Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. § The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.
Heritage	H 1: Physical disturbance of archaeological sites during the construction of the transmission lines.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ If any high concentrations of archaeological material such as stone artefacts, are recovered, HWC must be notified. § If any human remains are uncovered during excavations for tower structures, work must stop in that area and HWC must be alerted

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			immediately.
	H 2: Physical disturbance of archaeological sites. Physical disturbance of archaeological sites.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ If any high concentrations of archaeological material such as stone artefacts, are recovered, HWC must be notified. § If any human remains are uncovered during excavations for tower structure, work must stop in that area and HWC must be alerted immediately.
Paleontological	P 1: Physical disturbance of palaeontological sites-disturbance, damage or destruction of fossils preserved at or beneath the ground surface within the development footprint during the construction phase, mainly due to surface clearance or excavation activities.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Monitoring of all surface clearances and substantial excavations (>1m deep) by the ECO for fossil material (e.g. bones, teeth, fossil wood) on an on-going basis during the construction phase. § Safeguarding of chance fossil finds (preferably in situ) during the construction phase by the responsible ECO, followed by reporting of finds to Heritage Western Cape. § Recording and judicious sampling of significant chance fossil finds by a qualified palaeontologist, together with the pertinent contextual data. § Curation of fossil material within an approved repository by a qualified palaeontologist.
Visual	V 1: Visual impact during construction due to dust, vehicles and equipment	Pre-Mitigation: Medium (-ve)	§ The handling and transportation of materials

Environmental Aspect	Impact summary	Significance	Proposed mitigation
		Post Mitigation: Low (-ve)	which may generate dust must be avoided during high wind conditions. § The building site and construction facilities must be well maintained and strictly controlled. § Dust and Litter control measures must be included in the EMPr.
	V 2: Visual impact during construction due to vegetation clearing.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ The construction footprint must be kept as small as possible, to avoid unnecessary disruption to the existing vegetation. § No blanket clearing or removal of vegetation outside of the building zone is allowed. § Rehabilitation and restoration of all disturbed areas.
Traffic	T 1: Increased traffic generation around the study area by construction vehicles- the construction phase is expected to generate additional traffic volumes on the local road network due to the transport of raw materials and machinery to site. However, whilst there will be an increase in the traffic flow, it is expected that the road network can accommodate the increase.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ The posted speed limit on the R354 in the vicinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road. § intersection warning signs should be erected either side of the access road in accordance with the requirements of the South African Road Traffic Signs Manual. § Construction vehicles should only use the roads during the daylight hours. no construction vehicles should be operational from 6pm- 6am.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Noise	N 1: Acoustic impact on residential receptors	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	Planning construction activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance. Information regarding construction activities should be provided to all local communities. Such information includes: § Proposed working times; § Anticipated duration of activities; § Explanations on activities to take place and reasons for activities; and § Contact details of a responsible person on site should complaints arise. § When working near (within 500 m) a potential sensitive receptor, limit the number of simultaneous activities to a minimum as far as possible; § Avoiding or minimizing project transportation through community areas; § Using noise control devices, such as temporary noise barriers and deflectors for impact and blasting activities, and exhaust muffling devices for combustion engines; § Selecting equipment with the lowest possible sound power levels; and § Ensuring equipment is well-maintained to avoid additional noise generation.
Social	SE 1: Increase in employment and business	Pre- Mitigation:	§ Appointment of local contractors and use of

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	opportunities- Short term employment opportunities to be recognised at a local, regional and national level (largely contractor labour, limited unskilled local labour).	Low (+ve) Post Mitigation: Medium (+ve)	local suppliers and manufacturers where possible. § Development of a database of local companies for service provision. § Target 40% of the construction labour particularly semi and unskilled opportunities could be sourced locally. § Communication with Laingsburg Local Municipalities and community representatives in respect of employment opportunities.
	SE 2: Nuisance from noise, dust and traffic disturbances- Localised disturbance as a result of dust, noise and traffic.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Implement EMPr conditions in respect of mitigating dust, noise and traffic related impacts. § Establish a grievance mechanism to provide a means for affected stakeholders to communicate.
	SE 3: Increased risk of veld fires- Increased risk of veld fires as a result of construction phase activities.	Pre- Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ EMPr to include mitigation in respect of activities that may pose a fire risk: o No open fires allowed for cooking / heating; o Activity that pose a fire risk to be properly managed and confined to a designated area; o Adequate fire-fighting equipment to be provided on site, and appropriate training conducted; etc.
Indirect Impacts			
Heritage	H 3: Vandalism of heritage items- the powerline will run in close proximity to a small rock face, which includes a	Pre- Mitigation: Medium (-ve)	§ The rock art site next to the R354 must be

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	painted shelter. There is the potential for vandalism of the rock art by construction workers.	Post Mitigation: Low (-ve)	protected from vandalism, either by temporary fence during construction, or else by supervision staff.
Social	SE 4: Disruption through influx of job seekers- Influx of job seekers into towns could lead to social conflict in respect of resources and employment opportunities. Challenges for local municipality include establishment of informal settlements and service provision	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	Communicate employment opportunities to Laingsburg Local Municipality and community representatives to manage employment expectations as far as possible and to allow these parties to manage potential issues associated with influx of people.
	SE 5: Increase in communicable diseases and reduced public health- Presence of an outside labour force, and the influx of job seekers, should potentially affect local public health due to a higher likelihood of a spread of communicable diseases such as TB and HIV/AIDs and other sexually transmitted diseases.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Preparation and implementation of a labour force Health and Safety Plan. § In consultation with local HIV/AIDS organisations and government structures, all contractors must design and implement a proactive and ongoing HIV/AIDS awareness and prevention campaign. § Provide opportunities for workers to go home over the weekends or regularly. The cost of transporting workers home and back should be the responsibility of the contractor. § All workers are to be transported back to their homes within 2 days of completion of the construction contract at the cost of the contractor.
	SE 6: Increase risk to neighbouring land users- Potential increased risk to farmers as a result of the presence of labour force including petty theft, stock theft, damage to infrastructure.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Development of a code of conduct for workers, signed by the contractor, and communicated to work force. § Contractor to be held liable for compensating farmers for any losses / damage that can be

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			linked to workers.

Table 2: Impact Summary- Operational Phase

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Alternative 1 (Substation 1, Route Option 1)			
Direct Impacts			
Geology	G 2: There are no anticipated potential impacts associated with the operation of the transmission lines or substation.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Soils and Land Capability	SLC 4: Reduction in land available for grazing animals- during the operational phase there will be a reduction in land available for grazing animals due to the occupation of the Transmission line and substation infrastructure within land previously used for grazing.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Maintenance activities should be limited to area on which the transmission infrastructure is located. § Rehabilitation of any disturbed areas to prevent soil erosion. § Existing roads and access routes are to be utilised to gain access to the infrastructure for maintenance purposes. § All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Vehicles associated with the maintenance work must be in good working condition. § Traffic associated with maintenance vehicles should be kept to a minimum to reduce soil compaction, and limited to existing roadways where practical. § Long-term soil stockpiles should be appropriately stored with the use of vegetation cover as wind erosion is dominant for the
	SLC 5: Vegetation cleared for the powerlines and substation, soil disturbance and stockpiles, and increased traffic movement on site, resulting in a higher potential for soil erosion.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	
	SLC 6: Potential spillage of hazardous substances such as oils, fuel, grease from maintenance vehicles.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			region. § Water erosion action is considered limited, however backfilling with soil and use of gabions or Reno Mattresses should be used where evidence of erosion is present.
Surface Water	SW 3: Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Powerlines must only cross perpendicular to a watercourse and the chosen alignment must endeavour that the span across the watercourse is minimilised to restrict the number of tower structures within a system (which should be avoided as far as possible). § The proposed tower structures should be structured should be positioned above the 1:100 floodline of any watercourse.
	SW 4: Permanent degradation of wetland/ riparian habitat due to the proposed positioning of the powerlines and tower structures.	Pre-Mitigation: N/A Post Mitigation: N/A	No mitigation measures proposed as there is no anticipated impact.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Groundwater	GW 2: Groundwater contamination associated with the spill or loss of containment of chemicals or spillage/ leaks of oil, fuel or grease from vehicles and equipment associated with the maintenance work.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Any spilled hazardous substances must be cleaned up immediately and disposed of appropriately. § Vehicles and equipment associated with the maintenance activities must be serviced regularly and kept in good working order.
Natural Vegetation and Animal Life	BIO 4: Previously disturbed areas will remain vulnerable to erosion for some time into the operational phase- Areas disturbed during construction will remain vulnerable to disturbance for some time into the operational phase and will require regular maintenance to ensure that erosion is minimised.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Erosion management at the site should take place according to the Erosion and Rehabilitation Plan. § All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. § Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance. § All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	BIO 5: Previously disturbed areas will remain vulnerable to alien plant invasion for some time- Disturbed areas are vulnerable to alien plant invasion and it is likely that road verges, tower structure foundation areas and other cleared or disturbed areas will be foci for alien plant invasion. Uncontrolled invasion can result in invasion into the intact rangeland and where woody species are involved, this can result in loss of biodiversity and a decline in ecosystem services.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Wherever excavation is necessary, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species. § Due to the disturbance at the site as well as the increased runoff generated by the hard infrastructure, alien plant species are likely to be a long-term problem at the site and a long-term control plan will need to be implemented. Problem woody species such as Prosopis are already present in the area and are likely to increase rapidly if not controlled. § Regular monitoring for alien plants within the development footprint as well as adjacent areas which receive runoff from the facility as there are also likely to be prone to invasion problems. § Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.
Avifauna	AV 3: Collisions of Red Data avifauna with the earthwire of the proposed 132 kV powerlines.	Pre-Mitigation: High (-ve) Post Mitigation: Medium (-ve)	A walk-through must be conducted by the avifaunal specialist after final pole positions have been determined, to demarcate sections of line that will need to be mitigated with Bird Flight Diverters (BFDs).
	AV 4: Electrocution of Red Data avifauna on the powerlines.	Pre-Mitigation: Low (-ve) Post Mitigation:	No mitigation measures are proposed due to the low risk of electrocution posed by the steel monopole double circuit structures.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
		Low (-ve)	
	AV 5: Electrocution of Red Data avifauna in the substation yard.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	The hardware within the substation yard is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site specific mitigation be applied reactively. This is an acceptable approach because Red List bird species are unlikely to frequent the substation and be electrocuted.
Heritage	H 4: Physical disturbance of archaeological sites. No impacts are anticipated during the operational phase.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Paleontological	P 2: Physical disturbance of palaeontological sites. No impacts are anticipated during the operational phase.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Visual	V 3: Intrusion on sense of place and rural landscape	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Natural Vegetation must be re-established on disturbed areas following the completion of construction activities. § Roads should be appropriately stabilised to avoid erosion and visual scars. § Ensure all structures are well maintained.
	V 4: Visual impact of transmission lines and power tower	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Traffic	T 2: Increased traffic generation around the study area by maintenance vehicles- the operational phase is expected to generate minimal additional traffic volumes on the local road network due to maintenance vehicles and equipment doing route inspections and maintenance.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ The posted speed limit on the R354 in the vicinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road. § intersection warning signs should be erected either side of the access road in accordance with the requirements of the South African Road Traffic Signs Manual. § Construction vehicles should only use the roads during the daylight hours. no construction vehicles should be operational from 6pm- 6am.
Noise	N 2: Acoustic impact on residential receptors- It is anticipated that no noise disturbances will be generated during the operational phase with exception of maintenance activities that will occur on an infrequent basis. The noise will be generated through machinery, equipment and vehicles. It is not deemed necessary to assess potential noise impacts during the operational phase of the project.	Pre-Mitigation: N/A Post Mitigation: N/A	Not applicable as no impacts are anticipated.
Social	SE 7: Change in sense of place- change in overall nature of the area / sense of place primarily as a result of visual impact of transmission line and structures	Pre- Mitigation: Medium (-ve) Post Mitigation: Medium (-ve)	Implementation of recommendations contained in the Visual Impact Assessment.
Indirect Impacts			

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Social	SE 8: Evacuation of power- The proposed project will allow for the transmission of renewable power from the proposed WEF to the national grid. This will provide an additional source of energy for the national power supplier and the South African population. Indirectly the proposed project will allow for the social-economic benefits of the proposed WEF to be realised, i.e. increase in employment opportunities and increased economic development opportunities.	Pre- Mitigation: High (+ve) Post Mitigation: High (+ve)	No mitigation measures are required.
Alternative 2 (Substation 1, Route Option 2)- Preferred Alterative			
Direct Impacts			
Geology	G 3: There are no anticipated potential impacts associated with the operation of the transmission lines or substation.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Soils and Land Capability	SLC 4: Reduction in land available for grazing animals- during the operational phase there will be a reduction in land available for grazing animals due to the occupation of the Transmission line and substation infrastructure within land previously used for grazing.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Maintenance activities should be limited to area on which the transmission infrastructure is located. § Rehabilitation of any disturbed areas to prevent soil erosion. § Existing roads and access routes are to be utilised to gain access to the infrastructure for maintenance purposes. § All equipment that has the potential to spill or leak must have a drip tray underneath at all times.
	SLC 5: Vegetation cleared for the powerlines and substation, soil disturbance and stockpiles, and increased traffic movement on site, resulting in a higher potential for soil erosion.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	
	SLC 6: Potential spillage of hazardous substances such as oils, fuel, grease from maintenance vehicles.	Pre-Mitigation: Low (-ve)	

