4 Description of the Affected Environment

The following chapter presents an overview of the biophysical and socio-economic environment in which the proposed project is located to:

- Understand the general sensitivity of, and pressures on, the affected environment;
- Inform the identification of potential issues and impacts associated with the proposed project; and
- Start conceptualising practical mitigation measures.

The region has previously been studied to some extent and is recorded in various sources. Consequently, some components of the baseline have been generated based on literature review. However, where appropriate, baseline information has been supplemented or generated by specialists appointed to undertake baseline and impact assessments for the proposed project.

The specialist baseline and impact studies undertaken for the BA process are listed in Table 4-1.

Table 4-1: Specialist baseline studies undertaken for the BA

Specialist Study	Specialists	Organisation
Freshwater Ecology Impact Assessment	Liz Day	Freshwater Consulting Group
Botanical Impact Assessment	Paul Emms	Paul Emms Consulting
Faunal comment	Marius Burger	Private
Avifaunal Impact Assessment	Chris van Rooyen	Chris van Rooyen Consulting
Archaeology Impact Assessment	David Halkett	ACO Associates cc
Visual Impact Assessment	Scott Masson	SRK Consulting

Final specialist studies are attached as Appendices F1 to F6.

4.1 Biophysical Environment

4.1.1 Topography

The study area extends from the north-south aligned Wolseley – Tulbagh Valley, through the Witzenberg Mountains along Michell's Pass to the Ceres Valley (see Figure 1-1). The topography along the route is rugged and ranges in elevation from 303 m above mean sea level (mamsl) to 562 mamsl (WCDoA, 2017), though surrounding mountains are much higher.

The Wolseley – Tulbagh Valley is enclosed by the Witzenberg Mountains to the east, the Waterval Mountains to the west and the Groot Winterhoek Mountains at the head of the valley. Wolseley is situated on a natural watershed that divides the Berg River flowing north-west, and the Breede River flowing south. The Wittebrug Mountain juts out at this point, splitting the valley into two distinct portions.

Michell's Pass (R46) follows the narrow valley of the Breede River. From its western entrance near Wolseley, the pass ascends 190 metres to the summit at an elevation of 490 metres before descending a short distance into Ceres (WCDoA, 2017).

The Ceres Valley (also known as the Warm Bokkeveld Valley) is enclosed by the Skurweberge to the west, the Hex River Mountains to the south and the Gydoberge and Waboomberge to the north (see Figure 1-1). The landscape rises gently across the western and central portions of the valley (town of Ceres at approximately 460 m above sea level [masl]), but then rises sharply at the foothills in the east. Gydo Pass (R303) in the north of Ceres Valley connects the Warm Bokkeveld with the higher altitude Koue Bokkeveld.

Wolseley- Tulbagh Valley

Michell's Pass Valley

Ceres Valley

srk consulting	ROMANSRIVER - CERES POWERLINE Topography of Study Area	Project No. 509264

Figure 4-1: Topography of the study area

Source: SRK, 2017

4.1.2 Geology and Soils

The study area is surrounded by mountains of the Cape Fold Belt underlain by geological formations of the Bokkeveld Group and Table Mountain Group (see Figure 1-1) (WCDoA, 2017). Shale and sandstone form low rolling hills across the wider Wolseley-Tulbagh and Ceres valley bottoms.

Outcrops of the weather-resistant quartzitic sandstone, mainly of the Skurweberg Formation, forms steep rocky mountains such as the north-south trending Witzenberg and Skurweberg Mountains.

The soil types on the site include (WCDoA, 2017):

- Acidic lithosol soil derived from Ordovician sandstone of the Table Mountain Group;
- Clays derived from shale and sandstone of the Ceres Group and to a lesser extent the Biedouw Subgroups of the Bokkeveld Group;
- Acidic, moist clay-loam, Glenrosa or Mispah forms derived from Bokkeveld Shale, underlain by rocks of the Malmesbury Group; and
- Quaternary alluvial deposits consisting of round cobbles embedded in fine loamy sand over metasediments of the Malmesbury Group and Bokkeveld Group shales.

Table 4-2: Soil types along the powerline route

Area Along Route	Soil	Average Soil Depth (mm)	Clay Content	Soil Erodibility
Romansrivier Sub-Station	Glenrosa and/or Mispah forms (other soils may occur), lime rare or absent in the entire landscape.	< 450	< 15%	High (0.53)
Michell's Pass	Miscellaneous land classes, very rocky with little or no soils.	< 450	< 15%	Moderate (0.47)
Ceres Substation	Plinthic catena: dystrophic and/or mesotrophic; red soils not widespread, upland duplex and margalitic soils rare	>= 750	< 15%	High (0.56)

Source: WCDoA, 2017

4.1.3 Climate

The Ceres area is characterised by a major temperature variance between the summer maximums and the winter minimums. January and February are the hottest months of the year with temperatures reaching 30°C, whilst minimum temperatures can be as low as 3°C during July. Mean Annual Temperature (MAT) throughout the study area doesn't vary too significantly and ranges from 17.3°C in the Wolseley – Tulbagh Valley to 14.3°C in Michell's Pass.

Most of the study area's precipitation falls in winter (between May and August), while December and January are virtually precipitation-free. The region has high spatial variability of precipitation, with some rain shadows experiencing an average of 599 mm of precipitation per year near the Romansrivier substation and others experiencing an average of 1490 mm per year near the Ceres substation (DWS, 2008).

The prevailing wind is northeasterly.

4.1.4 Air Quality

Farming activities generate limited emissions, mainly airborne particulates, and there are no significant sources of air pollution in the study area. It is therefore expected that air quality in the project area is good.

Many roads in the development area are dirt roads and small volumes of dust are generated by the movement of vehicles.

4.1.5 Noise

There are no significant sources of noise in the area but some noise is propagated by vehicles.

Due to the low population density there are few noise receptors. Noise receptors are, however, likely to be sensitive to disturbance.

4.1.6 Hydrology

4.1.6.1 Catchment

The site is located within the H10C, H10D and H10F quaternary catchments which all form part of the Upper Breede River catchment, within the Breede-Gouritz Water Management Area (WMA) (covering an area of approximately 19 692km²). Major rivers within this WMA include the Breede, Sonderend, Sout, Bot and Palmiet. Figure 4-2 shows the major rivers within the vicinity of the proposed route.

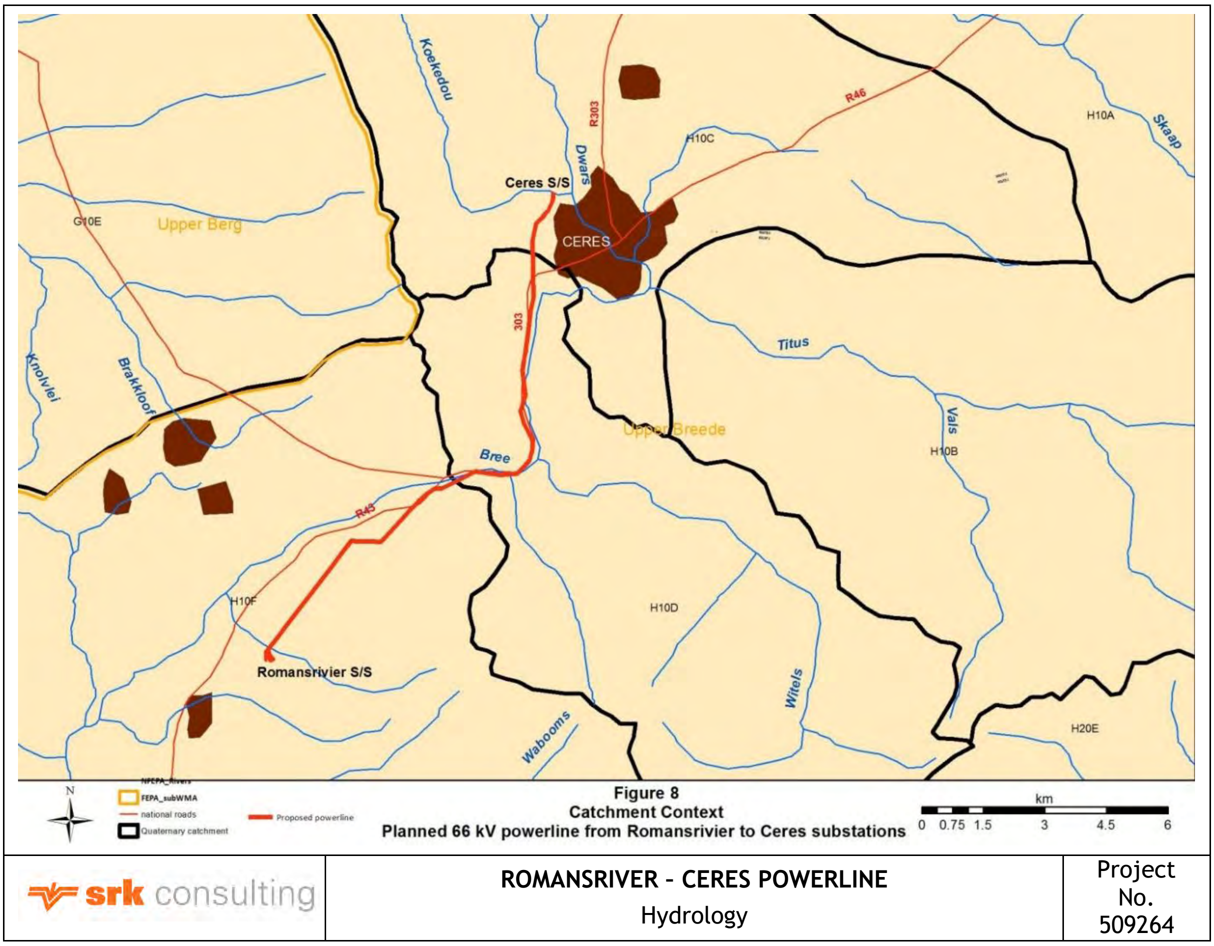


Figure 4-2: Hydrology of surrounding area

Source: FCG, 2017

4.1.6.2 Rivers

The Dwars / Breede and Witels Rivers are the main surface drainage features that are crossed by the proposed route (see Figure 4-2). The Dwars River originates in the Skurweberg mountains near Ceres and flows in a southeasterly direction before confluencing with the Witels River. Downstream of this confluence it is known as the Breede River.

The Tierhokkloof River lies to the east of the Witels. This watercourse is a foothill river that discharges onto the flat valley bottom of the Breede. An access road crossing is proposed through this watercourse.

The Koekedou River passes into Ceres town from the west, and joins the Dwars River within the town boundaries. The powerline and access roads would pass through a number of smaller watercourses drain into the Koekedou River to the north. These watercourses have been evaluated in the Witzenberg Biodiversity Plan as CESAs.

4.1.6.3 Wetlands

According to the National Freshwater Ecosystems Priority Area (NFEPA) dataset, a number of wetlands occur in the vicinity of the study area, mainly in the southern portion (see Figure 4-3). These comprise mainly channelled valley bottom wetlands along the Breede River, downstream of the Witels River confluence, as well as numerous minor channelled valley bottom wetlands that drain in a westerly direction towards the Breede River, off the hillslopes to the east of the river, again south of the Witels River confluence (see Figure 4-3).

Numerous artificial wetlands (mainly farm dams) have also been classified in NFEPA data, with the largest artificial system in the vicinity of the proposed powerlines being the Ceres Dam (also known as the Koekedou Dam – see Figure 4-3) west of Ceres.

Watercourses flowing into the Koekedou River comprise mountain seeps that are considered to be in a near-reference condition, impacted only in places by footpath crossings. The seeps comprise mainly broad, shallow subsurface sheetflow across the mountain fynbos vegetated area at the top of the mountain. These sheetflow areas converge into small mountain streams and/or maintaining as mountain seeps down the steep mountain slopes to Michell's Pass to the east. Channels include wide wetlands and sandy to organic soils.

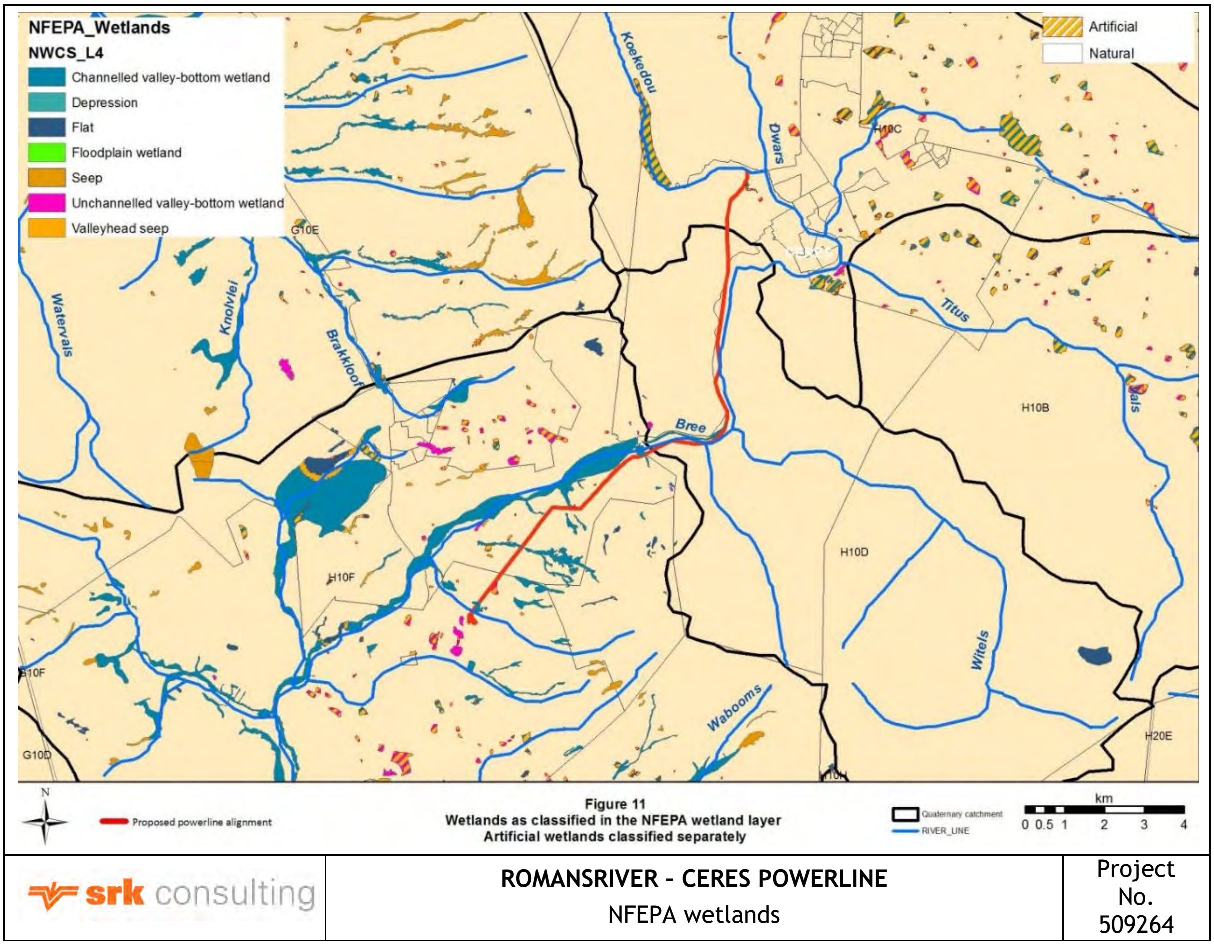


Figure 4-3: NFEPA wetlands

Source: FCG, 2017

4.1.7 Freshwater Ecology

For a more comprehensive description of the freshwater ecological context of the site and surrounding areas please refer to Appendix F1.

4.1.7.1 Assessment Methodologies

The NFEPA has identified a number of strategic spatial priorities for conserving freshwater ecosystems and associated biodiversity. Freshwater Ecosystem Priority Areas (FEPAs) are often tributaries and wetlands that support important rivers, which need to stay in a good condition to manage and conserve freshwater ecosystems and to protect water resources.

DWAF (1999) defines the ecological importance of a river or wetland as an expression of its importance (Ecological Importance – EI) to the maintenance of ecological diversity and functioning on local and wider scales, while ecological **sensitivity** (Ecological Sensitivity - ES) refers to the system's resilience. Both abiotic and biotic components of the system are taken into consideration in the assessment of ecological importance and sensitivity.

4.1.7.2 Ecological Importance

Dwars / Breede

According to the NFEPA database, the Dwars / Breede River is assigned a Category D Present Ecological State (PES) (largely modified with loss of habitat and wetland functions) upstream of Ceres, improving to Category C (largely modified with loss of habitat and wetland functions) in its reaches through the Michell's Pass as far as the Witels confluence and dropping back to Category D PES downstream of this tributary (see Figure 4-4). There is significant and extensive alien plant invasion along the river corridor and almost entire floodplain, and erosion, sedimentation, shading and other impacts associated with such levels of woody invasive alien encroachment.

The EI and ES of the Dwars River upstream of Ceres is rated as Medium for both categories, with EI for the Breede River downstream of the Witels confluence (i.e. at the R43 bridge) increasing to High.

The Witels River

In its reaches closest to the proposed powerline route, the Witels River is in relatively good condition and is assigned a Category A/B PES (unmodified or largely natural with few modifications and only minor loss of habitat).

It was rated as High for both EI and ES, highlighting the importance of this relatively unimpacted system, which lies largely outside of agricultural areas and is not subjected to the high levels of agricultural encroachment and abstraction that affect the Dwars River upstream of Ceres.

Tierhokkloof River

Although invaded by alien vegetation along its margins, the Tierhokkloof River flows through a relatively unimpacted catchment and has been rated as a PES B/C.

The dynamic nature of the river in the reaches through which the powerline would cross means that it is likely to show low long-term sensitivity to sediment accumulation.

Koekedou River

Wetland seeps and their associated channels above Ceres have been assigned PES ratings of Category A/B, have High ES and EI ratings.

Wetlands

Many seeps and wetlands are located along the route (see Figure 3-7). These systems vary in condition, but most are sensitivity, and almost always function as important sources of water to local indigenous fauna in an otherwise relatively barren area (FCG, 2017).