Environmental Aspect	Impact summary	Significance	Proposed mitigation
		Post Mitigation: Low (-ve)	§ Vehicles associated with the maintenance work must be in good working condition. § Traffic associated with maintenance vehicles should be kept to a minimum to reduce soil compaction, and limited to existing roadways where practical. § Long-term soil stockpiles should be appropriately stored with the use of vegetation cover as wind erosion is dominant for the region. § Water erosion action is considered limited, however backfilling with soil and use of gabions or Reno Mattresses should be used where evidence of erosion is present.
Surface Water	SW 3: Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Powerlines must only cross perpendicular to a watercourse and the chosen alignment must endeavour that the span across the watercourse is minimilised to restrict the number of tower structures within a system (which should be avoided as far as possible). § The proposed tower structures should be structured should be positioned above the 1:100 floodline of any watercourse.
	SW 4: Permanent degradation of wetland/riparian habitat due to the proposed positioning of the powerlines and tower structures	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ The WULA will require detailed functional assessments (i.e. ES, EIS and EcoServices) of freshwater habitats potentially affected by the site and powerlines. At this stage design

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			details should be available allowing the freshwater specialist to assess specific areas within the site. Therefore, a more in-depth and thorough freshwater functional assessment should be conducted should BioTherm be recognised as a Preferred Bidder. § The detailed freshwater habitat assessment must provide recommendations in terms of tower structure positions in relation to freshwater habitats. § A freshwater habitat specialist be present onsite during the construction phase of the project, and conduct an in-depth site walkover prior to any site work to assess the area for any wetlands and watercourses which may be affected by the actions conducted during the construction phase.
Groundwater	GW 2: Groundwater contamination associated with the spill or loss of containment of chemicals or spillage/ leaks of oil, fuel or grease from vehicles and equipment associated with the maintenance work.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Any spilled hazardous substances must be cleaned up immediately and disposed of appropriately. § Vehicles and equipment associated with the maintenance activities must be serviced regularly and kept in good working order.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Natural Vegetation and Animal Life	BIO 4: Previously disturbed areas will remain vulnerable to erosion for some time into the operational phase- Areas disturbed during construction will remain vulnerable to disturbance for some time into the operational phase and will require regular maintenance to ensure that erosion is minimised.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Erosion management at the site should take place according to the Erosion and Rehabilitation Plan. § All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. § Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance. § All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.
	BIO 5: Previously disturbed areas will remain vulnerable to alien plant invasion for some time- Disturbed areas are vulnerable to alien plant invasion and it is likely that road verges, tower structure foundation areas and other cleared or disturbed areas will be foci for alien plant invasion. Uncontrolled invasion can result in invasion into the intact rangeland and where woody species are involved, this can result in loss of biodiversity and a decline in ecosystem services.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Wherever excavation is necessary, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species. § Due to the disturbance at the site as well as the increased runoff generated by the hard infrastructure, alien plant species are likely to be a long-term problem at the site and a long-term control plan will need to be implemented. Problem woody species such as Prosopis are already present in the area and are likely to increase rapidly if not controlled. § Regular monitoring for alien plants within the development footprint as well as adjacent

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			areas which receive runoff from the facility as there are also likely to be prone to invasion problems. § Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.
Avifauna	AV 3: Collision of Red Data avifauna with the earthwire of the proposed 132 kV powerlines	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	A walk-through must be conducted by the avifaunal specialist after final pole positions have been determined, to demarcate sections of line that will need to be mitigated with Bird Flight Diverters (BFDs).
	AV 4: Electrocution of Red Data avifauna on the powerlines.	Pre-Mitigation: Low (-ve) Post Mitigation: N/A	No mitigation measures are proposed due to the low risk of electrocution posed by the steel monopole double circuit structures.
	AV 5: Electrocution of Red Data avifauna in the substation yard.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	The hardware within the substation yard is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site specific mitigation be applied reactively. This is an acceptable approach because Red List bird species are unlikely to frequent the substation and be electrocuted.
Heritage	H 4: Physical disturbance of archaeological sites. No impacts are anticipated during the operational phase.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Paleontological	P 2: Physical disturbance of palaeontological sites. No impacts are anticipated during the operational phase.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Visual	V 3: Intrusion on sense of place and rural landscape	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Natural Vegetation must be re-established on disturbed areas following the completion of construction activities. § Roads should be appropriately stabilised to avoid erosion and visual scars. § Ensure all structures are well maintained.
	V 4: Visual impact of transmission lines and power tower	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	
Traffic	T 2: Increased traffic generation around the study area by maintenance vehicles- the operational phase is expected to generate minimal additional traffic volumes on the local road network due to maintenance vehicles and equipment doing route inspections and maintenance.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ The posted speed limit on the R354 in the vicinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road. § intersection warning signs should be erected either side of the access road in accordance with the requirements of the South African Road Traffic Signs Manual. § Construction vehicles should only use the roads during the daylight hours. no construction vehicles should be operational from 6pm- 6am.
Noise	N 2: Acoustic impact on residential receptors- It is anticipated that no noise disturbances will be generated during the operational phase with exception of maintenance activities that will occur on an infrequent	Pre-Mitigation: N/A Post Mitigation:	Not applicable as no impacts are anticipated.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	basis. The noise will be generated through machinery, equipment and vehicles. It is not deemed necessary to assess potential noise impacts during the operational phase of the project.	N/A	
Social	SE 7: Change in sense of place- change in overall nature of the area / sense of place primarily as a result of visual impact of transmission line and structures	Pre- Mitigation: Medium (-ve) Post Mitigation: Medium (-ve)	Implementation of recommendations contained in the Visual Impact Assessment.
Indirect Impacts			
Social	SE 8: Evacuation of power- The proposed project will allow for the transmission of renewable power from the proposed WEF to the national grid. This will provide an additional source of energy for the national power supplier and the South African population. Indirectly the proposed project will allow for the social-economic benefits of the proposed WEF to be realised, i.e. increase in employment opportunities and increased economic development opportunities.	Pre- Mitigation: High (+ve) Post Mitigation: High (+ve)	No mitigation measures are required.
Alternative 3 (Substation 2, Route Option 1)			
Direct Impacts			
Geology	G 3: There are no anticipated potential impacts associated with the operation of the transmission lines or substation.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Soils and Land Capability	SLC 4: Reduction in land available for grazing animals- during the operational phase there will be a reduction in land available for grazing animals due to the occupation of the Transmission line and substation infrastructure within land previously used for grazing.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Maintenance activities should be limited to area on which the transmission infrastructure is located. § Rehabilitation of any disturbed areas to prevent soil erosion.
	SLC 5: Vegetation cleared for the powerlines and	Pre-Mitigation:	

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	substation, soil disturbance and stockpiles, and increased traffic movement on site, resulting in a higher potential for soil erosion.	Low (-ve) Post Mitigation: Low (-ve)	§ Existing roads and access routes are to be utilised to gain access to the infrastructure for maintenance purposes. § All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Vehicles associated with the maintenance work must be in good working condition § Traffic associated with maintenance vehicles should be kept to a minimum to reduce soil compaction, and limited to existing roadways where practical. § Long-term soil stockpiles should be appropriately stored with the use of vegetation cover as wind erosion is dominant for the region. § Water erosion action is considered limited, however backfilling with soil and use of gabions or Reno Mattresses should be used where evidence of erosion is present.
	SLC 6: Potential spillage of hazardous substances such as oils, fuel, grease from maintenance vehicles.	Pre-Mitigation: N/A Post Mitigation: N/A	
Surface Water	SW 3: Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Powerlines must only cross perpendicular to a watercourse and the chosen alignment must endeavour that the span across the watercourse is minimalised to restrict the number of tower structures within a system (which should be avoided as far as possible). § The proposed tower structures should be

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			structured should be positioned above the 1:100 floodline of any watercourse.
	SW 4: Permanent degradation of wetland/riparian habitat due to the proposed positioning of the transmission lines and tower structure.	Pre-Mitigation: N/A Post Mitigation: N/A	No mitigation measures are proposed as there are no impacts anticipated.
Groundwater	GW 2: Groundwater contamination associated with the spill or loss of containment of chemicals or spillage/ leaks of oil, fuel or grease from vehicles and equipment associated with the maintenance work.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Any spilled hazardous substances must be cleaned up immediately and disposed of appropriately. § Vehicles and equipment associated with the maintenance activities must be serviced regularly and kept in good working order.
Natural Vegetation and Animal Life	BIO 4: Previously disturbed areas will remain vulnerable to erosion for some time into the operational phase- Areas disturbed during construction will remain vulnerable to disturbance for some time into the operational phase and will require regular maintenance to ensure that erosion is minimised.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Wherever excavation is necessary, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species. § Due to the disturbance at the site as well as the increased runoff generated by the hard infrastructure, alien plant species are likely to be a long-term problem at the site and a long-term control plan will need to be implemented. Problem woody species such as Prosopis are already present in the area and are likely to increase rapidly if not controlled. § Regular monitoring for alien plants within the

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			development footprint as well as adjacent areas which receive runoff from the facility as there are also likely to be prone to invasion problems. § Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.
	BIO 5: Previously disturbed areas will remain vulnerable to alien plant invasion for some time- Disturbed areas are vulnerable to alien plant invasion and it is likely that road verges, tower structure foundation areas and other cleared or disturbed areas will be foci for alien plant invasion. Uncontrolled invasion can result in invasion into the intact rangeland and where woody species are involved, this can result in loss of biodiversity and a decline in ecosystem services.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Wherever excavation is necessary, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species. § Due to the disturbance at the site as well as the increased runoff generated by the hard infrastructure, alien plant species are likely to be a long-term problem at the site and a long-term control plan will need to be implemented. Problem woody species such as Prosopis are already present in the area and are likely to increase rapidly if not controlled. § Regular monitoring for alien plants within the development footprint as well as adjacent areas which receive runoff from the facility as there are also likely to be prone to invasion problems. § Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Avifauna	AV 3: Collisions with the earthwire of the proposed 132 kV powerlines.	Pre-Mitigation: High (-ve) Post Mitigation: Medium (-ve)	A walk-through must be conducted by the avifaunal specialist after final pole positions have been determined, to demarcate sections of line that will need to be mitigated with Bird Flight Diverters (BFDs).
	AV 4: Electrocution of Red Data avifauna on the powerlines.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	No mitigation measures are proposed due to the low risk of electrocution posed by the steel monopole double circuit structures.
	AV 5: Electrocution of Red Data avifauna in the substation yard.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	The hardware within the substation yard is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site specific mitigation be applied reactively. This is an acceptable approach because Red List bird species are unlikely to frequent the substation and be electrocuted.
Heritage	H 4: Physical disturbance of archaeological sites. No impacts are anticipated during the operational phase.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Paleontological	P 2: Physical disturbance of palaeontological sites. No impacts are anticipated during the operational phase.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Visual	V 3: Intrusion on sense of place and rural landscape	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Natural Vegetation must be re-established on disturbed areas following the completion of construction activities.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	V 4: Visual impact of transmission lines and power tower	Pre-Mitigation: Medium (-ve) Post Mitigation: Medium (-ve)	§ Roads should be appropriately stabilised to avoid erosion and visual scars. § Ensure all structures are well maintained.
Traffic	T 2: Increased traffic generation around the study area by maintenance vehicles- the operational phase is expected to generate minimal additional traffic volumes on the local road network due to maintenance vehicles and equipment doing route inspections and maintenance.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ The posted speed limit on the R354 in the vicinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road. § intersection warning signs should be erected either side of the access road in accordance with the requirements of the South African Road Traffic Signs Manual. § Construction vehicles should only use the roads during the daylight hours. no construction vehicles should be operational from 6pm- 6am.
Noise	N 2: Acoustic impact on residential receptors- It is anticipated that no noise disturbances will be generated during the operational phase with exception of maintenance activities that will occur on an infrequent basis. The noise will be generated through machinery, equipment and vehicles. It is not deemed necessary to assess potential noise impacts during the operational phase of the project.	Pre-Mitigation: N/A Post Mitigation: N/A	Not applicable as no impacts are anticipated.
Social	SE 7: Change in sense of place- change in overall nature of the area / sense of place primarily as a result of visual impact of transmission line and structures	Pre- Mitigation: Medium (-ve) Post Mitigation: Medium (-ve)	Implementation of recommendations contained in the Visual Impact Assessment.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Indirect Impacts			
Social	SE 8: Evacuation of power- The proposed project will allow for the transmission of renewable power from the proposed WEF to the national grid. This will provide an additional source of energy for the national power supplier and the South African population. Indirectly the proposed project will allow for the social-economic benefits of the proposed WEF to be realised, i.e. increase in employment opportunities and increased economic development opportunities.	Pre- Mitigation: High (+ve) Post Mitigation: High (+ve)	No mitigation measures are required.
Alternative 4 (Substation 2, Route Option 2)			
Direct Impacts			
Geology	G 3: There are no anticipated potential impacts associated with the operation of the transmission lines or substation.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Soils and Land Capability	SLC 4: Reduction in land available for grazing animals- during the operational phase there will be a reduction in land available for grazing animals due to the occupation of the Transmission line and substation infrastructure within land previously used for grazing.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Maintenance activities should be limited to area on which the transmission infrastructure is located. § Rehabilitation of any disturbed areas to prevent soil erosion. § Existing roads and access routes are to be utilised to gain access to the infrastructure for maintenance purposes. § All equipment that has the potential to spill or leak must have a drip tray underneath at all
	SLC 5: Vegetation cleared for the powerlines and substation, soil disturbance and stockpiles, and increased traffic movement on site, resulting in a higher potential for soil erosion.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	
	SLC 6: Potential spillage of hazardous substances such as oils, fuel, grease from maintenance vehicles.	Pre-Mitigation: Low (-ve)	

Environmental Aspect	Impact summary	Significance	Proposed mitigation
		Post Mitigation: Low (-ve)	times. § Vehicles associated with the maintenance work must be in good working condition
Surface Water	SW 3: Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Powerlines must only cross perpendicular to a watercourse and the chosen alignment must endeavour that the span across the watercourse is minimilised to restrict the number of tower structures within a system (which should be avoided as far as possible). § The proposed tower structures should be structured should be positioned above the 1:100 floodline of any watercourse.
	SW 4: Permanent degradation of wetland/riparian habitat due to the proposed positioning of the transmission lines and tower structures.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ The WULA will require detailed functional assessments (i.e. ES, EIS and EcoServices) of freshwater habitats potentially affected by the site and powerlines. At this stage design details should be available allowing the freshwater specialist to assess specific areas within the site. Therefore, a more in-depth and thorough freshwater functional assessment should be conducted should BioTherm be recognised as a Preferred Bidder. § The detailed freshwater habitat assessment must provide recommendations in terms of tower structure positions in relation to freshwater habitats. § A freshwater habitat specialist be present onsite during the construction phase of the project, and conduct an in-depth site walkover

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			prior to any site work to assess the area for any wetlands and watercourses which may be affected by the actions conducted during the construction phase.
Groundwater	GW 2: Groundwater contamination associated with the spill or loss of containment of chemicals or spillage/ leaks of oil, fuel or grease from vehicles and equipment associated with the maintenance work.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Any spilled hazardous substances must be cleaned up immediately and disposed of appropriately. § Vehicles and equipment associated with the maintenance activities must be serviced regularly and kept in good working order.
Natural Vegetation and Animal Life	BIO 4: Previously disturbed areas will remain vulnerable to erosion for some time into the operational phase- Areas disturbed during construction will remain vulnerable to disturbance for some time into the operational phase and will require regular maintenance to ensure that erosion is minimised.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Wherever excavation is necessary, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species. § Due to the disturbance at the site as well as the increased runoff generated by the hard infrastructure, alien plant species are likely to be a long-term problem at the site and a long-term control plan will need to be implemented. Problem woody species such as Prosopis are already present in the area and are likely to increase rapidly if not controlled. § Regular monitoring for alien plants within the development footprint as well as adjacent areas which receive runoff from the facility as there are also likely to be prone to invasion

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			problems. § Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.
	BIO 5: Previously disturbed areas will remain vulnerable to alien plant invasion for some time- Disturbed areas are vulnerable to alien plant invasion and it is likely that road verges, tower structure foundation areas and other cleared or disturbed areas will be foci for alien plant invasion. Uncontrolled invasion can result in invasion into the intact rangeland and where woody species are involved, this can result in loss of biodiversity and a decline in ecosystem services.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Wherever excavation is necessary, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species. § Due to the disturbance at the site as well as the increased runoff generated by the hard infrastructure, alien plant species are likely to be a long-term problem at the site and a long-term control plan will need to be implemented. Problem woody species such as Prosopis are already present in the area and are likely to increase rapidly if not controlled. § Regular monitoring for alien plants within the development footprint as well as adjacent areas which receive runoff from the facility as there are also likely to be prone to invasion problems. § Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.
Avifauna	AV 3: Collision with the earthwire of the proposed 132 kV powerlines.	Pre-Mitigation: Medium (-ve)	A walk-through must be conducted by the avifaunal specialist after final pole positions have

Environmental Aspect	Impact summary	Significance	Proposed mitigation
		Post Mitigation: Medium (-ve)	been determined, to demarcate sections of line that will need to be mitigated with Bird Flight Diverters (BFDs).
	AV 4: Electrocution of Red Data avifauna.	Pre-Mitigation: Low (-ve)	No mitigation is required due to the low risk of electrocution posed by the steel monopole double circuit structures
		Post Mitigation: Low (-ve)	
	AV 5: Electrocution of Red Data avifauna in the substation yard.	Pre-Mitigation: Low (-ve)	The hardware within the substation yard is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site specific mitigation be applied reactively. This is an acceptable approach because Red List bird species are unlikely to frequent the substation and be electrocuted.
		Post Mitigation: Low (-ve)	
Heritage	H 4: Physical disturbance of archaeological sites. No impacts are anticipated during the operational phase.	Pre-Mitigation: N/A	Not Applicable as no impacts are anticipated.
		Post Mitigation: N/A	
Paleontological	P 2: Physical disturbance of palaeontological sites. No impacts are anticipated during the operational phase.	Pre-Mitigation: N/A	Not Applicable as no impacts are anticipated.
		Post Mitigation: N/A	
Visual	V 3: Intrusion on sense of place and rural landscape	Pre-Mitigation: Low (-ve)	§ Natural Vegetation must be re-established on disturbed areas following the completion of construction activities. § Roads should be appropriately stabilised to avoid erosion and visual scars. § Ensure all structures are well maintained.
		Post Mitigation: Low (-ve)	
	V 4: Visual impact of transmission lines and power tower	Pre-Mitigation: Medium (-ve)	
		Post Mitigation:	

Environmental Aspect	Impact summary	Significance	Proposed mitigation
		Medium (-ve)	
Traffic	T 2: Increased traffic generation around the study area by maintenance vehicles- the operational phase is expected to generate minimal additional traffic volumes on the local road network due to maintenance vehicles and equipment doing route inspections and maintenance.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ The posted speed limit on the R354 in the vicinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road. § intersection warning signs should be erected either side of the access road in accordance with the requirements of the South African Road Traffic Signs Manual. § Construction vehicles should only use the roads during the daylight hours. no construction vehicles should be operational from 6pm- 6am.
Noise	N 2: Acoustic impact on residential receptors- It is anticipated that no noise disturbances will be generated during the operational phase with exception of maintenance activities that will occur on an infrequent basis. The noise will be generated through machinery, equipment and vehicles. It is not deemed necessary to assess potential noise impacts during the operational phase of the project.	Pre-Mitigation: N/A Post Mitigation: N/A	Not applicable as no impacts are anticipated.
Social	SE 7: Change in sense of place- change in overall nature of the area / sense of place primarily as a result of visual impact of transmission line and structures	Pre- Mitigation: Medium (-ve) Post Mitigation: Medium (-ve)	Implementation of recommendations contained in the Visual Impact Assessment.
Indirect Impacts			

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Social	SE 8: Evacuation of power- The proposed project will allow for the transmission of renewable power from the proposed WEF to the national grid. This will provide an additional source of energy for the national power supplier and the South African population. Indirectly the proposed project will allow for the social-economic benefits of the proposed WEF to be realised, i.e. increase in employment opportunities and increased economic development opportunities.	Pre- Mitigation: High (+ve) Post Mitigation: High (+ve)	No mitigation measures are required.

Table 3: Impact Summary- Decommissioning phase

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Alternative 1 (Substation 1, Route Option 1)			
Direct Impacts			
Geology	G 4: Disturbance to underlying geology: during the decommissioning phase no earthworks are anticipated and therefore no potential impacts have been identified.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Soils and Land Capability	SLC 7: Increased potential of soil erosion- due to vegetation clearance, soil disturbance due to the removal of the transmission line structures and substation and a high traffic movement on sit.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Areas of disturbance should be (practically) limited in extent, and activities outside of the site should be kept to a minimum. § Traffic from vehicles associated with the decommissioning should be kept to a minimum to reduce soil compaction, and limited to existing roadways where practical. § Long term soil stockpiles should be appropriately redistributed to the site to infill any excavations incurred during the decommissioning phase. § All equipment that has the potential to spill or leak must have a drip tray underneath at all times.
	SLC 8: Potential land contamination from hazardous substances. This includes spillage of concrete onto soil surface, as well as oils, fuel, grease (from construction vehicles) and sewage from temporary on-site ablution facilities.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	
Surface Water	SW 5: Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ After the decommissioning, rehabilitation of the site must occur immediately to ensure no residual impacts remain. § A rehabilitation specialist must compile the

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	SW 6: Temporary/ Permanent degradation of wetland/riparian habitat due to the proposed positioning of the transmission lines and tower structures.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	rehabilitation plan and monitoring its implementation.
Groundwater	GW 3: Groundwater contamination associated with the spill or loss of containment of chemicals.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Adequate ablution facilities must be placed onsite. § All hazardous chemicals and materials must be stored within a lockable area on an impermeable surface.
Natural Vegetation and Animal Life	BIO 6: Faunal impacts due to the decommissioning of the wind farm such as noise, and operation of heavy machinery on-site. Decommissioning will require the use of heavy machinery on-site and will generate a lot of noise and disturbance which would have a negative impact on fauna. This impact would however be relatively short-lived and would ultimately result in the removal of the development and rehabilitation of the site.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Any potentially dangerous fauna such snakes or fauna threatened by the decommissioning activities should be removed to a safe location. § All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. § All vehicles accessing the site should adhere to a low speed limit (40km/h max) to avoid collisions with susceptible species such as snakes and tortoises. § All above-ground infrastructure should be removed from the site. Below-ground

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			infrastructure such as cabling can be left in place if it does not pose a risk, as removal of such cables may generate additional disturbance and impact.
	BIO 7: Soil Erosion following Decommissioning. Decommissioning will result in a lot of disturbance which will leave the site vulnerable to erosion. As a result the site should be monitored for erosion problems for at least 2 years after decommissioning.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Any roads that will not be rehabilitated should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. § There should be regular monitoring for erosion for at least 2 years after decommissioning by the applicant to ensure that no erosion problems develop as result of the disturbance, and if they do, to immediately implement erosion control measures. § All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. § All disturbed and cleared areas should be revegetated with indigenous perennial shrubs and grasses from the local area.
	Bio 8: Alien Plant Invasion during Decommissioning- Decommissioning will leave the site vulnerable to alien plant invasion and alien plants should be monitored and managed for at least two years following decommissioning or until an adequate cover of perennial plants has been established in disturbed areas.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Wherever excavation is necessary for decommissioning, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species. § Due to the disturbance at the site alien plant species are likely to be a long-term problem at the site following decommissioning and

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			regular control will need to be implemented until a cover of indigenous species has returned. § Regular monitoring for alien plants within the disturbed areas for at least two years after decommissioning. § Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.
Avifauna	AV 6: Displacement due to habitat destruction and disturbance associated with the decommissioning of the powerlines.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Activity should be restricted to the immediate footprint of the infrastructure. § Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. § Measures to control noise and dust should be applied according to current best practice in the industry. § Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. § The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the footprint and rehabilitation of disturbed areas is concerned.
	AV 7: Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the	Pre-Mitigation: Low (-ve)	§ Activity should be restricted to the immediate

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	decommissioning of the substation.	Post Mitigation: Low (-ve)	footprint of the infrastructure. § Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. § Measures to control noise and dust should be applied according to current best practice in the industry. § Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. § The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the footprint and rehabilitation of disturbed areas is concerned.
Heritage	H5: Physical disturbance of archaeological sites. No impacts are anticipated for the decommissioning phase.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Paleontological	P 3: Physical disturbance of palaeontological sites. No impacts are anticipated for the decommissioning phase.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Visual	V 5: Visual impact during decommissioning due to dust, vehicles and equipment.	Pre-Mitigation: Medium (-ve)	§ Natural vegetation must be re-established on disturbed areas following decommissioning.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
		Post Mitigation: Low (-ve)	§ The decommissioning footprint must be kept as small as possible. § Dust control and litter measures must be included in the EMPr.
Traffic	T 3: Increased traffic generation around the study area by vehicles associated with the decommissioning- the decommissioning phase is expected to generate additional traffic volumes on the local road network due to the transport of machinery to site and the transmission structures from site. However, whilst there will be an increase in the traffic flow, it is expected that the road network can accommodate the increase	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ The posted speed limit on the R354 in the vicinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road. § intersection warning signs should be erected either side of the access road in accordance with the requirements of the South African Road Traffic Signs Manual. § Vehicles associated with decommissioning should only use the roads during the daylight hours. No construction vehicles should be operational from 6pm- 6am.
Noise	N 3: Acoustic impact on residential receptors- It is anticipated that minor noise disturbances will be generated during the decommissioning and removal of the transmission lines and substation. The noise will be generated through machinery, equipment and vehicles.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	Planning decommissioning activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance. Information regarding construction activities should be provided to all local communities. Such information includes: § Proposed working times; § Anticipated duration of activities; § Explanations on activities to take place and reasons for activities; and