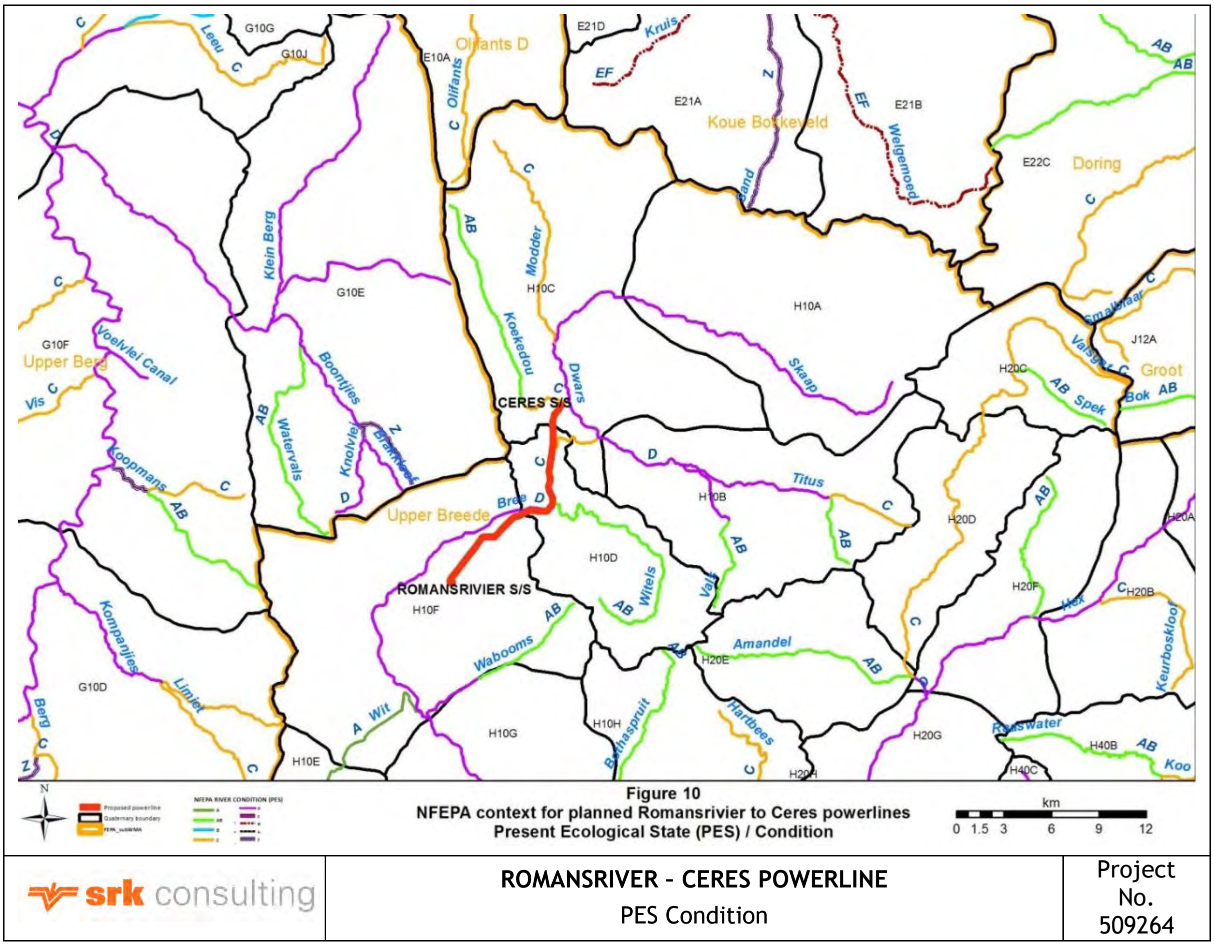


Figure 4-4: PES condition

Source: FCG, 2017

4.1.7.3 Conservation

The WCBSP is a biodiversity planning assessment that delineates priority biodiversity and spatial (land) features such as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) in order to safegaurd the *"continued existence and functioning of species and ecosystems, including the delivery of ecosystem services, across terrestrial and freshwater realms"* (CapeNature, 2017). The purpose of the WCSBP is to inform sustainable development, including (a) development planning, (b) environmental assessment and regulation, (c) natural resource protection and management in the broader sense.

Refer to Figure 3-7 to Figure 3-11 for a graphic representation of the WCBSP spatial features in the study area.

In terms of the WCBSP, a large portion of the study area is formally protected. The watercourses which drain into the Koekedou River above Ceres to the north of the study area have been evaluated in the Witzenberg Biodiversity Plan as Critical ESA (CESA's).

Numerous Other ESAs (OESAs) have been mapped in the vicinity of the proposed powerlines, and these drain east-south-east, directly into the Dwars / Breede River, in its reaches through Michell's

Pass, as well as west, off the adjacent parallel mountain range, into the Dwars / Breede River that courses as a foothill river along the valley bottom.

The Witels River also drains into the main stem of the Breede River in these reaches. Although it has been classified in the CBA dataset as associated with several minor tributaries that have been mapped as OESAs, the Witels itself is not classified.

CBA wetlands occur along the main stem of the Dwars / Breede River immediately downstream of the Witels River confluence.

South of the confluence of the Witels River with the Dwars River access would cross over at least five watercourses that have been mapped as CBA wetlands.

The Koekedou and Titus Rivers have been classified as Fish Support areas in terms of the NFEPA datasets, supporting at least one Vulnerable or near-threatened species, *Pseudobarbus burchelli* (Breede River redfin). The proposed route does not, however, cross through any of the main tributaries of the Koekedou or Titus Rivers.

4.1.8 Flora

This section is based on the Botanical Impact Assessment (2017) undertaken by Paul Emms Consulting (2017) (see Appendix F3).

4.1.8.1 Regional Context

The study area falls within the Northwest Fynbos Bioregion (F01) within the Fynbos Biome (SANBI, 2009). The Fynbos Biome comprises three distinct, naturally fragmented vegetation types (fynbos, renosterveld and strandveld), all of which occur in winter- and summer-rainfall areas (Mucina & Rutherford 2006). Regions supporting the Fynbos Biome consist of various geological substrates including (amongst others) sandstone, quartzite, granite, gneiss, shales and limestone sediments.

4.1.8.2 Vegetation along the Powerline Route

The study area falls within five vegetation types as identified by Mucina and Rutherford (2006) (see Figure 4-5:

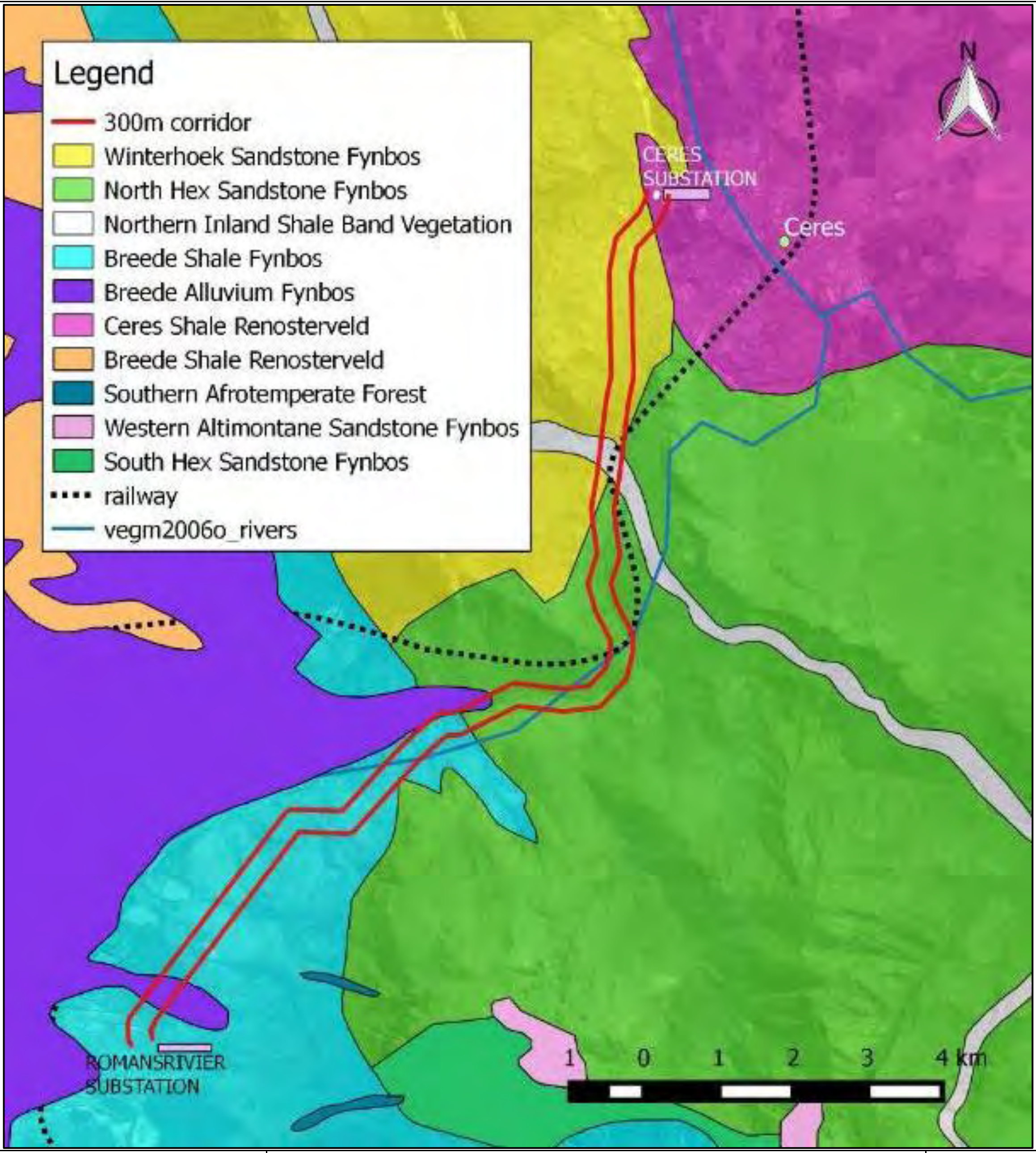
- Winterhoek Sandstone Fynbos (FFs5);
- Ceres Shale Renosterveld (FRs4);
- North Hex Sandstone Fynbos (FFs7);
- Breede Shale Fynbos (FFh4); and
- Breede Alluvium Fynbos (FFa2).

Winterhoek Sandstone Fynbos

Winterhoek Sandstone Fynbos occurs along the northern reaches of the proposed route and extends from Michell's Pass to just before the Ceres substation. The vegetation type occurs mostly on acidic lithosol soils from the Table Mountain Group. Only 5% of the total extent of this vegetation type has been transformed (generally for the cultivation of proteas and fruit orchards). The conservation target for this vegetation type is 29 %.

Ceres Shale Renosterveld

A small patch of Ceres Shale Renosterveld is mapped near the Ceres substation (see Figure 4-5). The vegetation type occurs on clays derived from shale and sandstone of the Ceres and Bidouw Subgroups of the Bokkeveld Group. 36% of the vegetation type is transformed (mainly by cultivation, short-interval burning and overgrazing). The conservation target for this vegetation type is 27 %.



srk consulting	ROMANSRIVER - CERES POWERLINE Vegetation Types	Project No. 509264

Figure 4-5: Vegetation along the powerline route

Source: FCG, 2017

North Hex Sandstone Fynbos

North Hex Sandstone Fynbos is mapped as the predominant vegetation type that occurs along the mid-sections of the route, through Michell's Pass (see Figure 4-5). This vegetation type generally occurs on north-facing steep and gentle slopes from foothills to high mountain peaks (Mucina and Rutherford, 2006). The dominant restiolands often have a proteoid overstorey. Asteraceous fynbos found on lower slopes. The vegetation type occurs mostly on acidic lithosol soils from the Table Mountain Group. Only 6% of the total extent of this vegetation type has been transformed (generally for cultivation). The conservation target for this vegetation type is 29%.

Breede Shale Fynbos

Breede Shale Fynbos is mapped as the predominant vegetation type that occurs along the bottom reaches of the route (i.e. between Romansrivier substation and Michell's Pass- see Figure 4-5). This vegetation type occurs on the steep upper slopes of mountains grading to slightly undulating plains, well dissected by rivers (Mucina and Rutherford, 2006). The vegetation consists of moderately tall and dense shrubland. The vegetation type occurs on acidic, moist clay-loam Glenrosa or Mispah forms of the Malmesbury Group. 30% of the total extent of this vegetation type has been transformed (mostly for cultivation). *Pinus pinaster* and *Hakea sericea* are the most prominent woody aliens in the unit. The conservation target for this vegetation type is 30 %.

Breede Alluvium Fynbos

A reletaively small patch of Breede Alluvium Fynbos is mapped near the Romansrivier substation (see Figure 4-5). The vegetation type occurs on quaternary alluvial deposits consisting of round cobbles embedded in fine loamy sand of the Malmesbury Group and Bokkeveld Group shales. Almost 60% of the total extend of this vegetation type has been transformed (mainly due to the cultivation of vineyards, pastures, pine plantations, road building and urban sprawl). The conservation target for this vegetation type is 30 %.

The national List of Threatened Terrestrial Ecosystems in South Africa lists two of the above vegetation types as threatened (Government Gazette, 2011), including:

- Breede Alluvium Fynbos, which is listed as Endangered due to irreversible loss of habitat (criterion A1), and
- Ceres Shale Renosterveld, which is listed as Vulnerable under the same criterion.

The remaining vegetation types are Least Threatened.

4.1.8.3 Conservation

In terms of NEM:PAA, the section of the route that stretches from the Ceres substation via Michell's Pass to White Bridge falls within three formally protected areas, namely the Winterhoek Mountain Catchment Area, Matroosberg Mountain Catchment Area and Wittebrug Nature Reserve. Furthermore, a substantial proportion of the site comprises CBA1 and ESA1 sites (see Figure 3-7 - Figure 3-11).

No SCC were identified during a site visit undertaken during May 2017. This is likely due to the seasonal timing of the site visit and as such the EMPr includes a recommendation for a spring search and rescue to take place prior to construction (see Appendix E).

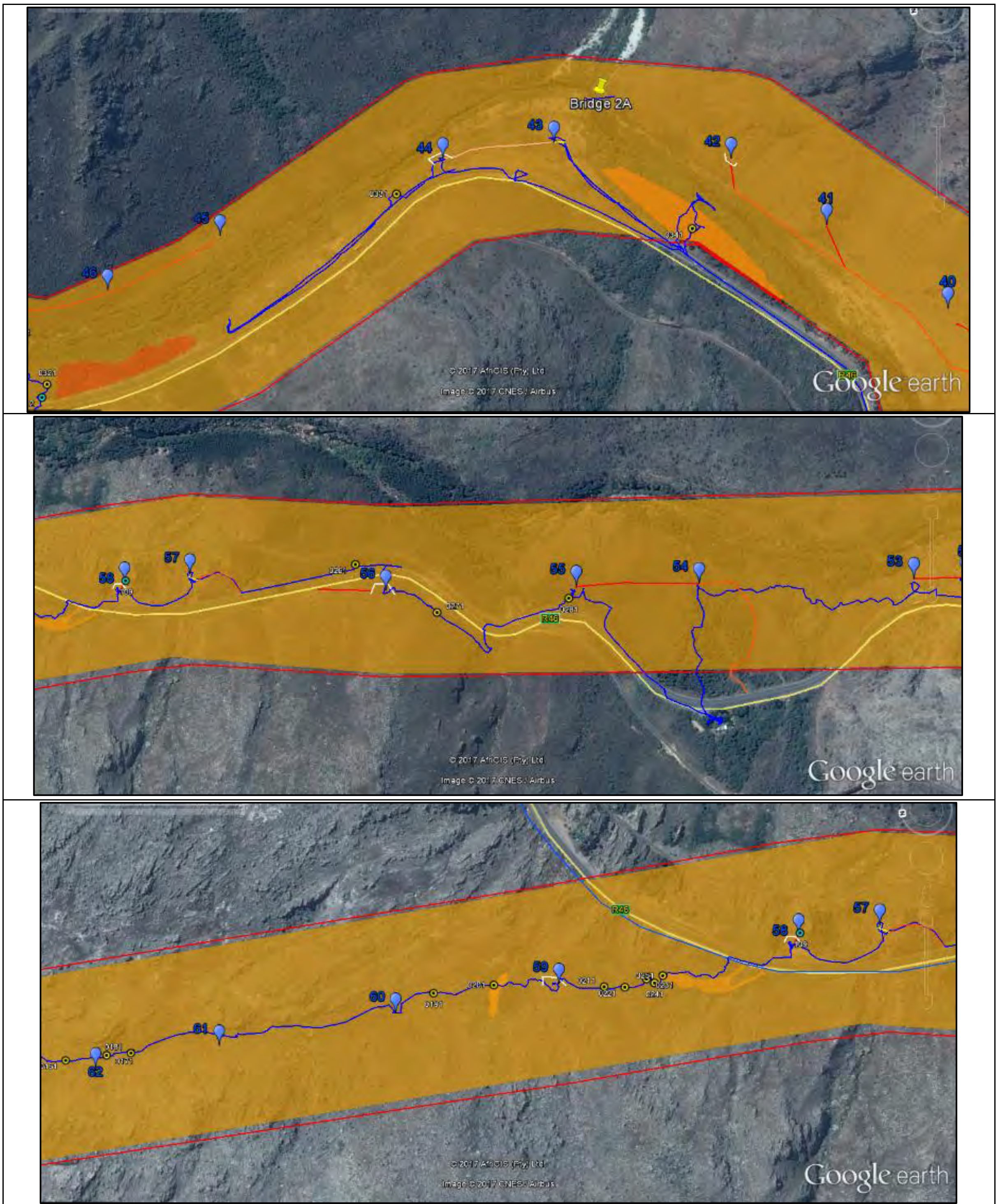
4.1.8.4 Vegetation Sensitivity

Sensitivity refers to the capacity of an environment to tolerate disturbance, taking the environment's natural capacity to recover from disturbance as well as existing cumulative impacts into account (Emms, 2017).

The following indicators were used to evaluate the sensitivity of the vegetation on site (Emms, 2017):

- Ecological condition;
- Ecosystem status;
- Conservation status; and
- Presence of important species.

The majority of vegetation along the route is rated as moderate sensitivity (intact, well represented vegetation). Some small patches of vegetation, mainly associated with wetlands, situated towards the top and middle of Michell's Pass are rated as having high and very high sensitivity (see Figure 4-6 – dark orange shading indicates areas of high sensitivity). No infrastructure will be placed in these areas.



srk consulting	ROMANSRIVER – CERES POWERLINE Vegetation Sensitivity	Project No. 509264

Figure 4-6: Vegetation sensitivity

Source: Emms, 2017

Key: light orange – moderate sensitivity; dark orange – high sensitivity.

4.1.9 Fauna

This section is based on a faunal baseline report (2017) undertaken by Marius Burger (see Appendix F2).

4.1.9.1 Faunal Habitats and Importance

The purpose of assessing the faunal importance of the site for each of the three vertebrate faunal groups, i.e. mammals, amphibians and reptiles, is to obtain an approximate impression of the site's value for each of the faunal groups at regional (Witzenberg Municipality) and national (South African; SA) scales. This assessment incorporates a variety of components, including the presence/absence of threatened species, conservation status, species richness, endemism, ecological functioning, size and habitat quality, habitat heterogeneity or homogeneity, and the site's value as an ecological corridor, a green zone, or source or sink for genetic exchange in respect of peripheral natural areas.

Most of this vegetation is relatively pristine in the mountainous regions, but much of the flatter terrain have been transformed by agricultural activities. Generalist faunal species (e.g. Chacma Baboons) may frequent most or all of these vegetation types, whereas some of the specialist faunal species (e.g. Geometric Tortoise) would be restricted to one or two specific vegetation types.

In addition to vegetation type, faunal assemblages are also influenced by substrate type and various other physical features.

From west (Romansrivier) to east (Ceres), the proposed powerline route transects a variety of habitat types which can briefly be summarised as follow:

- The western-most section is mostly flattish terrain, changing into slight to moderate slopes along the way and culminating in some steep mountainous sections with rocky terrain towards Ceres.
- The western half of the proposed route has some artificial dams, whereas the latter half is characterised by prominent watercourses (Figures 6 and 7), e.g. Dwars and Breede rivers.
- Altitude ranges from about 330 to 450 m along the route, with some of the adjacent peaks near Ceres reaching 1200+ m.

The importance of the habitat along the powerline route is considered to be *moderate* at a regional scale for mammals, amphibians and reptiles.

4.1.9.2 Mammals

Potential mammal species richness total along the proposed Romansrivier powerline route and immediately surrounding areas may be as high as 61 (see Appendix F2), but more realistically only about 40 (or less) mammal species are likely to inhabit or occasionally utilise the area. Of these, the following are SCC: Leopard (*Panthera pardus*); White-tailed Mouse (*Mystromys albicaudatus*); Spectacled Dormouse (*Graphiurus ocularis*); African Clawless Otter (*Aonyx capensis*); Honey Badger (*Mellivora capensis*); African Striped Weasel (*Poecilogale albinucha*) and Grey Rhebok (*Pelea capreolus*).

No mammalian SCC are likely to be impacted in any significant way by the construction and maintenance of the proposed Romansrivier powerline.

4.1.9.3 Reptiles

The reptile diversity of the area is very high, and comprises tortoises, terrapins, snakes, lizards and skinks, a chameleon and geckos (Todd, 2012). Species richness total along the proposed Romansrivier powerline route and immediately surrounding areas is also high, and as many as 54 species (see Appendix F2), but more realistically only about 45 (or less) reptile species are likely to inhabit or occasionally utilise the area. Of these, the following are SCC: Geometric Tortoise (*Psammobates geometricus*) and Oelofsen's Girdled Lizard (*Cordylus oelofseni*). The Geometric Tortoise is critically endangered.

These SCC are not likely to be impacted in any significant way by the construction and maintenance of the proposed Romansrivier powerline, there is a high probability of occurrence of the Geometric Tortoise between pylons 1 and 12, and a moderate probability of occurrence between 13 and 21. Therefore, the precautionary approach should be taken in protecting the Geometric Tortoise during construction.

4.1.9.4 Amphibians

Potential amphibian species richness total along the proposed Romansrivier powerline route and immediately surrounding areas may be as high as 15 (see Appendix F2), but more realistically only about eight amphibian species are likely to inhabit or occasionally utilise the area. Of these, the following are SCC: Cape Rain Frog (*Breviceps gibbosus*) and Cape Caco Frog (*Cacosternum capense*).

Neither of these SCC are likely to be impacted in any significant way by the construction and maintenance of the proposed Romansrivier powerline.

4.1.10 Avifauna

This section has been informed by an Avifaunal Impact Assessment conducted by Chris van Rooyen Consulting (CvR) (see Appendix F4).

Approximately 181 bird species are expected to occur in the region according to the bird distribution data obtained between 2007 and 2017 on the South African Bird Atlas 2 (SABAP2) (2017).

Various bird habitat classes were recorded in the study area including fynbos, drainage lines and rivers, dams, mountains, alien trees and agriculture and urban areas (see Table 4-3) of which many are likely to attract Red Data species (CvR, 2017).

Red Data and / or IBA trigger species that could potentially occur in the study are included in Table 4-3. These species have been identified in SABAP2 or may occur based on the presence of habitat units but have not been observed in the study area. For each species, the potential for occurring in a specific habitat class as well as regional conservation status (in terms of the 2016 Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland) is indicated.

Table 4-3: Red Data species potentially occurring in the study area

Name	Regional Conservation status	Habitat type					
		Fynbos	Mountains	Rivers	Alien trees	Dams	Agriculture / urban areas
Falcon, Lanner *Falco biarmicus*	VU[9]	X	X		X		X
Crane, Blue *Anthropoides paradiseus*	NT[10]	X				X	X
Flamingo, Greater *Phoenicopterus ruber*	NT					X	

[9] VU - Vulnerable
[10] NT - Near-threatened

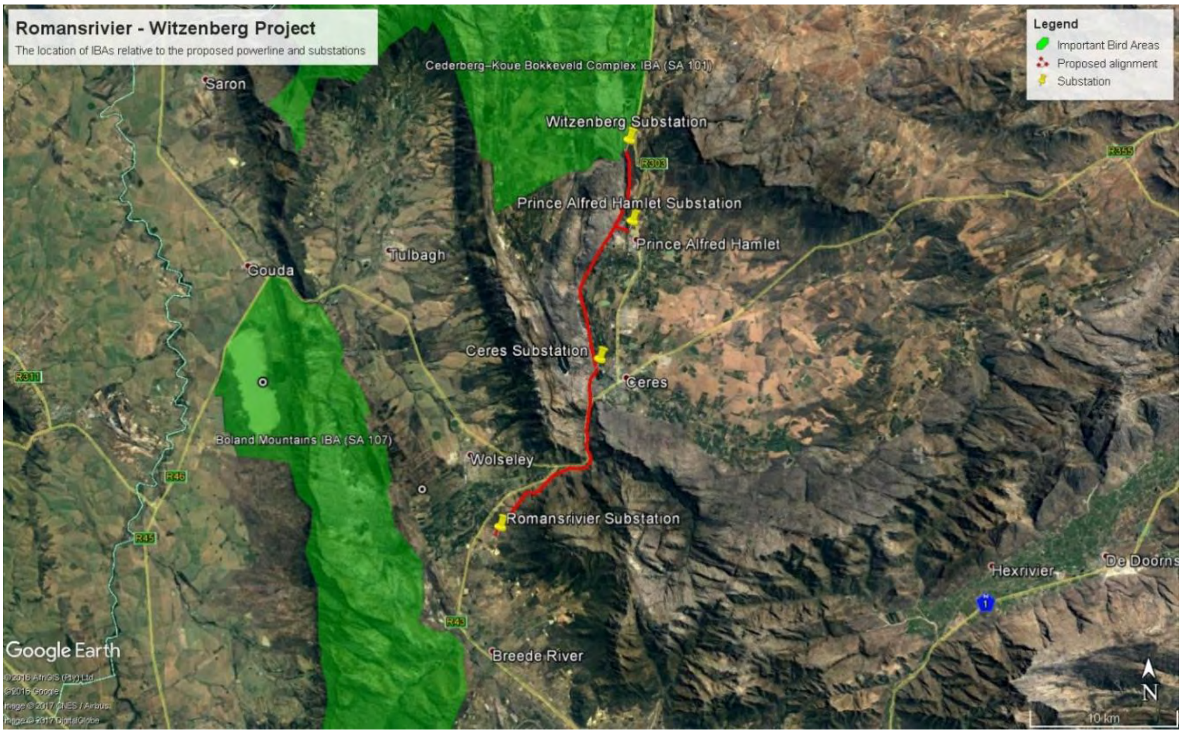
Name	Regional Conservation status	Habitat type					
		Fynbos	Mountains	Rivers	Alien trees	Dams	Agriculture / urban areas
Harrier, Black *Circus maurus*	EN[11]	X					
Marsh-harrier, African *Circus ranivorus*	EN	X					
Secretarybird *Sagittarius serpentarius*	VU	X					X
Verreaux's Eagle *Aquila verreauxii*	VU	X	X		X		
Rock-jumper, Cape *Chaetops frenatus*	NT	X	X				
Seedeater, Protea *Crithagra leucopterus*	NT	X					

Source: CvR, 2017

A Verreaux's Eagle nest was observed within the study area on a cliff off the Skurweberge.

Conservation

The study area falls just south of the Cederberg–Koue Bokkeveld Complex Important Bird Area (IBA) and just east of the Boland Mountains IBA (see Figure 4-7). Both IBA's support similar mountain fynbos habitats. As such, it is likely that species associated with these IBA's could on occasion occur within the study area.



ROMANSRIVER - CERES POWERLINE
Cederberg–Koue Bokkeveld Complex IBA
Project No. 509264

[11] EN - Endangered

Figure 4-7: Cederberg–Koue Bokkeveld Complex IBA

Source: CvR, 2017

4.2 Socio-Economic Environment

4.2.1 Local Economy

Average Regional Gross Domestic Product (GDPR) growth tapered down from 9.7% per annum (2004 – 2008) to 3.0% per annum during the recessionary period (2008-2009). Average GDPR growth increased again to 3.9% per annum over the period of 2009 – 2015, which is 1.1% higher than the average for the District. (MERO, 2015).

The Witzenberg Municipality comprised the second smallest share (14.3%) of the Cape Winelands District's GDPR in 2015.

The three sectors with the largest contributions to the Witzenberg Municipality's economy are the finance (17.6%), wholesale and retail (17.4%) and agricultural (13.7%) sectors.

The Witzenberg Municipality is dominated by the agricultural sector with the focus on fruit industries. Witzenberg Municipality contributes 60% to the Western Cape Province's pear production (WCG, 2013). The Tulbagh- and upper Breede Valley is also well known for its wine and the Ceres and Bokkeveld region for its fruit production. The dependence on agriculture as the major economic stimulus without other diverse economic sectors plays a significant role in the poverty of the region due to the seasonality and export fluctuations of agricultural.

The two fastest growing sectors over the 2005 to 2013 period were commercial services sector experienced the highest annual average growth at 4.8 %, followed by general government and community, social and personal services at 3.3%.

4.2.2 Employment

In 2011 the Witzenberg Municipality had an unemployment rate of 36% (StatsSA, 2011).

The African population group have an unemployment rate of 9% and account for 34% of the total labour force and 42% of the unemployed within Witzenberg. The Coloured population group have an unemployment rate of 7%. They account for 57% of the total labour force and 54% of the unemployed within Witzenberg. The White population group has an unemployment rate of 3% and accounts for 7% of the total labour force and 3% of the unemployed within Witzenberg.

Unemployment is most concentrated within the "Other" population group. This group represents the smallest percentage share (1%) of the total labour force, but has the highest unemployment rate (12%).

Unemployment is mainly concentrated amongst the youth (15 - 34 years) as the youth accounts for 2 915 (68%) of the unemployed. The 20 - 24 age group is particularly vulnerable at 23% of the total unemployed (StatsSA, 2011).

4.2.3 Education

According to the Witzenberg Municipality IDP (2012/17), 71% of the local population is literate.

Of those aged 20 years and older, 9% have completed primary school, 40% have some secondary education, 20% have completed matric, and 6% have some form of higher education, while 6% of those aged 20 years and older have no form of schooling (StatsSA 2011).

4.3 Historical and Cultural Environment

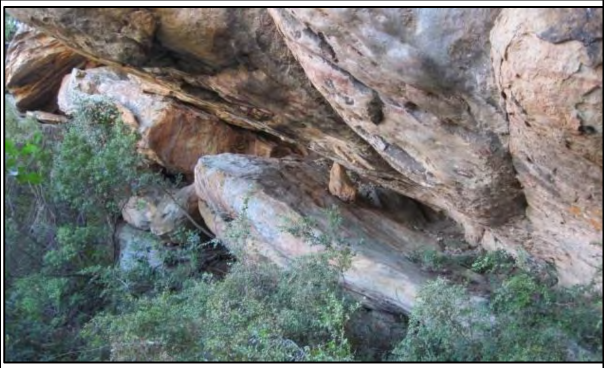
For a more comprehensive description of the historical context of the site and surrounding areas please refer to Appendix F5.

4.3.1 Archaeology

4.3.1.1 Pre-colonial sites

While there are documented finds of Earlier Stone Age (ESA) and Middle Stone Age (MSA) material along the general route, the current and previous assessments in the area have not identified many significant sites containing this type of material. In areas where the line crosses areas of Table Mountain Sandstones (TMS) (e.g. between the top of Michell's Pass and Ceres), rock shelters containing Late Stone Age (LSA) artefacts and occasional rock paintings are known to occur (see Figure 4-8), but none were located on or close to the currently proposed route during two route inspections.

Small rock wall containing an ephemeral scatter of LSA artefacts near the White Bridge.



Large overhang containing LSA artefacts, pottery and well preserved rock paintings near Ceres substation.

Rock painting on a boulder on the valley floor near Ceres substation.

Localised surface MSA artefact scatter near Ceres substation.

srk consulting | ROMANSRIVER - CERES POWERLINE
Artefacts and Paintings | Project No. 509264

Figure 4-8: Artefacts

Source: ACRM, 2017

The current assessment did not identify any archaeological resources along the proposed route that would require mitigation.

4.3.1.2 Built Environmental

Intact sections of the Old Pass built by Andrew Geddes Bain in 1848 are located at various places along Michell's Pass. The best preserved sections lie between the Old Toll House (built shortly after the completion of the pass in 1848, a Grade II Provincial Heritage site) and the point where the pass turns east before entering Ceres. The new powerline route lies some 250 m to the east and down the valley from this building.

Sections of the Old Pass (built in 1848, most sections broadly graded as IIIA) are still evident to the east of Michell's Pass. To some degree, the original old stone retaining walls are in many places an integral part of the Michell's Pass road, but are variably preserved along the way.

The placement of pylons near the Old Toll House and remains of the Old Pass have been planned carefully to avoid impacts as far as possible.

A roughly constructed dry stone structure (graded as IIIA) is located close to the proposed route, near the Ceres substation (see Figure 4-9). It is thought to be an Anglo Boer war structure, however, it cannot be confirmed as there are no associated artefacts (ACRM, 2017).

srk consulting	**ROMANSRIVER - CERES POWERLINE** Stone Structure	Project No. 509264

Figure 4-9: Possible Anglo-Boer war structure

Source: ACRM, 2017

The powerline crosses the Old Railway (built in 1912) in one place but no powerline infrastructure will be placed on or close to the line.

4.3.2 Palaeontology

The only paleontologically sensitive section of the powerline route is located in Michell's Pass close to the Old Toll House where the route crosses the narrow outcrop band of the Cederberg Formation with very high palaeontological sensitivity (Late Ordovician marine mudrocks).

Cederberg mudrocks where the powerline crosses this formation are likely to be mantled with colluvial deposits and weathered near-surface here and significant impacts on palaeontological resources are unlikely.

As confirmed by specialist input, no significant impacts on palaeontological resources would result from the activity and hence no specialist palaeontological assessment was required for the HIA (ACRM, 2017).

4.4 Visual and Aesthetic Environment

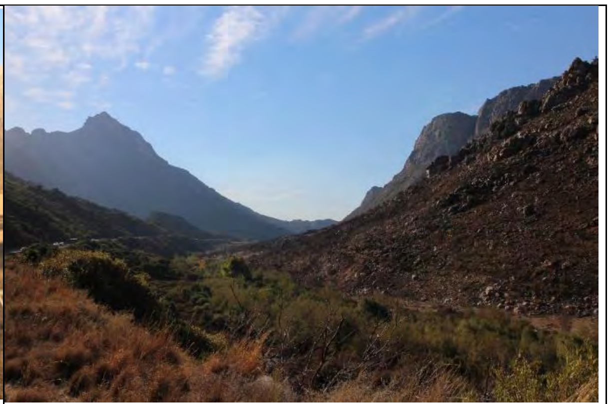
This section has been informed by input by a visual specialist. The Visual Impact Assessment (VIA) Report is attached as Appendix F6.

4.4.1 Visual Character

The basis for the visual character of the area is provided by the geology, vegetation and land use of the area (see Figure 4-10):

- Tulbagh-Wolseley Valley: Overall, this landscape unit can be described as a modified rural landscape. It is a predominantly rural environment in an open valley, rising to vegetated foothills and enclosed by steep, rugged mountains;
- Michell's Pass Valley: Overall, this landscape unit can be described as a natural transition landscape. The Michell's Pass landscape unit is characterised by steep, rugged mountains on either side of a narrow valley. The Bree River, the Michell's Pass scenic route (road and rail) and an existing powerline pass through this landscape unit; and
- Ceres Valley: Overall, this landscape unit can be described as a modified rural landscape. It is a predominantly rural environment situated on a wide rolling basin (valley) rising to vegetated foothills and then steep, rugged mountains.


Lower slopes of Wittebrug Mountain


Southern extent of Michell's Pass


Northern extent of Michell's Pass


Farmland in the Ceres Valley

srk consulting | ROMANSRIVER - CERES POWERLINE
Visual Character | Project No. 509264

Figure 4-10: Visual character

Source: SRK, 2017

4.4.2 Visual Quality

The visual quality of the overall area is largely ascribable to the rural patterns across the wide open valley contained by the steep and rugged mountains.

The visual quality of the area can be experienced through a number of views (see Figure 4-1). These views include:

- Complex rolling views from and across the valleys towards the mountains;
- Extended closed views from high vantage points looking out across the valley towards the mountains; and

- Short closed views to nearby mountains and within Michell's Pass Valley.

Some elements detract from the visual quality in the study area, notably vertical elements traversing the landscape including powerlines (including the existing 132 kV powerline from Romansrivier Substation to Tulbagh, the existing 66 kV powerline between Ceres Substation and Witzenberg Substation, the new 765 kV powerline over the Skurweberg Mountains and across the Ceres Valley, the two 400kV powerlines from Kappa to Bacchus and Muldersvlei Substations, the existing 11kV farm feeders, and the remains of the 66 kV powerline through Michell's Pass) and telephone lines. Nevertheless the visual quality of the study area is considered to be ***moderate to high***.

4.4.3 Sense of Place

The region has scenic value in terms of the rural setting and sense of nature invoked by the steep mountainous backdrop. The region has attractive visual-spatial qualities and residents and tourists are attracted to the area because of its scenery and location in the landscape. The visual-spatial qualities are influenced by the rural patterns created by rolling wheatfields, patchwork of fruit orchards and vineyards in a mountainous setting. Views across the valley and from the scenic mountain passes add to the sense of place of the area. Tourists are also attracted to the area during the winter months when the surrounding mountains are often covered in snow

4.4.4 Visual Receptors

Receptors are important insofar as they inform visual sensitivity. The sensitivity of viewers is determined by the number of viewers and by how likely they are to be impacted upon. Potential viewers include the following:

- **Residents of Wolseley and Ceres**: Visibility from residences in Wolseley and Ceres is likely to be low, since the urban fabric obtrudes views beyond the very immediate foreground.
- **Motorists**: The provincial roads (e.g. R43 and R46) traversing the valleys are used daily by the local farming community, local residents and by visitors / tourists. Motorists using Michell's Pass, a scenic route, will be more sensitive to the powerline because of the proximity of the powerline to the road (within 200 m) and the attractive scenery in the valley.
- **Farmers and farm labourers**: The powerline may be visible to the numerous farmsteads in the Tulbagh-Wolseley Valley and Ceres Valley. Many of the farmers and labourers are already exposed to existing powerlines (some of which are located along the proposed route) and telephone lines in the area.
- **Visitors/Tourists**: Visitors to the area are particularly sensitive receptors and are likely to us the R43 and R46 roads to reach the Ceres Valley (via Michell's Pass). The Ceres Rail Company offers scenic train trips between Cape Town and Ceres. Hikers in the surrounding mountains will also be exposed to the powerline. Visitors are likely to be somewhat sensitised to powerlines in the region.