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			§ Contact details of a responsible person on site should complaints arise. § When working near (within 500 m) a potential sensitive receptor, limit the number of simultaneous activities to a minimum as far as possible; § Avoiding or minimizing project transportation through community areas; § Using noise control devices, such as temporary noise barriers and deflectors for impact and blasting activities, and exhaust muffling devices for combustion engines; § Selecting equipment with the lowest possible sound power levels; and § Ensuring equipment is well-maintained to avoid additional noise generation.
Social	SE 9: Gain of short term employment- Limited short term skilled and unskilled opportunities associated with decommissioning of the transmission infrastructure.	Pre- Mitigation: Low (+ve) Post Mitigation: Medium (+ve)	§ Appointment of local contractors; § Employment of local labour as far as possible, particularly for semi- and unskilled opportunities.
	SE 10: Nuisance from noise, dust and traffic disturbances- Localised disturbance as a result of dust, noise and traffic.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	Air quality, noise and traffic related mitigation measures recommended by relevant specialists and included in the EMPr.
Indirect Impacts			
Social	SE 11: Increased risk to neighbouring land users- Potential increased risk to farmers as a result of presence of labour force including petty theft, stock	Pre- Mitigation: Low (-ve) Post Mitigation:	Development of a code of conduct for decommissioning phase workers, to be signed by the contractor. Contractor to be held liable for

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	theft, damage to infrastructure.	Low (-ve)	compensating farmers for any loses and/or damage that can be linked to decommissioning workers.
Alternative 2 (Substation 1, Route Option 2)			
Direct Impacts			
Geology	G 4: Disturbance to underlying geology: during the decommissioning phase no earthworks are anticipated and therefore no potential impacts have been identified.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Soils and Land Capability	SLC 7: Increased potential of soil erosion- due to vegetation clearance, soil disturbance due to the removal of the transmission structures and substation and a high traffic movement on site.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Areas of disturbance should be (practically) limited in extent, and activities outside of the site should be kept to a minimum. § Traffic from vehicles associated with the decommissioning should be kept to a minimum to reduce soil compaction, and limited to existing roadways where practical. § Long term soil stockpiles should be appropriately redistributed to the site to infill any excavations incurred during the decommissioning phase. § All equipment that has the potential to spill or leak must have a drip tray underneath at all times.
	SLC 8: Potential land contamination from hazardous substances. This includes spillage of concrete onto soil surface, as well as oils, fuel, grease (from construction vehicles) and sewage from temporary on-site ablution facilities.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	
Surface Water	SW 5: Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ After the decommissioning, rehabilitation of the site must occur immediately to ensure no residual impacts remain. § A rehabilitation specialist must compile the

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	Temporary/ Permanent degradation of wetland/riparian habitat due to the proposed positioning of the transmission lines and tower structures.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	rehabilitation plan and monitoring its implementation.
Groundwater	SW 6: Groundwater contamination associated with the spill or loss of containment of chemicals.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Adequate ablution facilities must be placed onsite. § All hazardous chemicals and materials must be stored within a lockable area on an impermeable surface.
Natural Vegetation and Animal Life	BIO 6: Faunal impacts due to the decommissioning of the wind farm such as noise, and operation of heavy machinery on-site. Decommissioning will require the use of heavy machinery on-site and will generate a lot of noise and disturbance which would have a negative impact on fauna. This impact would however be relatively short-lived and would ultimately result in the removal of the development and rehabilitation of the site.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Any potentially dangerous fauna such snakes or fauna threatened by the decommissioning activities should be removed to a safe location. § All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. § All vehicles accessing the site should adhere to a low speed limit (40km/h max) to avoid collisions with susceptible species such as snakes and tortoises. § All above-ground infrastructure should be removed from the site. Below-ground

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			infrastructure such as cabling can be left in place if it does not pose a risk, as removal of such cables may generate additional disturbance and impact.
	Bio 7: Soil Erosion following Decommissioning. Decommissioning will result in a lot of disturbance which will leave the site vulnerable to erosion. As a result the site should be monitored for erosion problems for at least 2 years after decommissioning.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Any roads that will not be rehabilitated should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. § There should be regular monitoring for erosion for at least 2 years after decommissioning by the applicant to ensure that no erosion problems develop as result of the disturbance, and if they do, to immediately implement erosion control measures. § All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. § All disturbed and cleared areas should be revegetated with indigenous perennial shrubs and grasses from the local area.
	Bio 8: Alien Plant Invasion during Decommissioning- Decommissioning will leave the site vulnerable to alien plant invasion and alien plants should be monitored and managed for at least two years following decommissioning or until an adequate cover of perennial plants has been established in disturbed areas	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Wherever excavation is necessary for decommissioning, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species. § Due to the disturbance at the site alien plant species are likely to be a long-term problem at the site following decommissioning and

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			regular control will need to be implemented until a cover of indigenous species has returned. § Regular monitoring for alien plants within the disturbed areas for at least two years after decommissioning. § Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.
Avifauna	AV 6: Displacement due to habitat destruction and disturbance associated with the decommissioning of the powerlines.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Activity should be restricted to the immediate footprint of the infrastructure. § Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. § Measures to control noise and dust should be applied according to current best practice in the industry. § Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical.
	AV 7: Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the decommissioning of the substation.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Activity should be restricted to the immediate footprint of the infrastructure. § Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. § Measures to control noise and dust should be

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			applied according to current best practice in the industry. § Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. § The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the footprint and rehabilitation of disturbed areas is concerned.
Heritage	H 5: Physical disturbance of archaeological sites. No impacts are anticipated for the decommissioning phase.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Paleontological	P 3: Physical disturbance of palaeontological sites. No impacts are anticipated for the decommissioning phase.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Visual	V 5: Visual impact during decommissioning due to dust, vehicles and equipment.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Natural vegetation must be re-established on disturbed areas following decommissioning. § The decommissioning footprint must be kept as small as possible. § Dust control and litter measures must be included in the EMPr.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Traffic	T 3: Increased traffic generation around the study area by vehicles associated with the decommissioning- the decommissioning phase is expected to generate additional traffic volumes on the local road network due to the transport of machinery to site and the transmission structures from site. However, whilst there will be an increase in the traffic flow, it is expected that the road network can accommodate the increase	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ The posted speed limit on the R354 in the vicinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road. § intersection warning signs should be erected either side of the access road in accordance with the requirements of the South African Road Traffic Signs Manual. § Vehicles associated with decommissioning should only use the roads during the daylight hours. No construction vehicles should be operational from 6pm- 6am.
Noise	N 3: Acoustic impact on residential receptors- It is anticipated that minor noise disturbances will be generated during the decommissioning and removal of the transmission lines and substation. The noise will be generated through machinery, equipment and vehicles.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	Planning decommissioning activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance. Information regarding construction activities should be provided to all local communities. Such information includes: § Proposed working times; § Anticipated duration of activities; § Explanations on activities to take place and reasons for activities; and § Contact details of a responsible person on site should complaints arise. § When working near (within 500 m) a potential sensitive receptor, limit the number of

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			simultaneous activities to a minimum as far as possible; § Avoiding or minimizing project transportation through community areas; § Using noise control devices, such as temporary noise barriers and deflectors for impact and blasting activities, and exhaust muffling devices for combustion engines; § Selecting equipment with the lowest possible sound power levels; and § Ensuring equipment is well-maintained to avoid additional noise generation.
Social	SE 9: Gain of short term employment- Limited short term skilled and unskilled opportunities associated with decommissioning of the transmission infrastructure.	Pre- Mitigation: Low (+ve) Post Mitigation: Medium (+ve)	§ Appointment of local contractors; § Employment of local labour as far as possible, particularly for semi- and unskilled opportunities.
	SE 10: Nuisance from noise, dust and traffic disturbances- Localised disturbance as a result of dust, noise and traffic.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	Air quality, noise and traffic related mitigation measures recommended by relevant specialists and included in the EMPr.
Indirect Impacts			
Social	SE 11: Increased risk to neighbouring land users- Potential increased risk to farmers as a result of presence of labour force including petty theft, stock theft, damage to infrastructure.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	Development of a code of conduct for decommissioning phase workers, to be signed by the contractor. Contractor to be held liable for compensating farmers for any loses and/or damage that can be linked to decommissioning workers.
Alternative 3 (Substation 2, Route Option 1)			
Direct Impacts			

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Geology	G 4: Disturbance to underlying geology: during the decommissioning phase no earthworks are anticipated and therefore no potential impacts have been identified.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Soils and Land Capability	SLC 7: Increased potential of soil erosion- due to vegetation clearance, soil disturbance due to the removal of the transmission structures and a high traffic movement on site due.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Areas of disturbance should be (practically) limited in extent, and activities outside of the site should be kept to a minimum. § Traffic from vehicles associated with the decommissioning should be kept to a minimum to reduce soil compaction, and limited to existing roadways where practical. § Long term soil stockpiles should be appropriately redistributed to the site to infill any excavations incurred during the decommissioning phase. § All equipment that has the potential to spill or leak must have a drip tray underneath at all times.
	SLC 8: Potential land contamination from hazardous substances. This includes spillage of concrete onto soil surface, as well as oils, fuel, grease (from construction vehicles) and sewage from temporary on-site ablution facilities.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	
Surface Water	SW 5: Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ After the decommissioning, rehabilitation of the site must occur immediately to ensure no residual impacts remain. § A rehabilitation specialist must compile the rehabilitation plan and monitoring its implementation.
	SW 6: Temporary/ Permanent degradation of wetland/riparian habitat due to the proposed positioning of the transmission lines and tower structures.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Groundwater	GW 3: Groundwater contamination associated with the spill or loss of containment of chemicals.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Adequate ablution facilities must be placed onsite. § All hazardous chemicals and materials must be stored within a lockable area on an impermeable surface.
Natural Vegetation and Animal Life	BIO 6: Faunal impacts due to the decommissioning of the wind farm such as noise, and operation of heavy machinery on-site. Decommissioning will require the use of heavy machinery on-site and will generate a lot of noise and disturbance which would have a negative impact on fauna. This impact would however be relatively short-lived and would ultimately result in the removal of the development and rehabilitation of the site.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Any potentially dangerous fauna such snakes or fauna threatened by the decommissioning activities should be removed to a safe location. § All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. § All vehicles accessing the site should adhere to a low speed limit (40km/h max) to avoid collisions with susceptible species such as snakes and tortoises. § All above-ground infrastructure should be removed from the site. Below-ground infrastructure such as cabling can be left in place if it does not pose a risk, as removal of such cables may generate additional disturbance and impact.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	BIO 7: Soil Erosion following Decommissioning. Decommissioning will result in a lot of disturbance which will leave the site vulnerable to erosion. As a result the site should be monitored for erosion problems for at least 2 years after decommissioning.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Any roads that will not be rehabilitated should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. § There should be regular monitoring for erosion for at least 2 years after decommissioning by the applicant to ensure that no erosion problems develop as result of the disturbance, and if they do, to immediately implement erosion control measures. § All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. § All disturbed and cleared areas should be revegetated with indigenous perennial shrubs and grasses from the local area.
	BIO 8: Alien Plant Invasion during Decommissioning- Decommissioning will leave the site vulnerable to alien plant invasion and alien plants should be monitored and managed for at least two years following decommissioning or until an adequate cover of perennial plants has been established in disturbed areas	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Any roads that will not be rehabilitated should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. § There should be regular monitoring for erosion for at least 2 years after decommissioning by the applicant to ensure that no erosion problems develop as result of the disturbance, and if they do, to immediately implement erosion control measures. § All erosion problems observed should be rectified as soon as possible, using the

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			appropriate erosion control structures and revegetation techniques. § All disturbed and cleared areas should be revegetated with indigenous perennial shrubs and grasses from the local area.
Avifauna	AV 6: Displacement due to habitat destruction and disturbance associated with the decommissioning of the powerlines.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Activity should be restricted to the immediate footprint of the infrastructure. § Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. § Measures to control noise and dust should be applied according to current best practice in the industry. § Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. § The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the footprint and rehabilitation of disturbed areas is concerned.
	AV 7: Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the decommissioning of the substation	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Activity should be restricted to the immediate footprint of the infrastructure. § Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. § Measures to control noise and dust should be