The sensitivity of viewers or visual receptors potentially affected by the visual impact of the project is considered to be ***moderate*** because many receptors are exposed to existing powerlines in the study area, including powerlines along the same route, but visitors / tourists travelling through Michell's Pass are particularly sensitive receptors.

4.4.5 Viewing Distance and Visibility

The distance of a viewer from an object (in this case the powerline) is an important determinant of the magnitude of the visual impact. This is because the visual impact of an object diminishes/attenuates as the distance between the viewer and the object increases. Thus the visual impact at 1 000 m would, nominally, be 25% of the impact as viewed from 500 m. At 2 000 m it would be 10% of the impact at 500 m (Hull and Bishop, 1988 in Young, 2000).

Three basic distance categories can be defined for a project of this scale:

- Foreground;
- Middleground; and
- Background.

A range of viewpoints were selected in the study area in order to identify potential receptors and to provide an indication of the likely visibility of the project (see Figure 4-11). The viewpoints were not randomly selected but were chosen because they are likely to best represent the visibility of the powerline to receptors.

The visibility of the site from selected viewpoints is presented in

Table 4-4 below. The selected viewpoints and views from these viewpoints are shown in the accompanying photographs included in the VIA (see Appendix F6).

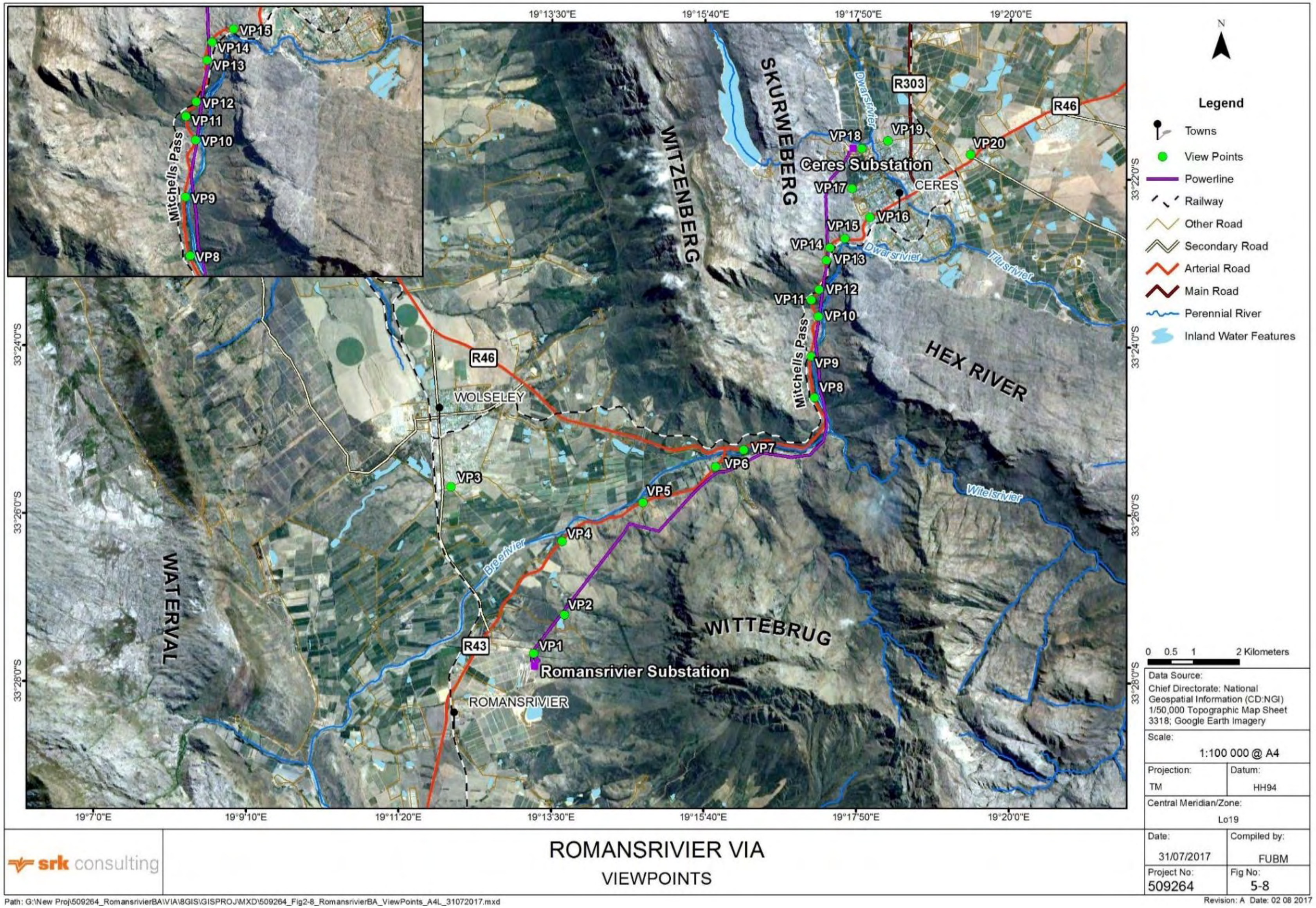


Figure 4-11: Viewpoints

Source: SRK, 2017

Table 4-4: Visibility from viewpoints

Land-scape Unit	Viewpoint #	Location	Co-ordinates	Direction of view from the viewpoint	Time Photograph Taken	Significant Receptors and Visibility
TULBAGH-WOLSELEY VALLEY	VP1	Romansrivier Substation	33°27'40.04"S; 19°13'15.14"E	West	15h30	• Residents of Wolseley and farmsteads in the valley – not visible to marginally visible as the windrows provide a high level of screening and Wolseley is over 3 km from the Romansrivier Substation and powerline; and • Users of R43 – visible although visibility is reduced by the distance of the substation and powerline from the road (over 1 km) and partial screening provided by trees along the road.
	VP2	Pylon 11 on lower slopes of Wittebrug Mountain	33°27'12.26"S; 19°13'41.26"E	West	15h46	
	VP3	Wolseley	33°25'40.71"S; 19°12'4.27"E	South-east	17h13	• Residents of Wolseley – not visible to marginally visible as the windrows provide a high level of screening and Wolseley is over 3 km from the substation and powerline.
	VP4	R43	33°26'19.74"S; 19°13'38.88"E	East	17h00	• Users of R43 – visible; and • Residents and businesses along R43 – highly visible as some residents are within 100 – 200 m of the pylons (pylons 23, 24, 32 and 33) although the primary view is out over the Valley and away from the powerline.
	VP5	R43	33°25'51.72"S; 19°14'47.90"E	East	16h56	
	VP6	R43	33°25'26.05"S; 19°15'49.72"E	East	16h42	
MICHELL'S PASS	VP7	Near R46 / R43 intersection	33°25'14.06"S; 19°16'13.38"E	East	16h46	• Users of Michell's Pass – highly visible (pylon 36 within 260 m).
	VP8a	R46 (Michell's Pass), bottom of Pass	33°24'36.37"S; 19°17'13.62"E	North	15h20	• Users of Michell's Pass – highly visible (pylons 45 and 46 within 200 m).
	VP8b			South		
	VP9a	R46 (Michell's Pass), rest area	33°24'7.00"S; 19°17'10.76"E	South	14h50	• Users of Michell's Pass – highly visible (pylon 49 within 130 m).
	VP9b			North		
	VP10	R46 (Michell's Pass) rest area	33°23'38.45"S; 19°17'16.67"E	North	11h45	• Users of Michell's Pass – highly visible (pylon 53 within 30 m).
	VP11	R46 (Michell's Pass), Die Tolhuis	33°23'26.62"S; 19°17'10.86"E	South-east	11h36	• Users of Michell's Pass – visible as pylon 54 (within 215 m) will be partially visible from Die Tolhius (pylon at a lower elevation), but pylons 53 and 55 (within 300 – 400 m) will be visible.
	VP12a			South	11h22	

	VP12b	R46 (Michell's Pass), railway crossing	33°23'19.39"S; 19°17'17.20"E	North		• Users of Michell's Pass – highly visible (pylon 55 within 80 m).
	VP13a	R46 (Michell's Pass), old toll road	33°22'58.48"S; 19°17'23.55"E	South	11h13	• Users of Michell's Pass – highly visible (pylon 58 within 35 m).
	VP13b			North		
	VP14	R46 (Michell's Pass), rest area	33°22'49.37"S; 19°17'26.36"E	South	11h10	• Users of Michell's Pass – highly visible as the powerline will cross the road close to this viewpoint (pylon 58 to pylon 59).
	VP15a	R46 (Michell's Pass), top of Pass	33°22'42.84"S; 19°17'39.27"E	South	10h57	• Users of Michell's Pass – highly visible.
	VP15b			West		
CERES VALLEY	VP16	R46, entrance to Ceres	33°22'27.50"S; 19°18'0.44"E	South-west	10h45	• Residents of and visitors to Ceres – not visible as the location of this viewpoint at the base of the steep slope screens the powerline.
	VP17	Residential area of Ceres (c/o Mostertshoek Lane and Carson Street)	33°22'6.95"S; 19°17'45.27"E	West	12h19	• Residents of Ceres – not visible as the location of this viewpoint at the base of the steep slope screens the powerline and the forested area to the north provides additional screening.
	VP18	Residential area of Ceres (Plantation Street)	33°21'38.34"S; 19°17'53.34"E	West	12h23	• Residents of Ceres – not visible to marginally visible as the urban fabric and planted trees provide effective screening.
	VP19	Residential area of Ceres (Plantation Street)	33°21'32.96"S; 19°18'15.52"E	West	12h31	• Residents of Ceres – marginally visible as screening is provided by trees surrounding the Ceres Substation.
	VP20	R46 (Ceres industrial area)	33°21'42.52"S; 19°19'25.86"E	West	10h36	• Residents of Ceres – marginally visible as the powerline is over 3 km away and the pylons will blend into the grey background.

Source: SRK, 2017

4.4.6 Compatibility with Landscape Integrity

Landscape (or townscape) integrity refers to the compatibility of the development/visual intrusion with the existing landscape.

The powerline is partially compatible with the existing land use of the Tulbagh-Wolseley Valley where it traverses rural areas. As these areas have been altered by agricultural activities, the powerline is moderately sensitive to the natural environment. A section of the proposed powerline will be located in the servitude of an existing 132 kV powerline (pylon 1 to pylon 23). Receptors are familiar with the existing powerline along this alignment, and the proposed powerline replicates the land use along this section.

Beyond pylon 23, the proposed powerline follows the route of an old wooden pole 66 kV powerline until pylon 49 in Michell's Pass, although sections of the old powerline no longer exist due to fire damage.

The powerline through Michell's Pass and down to the Ceres Substation is visually intrusive and not sympathetic to the sensitivity of the natural environment and the powerline is therefore not compatible with the existing landscape. The remaining wooden pylons in the valley, which will ultimately be decommissioned and removed as part of the project only marginally increase the compatibility of the powerline with the existing land use. The compatibility increases nearer the Ceres Substation as the powerline is more consistent with the existing land use on the property.

Overall, the landscape integrity of the powerline is rated as ***low to moderate***.

5 Stakeholder Engagement

Stakeholder engagement forms a key component of the BA process. The objectives of stakeholder engagement are outlined in this section, followed by a summary of the approach followed in compliance with Chapter 6 of the EIA Regulations, 2014 and issues raised by the public with regard to the proposed development.

It should be noted that prior to the BA process, Eskom has engaged landowners along the route. Proof of these meetings and formal correspondence is attached as Appendix H.

5.1 Objectives and Approach to Stakeholder Engagement

The overall aim of public consultation is to ensure that all stakeholders have adequate opportunity to provide input into the process and raise their comments and concerns. More specifically, the objectives of public consultation are to:

- Identify IAPs and inform them about the proposed development and BA process;
- Provide the public with the opportunity to participate effectively in the process and identify relevant issues and concerns;
- Coordinate cooperation between organs of state in the consideration of the assessment; and
- Provide the public with the opportunity to review documentation and assist in identifying mitigation and management options to address potential environmental issues.

5.2 Stakeholder Engagement during the Basic Assessment Phase

Public participation is currently being undertaken to raise public and authority awareness of the proposed project.

The key activities are described in further detail below.

- Placement of notice boards (size A2) at the Romansrivier and Ceres Substations;
- Placement of an advertisement (in English and Afrikaans) in one local newspaper;
- Notification of stakeholders in terms of Section 41 (2) (b) of GN R982 of 2014;
- Stakeholders and the public were invited to register on the stakeholder database for the project on or before 23 October 2017.

Comments received on the BAR will be collated into an Issues and Responses Summary which will be included with the Final BAR to be submitted to the DEA for decision making.

Proof of the notification of stakeholders will be provided in the Final BAR.

5.2.1 Newspaper Advertisements and Posters

A newspaper advertisement (in English and Afrikaans) announcing the commencement of the BA process, the availability of the BAR and inviting IAPs to register on the project database was placed in the Witzenberg Herald on 21 September 2017.

In addition to the advertisement, a set of A2 posters (an English and Afrikaans version) were placed on the Romansriver and Ceres substation fences. These posters contained brief details of the proposed project and process and the contact details of the consultant. In addition, A4 copies of the posters (English and Afrikaans) were placed on community noticeboards located at the John Steyn (Ceres) Public Library in Ceres.

5.2.2 Identification of Key Stakeholders and IAPs

Relevant IAPs from local, provincial and national authorities, conservation bodies, Non-Governmental Organisations (NGO) groups, local businesses and forums and surrounding land owners and occupants were considered for inclusion in the initial notification of the project and BA process. Relevant authorities were automatically registered as IAPs. Owners of properties neighbouring the site were notified but not registered as IAPs.

As specified in GN R 982, authorities and all (only) persons who submit written comments, attend meetings or request in writing to be placed on the register will be registered as IAPs.

The notification database is attached as Appendix G. The database of registered stakeholders will be updated throughout the process.

5.2.3 Notification of BAR for Public Comment

The release of the BAR for public review was communicated to all identified IAPs by post, email or fax on or by 21 September 2017. Hard copies of the full report have been placed at the following venues:

- John Steyn (Ceres) Public Library;
- Witzenberg Municipality in Ceres; and
- SRK's office in Rondebosch, Cape Town.

An electronic version of the report is available on SRK's website www.srk.co.za.

Hard copies of the BAR were sent to the following Organs of State on 21 September 2017 for comment:

- Department of Environmental Affairs (DEA);
- Breede-Overberg Catchment Management Agency (BOCMA)
- Department of Environmental Affairs & Development Planning (DEA&DP);
- Department of Agriculture;
- Heritage Western Cape (HWC);
- CapeNature;
- Cape Winelands District Municipality; and
- Witzenberg Local Municipality.

DEA was notified that the reports were sent to the organs of state listed above to request their comment. Proof of notifications will be provided to DEA in the Final BAR.

Stakeholders will be afforded a 30 day comment period, ending on 23 October 2017.

5.2.4 Submission and Acceptance of Final BAR

Following initial review of the BAR, issues raised by authorities and the public will be summarised and responded to in an Issues and Responses Summary, which will be appended to the Final BAR. The BAR will be updated (if necessary) taking stakeholder input into account. The Final BAR will then be submitted to the DEA for decision making. IAPs will be informed of the submission of the Final BAR to the DEA, including the Issues and Responses Summary.

6 Environmental Impact Assessment

6.1 Introduction

6.1.1 Specialist Studies Undertaken

A number of specialist studies (see Table 4-1 and below) were undertaken during the Impact Assessment Phase to investigate the key potential direct, indirect and cumulative impacts (negative and positive) identified during Scoping. These specialist impact studies are as follows:

- Freshwater Ecology;
- Botany;
- Avifaunal; and
- Archaeology, Palaeontology and Heritage;
- Visual.

These specialist reports (including Faunal comment) are included as Appendices F1 to F6 to this report.

Certain impacts which do not warrant specialist investigation were also assessed. These impacts include:

- Increased dust and associated impacts on air quality;
- Increased noise and vibration; and
- Creation of jobs during construction and the facilitation of economic growth during operations.

As confirmed by specialist input, no significant impacts on palaeontological resources would result from the activity and hence no specialist palaeontological assessment was required for the HIA (ACRM, 2017).

6.1.2 Impact Rating Methodology

The assessment of impacts was based on specialists' expertise, SRK's professional judgement, field observations and desk-top analysis.

The significance of potential impacts that may result from the proposed project was determined in order to assist decision-makers (typically by a designated competent authority or state agency, but in some instances, the applicant).

The **significance** of an impact is defined as a combination of the **consequence** of the impact occurring and the **probability** that the impact will occur.

The criteria used to determine impact consequence are presented in the table below.

Table 6-1: Criteria used to determine the consequence of the impact

Rating	Definition of Rating	Score
A. ***Extent****– the area over which the impact will be experienced*		
Local	Confined to individual pylon sites or access roads	1
Regional	The region (Municipality or catchment)	2
(Inter) national	Nationally or beyond	3
B. ***Intensity****– the magnitude of the impact in relation to the sensitivity of the receiving environment, taking into account the degree to which the impact may cause irreplaceable loss of resources*		

Low	Site-specific and wider natural and/or social functions and processes are negligibly altered	1
Medium	Site-specific and wider natural and/or social functions and processes continue albeit in a modified way	2
High	Site-specific and wider natural and/or social functions or processes are severely altered	3
C. ***Duration****– the timeframe over which the impact will be experienced and its reversibility*		
Short-term	Up to 2 years and reversible	1
Medium-term	2 to 15 years and reversible	2
Long-term	More than 15 years and irreversible	3

The combined score of these three criteria corresponds to a **Consequence Rating**, as follows:

Table 6-2: Method used to determine the consequence score

Combined Score **(A+B+C)**	3 – 4	5	6	7	8 – 9
Consequence Rating	Very low	Low	Medium	High	Very high

Once the consequence was derived, the probability of the impact occurring was considered, using the probability classifications presented in the table below.