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			applied according to current best practice in the industry. § Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. § The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the footprint and rehabilitation of disturbed areas is concerned.
Heritage	H 5: Physical disturbance of archaeological sites. No impacts are anticipated for the decommissioning phase.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Paleontological	P 3: Physical disturbance of palaeontological sites. No impacts are anticipated for the decommissioning phase.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Visual	V 5: Visual impact during decommissioning due to dust, vehicles and equipment.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Natural vegetation must be re-established on disturbed areas following decommissioning. § The decommissioning footprint must be kept as small as possible. § Dust control and litter measures must be included in the EMPr.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Traffic	T 3: Increased traffic generation around the study area by vehicles associated with the decommissioning- the decommissioning phase is expected to generate additional traffic volumes on the local road network due to the transport of machinery to site and the transmission structures from site. However, whilst there will be an increase in the traffic flow, it is expected that the road network can accommodate the increase	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ The posted speed limit on the R354 in the vicinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road. § intersection warning signs should be erected either side of the access road in accordance with the requirements of the South African Road Traffic Signs Manual. § Vehicles associated with decommissioning should only use the roads during the daylight hours. No construction vehicles should be operational from 6pm- 6am.
Noise	N 3: Acoustic impact on residential receptors- It is anticipated that minor noise disturbances will be generated during the decommissioning and removal of the transmission lines and substation. The noise will be generated through machinery, equipment and vehicles.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	Planning decommissioning activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance. Information regarding construction activities should be provided to all local communities. Such information includes: § Proposed working times; § Anticipated duration of activities; § Explanations on activities to take place and reasons for activities; and § Contact details of a responsible person on site should complaints arise. § When working near (within 500 m) a potential sensitive receptor, limit the number of

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			simultaneous activities to a minimum as far as possible; § Avoiding or minimizing project transportation through community areas; § Using noise control devices, such as temporary noise barriers and deflectors for impact and blasting activities, and exhaust muffling devices for combustion engines; § Selecting equipment with the lowest possible sound power levels; and § Ensuring equipment is well-maintained to avoid additional noise generation.
Social	SE 9: Gain of short term employment- Limited short term skilled and unskilled opportunities associated with decommissioning of the transmission infrastructure.	Pre- Mitigation: Low (+ve) Post Mitigation: Medium (+ve)	§ Appointment of local contractors; § Employment of local labour as far as possible, particularly for semi- and unskilled opportunities.
	SE 10: Nuisance from noise, dust and traffic disturbances- Localised disturbance as a result of dust, noise and traffic.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	Air quality, noise and traffic related mitigation measures recommended by relevant specialists and included in the EMPr.
Indirect Impacts			
Social	SE 11: Increased risk to neighbouring land users- Potential increased risk to farmers as a result of presence of labour force including petty theft, stock theft, damage to infrastructure.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	Development of a code of conduct for decommissioning phase workers, to be signed by the contractor. Contractor to be held liable for compensating farmers for any loses and/or damage that can be linked to decommissioning workers.
Alternative 4 (Substation 2, Route Option 2)			
Direct Impacts			

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Geology	G 4: Disturbance to underlying geology: during the decommissioning phase no earthworks are anticipated and therefore no potential impacts have been identified.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Soils and Land Capability	SLC 7: Increased potential of soil erosion- due to vegetation clearance, soil disturbance due to the removal of the transmission structures and a high traffic movement on site due.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Areas of disturbance should be (practically) limited in extent, and activities outside of the site should be kept to a minimum. § Traffic from vehicles associated with the decommissioning should be kept to a minimum to reduce soil compaction, and limited to existing roadways where practical. § Long term soil stockpiles should be appropriately redistributed to the site to infill any excavations incurred during the decommissioning phase. § All equipment that has the potential to spill or leak must have a drip tray underneath at all times.
	SLC 8: Potential land contamination from hazardous substances. This includes spillage of concrete onto soil surface, as well as oils, fuel, grease (from construction vehicles) and sewage from temporary on-site ablution facilities.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	
Surface Water	SW 5: Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ After the decommissioning, rehabilitation of the site must occur immediately to ensure no residual impacts remain. § A rehabilitation specialist must compile the rehabilitation plan and monitoring its implementation.
	SW 6: Temporary/ Permanent degradation of wetland/riparian habitat due to the proposed positioning of the transmission lines and tower structures.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	

Environmental Aspect	Impact summary	Significance	Proposed mitigation
Groundwater	GW 3: Groundwater contamination associated with the spill or loss of containment of chemicals.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Adequate ablution facilities must be placed onsite. § All hazardous chemicals and materials must be stored within a lockable area on an impermeable surface.
Natural Vegetation and Animal Life	BIO 6: Faunal impacts due to the decommissioning of the wind farm such as noise, and operation of heavy machinery on-site. Decommissioning will require the use of heavy machinery on-site and will generate a lot of noise and disturbance which would have a negative impact on fauna. This impact would however be relatively short-lived and would ultimately result in the removal of the development and rehabilitation of the site.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Any potentially dangerous fauna such snakes or fauna threatened by the decommissioning activities should be removed to a safe location. § All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. § All vehicles accessing the site should adhere to a low speed limit (40km/h max) to avoid collisions with susceptible species such as snakes and tortoises. § All above-ground infrastructure should be removed from the site. Below-ground infrastructure such as cabling can be left in place if it does not pose a risk, as removal of such cables may generate additional disturbance and impact.

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	BIO 7: Soil Erosion following Decommissioning. Decommissioning will result in a lot of disturbance which will leave the site vulnerable to erosion. As a result the site should be monitored for erosion problems for at least 2 years after decommissioning.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Any roads that will not be rehabilitated should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. § There should be regular monitoring for erosion for at least 2 years after decommissioning by the applicant to ensure that no erosion problems develop as result of the disturbance, and if they do, to immediately implement erosion control measures. § All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. § All disturbed and cleared areas should be revegetated with indigenous perennial shrubs and grasses from the local area.
	BIO 8: Alien Plant Invasion during Decommissioning- Decommissioning will leave the site vulnerable to alien plant invasion and alien plants should be monitored and managed for at least two years following decommissioning or until an adequate cover of perennial plants has been established in disturbed areas.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Wherever excavation is necessary for decommissioning, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species. § Due to the disturbance at the site alien plant species are likely to be a long-term problem at the site following decommissioning and regular control will need to be implemented until a cover of indigenous species has returned. § Regular monitoring for alien plants within the

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			disturbed areas for at least two years after decommissioning. § Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.
Avifauna	AV 6: Displacement due to habitat destruction and disturbance associated with the decommissioning of the powerlines.	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Activity should be restricted to the immediate footprint of the infrastructure. § Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. § Measures to control noise and dust should be applied according to current best practice in the industry. § Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical.
	AV 7: Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the decomissioning of the substation	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Activity should be restricted to the immediate footprint of the infrastructure. § Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. § Measures to control noise and dust should be applied according to current best practice in the industry. § Maximum use should be made of existing access roads and the construction of new

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			roads should be kept to a minimum as far as practical. § The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the footprint and rehabilitation of disturbed areas is concerned.
Heritage	H 5: Physical disturbance of archaeological sites. No impacts are anticipated for the decommissioning phase.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Paleontological	P 3: Physical disturbance of palaeontological sites. No impacts are anticipated for the decommissioning phase.	Pre-Mitigation: N/A Post Mitigation: N/A	Not Applicable as no impacts are anticipated.
Visual	V 5: Visual impact during decommissioning due to dust, vehicles and equipment.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Natural vegetation must be re-established on disturbed areas following decommissioning. § The decommissioning footprint must be kept as small as possible. § Dust control and litter measures must be included in the EMPr.
Traffic	T 3: Increased traffic generation around the study area by vehicles associated with the decommissioning- the decommissioning phase is expected to generate additional traffic volumes on the local road network due to the transport of machinery to site and the transmission structures from site. However, whilst there will be an increase in the traffic flow, it is expected	Pre-Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ The posted speed limit on the R354 in the vicinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road. § intersection warning signs should be erected either side of the access road in accordance

Environmental Aspect	Impact summary	Significance	Proposed mitigation
	that the road network can accommodate the increase		with the requirements of the South African Road Traffic Signs Manual. § Vehicles associated with decommissioning should only use the roads during the daylight hours. No construction vehicles should be operational from 6pm- 6am.
Noise	N 3: Acoustic impact on residential receptors- It is anticipated that minor noise disturbances will be generated during the decommissioning and removal of the transmission lines and substation. The noise will be generated through machinery, equipment and vehicles.	Pre-Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	Planning decommissioning activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance. Information regarding construction activities should be provided to all local communities. Such information includes: § Proposed working times; § Anticipated duration of activities; § Explanations on activities to take place and reasons for activities; and § Contact details of a responsible person on site should complaints arise. § When working near (within 500 m) a potential sensitive receptor, limit the number of simultaneous activities to a minimum as far as possible; § Avoiding or minimizing project transportation through community areas; § Using noise control devices, such as temporary noise barriers and deflectors for impact and blasting activities, and exhaust

Environmental Aspect	Impact summary	Significance	Proposed mitigation
			muffling devices for combustion engines; § Selecting equipment with the lowest possible sound power levels; and § Ensuring equipment is well-maintained to avoid additional noise generation.
Social	SE 9: Gain of short term employment- Limited short term skilled and unskilled opportunities associated with decommissioning of the transmission infrastructure.	Pre- Mitigation: Low (+ve) Post Mitigation: Medium (+ve)	§ Appointment of local contractors; § Employment of local labour as far as possible, particularly for semi- and unskilled opportunities.
	SE 10: Nuisance from noise, dust and traffic disturbances- Localised disturbance as a result of dust, noise and traffic.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	Air quality, noise and traffic related mitigation measures recommended by relevant specialists and included in the EMPr.
Indirect Impacts			
Social	SE 11: Increased risk to neighbouring land users- Potential increased risk to farmers as a result of presence of labour force including petty theft, stock theft, damage to infrastructure.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	Development of a code of conduct for decommissioning phase workers, to be signed by the contractor. Contractor to be held liable for compensating farmers for any loses and/or damage that can be linked to decommissioning workers.

Table 4: Cumulative Impacts associated with the Project Phase\

Cumulative Impacts			
Soil and Land Capacity	Reduction in land available for grazing animals- during the construction phase there will be a reduction in land available for grazing animals due to the occupation of the Transmission line and substation infrastructure within land previously used for grazing.	Pre- Mitigation: Medium (-ve)	§ Areas of construction should be (practically) limited in extent, and activities outside of the site should be kept to a minimum. § Excavated Soils should be appropriately stored in stockpiles which are protected from erosion. § Due to the potential for wind erosion, wind-breaks may be required in areas where wind erosion occurs. § Due to the flat topography water erosion is expected to be limited; however it should be rehabilitated if observed. § All equipment that has the potential to spill or leak must have a drip tray underneath at all times. § Cement must be mixed on an impermeable surface and not on the bare ground. § Any spilled or waste concrete onsite must be removed immediately and disposed of appropriately.
		Post Mitigation: Low (-ve)	
	Increased potential of soil erosion due to vegetation clearance, soil disturbance and a high traffic movement on site.	Pre- Mitigation: Low (-ve)	
		Post Mitigation: Low (-ve)	
	Potential land contamination from hazardous substances. This includes spillage of concrete onto soil surface, as well as oils, fuel, grease (from construction vehicles) and sewage from temporary on-site ablution facilities.	Pre- Mitigation: Low (-ve)	
		Post Mitigation: Low (-ve)	
Natural Vegetation and Animal Life	Impacts on CBA's and Broad-Scale Ecological Processes and due to habitat loss- Cumulative impacts are a significant concern in the area due to the large amount of wind energy development on the area. Furthermore, large parts of the Esizayo site and the powerline corridors are within CBAs and the loss of habitat within the CBAs may impact the ecological functioning of the CBAs and result in increased habitat	Pre- Mitigation: Low (-ve)	§ Minimise the development footprint within the Higher sensitivity parts of the site. § The development footprint should be kept to a minimum and natural vegetation should be encouraged to return to disturbed areas. § An Open Space Management plan should be
		Post Mitigation: Low (-ve)	

	fragmentation and reduced landscape connectivity. However, the footprint of the power line would be low and this impact is considered to be of low significance.		developed for the site, which should include management of biodiversity within the affected areas, as well as that in the adjacent rangeland.
	Impact on NPAES Focus Area and future conservation in the area- The majority of the site is within a NPAES Focus Area and the habitat loss resulting from this as well as the other wind energy developments in the area will contribute to cumulative impacts on the NPAES and this may have consequences for future conservation options in the area and the ability of the county to meet its conservation targets.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	
Avifauna	Habitat destruction and disturbance, collisions, electrocutions associated with the powerlines.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	§ Strict implementation of site-specific mitigation. § Strict monitoring of total number of authorised renewable applications to ensure that populations of Red Data avifauna can absorb the impacts.
	Habitat destruction and disturbance, electrocutions associated with the substation.	Pre- Mitigation: Low (-ve) Post Mitigation: Low (-ve)	
Paleontological	Physical disturbance of palaeontological sites- disturbance, damage or destruction of fossils preserved at or beneath the ground surface within the development footprint during the construction phase, mainly due to surface clearance or excavation activities.	Pre- Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	§ Monitoring of all surface clearance and substantial excavations (>1 m deep) by the ECO for fossil material (e.g. bones, teeth, fossil wood) on an on-going basis during the construction phase. § Safeguarding of chance fossil finds (preferably in situ) during the construction phase by the responsible ECO, followed by reporting of finds to Heritage Western Cape (HWC) / SAHRA. § Recording and judicious sampling of significant chance fossil finds by a qualified

			palaeontologist, together with pertinent contextual data (stratigraphy, sedimentology, taphonomy) (Phase 2 mitigation). § Curation of fossil material within an approved repository (museum / university fossil collection) and submission of a Phase 2 palaeontological heritage report to HWC / SAHRA by a qualified palaeontologist.
Noise	Acoustic impact on residential receptors.	Pre- Mitigation: Medium (-ve) Post Mitigation: Low (-ve)	Planning construction activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance. Information regarding construction activities should be provided to all local communities. Such information includes: § Proposed working times; § Anticipated duration of activities; § Explanations on activities to take place and reasons for activities; and § Contact details of a responsible person on site should complaints arise. § When working near (within 500 m) a potential sensitive receptor, limit the number of simultaneous activities to a minimum as far as possible; § Avoiding or minimizing project transportation through community areas; § Using noise control devices, such as temporary noise barriers and deflectors for impact and

			blasting activities, and exhaust muffling devices for combustion engines; § Selecting equipment with the lowest possible sound power levels; and § Ensuring equipment is well-maintained to avoid additional noise generation.
Social	Change in Sense of Place- Change in the landscape as a result of the development of transmission infrastructure associated with numerous renewable energy projects	Pre- Mitigation: Medium (-ve) Post Mitigation: N/A	The only mitigation measure proposed is that the project does not go ahead.