Table 6-3: Probability classification

Probability*– the likelihood of the impact occurring*	
Improbable	< 40% chance of occurring
Possible	40% - 70% chance of occurring
Probable	> 70% - 90% chance of occurring
Definite	> 90% chance of occurring

The overall **significance** of impacts was determined by considering consequence and probability using the rating system prescribed in the table below.

Table 6-4: Impact significance ratings

		Probability			
		Improbable	Possible	Probable	Definite
Consequence	Very Low	**INSIGNIFICANT**	**INSIGNIFICANT**	**VERY LOW**	**VERY LOW**
	Low	**VERY LOW**	**VERY LOW**	**LOW**	**LOW**
	Medium	**LOW**	**LOW**	**MEDIUM**	**MEDIUM**
	High	**MEDIUM**	**MEDIUM**	**HIGH**	**HIGH**
	Very High	**HIGH**	**HIGH**	**VERY HIGH**	**VERY HIGH**

Finally the impacts were also considered in terms of their status (positive or negative impact) and the confidence in the ascribed impact significance rating. The prescribed system for considering impacts status and confidence (in assessment) is laid out in the table below.

Table 6-5: Impact status and confidence classification

Status of impact	
Indication whether the impact is adverse (negative) or beneficial (positive).	+ ve (positive – a ‘benefit’)
	– ve (negative – a ‘cost’)
Confidence of assessment	
The degree of confidence in predictions based on available information, SRK’s judgment and/or specialist knowledge.	Low
	Medium
	High

The impact significance rating should be considered by authorities in their decision-making process based on the implications of ratings ascribed below:

- **INSIGNIFICANT**: the potential impact is negligible and **will not** have an influence on the decision regarding the proposed activity/development.
- **VERY LOW**: the potential impact is very small and **should not** have any meaningful influence on the decision regarding the proposed activity/development.
- **LOW**: the potential impact **may not** have any meaningful influence on the decision regarding the proposed activity/development.
- **MEDIUM**: the potential impact **should** influence the decision regarding the proposed activity/development.
- **HIGH**: the potential impact **will** affect the decision regarding the proposed activity/development.
- **VERY HIGH**: The proposed activity should only be approved under special circumstances.

6.1.3 Integration of Studies into the BAR and Review

The completed specialist studies and their findings have been integrated into the BAR. The key findings of each specialist were evaluated in relation to each other to provide an overall and integrated assessment of the project impacts.

SRK has considered the suite of potential impacts in a holistic manner and in certain instances, based on independent professional judgment and this integrated approach, may have altered impact significance ratings provided by the specialist.

Specialists have made recommendations for the management of impacts, and the BA team has assessed these recommendations. For the sake of brevity, only **key** (i.e. non-standard essential) mitigation measures are presented in impact rating tables (later in this section), with a collective summary of all recommended mitigation measures presented at the end of each discipline.

6.2 Impact Assessment: Construction

Direct impacts associated with the Construction Phase of the project have been quantitatively assessed both with and without recommended mitigation measures. This was undertaken to assess significance according to the methodology laid out in Section 6.1.2. A distinction has been made between essential mitigation measures (which must be implemented and will have an effect on the impact rating) and best practice mitigation measures (which are not essential and will not have an effect on the impact rating). Findings are represented in Impact Rating Tables: Table 6-6 to Table 6-18.

Although no alternatives (other than the no-go alternative) are comparatively assessed, the final project description has been arrived at following an extensive alternative analysis with the input from all specialists on the project team (see Section 3.3).

Cumulative impacts of construction are described qualitatively in Section 6.2.9.

6.2.1 Air Quality Impact

6.2.1.1 Impact A1: Nuisance from Reduced Air Quality

Construction activities, particularly blasting, vegetation clearing and earthworks, are expected to generate dust in the construction area, temporarily affecting air quality in the area immediately surrounding construction sites. Emissions are also anticipated from vehicles and other equipment.

These activities are not expected to cause health impacts as emissions from vehicles and other equipment (including nitrogen oxides (NO_X), carbon dioxide (CO_2), carbon monoxide (CO) and volatile organic compounds (VOC)) are likely to be very low, and will be limited in extent and duration. Furthermore, the area is rural, construction sites are remote, and no sensitive air quality receptors are located in close proximity.

Although dust levels are not likely to exceed normal dust levels associated with construction activities and will be limited in extent and duration, dust may pose a nuisance to users of Michell's Pass.

The impact is assessed to be of ***very Low*** significance without mitigation and ***insignificant*** with the implementation of mitigation measures (see Table 6-6).

Table 6-6: Nuisance from reduced air quality

	Extent	*Intensity*	*Duration*	*Consequence*	*Probability*	*Significance*	*Status*	*Confidence*
Without mitigation	Local	Low	Short-term	Very Low	Definite	**VERY LOW**	Negative	High
	1	1	1	3				
Essential Mitigation Measures: ▪ Implement dust suppression measures on access roads. ▪ Investigate and respond to complaints about dust and take appropriate corrective action.								
With mitigation	Local	Low	Short-term	Very Low	Possible	**INSIGNIFICANT**	Negative	High
	1	1	1	3				

6.2.1.2 Mitigation Measures: Air Quality Impact

Essential air quality mitigation measures during **construction** are as follows:

- Investigate and respond to complaints about dust and take appropriate corrective action.
- Implement dust suppression measures on access roads.
- Limit vehicle speeds to 30 km/h on all unsurfaced access tracks.
- Avoid transport and handling of materials which may generate dust during windy conditions.
- Confine clearing of vegetation to the construction footprint.

6.2.2 Noise Impact

6.2.2.1 Impact N1: Nuisance from Excessive Noise

Noise pollution results from unwanted or excessive noise with effects that range from causing a nuisance to more harmful effects such as sleep disturbance, high stress levels and impaired hearing.

Site preparation and construction activities, including the use of construction machinery and vehicles, will result in persistent, low frequency noise and vibration during the Construction Phase. Blasting activities will result in sporadic, high frequency noise.

Although there are few noise-sensitive anthropogenic receptors in direct proximity to the powerline route, residents of Ceres and Romansriver, as well as road users of Michel's Pass are considered to be sensitive.

Persistent noise from construction activities (such as the operation of vehicles and machinery) is not expected to cause significant nuisance due to the distance from sensitive receptors, and the congruency of this noise with ambient noise in the area (mostly from vehicles using Michel's Pass). Blasting activities, however, will be out of character with ambient noise in the area, may be unanticipated and experienced in the broader region.

Construction related noise is typically limited to daylight (construction) hours.

The impact of nuisance caused by noise from construction activities is therefore assessed to be of ***low*** significance without mitigation and ***very Low*** significance with the implementation of mitigation measures (see Table 6-7).

Table 6-7: Nuisance from excessive noise

	Extent	***Intensity***	***Duration***	***Consequence***	***Probability***	***Significance***	***Status***	***Confidence***
Without mitigation	Regional	Medium	Short-term	Low	Definite	**LOW**	Negative	High
	2	2	1	5				
Essential Mitigation Measures: ▪ Notify the community of the proposed blasting schedule by way of notice boards near the blasting site and in the local press. ▪ Limit particularly noisy operations (including blasting) to Mondays to Fridays between the hours of 08h00 and 17h00.								
With mitigation	Regional	Low	Short-term	Very Low	Definite	**VERY LOW**	Negative	High
	2	1	1	4				

6.2.2.2 Mitigation Measures: Noise Impact

Essential noise impact mitigation measures during **construction** are as follows:

- Notify the community of the proposed blasting schedule by way of notice boards near the blasting site and in the local press.
- Limit particularly noisy operations (including blasting) to Mondays to Fridays between the hours of 08h00 and 17h00.
- Limit construction activities to Mondays to Saturdays between the hours of 07h00 and 18h00, or in accordance with relevant municipal bylaws, if applicable.
- Maintain construction equipment and vehicles in good working order to prevent unnecessary noise.
- Limit vehicle speeds to 30 km/h on all unsurfaced access tracks.
- Investigate and respond to complaints about excessive noise and take appropriate corrective action.

6.2.3 Terrestrial Ecology Impacts

This section of the report is informed by botanical, faunal and avifaunal specialist input undertaken for the BA (refer to Section 6.1.1).

The following potential direct construction phase impacts on the terrestrial ecology were identified:

- T1: Loss of vegetation;
- T2: Loss of floral species of conservation concern;
- T3: Loss of faunal species of conservation concern; and
- T4: Avifaunal displacement.

6.2.3.1 Impact T1: Loss of Vegetation

The powerline route spans six different vegetation types (or terrestrial habitat units): Winterhoek Sandstone Fynbos, Ceres Shale Renosterveld, North Hex Sandstone Fynbos, Breede Shale Fynbos, Breede Alluvium Fynbos and Northern Inland Shale band Vegetation. Two of these are listed as threatened due to historical loss of habitat: Breede Alluvium Fynbos (Endangered) and Ceres Shale Renosterveld (Vulnerable). All other vegetation types in the study area are listed as least threatened.

Aspects of the construction of project that are anticipated to lead to a loss of indigenous vegetation are as follows:

- Construction / clearing of new access roads;
- The upgrade of existing access roads;
- Clearing for pylon footprints;
- Construction laydown areas at pylon footprints; and
- Decommissioning the existing partially burnt wood pole powerline.

The total loss of each vegetation type within the study area from project activities has been calculated and is presented in Table 6-8. Threatened vegetation types are highlighted in **bold** in this table.

Table 6-8: Loss of vegetation anticipated during construction

Vegetation Type	Extent of clearing required – Access Roads		Extent of clearing required – Pylons		Total
	Intact	Degraded	Intact	Degraded	
Ceres Shale Renosterveld	0 m^2	0 m^2	400 m^2	0 m^2	**400 m^2**
Winterhoek Sandstone Fynbos	4 209 m^2	0 m^2	2 200 m^2	0 m^2	6 409 m^2
Northern Inland Shale Band	1 030 m^2	0 m^2	600 m^2	0 m^2	1 630 m^2
North Hex Sandstone Fynbos	22 497 m^2	0 m^2	3 200 m^2	200 m^2	25 897 m^2
Breede Alluvium Fynbos	0 m^2	0 m^2	400 m^2	0 m^2	**400 m^2**
Breede Shale Fynbos	8 114 m^2	0 m^2	4 600 m^2	400 m^2	13 114 m^2
Total:					**47 850 m^2**

From Table 6-8 it can be seen that nearly 50 000 m^2 (~5 ha) of vegetation will be cleared for the project, and that more than half (~3.7 ha) of this clearing will be required for access roads. Of this clearing only 800 m^2 will take place in Endangered (400 m^2) or Vulnerable (400 m^2) vegetation types.

Table 6-9 represents the remaining extents and conservation targets for the vegetation types to be impacted, and compares these to the extent of clearing required for the project. Threatened vegetation types are highlighted in **bold** in the table.

Table 6-9: Remaining extents and conservation targets of vegetation at the site

Vegetation Type	Extent of clearing required	Remaining Extent	Remaining extent (% of original)	% of remaining extent to be cleared	Conservati on target	% conserved
Ceres Shale Renosterveld	**0.04 ha**	**24 221 ha**	**46%**	**0,00017%**	**27%**	**2.7%**
Winterhoek Sandstone Fynbos	0.64 ha	108 417 ha	94%	0,00059%	29%	278%
Northern Inland Shale Band	0.16 ha	25 942 ha	95%	0,00062%	29%	270%
North Hex Sandstone Fynbos	2.59 ha	37 200 ha	94%	0,00696%	29%	270%
Breede Alluvium Fynbos	**0.04 ha**	**18 831 ha**	**40%**	**0,00021%**	**30%**	**13%**
Breede Shale Fynbos	1.31 ha	21 881 ha	70%	0,00599%	30%	100%

From Table 6-9 it can be seen that:

- Less than 0.007% of the remaining extent of vegetation types in the study area will be cleared for the project;
- All least threatened vegetation types that will require clearing are conserved at least at the target percentage;

- Less than 0.0003% of both threatened vegetation types would be cleared for the project; and
- Clearing of threatened vegetation types required for the project will reduce the potential to meet the conservation targets by 1/80 000 for Breede Alluvium Fynbos (i.e. 1/80 000 of the area required to meet conservation targets will be cleared for the project) and 1/140 000 for Ceres Shale Renosterveld.

It should also be noted that the final layout of the project was determined following an extensive alternative analysis with the input from all specialists on the project team, including the botanist. Areas with high botanical sensitivity were avoided (see Appendix F2).

The majority of clearing required for the project will take place within least threatened vegetation types that are well conserved, and the project will not affect the potential to meet conservation targets for any vegetation type. Therefore, and provided that areas of high sensitivity are avoided during construction[12], and that the clearance footprint does not exceed the anticipated extent, clearing required for the project will be easily sustainable on a regional scale.

The impact of a loss of vegetation from clearing required for construction activities is assessed to be of ***high*** significance without mitigation and ***medium*** significance with the implementation of mitigation measures (see Table 6-10).

Table 6-10: Loss of vegetation

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Regional	Medium	Long-term	Medium	Definite	**HIGH**	Negative	High
	2	2	3	6				
Essential Mitigation Measures: ▪ Apply site-specific mitigation specified in the EMPr. ▪ Limit vegetation clearance and the footprint of construction activities to what is absolutely essential. ▪ Define all areas outside of the planned project and construction footprint as no-go areas. ▪ Demarcate construction footprints and restrict access beyond these areas. ▪ Restrict the movement of construction vehicles to new and existing access roads only.								
With mitigation	Regional	Low	Long-term	Medium	Definite	**MEDIUM**	Negative	High
	2	1	3	6				

6.2.3.2 Impact T2: Loss of Floral Species of Conservation Concern

All least threatened vegetation types in the project footprint are data deficient in terms of their composition of floral SCC, while Ceres Shale Renosterveld is known to include seven Red Listed plant species and three endemics, and Breede Alluvial Fynbos hosts 52 Red Listed plant species and 21 endemics.

Although no floral SCC were identified within the project footprint during two site inspections by the botanist, this may be strongly influenced by the season in which the survey was carried out and lack of vegetation cover in recently burnt areas. It is likely that a number of floral SCC would be identified during a spring survey.

The impact of a loss of floral SCC from clearing required for construction activities is therefore conservatively assessed to be of ***medium*** significance without mitigation and ***low*** significance with the implementation of mitigation measures (Table 6-11).

Table 6-11: Loss of floral SCC

[12] Unmitigated disturbances in Vulnerable or Endanger habitat units could result in irreplaceable loss. This is the motivation for the unmitigated "Medium" intensity rating on a regional scale.

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Regional	Low	Long-term	High	Probable	**HIGH**	Negative	Low
	2	1	3	7				
Essential Mitigation Measures: ▪ Appoint a suitably qualified botanist to conduct a spring season search and rescue for floral SCC (focusing on geophytes) in areas specified in the EMPr.								
With mitigation	Regional	Low	Long-term	Medium	Possible	**LOW**	Negative	Low
	2	1	3	6				

6.2.3.3 Impact T3: Reduction in Faunal Abundance

It is typical that the abundance of certain faunal species will be reduced due to habitat (vegetation) loss. Habitat transformation and fragmentation has already occurred in several areas along the powerline route, mostly from historic and current agricultural activities. This has had a significant impact on species like the Geometric Tortoise, but less of an impact on generalists.

Historical fragmentation of natural habitat at a landscape level has shown to be a substantial negative impact for certain species like, but less so for birds and most generalist faunal species.

Furthermore, the presence of people, vehicles and machinery is likely to cause temporary disturbances to certain faunal species, especially for medium to large sized mammals. Likewise, blasting activities will cause certain species to temporarily leave the general area. The surrounding region (including protected areas) provides ample refuge for these species, which are expected to return on the cessation of construction activities.

Due to the relatively low extent of clearance required for the project, relative absence of faunal SCC and the level of historical fragmentation, the intensity of a reduction in the abundance of faunal species is considered to be low.

Nevertheless, there is a chance of occurrence of the Critically Endangered Geometric Tortoise between pylons 1 and 12, and a moderate probability of occurrence between 13 and 21. Therefore, the precautionary approach should be taken in protecting this species during construction.

The impact of a reduction in faunal abundance from construction activities is therefore assessed to be of ***low*** significance with or without the implementation of mitigation measures (Table 6-12).

Table 6-12: Reduction in faunal abundance

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Local	Low	Long-term	Low	Probable	**LOW**	Negative	Medium
	2	1	3	5				
Essential Mitigation Measures: ▪ Apply mitigation measures recommended to prevent indiscriminate vegetation clearance. ▪ Educate construction staff of the sensitivity and possible presence of rare tortoise species. ▪ Photograph and record the location of any tortoise found on site, dead or alive. ▪ Report the tortoise find to CapeNature and the ECO. ▪ Move live tortoise specimens the shortest distance possible away from the disturbance footprint. ▪ Apply no-fire policy on site. ▪ Extinguish veld fires should any break out occur. ▪ Apply a no-poaching policy on site.								
With mitigation	Regional	Low	Long-term	Medium	Probable	**LOW**	Negative	Medium
	2	1	3	6				

6.2.3.4 Impact T4: Avifaunal Displacement

During the Construction Phase avifaunal habitat destruction and transformation will takes place. These activities have an impact on birds breeding, foraging and roosting in or in close proximity to the development area through transformation of habitat, which could result in temporary or permanent displacement.

The avifaunal Red Data species most likely to be affected by habitat destruction are the fynbos associated species, namely Cape Rock-jumper and Protea Seed-eater. However, the relatively limited total footprint of clearing required for the project (see Impact T1) should not materially affect the local populations of these species, as there will still be large areas of undisturbed habitat remaining.

In addition to displacement from habitat destruction, other avifaunal Red Data species that are sensitive to disturbance from construction activities themselves (especially blasting) include the Verreaux's Eagle, Balck Harrier and Cape Rock-jumper. Although the Black Harrier and Cape Rock-jumper are considered to be of low risk in this regard, an active Verreaux's Eagle nest has been identified on the opposite side of the Michell's Pass valley at pylons 54 and 55. The birds utilizing this nest are at high risk of displacement from construction activities, especially blasting.

The impact of a avifaunal displacement from construction activities is assessed to be of ***low*** significance without mitigation and ***insignificant*** with the implementation of mitigation measures (Table 6-13).