Table 5: Impact Summary- No-Go Powerlines

Environmental Aspect	Impact summary	Significance	Proposed mitigation
No- Go Option- Power lines and substation			
Direct Impacts			
Natural vegetation and Animal life	Impacts on vegetation and protected plant species	Pre-Mitigation: Low (+ve) Post Mitigation: N/A	No impacts are proposed, as this impact can't be mitigated.
	Impacts on fauna due to construction and operational activities	Pre-Mitigation: Low (+ve) Post Mitigation: N/A	No impacts are proposed, as this impact can't be mitigated.
Avifauna	The no-go option will result in no additional impacts on avifauna and will maintain the current ecological integrity	Pre-Mitigation: Low (+ve) Post Mitigation: N/A	No impacts are proposed, as this impact can't be mitigated.
Social	Loss of employment and local economic development resulting from construction and decommissioning activities.	Pre-Mitigation: Medium (-ve) Post Mitigation: N/A	No impacts are proposed, as this impact can't be mitigated.
	Maintenance of the existing landscape and sense of place.	Pre-Mitigation: Medium (+ve) Post Mitigation: N/A	No impacts are proposed, as this impact can't be mitigated.
	No infrastructure for the evacuation of power.	Pre-Mitigation: High (-ve) Post Mitigation: High (-ve)	No impacts are proposed, as this impact can't be mitigated.

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

2. ENVIRONMENTAL IMPACT STATEMENT

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

Alternative 1 (Substation 1, Route Option 1)

The impacts identified and assessed for the construction phase of Alternative 1 ranged from Low to Medium significance. However, with the implementation of mitigation measures all impacts identified were of Low significance, with the exception of the direct social impacts, specifically increase in employment and business opportunities. The increase in employment and business opportunities was of a Low positive significance however should the recommendations of the social impact assessment be implemented the impact is deemed to be of Medium positive significance. 20th century colonel ruins were identified at the proposed Substation 2 site. It is therefore proposed that the substation be shifted slightly and a 20m buffer placed around the ruins to protect them.

The impacts identified and assessed for the operational phase of Alternative 1 ranged from Low to Medium Significance. However, with mitigation measures impacts were all of Low significance with the exception of the Avifauna and Social impacts.

The most significant avifaunal impact identified is the collision of red data species with the powerline. There is very little in terms of mitigation measures that can be implemented to reduce the significance of the impact, however, should BFDs be installed on the powerlines, which have identified by an avifaunal specialist to be within the flight path of red data species the significance is reduced to a Medium negative significance.

With regards to the social impacts the most significant impacts identified were:

- A change in the sense of place
- Evacuation of power

The change in sense of place is deemed to be of Medium negative significance with very little mitigation that can be implemented to reduce the significance of the impact, with the exception of the removal of the infrastructure. It is recommended that the mitigation measures associated with the visual aspects are implemented to manage the impact. In terms of the evacuation of power, it is the only positive impact identified during this phase of the project and deemed to be of High significance with no mitigation or recommendations required with the exception of ensuring that the infrastructure is well maintained.

The impacts identified and assessed for the decommissioning phase of Alternative 1 ranged from Low to Medium significance. However, with the implementation of mitigation measures all impacts identified were of Low significance, with the exception of the direct social impacts, specifically gain of short-

term employment. The gain of short-term employment was of a Low positive significance however should the recommendations of the social impact assessment be implemented the impact is deemed to be of Medium positive significance.

The table below provides an overall summary of impacts identified and their considered significance as a result of the project.

Aspect	Impact	Significance	
		Pre-Mitigation	Post Mitigation
Construction Phase			
Direct Impacts			
Geology	Disturbance to underlying geology for the construction of the power lines	Low (-ve)	Low (-ve)
	Disturbance to underlying geology for the construction of the Substation	Low (-ve)	Low (-ve)
Soils and Land Capability	Reduction in land available for grazing animals	Medium (-ve)	Low (-ve)
	Increased potential of soil erosion	Low (-ve)	Low (-ve)
	Potential land contamination from hazardous substances	Low (-ve)	Low (-ve)
Surface Water	Alterations of flow regimes of watercourses	Medium (-ve)	Low (-ve)
	Temporary degradation of wetland/riparian habitat	Medium (-ve)	Low (-ve)
Ground Water	Groundwater contamination associated with the spill or loss of containment of chemicals	Low (-ve)	Low (-ve)
Natural Vegetation and Animal Life	Impacts on vegetation and protected plant species	Medium (-ve)	Low (-ve)
	Faunal impacts due to construction activities	Low (-ve)	Low (-ve)
	Increased Soil Erosion risk during construction	Medium (-ve)	Low (-ve)
Avifauna	Displacement of Red Data avifauna due to habitat destruction and disturbances associated with the construction of powerlines.	Low (-ve)	Low (-ve)
	Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the substation.	Low (-ve)	Low (-ve)
Heritage	Physical disturbance of archaeological sites during the construction of the transmission lines.	Medium (-ve)	Low (-ve)
	Physical disturbance of archaeological sites during the construction of the substation.	High (-ve)	Low (-ve)
Paleontological	Physical disturbance of palaeontological sites	Low (-ve)	Low (-ve)

Visual	Visual impact during construction due to dust, vehicles and equipment	Medium (-ve)	Low (-ve)
	Visual impact during construction due to vegetation clearing	Low (-ve)	Low (-ve)
Traffic	Increased traffic generation around the study area by construction vehicles	Low (-ve)	Low (-ve)
Noise	Acoustic impact on residential receptors	Medium (-ve)	Low (-ve)
Social	Increase in employment and business opportunities	Low (+ve)	Medium (+ve)
	Nuisance from noise, dust and traffic disturbances	Low (-ve)	Low (-ve)
	Increased risk of veld fires	Medium (-ve)	Low (-ve)
Indirect Impacts			
Social	Disruption due to influx of job seekers	Low (-ve)	Low (-ve)
	Increase in communicable diseases and reduced public health	Low (-ve)	Low (-ve)
	Increase risk to neighbouring land users	Low (-ve)	Low (-ve)
Operational Phase			
Direct Impacts			
Geology	No anticipated impacts	N/A	N/A
Soils and Land Capability	Reduction in land available for grazing animals	Medium (-ve)	Low (-ve)
	Vegetation cleared for the powerlines and substation resulting in a higher potential for soil erosion.	Low (-ve)	Low (-ve)
	Potential spillage of hazardous substances such as oils, fuel, grease from maintenance vehicles	Low (-ve)	Low (-ve)
Surface Water	Alterations of flow regimes of watercourses	Medium (-ve)	Low (-ve)
	Permanent degradation of wetland/riparian habitat	N/A	N/A
Groundwater	Groundwater contamination associated with the spill or loss of containment of chemicals or spillage/ leaks of oil, fuel or grease	Low (-ve)	Low (-ve)
Natural vegetation and Animal life	Previously disturbed areas will remain vulnerable to erosion for some time into the operational phase	Medium (-ve)	Low (-ve)
	Previously disturbed areas will remain vulnerable to alien plant invasion for some time	Low (-ve)	Low (-ve)
Avifauna	Collisions of Red Data avifauna with the earthwire of the proposed 132 kV powerlines.	High (-ve)	Medium (-ve)
	Electrocution of Red Data avifauna on the powerlines.	Low (-ve)	N/A (-ve)

	Electrocution of Red Data avifauna in the substation yard.	Low (-ve)	Low (-ve)
Heritage	No anticipated impacts	N/A	N/A
Paleontological	No anticipated impacts	N/A	N/A
Visual	Intrusion on sense of place and rural landscape	Low (-ve)	Low (-ve)
	Visual impact of transmission lines and power tower	Low (-ve)	Low (-ve)
Traffic	Increased traffic generation around the study area by maintenance vehicles-	Low (-ve)	Low (-ve)
Noise	No anticipated impacts	N/A	N/A
Social	Change in sense of place	Medium (-ve)	Medium (-ve)
Indirect impacts			
Social	Evacuation of power	High (+ve)	High(+ve)
Decommissioning Phase			
Direct Impacts			
Geology	No impacts anticipated.	N/A	N/A
Soils and Land Capability	Increased potential of soil erosion	Low (-ve)	Low (-ve)
	Potential land contamination from hazardous substances	Low (-ve)	Low (-ve)
Surface Water	Alterations of flow regimes of watercourses	Medium (-ve)	Low (-ve)
	Temporary/ Permanent degradation of wetland/riparian habitat	Medium (-ve)	Low (-ve)
Groundwater	Groundwater contamination associated with the spill or loss of containment of chemicals.	Low (-ve)	Low (-ve)
Natural Vegetation and Animal Life	Faunal impacts due to the decommissioning of the wind farm	Low (-ve)	Low (-ve)
	Soil Erosion following Decommissioning	Medium (-ve)	Low (-ve)
	Alien Plant Invasion during Decommissioning	Low (-ve)	Low (-ve)
Avifauna	Displacement due to habitat destruction and disturbance associated with the decommissioning of the powerlines.	Low (-ve)	Low (-ve)
	Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the decommissioning of the substation.	Low (-ve)	Low (-ve)
Heritage	No impacts anticipated	N/A	N/A
Paleontological	No impacts anticipated	N/A	N/A
Visual	Visual impact during decommissioning due to dust, vehicles and equipment	Medium (-ve)	Low (-ve)

Traffic	Increased traffic generation around the study area by vehicles associated with the decommissioning	Low (-ve)	Low (-ve)
Noise	Acoustic impact on residential receptors	Medium (-ve)	Low (-ve)
Social	Gain of short term employment	Low (+ve)	Medium (+ve)
	Nuisance from noise, dust and traffic disturbances	Low (-ve)	Low (-ve)
Indirect Impacts			
Social	Increased risk to neighbouring land users	Low (-ve)	Low (-ve)

Alternative 2 (Substation 1, Route Option 2)- Preferred Alternative

The impacts identified and assessed for the construction phase of Alternative 2 ranged from Low to Medium significance. However, with the implementation of mitigation measures all impacts identified were of Low significance, with the exception of the direct social impacts, specifically increase in employment and business opportunities. The increase in employment and business opportunities was of a Low positive significance however should the recommendations of the social impact assessment be implemented the impact is deemed to be of Medium positive significance. 20th century colonel ruins were identified at the proposed Substation 2 site. It is therefore proposed that the substation be shifted slightly and a 20m buffer placed around the ruins to protect them.

In terms in the difference between Alternative 1 and Alternative 2, the significance of the impact on vegetation and protected species is slightly lower prior to mitigation in Alternative 2, however the displacement of Red Data avifauna due to the construction of the powerlines is of slightly higher significance prior to mitigation.

The impacts identified and assessed for the operational phase of Alternative 2 ranged from Low to Medium Significance. However, with mitigation measures impacts were all of Low significance with the exception of the Social impacts.

With regards to the social impacts the most significant impacts identified were:

- A change in the sense of place
- Evacuation of power

The change in sense of place is deemed to be of Medium negative significance with very little mitigation that can be implemented to reduce the significance of the impact, with the exception of the removal of the infrastructure. It is recommended that the mitigation measures associated with the visual aspects are implemented to manage the impact. In terms of the evacuation of power, it is the only positive impact identified during this phase of the project and deemed to be of High significance with no mitigation or recommendations required with the exception of ensuring that the infrastructure is well maintained.

It is noted that the risk of collision of red data species with the powerline was deemed to be of Medium Significance prior to mitigation measures and of Low Significance with the introduction of mitigation measures. Alternative 1 had a High significance prior to mitigation and was of Medium significance once

mitigation measures are introduced. The powerline route for Alternative 2 is deemed to be of a lower significance is due to it running along the R354 and existing transmission lines for most of the way. The road and powerlines already constitute utility corridors and by placing it along these linear anthropogenic features should reduce the risk of collisions. Red Data species would normally avoid the immediate vicinity of a road due to the noise and movement of the traffic, and putting a new powerline next to an existing one could help to make both lines more visible.

The impacts identified and assessed for the decommissioning phase of Alternative 2 ranged from Low to Medium significance. However, with the implementation of mitigation measures all impacts identified were of Low significance, with the exception of the direct social impacts, specifically gain of short-term employment. The gain of short-term employment was of a Low positive significance however should the recommendations of the social impact assessment be implemented the impact is deemed to be of Medium positive significance. No fatal flaws or impacts with high negative significance where identified.

The table below provides an overall summary of impacts identified and their considered significance as a result of the project.

Aspect	Impact	Significance	
		Pre-Mitigation	Post Mitigation
Construction Phase			
Direct Impacts			
Geology	Disturbance to underlying geology for the construction of the power lines	Low (-ve)	N/A
	Disturbance to underlying geology for the construction of the Substation	Low (-ve)	N/A
Soils and Land Capability	Reduction in land available for grazing animals	Medium (-ve)	Low (-ve)
	Increased potential of soil erosion	Low (-ve)	Low (-ve)
	Potential land contamination from hazardous substances	Low (-ve)	Low (-ve)
Surface Water	Alterations of flow regimes of watercourses	Medium (-ve)	Low (-ve)
	Temporary degradation of wetland/riparian habitat	Medium (-ve)	Low (-ve)
Ground Water	Groundwater contamination associated with the spill or loss of containment of chemicals	Low (-ve)	Low (-ve)
Natural Vegetation and Animal Life	Impacts on vegetation and protected plant species	Low(-ve)	Low (-ve)
	Faunal impacts due to construction activities	Low (-ve)	Low (-ve)
	Increased Soil Erosion risk during construction	Low (-ve)	Low (-ve)
Avifauna	Displacement of Red Data avifauna due to habitat destruction and disturbances associated with the construction of powerlines.	Medium (-ve)	Low (-ve)
	Displacement of Red Data avifauna due to habitat destruction and	Low (-ve)	Low (-ve)

	disturbance associated with the construction of the substation.		
Heritage	Physical disturbance of archaeological sites during the construction of the transmission lines.	Medium (-ve)	Low (-ve)
	Physical disturbance of archaeological sites during the construction of the substation.	High (-ve)	Low (-ve)
Paleontological	Physical disturbance of palaeontological sites	Low (-ve)	Low (-ve)
Visual	Visual impact during construction due to dust, vehicles and equipment	Medium (-ve)	Low (-ve)
	Visual impact during construction due to vegetation clearing	Low (-ve)	Low (-ve)
Traffic	Increased traffic generation around the study area by construction vehicles	Low (-ve)	Low (-ve)
Noise	Acoustic impact on residential receptors	Medium (-ve)	Low (-ve)
Social	Increase in employment and business opportunities	Low (+ve)	Medium (+ve)
	Nuisance from noise, dust and traffic disturbances	Low (-ve)	Low (-ve)
	Increased risk of veld fires	Medium (-ve)	Low (-ve)
Indirect Impacts			
Heritage	Vandalism of heritage items	Medium (-ve)	Low (-ve)
Social	Disruption due to influx of job seekers	Low (-ve)	Low (-ve)
	Increase in communicable diseases and reduced public health	Low (-ve)	Low (-ve)
	Increase risk to neighbouring land users	Low (-ve)	Low (-ve)
Operational Phase			
Direct Impacts			
Geology	No anticipated impacts	N/A	N/A
Soils and Land Capability	Reduction in land available for grazing animals	Medium (-ve)	Low (-ve)
	Vegetation cleared for the powerlines and substation resulting in a higher potential for soil erosion.	Low (-ve)	Low (-ve)
	Potential spillage of hazardous substances such as oils, fuel, grease from maintenance vehicles	Low (-ve)	Low (-ve)
Surface Water	Alterations of flow regimes of watercourses	Medium (-ve)	Low (-ve)
	Permanent degradation of wetland/riparian habitat	Medium (-ve)	Low (-ve)
Groundwater	Groundwater contamination associated with the spill or loss of containment of chemicals or spillage/ leaks of oil, fuel or grease	Low (-ve)	Low (-ve)

Natural vegetation and Animal life	Previously disturbed areas will remain vulnerable to erosion for some time into the operational phase	Low (-ve)	Low (-ve)
	Previously disturbed areas will remain vulnerable to alien plant invasion for some time	Low (-ve)	Low (-ve)
Avifauna	Collisions of Red Data avifauna with the earthwire of the proposed 132 kV powerlines.	Medium (-ve)	Low (-ve)
	Electrocution of Red Data avifauna on the powerlines.	Low (-ve)	N/A
	Electrocution of Red Data avifauna in the substation yard.	Low (-ve)	Low (-ve)
Heritage	No anticipated impacts	N/A	N/A
Paleontological	No anticipated impacts	N/A	N/A
Visual	Intrusion on sense of place and rural landscape	Low (-ve)	Low (-ve)
	Visual impact of transmission lines and power tower	Low (-ve)	Low (-ve)
Traffic	Increased traffic generation around the study area by maintenance vehicles-	Low (-ve)	Low (-ve)
Noise	No anticipated impacts	N/A	N/A
Social	Change in sense of place	Medium (-ve)	Medium (-ve)
Indirect impacts			
Social	Evacuation of power	High (+ve)	High(+ve)
Decommissioning Phase			
Direct Impacts			
Geology	No impacts anticipated.	N/A	N/A
Soils and Land Capability	Increased potential of soil erosion	Low (-ve)	Low (-ve)
	Potential land contamination from hazardous substances	Low (-ve)	Low (-ve)
Surface Water	Alterations of flow regimes of watercourses	Medium (-ve)	Low (-ve)
	Temporary/ Permanent degradation of wetland/riparian habitat	Medium (-ve)	Low (-ve)
Groundwater	Groundwater contamination associated with the spill or loss of containment of chemicals.	Low (-ve)	Low (-ve)
Natural Vegetation and Animal Life	Faunal impacts due to the decommissioning of the wind farm	Low (-ve)	Low (-ve)
	Soil Erosion following Decommissioning	Low (-ve)	Low (-ve)
	Alien Plant Invasion during Decommissioning	Low (-ve)	Low (-ve)
Avifauna	Displacement due to habitat destruction and disturbance associated	Low (-ve)	Low (-ve)

	with the decommissioning of the powerlines.		
	Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the decommissioning of the substation.	Low (-ve)	Low (-ve)
Heritage	No impacts anticipated	N/A	N/A
Paleontological	No impacts anticipated	N/A	N/A
Visual	Visual impact during decommissioning due to dust, vehicles and equipment	Medium (-ve)	Low (-ve)
Traffic	Increased traffic generation around the study area by vehicles associated with the decommissioning	Low (-ve)	Low (-ve)
Noise	Acoustic impact on residential receptors	Medium (-ve)	Low (-ve)
Social	Gain of short term employment	Low (+ve)	Medium (+ve)
	Nuisance from noise, dust and traffic disturbances	Low (-ve)	Low (-ve)
Indirect Impacts			
Social	Increased risk to neighbouring land users	Low (-ve)	Low (-ve)

Alternative 3 (Substation 2, Route Option 1)

The impacts identified and assessed for the construction phase of Alternative 3 ranged from Low to Medium significance. However, with the implementation of mitigation measures all impacts identified were of Low significance, with the exception of the direct social impacts, specifically increase in employment and business opportunities. The increase in employment and business opportunities was of a Low positive significance however should the recommendations of the social impact assessment be implemented the impact is deemed to be of Medium positive significance.

The impacts identified and assessed for the operational phase of Alternative 3 ranged from Low to Medium Significance. However, with mitigation measures impacts were all of Low significance with the exception of the Avifauna and Social impacts.

The most significant avifaunal impact identified is the collision of red data species with the powerline. There is very little in terms of mitigation measures that can be implemented to reduce the significance of the impact, however, should BFDs be installed on the powerlines, which have identified by an avifaunal specialist to be within the flight path of red data species the significance is reduced to a Medium negative significance.

With regards to the social impacts the most significant impacts identified were:

- A change in the sense of place
- Evacuation of power

The change in sense of place is deemed to be of Medium negative significance with very little mitigation that can be implemented to reduce the significance of

the impact, with the exception of the removal of the infrastructure. It is recommended that the mitigation measures associated with the visual aspects are implemented to manage the impact. In terms of the evacuation of power, it is the only positive impact identified during this phase of the project and deemed to be of High significance with no mitigation or recommendations required with the exception of ensuring that the infrastructure is well maintained.

The impacts identified and assessed for the decommissioning phase of Alternative 3 ranged from Low to Medium significance. However, with the implementation of mitigation measures all impacts identified were of Low significance, with the exception of the direct social impacts, specifically gain of short-term employment. The gain of short-term employment was of a Low positive significance however should the recommendations of the social impact assessment be implemented the impact is deemed to be of Medium positive significance. No fatal flaws or impacts with high negative significance where identified.

The table below provides an overall summary of impacts identified and their considered significance as a result of the project.

Aspect	Impact	Significance	
		Pre-Mitigation	Post Mitigation
Construction Phase			
Direct Impacts			
Geology	Disturbance to underlying geology for the construction of the power lines	Low (-ve)	N/A
	Disturbance to underlying geology for the construction of the Substation	Low (-ve)	N/A
Soils and Land Capability	Reduction in land available for grazing animals	Medium (-ve)	Low (-ve)
	Increased potential of soil erosion	Low (-ve)	Low (-ve)
	Potential land contamination from hazardous substances	Low (-ve)	Low (-ve)
Surface Water	Alterations of flow regimes of watercourses	Medium (-ve)	Low (-ve)
	Temporary degradation of wetland/riparian habitat	Medium (-ve)	Low (-ve)
Ground Water	Groundwater contamination associated with the spill or loss of containment of chemicals	Low (-ve)	Low (-ve)
Natural Vegetation and Animal Life	Impacts on vegetation and protected plant species	Medium(-ve)	Low (-ve)
	Faunal impacts due to construction activities	Low (-ve)	Low (-ve)
	Increased Soil Erosion risk during construction	Medium (-ve)	Low (-ve)
Avifauna	Displacement of Red Data avifauna due to habitat destruction and disturbances associated with the construction of powerlines.	Low (-ve)	Low (-ve)
	Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the substation.	Medium (-ve)	Low (-ve)

Heritage	Physical disturbance of archaeological sites during the construction of the transmission lines.	Low (-ve)	Low (-ve)
	Physical disturbance of archaeological sites during the construction of the substation.	Low (-ve)	Low (-ve)
Paleontological	Physical disturbance of palaeontological sites	Low (-ve)	Low (-ve)
Visual	Visual impact during construction due to dust, vehicles and equipment	Medium (-ve)	Low (-ve)
	Visual impact during construction due to vegetation clearing	Low (-ve)	Low (-ve)
Traffic	Increased traffic generation around the study area by construction vehicles	Low (-ve)	Low (-ve)
Noise	Acoustic impact on residential receptors	Medium (-ve)	Low (-ve)
Social	Increase in employment and business opportunities	Low (+ve)	Medium (+ve)
	Nuisance from noise, dust and traffic disturbances	Low (-ve)	Low (-ve)
	Increased risk of veld fires	Medium (-ve)	Low (-ve)
Indirect Impacts			
Social	Disruption due to influx of job seekers	Low (-ve)	Low (-ve)
	Increase in communicable diseases and reduced public health	Low (-ve)	Low (-ve)
	Increase risk to neighbouring land users	Low (-ve)	Low (-ve)
Operational Phase			
Direct Impacts			
Geology	No anticipated impacts	N/A	N/A
Soils and Land Capability	Reduction in land available for grazing animals	Medium (-ve)	Low (-ve)
	Vegetation cleared for the powerlines and substation resulting in a higher potential for soil erosion.	Low (-ve)	Low (-ve)
	Potential spillage of hazardous substances such as oils, fuel, grease from maintenance vehicles	Low (-ve)	Low (-ve)
Surface Water	Alterations of flow regimes of watercourses	Medium (-ve)	Low (-ve)
	Permanent degradation of wetland/riparian habitat	N/A	N/A
Groundwater	Groundwater contamination associated with the spill or loss of containment of chemicals or spillage/ leaks of oil, fuel or grease	Low (-ve)	Low (-ve)
Natural vegetation and Animal life	Previously disturbed areas will remain vulnerable to erosion for some time into the operational phase	Medium (-ve)	Low (-ve)