Table 6-13: Avifaunal displacement

	Extent	*Intensity*	*Duration*	*Consequence*	*Probability*	*Significance*	*Status*	*Confidence*
Without mitigation	Local	High	Short-term	Low	Probable	**LOW**	Negative	Medium
	1	3	1	4				
Essential Mitigation Measures: ▪ Construct pylons 51 - 55 between December and April only (outside of Verreaux's Eagles breeding season).								
With mitigation	Local	Low	Short-term	Very Low	Improbable	**INSIGNIFICANT**	Negative	Medium
	1	1	1	3				

6.2.3.5 Mitigation Measures: Terrestrial Ecology Impacts

Essential terrestrial ecology mitigation measures during **construction** are as follows:

- Apply site-specific mitigation specified in the EMPr.
- Appoint an ECO to monitor construction activities and compliance with the EMPr.
- Locate site camps in transformed areas to be approved by the ECO.
- Limit vegetation clearance and the footprint of construction activities to what is absolutely essential.
- Use existing access roads as far as possible.
- Define all areas outside of the planned project and construction footprint as no-go areas.
- Demarcate construction footprints and restrict access beyond these areas.
- Avoid the piling of excavated rock on natural vegetation and in watercourses.
- Restrict the movement of construction vehicles to new and existing access roads only.
- Access existing wood poles on foot where established vehicle access to these structures does not exist.
- Appoint a suitably qualified botanist to conduct a spring season search and rescue for floral SCC (focusing on geophytes) in areas specified in the EMPr.
- Educate construction staff of the sensitivity and possible presence of rare tortoise species.

- Photograph and record the location of any tortoise found on site, dead or alive.
- Report the tortoise find to CapeNature.
- Move live tortoise specimens the shortest distance possible away from the disturbance footprint.
- Apply no-fire policy on site.
- Extinguish veld fires should any break out.
- Apply a no-poaching policy on site.
- Construct pylons 51 - 55 between December and April only (outside of Verreaux's Eagles breeding season).
- Apply mitigation measures recommended for the loss of vegetation, nuisance from noise and nuisance from dust.

6.2.4 Freshwater Ecology Impact

This section of the report is informed by freshwater ecology specialist input undertaken for the BA (refer to Section 6.1.1).

6.2.4.1 Impact F1: Degradation of Freshwater Ecosystems

In terms of physical disturbance to watercourses during construction, the project would entail:

- The upgrade of existing and the construction of numerous new access roads within 100 m of watercourses and 500 m of wetlands;
- The construction of electrical pylons within 100 m of watercourses and 500 m of wetlands;
- The construction of a new vehicle bridge over the Dwars / Breede River;
- The construction of a new vehicle bridge over Tierhokkloof River;
- The construction of a new vehicle bridge over an unnamed channel to structure 64;
- The construction of, or upgrade to five vehicle crossings at new and existing access roads over smaller watercourses and seep wetlands;
- Aerial powerline crossings over at least 26 minor watercourses; and
- The use of access roads during pylon construction.

The project would cross, be located in, or be in the vicinity of:

- A number of near-pristine watercourses and seeps in the Ceres area that have been evaluated as CESAs and located in a CBA, and which drain into the Koekedou River to the north;
- The Dwars / Breede River;
- The Tierhokkloof River;
- Numerous non-perennial streams and seeps that drain into the Dwars / Breede River in Michell's Pass valley that have been evaluated as OESAs; and
- At least five watercourses south of the confluence of the Witels River with the Dwars River that have been mapped as CBA wetlands and are sensitive to disturbance.

Construction activities are anticipated to lead to the following disturbances to watercourses:

- Physical disturbance from construction, the use of laydown areas and line-stringing, such as:

  - Infilling of channel margins;
  - Clearing of vegetation (see Section 6.2.3 above);
  - Compaction from trampling and vehicles;
  - Creation of tracks and scour holes; and
  - Loss and removal of topsoil;
- Temporary diversion of flows from the creation of tracks and scour holes, vegetation clearing and compaction;
- Erosion accelerated by the creation of tracks and scour holes, vegetation clearing and compaction;
- Sedimentation from erosion;
- Sedimentation and infilling from blasting;
- Increased turbidity;
- Contamination (from e.g. cement and hydrocarbons); and
- Fire.

The PES of watercourses in the project footprint ranges from Category A and B (natural / largely natural with few modifications) near the Romansriver Substation, Ceres Peak and lower slopes Witzenberg and Skurweberg mountain ranges, to Category C and D (moderate to high levels of habitat degradation) for the remainder of the route. The sensitivity of watercourses is mostly high, with some isolated sections of the route being of only moderate sensitivity.

Although construction of individual project components present only *low risk* to freshwater ecosystems in most cases (as defined by the DWS risk assessment matrix - as assessed by the freshwater ecologist) vehicle access to structures 64 and 65 in this very sensitive and near natural aquatic environment would be at least of *moderate risk.* Furthermore, project construction is anticipated to entail significant stress to sensitive and protected freshwater systems in the region, that could persist in the long term should recommended mitigation not be applied strictly.

The impact of degradation of numerous freshwater habitats from construction activities is therefore assessed to be of ***High*** significance without mitigation and ***Low*** significance with the implementation of mitigation measures (see Table 6-14).

Table 6-14: Degradation of freshwater habitats

	Extent	***Intensity***	***Duration***	***Consequence***	***Probability***	***Significance***	***Status***	***Confidence***
Without mitigation	Regional	Medium	Long-term	High	Definite	**HIGH**	Negative	High
	2	2	3	7				
Essential Mitigation Measures: ▪ Apply site-specific mitigation specified in the EMPr. ▪ Construct new watercourse crossings and upgrade existing watercourse crossings during the dry season (Oct – April) only. ▪ Limit the footprint area of the construction activity to what is absolutely essential. ▪ Define all areas outside of the planned project and construction footprint (including roads and walking routes) as no-go areas. ▪ Restrict the movement of construction vehicles to new and existing access roads only. ▪ Close and rehabilitate erosion gullies as they form. ▪ Undertake vegetation clearing by hand in watercourses. ▪ String conductors through watercourses by hand. ▪ Rehabilitate each site at closure by revegetating cleared areas and ripping and revegetating compacted areas.								
With mitigation	Regional	Low	Medium-term	Low	Definite	**LOW**	Negative	High
	2	1	2	5				

6.2.4.2 Mitigation Measures: Freshwater Ecology Impact

Essential freshwater ecology mitigation measures during **construction** are as follows:

- Apply site-specific mitigation specified in the EMPr.
- Appoint an ECO to monitor construction activities and compliance with the EMPr.
- Construct new watercourse crossings and upgrade existing watercourse crossings during the dry season only.
- Locate site camps in transformed areas approved by the ECO.
- Restrict refueling of vehicles and machinery to a designated area at site camps unless in field refueling is absolutely essential.
- Limit the footprint area of the construction activity to what is absolutely essential.
- Define walking routes for workers between roads, laydown areas and construction sites.
- Define all areas outside of the planned project and construction footprint (including roads and walking routes) as no-go areas.
- Restrict the movement of construction vehicles to new and existing access roads only.
- Provide adequate on-site ablutions.
- Locate lay-down areas at least 20 m from all watercourses (or if this is not possible, in consultation with the ECO).
- Stabilize exposed slopes within 30 m of any watercourse as soon as these are created (e.g. at stockpiles and cut and fill areas) to prevent sedimentation.
- Install cut-off trenches with silt traps around work areas where wet-season work is permissible (see site-specific mitigation measures in the EMPr).
- Close and rehabilitate erosion gullies as they form.
- Remove blast material from watercourses and dispose at least 20 m from any watercourse in disturbed areas.
- Favour the use of ready-mix cement over on-site batching.
- Undertake vegetation clearing by hand in watercourses.
- String conductors through watercourses by hand.
- Remove cuttings of alien vegetation from the site.
- Apply herbicides to cleared stands of alien plants to prevent re-sprouting.
- Remove all waste from the site daily and at closure.
- Rehabilitate each site at closure by revegetating cleared areas and ripping and revegetating compacted areas.
- Revegetate using locally indigenous plant species.
- Apply good housekeeping measures for on-site refueling, cement batching the management of fuels and waste as specified in the EMPr.
- Update the Operational Phase EMPr with lessons learnt during construction in consultation with the DEA (if better practices are identified during this phase).

6.2.5 Heritage Impacts

This section of the report is informed by heritage specialist input undertaken for the BA (refer to Section 6.1.1).

The following potential direct construction phase impacts on heritage were identified:

- H1: Destruction of Pre-colonial Archaeology; and
- H2: Loss of Historical Built Environment.

6.2.5.1 Impact H1: Destruction of Pre-colonial Archaeology

Although the heritage specialist identified a number of pre-colonial archaeological resources (stone artefacts and rock paintings) during two site inspections, these were all found to be located some distance from project infrastructure. As such, no impacts on pre-colonial archaeology are anticipated during construction.

The impact of destruction of pre-colonial archaeology during construction is therefore assessed to be ***insignificant*** and no mitigation is considered necessary (see Table 6-15).

Table 6-15: Destruction and loss of pre-colonial archaeology

	Extent	*Intensity*	*Duration*	*Consequence*	*Probability*	*Significance*	*Status*	*Confidence*
Without mitigation	Local	Low	Short-term	Very Low	Improbable	**INSIGNIFICANT**	Negative	High
	1	1	1	3				
Essential Mitigation Measures: ▪ No mitigation is required.								
With mitigation	Local	Low	Short-term	Very Low	Improbable	**INSIGNIFICANT**	Negative	High
	1	1	1	3				

6.2.5.2 Impact H2: Loss of Historical Built Environment

A number of built environment sites of heritage significance are located along the project route:

- The Old Toll House (1848 – Grade II);
- Remains of the Old Bain Road (1848 – Ungraded); and
- An “Anglo Boer war” structure (Undated – Ungraded).

For the most part, the construction of the powerline will not impact remaining sections of the old road, however, the position of Tower 57 lies close to a section that is well preserved, though neglected (the pylon position was shifted marginally to the east to avoid placement on the old road). The intention is to use the remaining section of the old road to provide access to this pylon during the Construction Phase, and to build a short access track from the old road to the new tower location. Use of, construction and use of the new access track, and construction activities in general may damage this well preserved portion of the old road.

Construction will not impact on the “Anglo Boer war” structure or the Old Toll House.

The impact of a loss of historical built environment (damage to a portion of the old road) from construction activities is therefore assessed to be of ***medium*** significance without mitigation and ***insignificant*** with the implementation of mitigation measures (Table 6-16).

Table 6-16: Loss of historical built environment

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Local	Medium	Long-term	Medium	Probable	**MEDIUM**	Negative	High
	1	2	3	6				
Essential Mitigation Measures: ▪ Select construction and laydown areas at pylon 57 in consultation with an archaeologist. ▪ Appoint an archaeologist to monitor construction activities at pylon 57 twice during construction. ▪ Limit, demarcate and control the construction footprint to prevent damage to remnants of the Old Bain Road.								
With mitigation	Local	Low	Short-term	Very Low	Possible	**INSIGNIFICANT**	Negative	High
	1	1	1	3				

6.2.5.3 Mitigation Measures: Heritage Impacts

Essential heritage mitigation measures during **construction** are as follows:

- Select construction and laydown areas at pylon 57 in consultation with an archaeologist.
- Appoint an archaeologist to monitor construction activities at pylon 57 twice during construction.
- Limit, demarcate and control the construction footprint to prevent damage to remnants of the Old Bain Road.

6.2.6 Socio-Economic Impact

6.2.6.1 Impact E1: Increased Employment, Income and Skills Development

The Construction Phase will provide opportunities for skills development, employment and job creation for service providers and construction workers.

Employment provides many socio-economic benefits to employees and their dependants, including improved material wealth and standard of living, enhanced potential to invest and improved access to social services such as education, health services, etc. The employment and training of unskilled workers facilitates skills transfer and improves the future employment prospects of less-skilled workers.

It is anticipated that as many as 240 people will be employed for the project over an ~8 month construction period.

The *benefit* of increased (direct) employment and income as well as skills development during construction is assessed to be ***insignificant*** without optimisation and of ***low*** significance with the implementation of optimisation measures (Table 6-17).

Table 6-17: Increased employment, income and skills development

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without optimisation	Regional	Low	Short-term	Very Low	Possible	**INSIGNIFICANT**	Positive	High
	2	1	1	4				
Essential Optimisation Measures: ▪ Comply with the provisions outlined in the Eskom Commercial Supply Chain Procedure. For example: ▪ Hierarchical grading of prospective service providers according to their level of black ownership. ▪ Skills development with the objective of increasing the skills base of South African workers. ▪ Employment and job creation with the objective of ensuring the creation of new jobs by suppliers. ▪ Localisation and supplier development to develop South African based suppliers.								
With optimisation	Regional	Low	Medium-term	Low	Probable	**LOW**	Positive	High
	2	1	2	5				

6.2.6.2 Optimisation Measures: Socio-Economic Impact

Essential socio-economic optimisation measures during **construction** are as follows:

- Comply with the provisions outlined in the Eskom Commercial Supply Chain Procedure.

6.2.7 Visual Impact

This section of the report is informed by visual specialist input undertaken for the BA (refer to Section 4).

6.2.7.1 Impact V1: Altered Sense of Place and Visual Intrusion

Visual impacts will be generated by construction activities such as vegetation stripping, earthworks, which can cause scarring, and from construction infrastructure, plant and materials on site (e.g. site camp, cranes and stockpiles). Dust generated at the site will be visually unappealing and may further detract from the visual quality of the area. Such impacts are typically limited to the immediate area surrounding the construction site and the construction period.

Loss of sense of place in the Tulbagh-Wolseley Valley will be limited as construction activities will be marginally congruent with the current nature of the surrounding area (*viz*. agricultural activities) and the construction footprints will be visible from a limited number of viewpoints. However, loss of sense of place is expected along the natural sections of the powerline route during construction (through Michell's Pass and over into the Ceres Substation). Construction will change in the state of the site (vegetation clearance, scarring, construction equipment and dust generation) and will be incongruent with the current natural state of the surrounding area. These changes will be be visible to sensitive receptors, particularly when they take place on steep slopes or are in the foreground to the viewer (e.g. users of Michell's Pass[13]).

The impacts of construction activities are mitigated by the fact that they will take place in the short-term.

The impact is assessed to be of ***low*** significance with and without the implementation of mitigation measures (Table 6-18).

Table 6-18: Altered sense of place and visual intrusion

	Extent	*Intensity*	*Duration*	*Consequence*	*Probability*	*Significance*	*Status*	*Confidence*
Without mitigation	Regional	Medium	Short-term	Low	Definite	**LOW**	Negative	High
	2	2	1	5				
Essential Mitigation Measures: ▪ Prune large indigenous trees and shrubs rather than clearing vegetation completely, where possible. ▪ Rehabilitate disturbed areas incrementally and as soon as possible, not necessarily waiting until completion of the Construction Phase.								
With mitigation	Regional	Medium	Short-term	Low	Definite	**LOW**	Negative	High
	2	2	1	5				

6.2.7.2 Mitigation Measures: Visual Impact

Essential visual mitigation measures during **construction** are as follows:

- Prune large indigenous trees and shrubs rather than clearing vegetation completely, where possible.

---

[13] All the proposed pylons in the Michell's Pass Valley (pylons 36 to 58) will be within 500 m of the road.

- Consolidate the footprint of the construction camp to a functional minimum. Screen the yard with materials that blend into the surrounding area.
- Keep construction sites tidy and all activities, material and machinery contained within an area that is as small as possible.
- Rehabilitate disturbed areas incrementally and as soon as possible, not necessarily waiting until completion of the Construction Phase.
- Apply measures recommended to mitigate dust and vegetation loss.

6.2.8 Indirect Impacts

No indirect impacts were identified during the Construction Phase.

6.2.9 Cumulative Impacts

Anthropogenic activities can result in numerous and complex effects on the natural and social environment. While many of these are direct and immediate, the environmental effects of individual activities (or projects) can combine and interact with other activities in time and space to cause incremental or aggregate effects. Effects from disparate activities may accumulate or interact to cause additional effects that may not be apparent when assessing the individual activities one at a time (Canadian Environmental Protection Agency, date unknown). Cumulative impacts can also be defined as the total impact that a series of developments, either present, past or future, will have on the environment within a specific region over a particular period of time (DEAT IEM Guideline 7, Cumulative effects assessment, 2004).

For the most part, cumulative impacts or aspects thereof are too uncertain to be quantifiable, due mainly to a lack of data availability and accuracy. This is particularly true of cumulative impacts arising from potential or future projects, the design or details of which may not be envisaged, finalised or available and the direct and indirect impacts of which have not yet been assessed. Given the limited detail available regarding such future developments, the analysis will be of a more generic nature and focus on key issues and sensitivities for the project and how these might be influenced by cumulative impacts with other activities.

Cumulative impacts associated with the Construction Phase of this project are limited.

Table 6-19: Cumulative impacts during the Construction Phase

Aspect	Cumulative Impact	Significance
Air Quality	There are no significant sources of air pollution in the area and air quality in the area is expected to be quite good although farming activities may elevate dust levels marginally. Construction activities, predominantly earthmoving activities and vegetation clearance will add to the cumulative dust levels in the area, although to a fairly limited extent.	Very Low (-ve)
Noise	The noise generated by construction activities will add to the cumulative noise level. There are relatively few other noise sources in the area, but some receptors are considered sensitive, especially to blasting. Construction activities, predominantly blasting, earthmoving activities and the movement of large construction vehicles will add to the cumulative noise levels in the area.	Very Low (-ve)
Terrestrial Ecology	Loss of vegetation would result from clearing of vegetation for the pylons and construction of access tracks. The clearance footprint is fairly extensive, and passes through stands of intact indigenous vegetation. Clearance of Endangered vegetation is limited (800 m^2) as the majority of clearance will take place in relatively intact and well conserved vegetation. Vegetation clearance will nevertheless add to the cumulative loss of habitat for flora and avifauna species.	Low (-ve)

Aspect	Cumulative Impact	Significance
Freshwater Ecology	The project footprint passes through or adjacent to a number of watercourses, some of which are protected, in a near-pristine condition or are sensitive to degradation. The project will add to the cumulative levels of degradation and disturbance of already disturbed freshwater ecosystems in the area, and will introduce unique impacts to a number of intact and remote watercourses that are not expected to be impacted significantly by future development.	Medium (-ve)
Socio-economic	The project will contribute to job creation and poverty alleviation in the area in the short term (i.e. during the Construction Phase).	Very Low (+ve)
Heritage	The only heritage impact anticipated during construction is damage to the Old Bain Road. This road has already been significantly damaged through the construction of the contemporary Michell's Pass, the railway line, and through natural weathering. Well-preserved sections of the old pass are limited, but further development along the pass that could jeopardise remaining sections is not anticipated.	Very Low (-ve)

6.3 Operational Phase Impact Assessment

Direct impacts have been quantitatively assessed both with and without recommended mitigation measures associated with the Operational Phase of the Project. This was undertaken to assess significance according to the methodology laid out in Section 6.1.2. Findings are represented in Impact Rating Tables: Table 6-20 to Table 6-26.

Indirect impacts and cumulative impacts are described qualitatively in Section 6.3.6 and Section 6.3.7 respectively.

6.3.1 Terrestrial Ecology Impact

This section of the report is informed by botanical and avifaunal specialist input undertaken for the BA (refer to Section 6.1.1).

6.3.1.1 Impact T5: Loss of Vegetation

Although the majority of vegetation loss will take place during construction, further damage and loss of vegetation is anticipated during maintenance of pylons and access roads, during emergency repairs to infrastructure and when re-stringing the line. This activity will mostly take place in areas disturbed during the construction of this project.