	Previously disturbed areas will remain vulnerable to alien plant invasion for some time	Low (-ve)	Low (-ve)
Avifauna	Collisions of Red Data avifauna with the earthwire of the proposed 132 kV powerlines.	High (-ve)	Medium (-ve)
	Electrocution of Red Data avifauna on the powerlines.	Low (-ve)	N/A
	Electrocution of Red Data avifauna in the substation yard.	Low (-ve)	Low (-ve)
Heritage	No anticipated impacts	N/A	N/A
Paleontological	No anticipated impacts	N/A	N/A
Visual	Intrusion on sense of place and rural landscape	Low (-ve)	Low (-ve)
	Visual impact of transmission lines and power tower	Medium (-ve)	Medium (-ve)
Traffic	Increased traffic generation around the study area by maintenance vehicles-	Low (-ve)	Low (-ve)
Noise	No anticipated impacts	N/A	N/A
Social	Change in sense of place	Medium (-ve)	Medium (-ve)
Indirect impacts			
Social	Evacuation of power	High (+ve)	High(+ve)
Decommissioning Phase			
Direct Impacts			
Geology	No impacts anticipated.	N/A	N/A
Soils and Land Capability	Increased potential of soil erosion	Low (-ve)	Low (-ve)
	Potential land contamination from hazardous substances	Low (-ve)	Low (-ve)
Surface Water	Alterations of flow regimes of watercourses	Medium (-ve)	Low (-ve)
	Temporary/ Permanent degradation of wetland/riparian habitat	Medium (-ve)	Low (-ve)
Groundwater	Groundwater contamination associated with the spill or loss of containment of chemicals.	Low (-ve)	Low (-ve)
Natural Vegetation and Animal Life	Faunal impacts due to the decommissioning of the wind farm	Low (-ve)	Low (-ve)
	Soil Erosion following Decommissioning	Medium (-ve)	Low (-ve)
	Alien Plant Invasion during Decommissioning	Low (-ve)	Low (-ve)
Avifauna	Displacement due to habitat destruction and disturbance associated with the decommissioning of the powerlines.	Low (-ve)	Low (-ve)
	Displacement of Red Data avifauna due to habitat destruction and	Low (-ve)	Low (-ve)

	disturbance associated with the decommissioning of the substation.		
Heritage	No impacts anticipated	N/A	N/A
Paleontological	No impacts anticipated	N/A	N/A
Visual	Visual impact during decommissioning due to dust, vehicles and equipment	Medium (-ve)	Low (-ve)
Traffic	Increased traffic generation around the study area by vehicles associated with the decommissioning	Low (-ve)	Low (-ve)
Noise	Acoustic impact on residential receptors	Medium (-ve)	Low (-ve)
Social	Gain of short term employment	Low (+ve)	Medium (+ve)
	Nuisance from noise, dust and traffic disturbances	Low (-ve)	Low (-ve)
Indirect Impacts			
Social	Increased risk to neighbouring land users	Low (-ve)	Low (-ve)

Alternative 4 (Substation 2, Route Option 2)

The impacts identified and assessed for the construction phase of Alternative 4 ranged from Low to Medium significance. However, with the implementation of mitigation measures all impacts identified were of Low significance, with the exception of the direct social impacts, specifically increase in employment and business opportunities. The increase in employment and business opportunities was of a Low positive significance however should the recommendations of the social impact assessment be implemented the impact is deemed to be of Medium positive significance.

The impacts identified and assessed for the operational phase of Alternative 4 ranged from Low to Medium Significance. However, with mitigation measures impacts were all of Low significance with the exception of the Avifauna and Social impacts.

The most significant avifaunal impact identified is the collision of red data species with the powerline. There is very little in terms of mitigation measures that can be implemented to reduce the significance of the impact, however, should BFDs be installed on the powerlines, which have identified by an avifaunal specialist to be within the flight path of red data species the significance is reduced to a Medium negative significance.

With regards to the social impacts the most significant impacts identified were:

- A change in the sense of place
- Evacuation of power

The change in sense of place is deemed to be of Medium negative significance with very little mitigation that can be implemented to reduce the significance of the impact, with the exception of the removal of the infrastructure. It is recommended that the mitigation measures associated with the visual aspects are implemented to manage the impact. In terms of the evacuation of power, it is the only positive impact identified during this phase of the project and deemed to

be of High significance with no mitigation or recommendations required with the exception of ensuring that the infrastructure is well maintained.

The impacts identified and assessed for the decommissioning phase of Alternative 4 ranged from Low to Medium significance. However, with the implementation of mitigation measures all impacts identified were of Low significance, with the exception of the direct social impacts, specifically gain of short-term employment. The gain of short-term employment was of a Low positive significance however should the recommendations of the social impact assessment be implemented the impact is deemed to be of Medium positive significance. No fatal flaws or impacts with high negative significance where identified.

The table below provides an overall summary of impacts identified and their considered significance as a result of the project.

Aspect	Impact	Significance	
		Pre-Mitigation	Post Mitigation
Construction Phase			
Direct Impacts			
Geology	Disturbance to underlying geology for the construction of the power lines	Low (-ve)	N/A
	Disturbance to underlying geology for the construction of the Substation	Low (-ve)	N/A
Soils and Land Capability	Reduction in land available for grazing animals	Medium (-ve)	Low (-ve)
	Increased potential of soil erosion	Low (-ve)	Low (-ve)
	Potential land contamination from hazardous substances	Low (-ve)	Low (-ve)
Surface Water	Alterations of flow regimes of watercourses	Medium (-ve)	Low (-ve)
	Temporary degradation of wetland/riparian habitat	Medium (-ve)	Low (-ve)
Ground Water	Groundwater contamination associated with the spill or loss of containment of chemicals	Low (-ve)	Low (-ve)
Natural Vegetation and Animal Life	Impacts on vegetation and protected plant species	Medium(-ve)	Low (-ve)
	Faunal impacts due to construction activities	Low (-ve)	Low (-ve)
	Increased Soil Erosion risk during construction	Medium (-ve)	Low (-ve)
Avifauna	Displacement of Red Data avifauna due to habitat destruction and disturbances associated with the construction of powerlines.	Medium (-ve)	Low (-ve)
	Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the substation.	Low (-ve)	Low (-ve)
Heritage	Physical disturbance of archaeological sites during the construction of the transmission lines.	Low (-ve)	Low (-ve)

	Physical disturbance of archaeological sites during the construction of the substation.	Low (-ve)	Low (-ve)
Paleontological	Physical disturbance of palaeontological sites	Low (-ve)	Low (-ve)
Visual	Visual impact during construction due to dust, vehicles and equipment	Medium (-ve)	Low (-ve)
	Visual impact during construction due to vegetation clearing	Medium (-ve)	Low (-ve)
Traffic	Increased traffic generation around the study area by construction vehicles	Low (-ve)	Low (-ve)
Noise	Acoustic impact on residential receptors	Medium (-ve)	Low (-ve)
Social	Increase in employment and business opportunities	Low (+ve)	Medium (+ve)
	Nuisance from noise, dust and traffic disturbances	Low (-ve)	Low (-ve)
	Increased risk of veld fires	Medium (-ve)	Low (-ve)
Indirect Impacts			
Heritage	Vandalism of heritage items	Medium (-ve)	Low (-ve)
Social	Disruption due to influx of job seekers	Low (-ve)	Low (-ve)
	Increase in communicable diseases and reduced public health	Low (-ve)	Low (-ve)
	Increase risk to neighbouring land users	Low (-ve)	Low (-ve)
Operational Phase			
Direct Impacts			
Geology	No anticipated impacts	N/A	N/A
Soils and Land Capability	Reduction in land available for grazing animals	Low (-ve)	Low (-ve)
	Vegetation cleared for the powerlines and substation resulting in a higher potential for soil erosion.	Low (-ve)	Low (-ve)
	Potential spillage of hazardous substances such as oils, fuel, grease from maintenance vehicles	Low (-ve)	Low (-ve)
Surface Water	Alterations of flow regimes of watercourses	Medium (-ve)	Low (-ve)
	Permanent degradation of wetland/riparian habitat	Medium (-ve)	Low (-ve)
Groundwater	Groundwater contamination associated with the spill or loss of containment of chemicals or spillage/ leaks of oil, fuel or grease	Low (-ve)	Low (-ve)
Natural vegetation and Animal life	Previously disturbed areas will remain vulnerable to erosion for some time into the operational phase	Medium (-ve)	Low (-ve)
	Previously disturbed areas will remain vulnerable to alien plant	Low (-ve)	Low (-ve)

	invasion for some time		
Avifauna	Collisions of Red Data avifauna with the earth wire of the proposed 132 kV powerlines.	Medium (-ve)	Medium (-ve)
	Electrocution of Red Data avifauna on the powerlines.	Low (-ve)	Low (-ve)
	Electrocution of Red Data avifauna in the substation yard.	Low (-ve)	Low (-ve)
Heritage	No anticipated impacts	N/A	N/A
Paleontological	No anticipated impacts	N/A	N/A
Visual	Intrusion on sense of place and rural landscape	Low (-ve)	Low (-ve)
	Visual impact of transmission lines and power tower	Medium (-ve)	Medium (-ve)
Traffic	Increased traffic generation around the study area by maintenance vehicles-	Low (-ve)	Low (-ve)
Noise	No anticipated impacts	N/A	N/A
Social	Change in sense of place	Medium (-ve)	Medium (-ve)
Indirect impacts			
Social	Evacuation of power	High (+ve)	High(+ve)
Decommissioning Phase			
Direct Impacts			
Geology	No impacts anticipated.	N/A	N/A
Soils and Land Capability	Increased potential of soil erosion	Low (-ve)	Low (-ve)
	Potential land contamination from hazardous substances	Low (-ve)	Low (-ve)
Surface Water	Alterations of flow regimes of watercourses	Medium (-ve)	Low (-ve)
	Temporary/ Permanent degradation of wetland/riparian habitat	Medium (-ve)	Low (-ve)
Groundwater	Groundwater contamination associated with the spill or loss of containment of chemicals.	Low (-ve)	Low (-ve)
Natural Vegetation and Animal Life	Faunal impacts due to the decommissioning of the wind farm	Low (-ve)	Low (-ve)
	Soil Erosion following Decommissioning	Medium (-ve)	Low (-ve)
	Alien Plant Invasion during Decommissioning	Low (-ve)	Low (-ve)
Avifauna	Displacement due to habitat destruction and disturbance associated with the decommissioning of the powerlines.	Low (-ve)	Low (-ve)
	Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the decommissioning of the substation.	Low (-ve)	Low (-ve)

Heritage	No impacts anticipated	N/A	N/A
Paleontological	No impacts anticipated	N/A	N/A
Visual	Visual impact during decommissioning due to dust, vehicles and equipment	Medium (-ve)	Low (-ve)
Traffic	Increased traffic generation around the study area by vehicles associated with the decommissioning	Low (-ve)	Low (-ve)
Noise	Acoustic impact on residential receptors	Medium (-ve)	Low (-ve)
Social	Gain of short term employment	Low (+ve)	Medium (+ve)
	Nuisance from noise, dust and traffic disturbances	Low (-ve)	Low (-ve)
Indirect Impacts			
Social	Increased risk to neighbouring land users	Low (-ve)	Low (-ve)

No-go alternative (compulsory)

The No-go Alternative is the option of not implementing the proposed project. It is noted that the scope of this application includes the establishment of a 132 kV transmission line and associated substation for the integration of the power generated at the proposed Esizayo WEF to the national grid. The proposed transmission line is essential supporting infrastructure to the WEF, which, once developed, will generate power from renewable energy resources.

South Africa currently relies almost completely on fossil fuels as a primary energy source (approximately 90%) with coal providing 75% of the fossil fuel based energy supply. Coal combustion in South Africa is the main contributor to carbon dioxide emissions, which is the main greenhouse gas that has been linked to climate change.

An emphasis has therefore been placed on securing South Africa's future power supply through the diversification of power generation sources. Furthermore, South Africa would have to invest in a power generation mix, and not solely rely on coal-fired power generation, to honour its commitment made under the Copenhagen Accord and to mitigate climate change challenges. Under the Accord, the country committed to reduce its carbon dioxide emissions by 34% below the "business as usual" level by 2020.

With an increasing demand in energy predicted and growing environmental concerns about fossil fuel based energy systems, the development of large-scale renewable energy supply schemes is strategically important for increasing the diversity of domestic energy supplies and avoiding energy imports in the country. Without the implementation of this project, the use of renewable options for power supply will be compromised in the future. This has potentially significant negative impacts on environmental and social well-being.

The no-go option is a feasible option; however, this would prevent BioTherm from contributing to the significant environmental, social and economic benefits associated with the development of the renewables sector. Accordingly, the no-go option is therefore not the preferred option.

SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?	YES	NO

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment).

N/A

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application.

Environmental Authorisation is recommended based on the following factors:

- Prior to the start of contraction activities, a walk down of the final pole positions should be undertaken by appropriately qualified specialists including heritage, avifauna, ecology and surface water. The EMPr must be updated to include any pole specific mitigation measures that may have been identified during the walk down.
- An Environmental Control Officer (ECO) must be appointed during the construction to monitor and report against the conditions of the Environmental Authorisation and ensure compliance.
- The mitigation measures outlined in the EMPr must be implemented onsite.
- Any heritage resources identified during this project should be protected as detailed in the EMPr.

Is an EMPr attached?	YES	NO

The EMPr must be attached as Appendix G.

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix H.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix I.

Any other information relevant to this application and not previously included must be attached in Appendix J.

_____

NAME OF EAP

_____ _____

SIGNATURE OF EAP DATE

SECTION F: APPENDIXES

The following appendixes must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information