Project disturbances, vehicle movements and the import of foreign construction material are known to introduce weeds and invasive alien plants. In this instance, vehicle movements on access roads during maintenance activities could spread these species into sensitive and protected areas.

Changes in drainage patterns at access roads also have the potential to alter plant communities.

Aspects of operations that are anticipated to lead to the damage or loss of vegetation during operations include:

- Brush cutting;
- Crushing and trampling from uncontrolled access by vehicles and personnel;
- Proliferation of invasive alien plants; and
- Changes to drainage patterns.

The impact of a loss of vegetation during operations is assessed to be of ***Medium*** significance without mitigation and ***Low*** significance with the implementation of mitigation measures (Table 6-10).

Table 6-20: Loss of vegetation

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Regional	Low	Long-term	Medium	Definite	**MEDIUM**	Negative	High
	2	1	3	6				
Essential Mitigation Measures: ▪ Limit vegetation clearance, pruning and the footprint of maintenance activities to what is absolutely essential. ▪ Favour vegetation pruning over clearing. ▪ Remove any observed invasive alien plants within the Eskom servitude.								
With mitigation	Regional	Low	Long-term	Medium	Definite	**LOW**[14]	Negative	High
	2	1	3	6				

6.3.1.2 Impact T6: Avifaunal Mortalities from Electrocution and Collision with Powerlines

Electrocution occurs where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit. Phase-to-phase clearances and the length of stand-off insulators on monopole and lattice structures are sufficient to reduce the risk of avifaunal electrocutions to negligible levels because of the size of Red Data species that are likely to occur in the study (i.e. they are not big enough to short-circuit conductors). Avifaunal electrocution can therefore be ruled out as an aspect of the project.

Collisions with powerlines probably pose the biggest single threat to birds in southern Africa (van Rooyen, 2004; and Shaw, 2013). Species most heavily affected are mostly heavy-bodied birds with limited manoeuvrability such as bustards, storks, cranes and various species of waterbirds.

Several factors are thought to influence avian collisions, including the manoeuvrability and visual capacity of the bird, topography, weather conditions and powerline configuration.

Collision mitigation may need to vary substantially for different collision prone species. However, it is generally accepted that marking a line with PVC spiral type Bird Flight Diverters (BFDs) can reduce collision mortality rates, noting that even a slight mortality reduction may be biologically relevant in areas, species or populations of high conservation concern. Furthermore, black and white interspersed patterns on BFDs are likely to maximise the probability of detection (Martin *et al.,* 2010).

Avifaunal Red Data species likely to occur in the region that are at a high risk from collisions include the Blue Crane; Secretarybird; Black Stork; Maccoa Duck; and Greater Flamingo. Lower risk Red Data species include the following the Lanner Falcon; Verreaux's Eagle; Black Harrier and African Marsh-harrier.

The impact of avifaunal displacement from construction activities is assessed to be of ***Low*** significance without mitigation and ***Insignificant*** with the implementation of mitigation measures (Table 6-21).

[14] Although SRK's standard impact rating methodology calculates the significance of this impact to be of Medium significance with mitigation due to the extent of the project, and duration of the operational phase, it is the opinion of the EAP that the significance of this impact is reduced to Low by virtue of the reduced intensity of the impact following mitigation.

Table 6-21: Avifaunal mortalities from electrocution and collision with powerlines

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Local	High	Short-term	Low	Probable	**LOW**	Negative	Medium
	1	3	1	4				
Essential Mitigation Measures: ▪ Install BFDs on specific spans.								
With mitigation	Local	Low	Short-term	Very Low	Improbable	**INSIGNIFICANT**	Negative	Medium
	1	1	1	3				

6.3.1.3 Mitigation Measures: Terrestrial Ecology Impacts

Essential terrestrial ecology mitigation measures during **operations** are as follows:

- Limit vegetation clearance, pruning and the footprint of maintenance activities to what is absolutely essential.
- Favour vegetation pruning over clearing.
- Remove any observed invasive alien plants within the Eskom servitude.
- Restrict the movement of maintenance vehicles to designated access roads only.
- Restrict laydown areas for maintenance and repair work to areas disturbed during construction of the project.
- Inspect access roads annually during routine maintenance and report on the presence or absence of IAPSs.
- Remove cuttings of alien vegetation from the site.
- Install BFDs on specific spans.
- Get written sigh-off of any changes to the final pylon layout and consequent requirements for BFD installation by an avifaunal specialist.

6.3.2 Freshwater Ecology Impact

This section of the report is informed by freshwater ecology specialist input undertaken for the BA (refer to Section 6.1.1).

6.3.2.1 Impact F2: Degradation of Freshwater Ecosystems

In terms of physical disturbance to watercourses during operations, the project would entail:

- Diversion of surface and shallow subsurface flow from access roads in broad seepage wetlands;
- Concentration of flows from access roads in watercourses and bridges;
- Accumulation of woody debris and sediment on upstream approaches to bridges;
- Constriction of high flows at the Tierhokkloof River; and
- Maintenance activities within 100 m of watercourses and 500 m of wetlands.

The project would cross, be located in, or be in the vicinity of:

- A number of near-pristine watercourses and seeps in the Ceres area that have been evaluated as CESAs and located in a CBA, and which drain into the Koekedou River to the north;
- The Dwars / Breede River;

- The Tierhokkloof River;
- Numerous non-perennial streams and seeps that drain into the Dwars / Breede River in Michell's Pass valley that have been evaluated as OESAs; and
- At least five watercourses south of the confluence of the Witels River with the Dwars River that have been mapped as CBA wetlands and are sensitive to disturbance.

Operations are anticipated to lead to the following disturbances to watercourses:

- Disturbances in watercourses similar to those anticipated during construction, albeit at a lower frequency and intensity, but potentially in the wet season when watercourses, particularly wetlands, are more sensitive;
- The introduction of weeds and invasive alien plants to freshwater systems;
- Erosion, headcut erosion and downstream sedimentation from a concentration of flows at watercourse crossings and bridges;
- Wetland shrinkage, destabilization and fragmentation;
- Reductions of wetland function, such as attenuation, resilience and potential to absorb surface runoff (further erosion);
- Reduction in the habitat integrity of the Dwars and Tierhokkloof Rivers; and
- Scour and bank erosion at bridges during flooding.

During operations, project infrastructure, and access roads in particular, will lead to unavoidable and irreversible changes to the dynamics and condition of numerous sensitive, and in some cases near pristine or protected, freshwater ecosystems. The designs of bridges, as well as the layout of pylons and access roads have been determined in consultation with the freshwater ecologist, and the impact assessment presented here assumes that these designs and layouts will be as described in Sections 3.4.2 and 3.4.3.1 of this report. Final civil designs of new and upgraded minor watercourse and seep crossings are not yet available. It is therefore critical that Design and Operational Phase mitigation is strictly applied.

The impact of degradation of numerous freshwater habitats during operations is therefore assessed to be of ***High*** significance without mitigation and ***Medium*** significance with the implementation of mitigation measures (Table 6-10).

Table 6-22: Significance of degradation of freshwater ecosystems

	Extent	*Intensity*	*Duration*	*Consequence*	*Probability*	*Significance*	*Status*	*Confidence*
Without mitigation	Regional	Medium	Long-term	High	Definite	**HIGH**	Negative	High
	2	2	3	7				
Essential Mitigation Measures: ▪ Apply site-specific mitigation specified in the EMPr. ▪ Include design measures that allow for the spread of surface and subsurface flows across the full width of the watercourse at all road sections through seeps. ▪ Design low-level crossings through seeps that allow overtopping even during small floods (e.g. 1:2 year Return Interval (RI) events) and for the ongoing seepage and low flow through the structure. ▪ Get written sigh-off of final designs of all watercourse crossings from a freshwater ecologist. ▪ Inspect watercourses annually during routine maintenance and report on evidence of erosion at bridges and watercourse crossings. ▪ Respond to reports of erosion by closing gullies and reshaping and revegetating river and wetland banks.								
With mitigation	Regional	Low	Long-term	Medium	Definite	**MEDIUM**	Negative	High
	2	1	3	6				

6.3.2.2 Mitigation Measures: Freshwater Ecology Impact

Essential freshwater ecology mitigation measures during **operations** are as follows:

- Apply site-specific mitigation specified in the EMPr.
- Include design measures that allow for the spread of surface and subsurface flows across the full width of the watercourse at all road sections through seeps.
- Design low-level crossings through seeps that allow overtopping even during small floods (e.g. 1:2 year Return Interval (RI) events) and for the ongoing seepage and low flow through the structure.
- Surface crossings through seeps with rock (preferably, as this would facilitate the percolation of water through the structure in low flow conditions) or concrete.
- Include stormwater dissipation structures at the bank-edge of watercourse crossings and access roads.
- Get written sigh-off of final designs of all watercourse crossings from a freshwater ecologist.
- Apply mitigation measures recommended to reduce vegetation loss during operations.
- Apply appropriate Construction Phase mitigation measures to maintenance or emergency works within 50 m of any watercourse.
- Define (in the EMPr) and use helicopter landing locations and laydown areas established during construction for ongoing maintenance.
- Remove sediment and other debris from bridges, culverts and access roads periodically.
- Inspect watercourses annually during routine maintenance and report on evidence of erosion at bridges and watercourse crossings.
- Respond to reports of erosion by closing gullies and reshaping and revegetating river and wetland banks.
- Undertake vegetation clearing by hand in watercourses.
- Re-string conductors through watercourses by hand.
- Update the Operational Phase EMPr with lessons learnt during operations in consultation with the DEA (if better practices are identified during this phase).

6.3.3 Socio-Economic Impacts

The following potential direct Operational Phase socio-economic impacts were identified:

- E2: Economic Growth from Increased Electrical Supply; and
- E3: Decline in tourism in the region.

6.3.3.1 Impact E2: Economic Growth from Increased Electrical Supply

Although only limited direct employment will be sustained during the Operational Phase for maintenance activities, the project is urgently required to unlock further economic, and in particular agricultural development in the region:

The Witzenberg Municipal area is experiencing rapid socio-economic development, especially in the agricultural sector (for example from the Witzenberg PALS initiative), and a consequent exponential increase in energy demand. The Municipality does not have any unallocated supply capacity to meet the current and future electrical demands of the community, particularly in the agricultural sector.

The economy Witzenberg Municipality is dominated by the agricultural sector and the community is dependent on agriculture as the major economic stimulus.

The project is therefore necessary to:

- Increase the supply of electricity to meet growing demand in Ceres, thereby increasing the productive potential of the region; and
- Improve the reliability of the electrical supply to Ceres and Witzenberg.

Increased production will lead to direct, indirect and induced economic activity and growth in the region, and may in turn increase employment and income, and raise the community's standard of living.

The *benefit* of economic growth facilitated by the project is assessed to be of ***High*** significance and no optimisation is necessary or possible (Table 6-17).

Table 6-23: Economic growth

	Extent	*Intensity*	*Duration*	*Consequence*	*Probability*	*Significance*	*Status*	*Confidence*
Without optimisation	Regional	Medium	Long-term	High	Probable	**HIGH**	Positive	High
	2	2	3	7				
Essential Optimisation Measures: ▪ None.								
With optimisation	Regional	Medium	Long-term	High	Probable	**HIGH**	Positive	High
	2	2	3	7				

6.3.3.2 Impact E2: Decline in Tourism

The Breede Valley is also well known for its wine and the fertile Ceres Valley is known for producing deciduous fruits, and the region is also an attractive tourist destination for outdoor activities (as evidenced by the success of the Ceres Rail Company). The new powerline will be in the foreground of Michell's Pass (a scenic route) and the railway line, and is expected to detract from the visual quality of the valley and the sense of place to receptors (see Section 6.3.5.1). Although the visual character of the landscape will not be transformed by the project, and that there are numerous attractions in the area, it is therefore possible that the project will lead to a marginal decline in tourism in the region.

A decline in tourism could lead to a decline in economic activity, particularly in the services and retail sectors, with associated impacts on livlihoods.

The impact of a decline in tourism is assessed to be of ***Low*** significance with or without the implementation of essential mitigation (Table 6-21).

Table 6-24: Decline in tourism

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Regional	Low	Long-term	Medium	Possible	**LOW**	Negative	Medium
	2	1	3	6				
Essential Mitigation Measures: ▪ Implement mitigation measures to reduce visual impacts during operations.								
With mitigation	Regional	Low	Long-term	Medium	Improbable	**LOW**	Negative	Medium
	2	1	3	6				

6.3.3.3 Optimisation and Mitigation Measures: Socio-Economic Impacts

Essential socio-economic mitigation measure during **operations** is as follows:

- Implement mitigation measures to reduce visual impacts during operations.

6.3.4 Heritage Impact

This section of the report is informed by heritage specialist input undertaken for the BA (refer to Section 6.1.1).

6.3.4.1 Impact H3: Loss of Historical Built Environment

Eskom propose to use a remaining section of the Old Bain Road provide access to Pylon 57 during the operations, and to build a short access track from the old road to the new tower location. Maintenance activities may damage this well preserved portion of the old road.

The impact of a loss of historical built environment (damage to a portion of the old road) from maintenance activities is therefore assessed to be of ***Medium*** significance without mitigation and of ***Low*** significance with the implementation of mitigation measures (Table 6-16).

Table 6-25: Loss of historical built environment

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Local	Low	Long-term	Low	Probable	**LOW**	Negative	High
	1	1	3	5				
Essential Mitigation Measures: ▪ Protect remnants of Old Bain road during maintenance activities. ▪ Reinstate the existing vehicle barrier to the remnant of the Old Bain road near pylon 57.								
With mitigation	Local	Low	Long-term	Low	Possible	**VERY LOW**	Negative	High
	1	1	3	5				

6.3.4.2 Mitigation Measures: Heritage Impact

Essential heritage mitigation measures during **operations** are as follows:

- Protect remnants of Old Bain road during maintenance activities.
- Reinstate the existing vehicle barrier to the remnant of the Old Bain road near pylon 57.

6.3.5 Visual Impact

This section of the report is informed by visual specialist input undertaken for the BA (refer to Section 4.4).

6.3.5.1 Impact V2: Altered Sense of Place and Visual Intrusion

The region has scenic value in terms of the rural setting influenced by the rural patterns created by rolling wheatfields, patchwork of fruit orchards and vineyards, and the sense of nature invoked by the steep mountainous backdrop. Residents and tourists are attracted to the area because of its natural scenery and location in the landscape. The landscape has, however, been modified by vertical elements traversing the landscape including powerlines, sections of which are located along the proposed powerline route.

Although the powerline will not be visible from much of the Tulbagh-Wolseley Valley or Ceres Valley, the proposed powerline will be highly visible to sensitive receptors moving through the Michell's Pass Valley. The powerline will be in the foreground to these receptors (i.e. within 500 m) and is highly likely to alter the visual quality of the scenic Michell's Pass and therefore alter the sense of place to receptors moving through this space (by road / rail).

Although the powerline is moderately compatible with the existing land use of the Tulbagh-Wolseley Valley where it traverses rural areas, the powerline will be less compatible with the natural environment of the Michell's Pass Valley and mountainous area above Ceres, reducing the overall landscape integrity.

New access roads will be consistent with the existing and use when traversing rural areas in the Tulbagh-Wolseley Valley. Access roads in the Michell's Pass Valley will present as scars in the landscape and will be incongruent with the current natural state of the surrounding area.

Opportunities for visual mitigation are extremely limited taking technical constraints into account, however, Eskom must install the lattice structure as the preferred pylon structure in the Michell's Pass Valley and mountainous area above Ceres, as this structure type will blend into the mountainous backdrop better than the monopole structure.

The impact of altered sense of place and visual Intrusion during operations project is assessed to be of ***high*** significance with and without the implementation of mitigation (Table 6-26).

Table 6-26: Significance of altered sense of place and visual intrusion during operations

	Extent	*Intensity*	*Duration*	*Consequence*	*Probability*	*Significance*	*Status*	*Confidence*
Without mitigation	Regional	Medium	Long-term	High	Definite	**HIGH**	Negative	High
	2	2	3	7				
Essential Mitigation Measures: ▪ Utilise lattice structures in the Michell's Pass Valley and mountainous area above Ceres. ▪ Decommission the remaining 66 kV powerline within two years of the commencement of operations.								
With mitigation	Regional	Medium	Long-term	High	Definite	**HIGH**	Negative	High
	2	2	3	7				

6.3.5.2 Mitigation Measures: Visual Impacts

Essential visual mitigation measures during **operations** are as follows:

- Decommission the remaining 66 kV powerline within two years of the commencement of operations.
- Utilise lattice structures in the Michell's Pass Valley and mountainous area above Ceres.
- Prohibit the installation of lights on pylons.
- Implement mitigation measures to address the loss of vegetation and degradation of freshwater ecosystems during operations.

- Construct terrace walls using materials that blend in with the surroundings (e.g. sandstone stone-packing, riverstone gabions) where necessary.

6.3.6 Indirect Impacts

The creation of new access tracks may assist weeds and invasive alien plant control and eradication activities, and would assist with access to natural areas in the event of a fire. Conversely, these new tracks would improve access to protected and sensitive areas for individuals with nefarious intentions, such as poaching or arson. The net indirect benefit of the creation of new access tracks is considered to be of ***very low*** significance.

6.3.7 Cumulative Impacts

Table 6-27: Cumulative impacts during the Operational Phase

Aspect	Cumulative Impact	Significance
Terrestrial Ecology	Extremely limited loss of vegetation would take place during maintenance activities and is not expected to significantly contribute to cumulative effects on vegetation types during operations.	Insignificant (-ve)
Avifauna	During operations the powerline would add to the cumulative impact of avifaunal mortality due to collision with and electrocution from electrical infrastructure in the region. However, this impact will be reduced by using bird-friendly powerline designs.	Very low (-ve)
Freshwater Ecology	The route passes through or adjacent to a number of watercourses, some of which are protected, in a near-pristine condition or are sensitive to degradation. The project will add to the cumulative levels of degradation and disturbance of already disturbed freshwater ecosystems in the area, and will introduce unique impacts to a number of intact and remote watercourses that are not expected to be impacted significantly by future development.	Medium (-ve)
Socio-economic	Economic impacts are by nature cumulative, but this project is expected to facilitate numerous additional developments in the agricultural sector, and therefore can be considered to have a strong cumulative benefit to the region.	Medium (+ve)

6.4 Decommissioning Phase Impact Assessment

As it is expected that the powerline will be maintained in the long-term and not be decommissioned in the foreseeable future, impacts related to decommissioning and post-closure have not been assessed.

6.5 The No-Go Alternative

The No-Go alternative implies that the powerline will not be constructed and the electricity supply to surrounding areas will not be secured. This will inhibit future agricultural development and economic growth in the area. In other words, the benefit of increased economic growth in the region will be foregone.

As the project is located in a number of protected or conserved areas and within a scenic valley with steep relief, the significant visual and biophysical impacts associated with the project would not materialise if the project does not proceed.

Biophysical and cultural impacts of the No-Go alternative are therefore considered to be ***insignificant***, while the opportunity cost of increased economic growth and improvements to the lifestyle of the local community will be of ***high*** significance.

7 Conclusions and Recommendations

This chapter evaluates the impact of the proposed double circuit powerline and associated infrastructure between Romansriver and Ceres in the Western Cape Province. The principal findings are presented in this chapter, followed by an analysis of the need and desirability of the project and a discussion of the key factors DEA will have to consider in order to take a decision which is aligned with the principles of sustainable development. Key recommendations are also presented.

As is to be expected, the double circuit powerline and associated infrastructure has the potential to cause impacts, both negative and positive. Although, according to Eskom, the project is a critical infrastructure project, that is essential to meet the development needs of the Witzenberg Municipality, the locality of the powerline route through sensitive, conserved and protected environments compounds the intensity of biophysical and visual impacts of the project.

The BA has examined the available project layout information and drawn on both available (secondary) and specifically collected (primary) baseline data to identify and evaluate environmental (biophysical and socio-economic) impacts of the proposed project. The BAR aims to inform decision-makers of the key considerations by providing an objective and comprehensive analysis of the potential impacts and benefits of the project, and has created a platform for the formulation of mitigation measures to manage these impacts, presented in the EMPr (see Appendix E).

This chapter presents the general conclusions drawn from the BA process, which should be considered in evaluating the project. It should be viewed as a supplement to the detailed assessment of individual impacts presented in Chapter 6.

7.1 Environmental Impact Statement

The EIA Regulations, 2014 prescribe the required content of a BAR, including, *inter alia*, an EIS, which is presented in the section below.

7.1.1 Evaluation and Summary of Positive and Negative Impacts

The evaluation is undertaken in the context of:

- The project information provided by the proponent;
- The assumptions made for this BAR;
- The assumption that the recommended (essential) mitigation measures will be effectively implemented; and
- The assessments provided by specialists.

This evaluation aims to provide answers to a series of key questions posed as objectives at the outset of this report, which are repeated here:

- Assess in detail the environmental and socio-economic impacts that may result from the project;
- Identify environmental and social mitigation measures to address the impacts assessed; and
- Produce BAR that will assist DEA to decide whether (and under what conditions) to authorise the proposed development.

The evaluation and the basis for the subsequent discussion are represented concisely in Table 7-1, which summarises the potentially significant impacts and their significance ratings before and after application of mitigation and/or optimisation measures.

Table 7-1: Summary of potential impacts of the Eskom double circuit powerline and associated infrastructure

Potential negative impacts are shaded in reds, benefits are shaded in greens. Insignificant impacts have not been shaded. Only ***key (non-standard essential)*** *mitigation/optimisation measures are presented.*

ID #	Impact	Significance rating: Before mitigation/ optimisation	Significance rating: After mitigation/ optimisation	Key mitigation/optimisation measures
CONSTRUCTION PHASE IMPACTS				
A	**Air Quality Impacts**			
A1	Nuisance from reduced air quality	Very Low	Insignificant	• Implement dust suppression measures on access roads. • Investigate and respond to complaints about dust and take appropriate corrective action.
N	**Noise Impacts**			
N1	Nuisance from excessive noise	Low	Very Low	• Notify the community of the proposed blasting schedule by way of notice boards near the blasting site and in the local press. • Limit particularly noisy operations (including blasting) to Mondays to Fridays between the hours of 08h00 and 17h00.
T	**Terrestrial Ecology Impacts**			
T1	Loss of vegetation	High	Medium	• Apply site-specific mitigation specified in the EMPr. • Limit vegetation clearance and the footprint of construction activities to what is absolutely essential. • Define all areas outside of the planned project and construction footprint as no-go areas. • Demarcate no-go areas. • Restrict the movement of construction vehicles to new and existing access roads only.
T2	Loss of floral SCC	High	Low	• Appoint a suitably qualified botanist to conduct a spring season search and rescue for floral SCC (focusing on geophytes) in areas specified in the EMPr.
T3	Reduction in faunal abundance	Low	Low	• Educate construction staff of the sensitivity and possible presence of rare tortoise species. • Photograph and record the location of any tortoise found on site, dead or alive. • Report the tortoise find to CapeNature. • Move live tortoise specimens the shortest distance possible away from the disturbance footprint. • Apply no-fire policy on site. • Extinguish veld fires should any break out. • Apply a no-poaching policy on site.
T4	Avifaunal displacement	Low	Insignificant	• Construct pylons 51 - 55 between December and April only (outside of Verreaux's Eagles breeding season).
F	**Freshwater Ecology Impact**			

F1	Degradation of freshwater ecosystems	High	Medium	• Apply site-specific mitigation specified in the EMPr. • Construct new watercourse crossings and upgrade existing watercourse crossings during the dry season only. • Limit the footprint area of the construction activity to what is absolutely essential. • Define all areas outside of the planned project and construction footprint (including roads and walking routes) as no-go areas. • Restrict the movement of construction vehicles to new and existing access roads only. • Close and rehabilitate erosion gullies as they form. • Undertake vegetation clearing by hand in watercourses. • String conductors through watercourses by hand. • Rehabilitate each site at closure by revegetating cleared areas and ripping and revegetating compacted areas.
H	**Heritage Impacts**			
H1	Destruction of pre-colonial archaeology	Insignificant	Insignificant	• No mitigation required.
H2	Loss of historical built environment	Medium	Insignificant	• Appoint an archaeologist to monitor construction activities once every two weeks. • Select construction and laydown areas in consultation with an archaeologist. • Limit, demarcate and control the construction footprint to prevent damage to remnants of the Old Bain Road.
E	**Socio-Economic Impact**			
E1	Increased employment, income and skills development	Insignificant	Low	• Comply with the provisions outlined in the Eskom Commercial Supply Chain Procedure.
V	**Visual Impacts**			
V1	Altered sense of place and visual intrusion	Low	Low	• Prune large indigenous trees and shrubs rather than clearing vegetation completely, where possible. • Rehabilitate disturbed areas incrementally and as soon as possible, not necessarily waiting until completion of the Construction Phase.
OPERATIONAL PHASE IMPACTS				
T	**Terrestrial Ecology Impacts**			
T5	Loss of vegetation	Medium	Low	▪ Limit vegetation clearance, pruning and the footprint of maintenance activities to what is absolutely essential. ▪ Favour vegetation pruning over clearing. ▪ Remove any observed invasive alien plants.
T6	Avifaunal mortalities from electrocution and collision with powerlines	Low	Insignificant	▪ Install BFDs on specific spans.

F	**Freshwater Ecology Impacts**			
F2	Degradation of freshwater ecosystems	High	Medium	▪ Apply site-specific mitigation specified in the EMPr. ▪ Include design measures that allow for the spread of surface and subsurface flows across the full width of the watercourse at all road sections through seeps. ▪ Design low-level crossings through seeps that allow overtopping even during small floods (e.g. 1:2 year Return Interval (RI) events) and for the ongoing seepage and low flow through the structure. ▪ Get written sigh-off of final designs of all watercourse crossings from a freshwater ecologist. ▪ Inspect watercourses annually during routine maintenance and report on evidence of erosion at bridges and watercourse crossings. ▪ Respond to reports of erosion by closing gullies and reshaping and revegetating river and wetland banks.
E	**Socio-Economic Impacts**			
E2	Economic growth from increased electrical supply	High	High	▪ None
E3	Decline in tourism	Low	Low	▪ Implement mitigation measures to reduce visual impacts during operations.
H	**Heritage Impacst**			
H3	Loss of historical built environment	Medium	Low	▪ Protect remnants of Old Bain road during maintenance activities. ▪ Prevent the use of the remnant of Old Bain Road by the public.
V	**Visual Impacts**			
V2	Altered sense of place and visual intrusion	High	High	▪ Utilise lattice structures in the Michell's Pass Valley and mountainous area above Ceres. ▪ Decommission the remaining 66 kV powerline within two years of the commencement of operations.

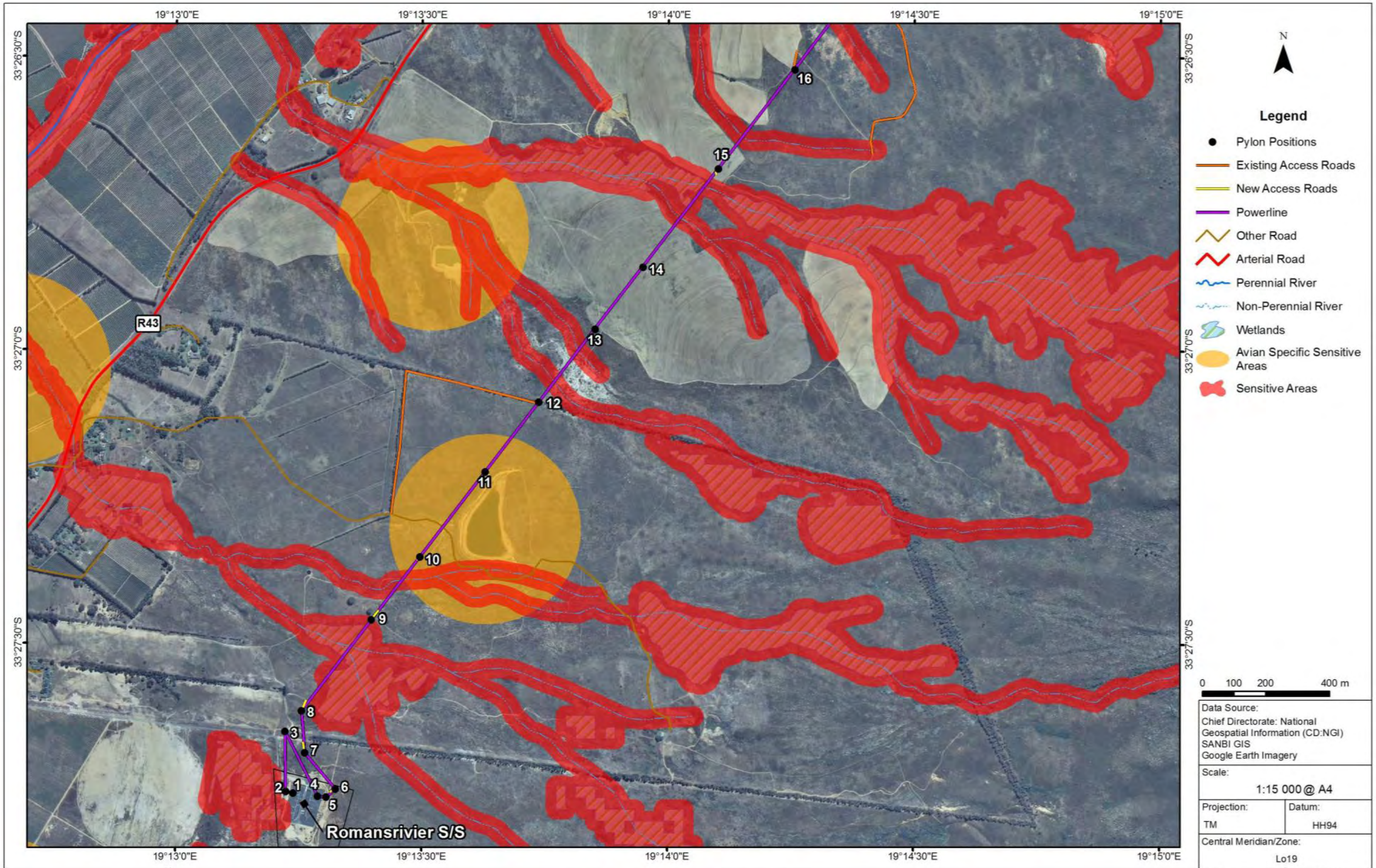
Relevant observations with regard to the overall impact ratings, assuming mitigation measures are effectively implemented, are:

- The predicted *air quality* impact, associated with the creation of dust and resulting nuisance effects during construction, notably on the users of Michell's Pass is rated as *insignificant*.
- The predicted *noise* impact, associated with sporadic blasting, is rated as *very low* during construction. Although not in close proximity, residents of Ceres and Romansrivier, as well as users of Michell's Pass are considered to be sensitive receptors.
- The predicted impacts on *freshwater ecology,* associated with the degradation of freshwater ecosystems, are rated as *medium*. Implementing design recommendations by the freshwater ecologist and restricting construction and maintenance activities in many sensitive areas are key mitigation.
- The predicted *terrestrial ecology* impacts, associated with the loss of vegetation and SCC, are rated as *medium to low*. This takes account of the mostly well represented and conserved receiving environment, the avoidance of sensitive areas during construction and specific measures to protect SCC.
- The predicted impacts on *avifauna,* associated with displacement and collisions, are rated as *insignificant*.
- The predicted *socio-economic* benefit*,* associated with economic growth from increased electrical supply is rated as *high.* This rating acknowledges that supply is constrained in an area experiencing growth in the agricultural sector.
- The predicted *socio-economic* impact*,* associated with a decline in tourism is rated as *low.*
- The predicted *heritage* impacts, associated with the loss of historical built environment, are rated as *insignificant* during construction and *very low* during operations.
- The predicted *visual* impacts associated with the altered sense of place and visual intrusion are rated as *low* during construction and *high* during operations. Opportunities for the mitigation of visual impacts in this scenic area are extremely limited.

Indirect and cumulative impacts of the project are assessed to be relatively benign.

7.1.2 Integrated Project and Sensitivity Map

The EIA Regulations, 2014 prescribe that an integrated map at an appropriate scale is presented in the EIS. The map should, so far as it is applicable, superimpose the proposed activity and associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers – see Figure 7-1 to Figure 7-5.



Data Source:
Chief Directorate: National Geospatial Information (CD:NGI)
SANBI GIS
Google Earth Imagery

Scale: 1:15 000 @ A4	
Projection: TM	Datum: HH94
Central Meridian/Zone: Lo19	
Date: 14/09/2017	Compiled by: FUBM
Project No: 509264	Fig No: 7-1

srk consulting

ROMANSRIVIER BA

SENSITIVE AREAS AND INFRASTRUCTURE LOCATIONS 1 – 16

Path: G:\New Proj\509264_RomansrivierBA\8GIS\GISPROJ\MXD\509264_Fig7-1_RomansrivierBA_Sensitivity1-16_A4L_14092017.mxd

Revision: B Date: 14 09 2017

Data Source: Chief Directorate: National Geospatial Information (CD:NGI) SANBI GIS Google Earth Imagery	
Scale: 1:15 000 @ A4	
Projection: TM	Datum: HH94
Central Meridian/Zone: Lo19	
Date: 14/09/2017	Compiled by: FUBM
Project No: 509264	Fig No: 7-2

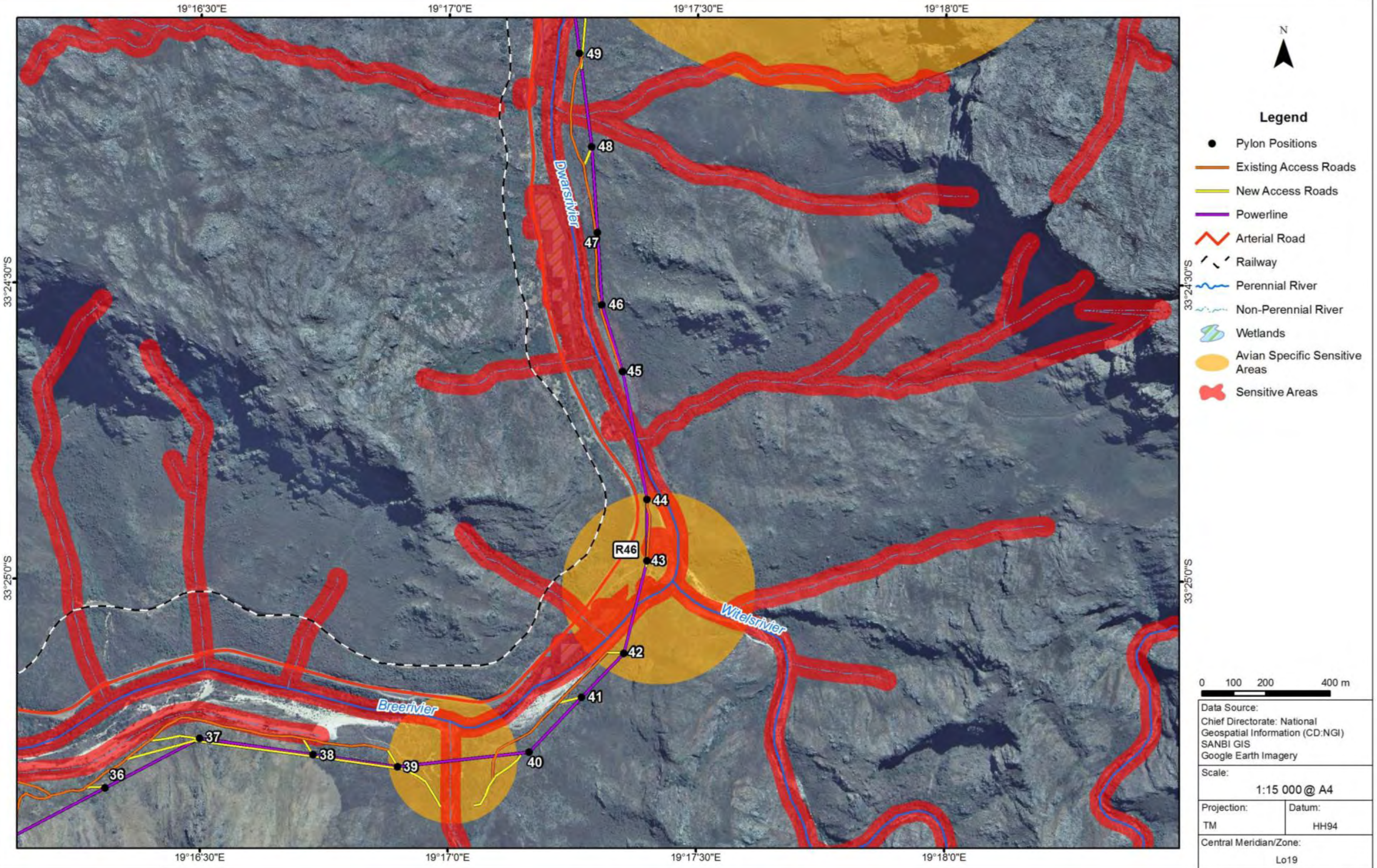
srk consulting

ROMANSRIVIER BA

SENSITIVE AREAS AND INFRASTRUCTURE LOCATIONS 17 – 35

Path: G:\New Proj\509264_RomansrivierBA\8GIS\GISPROJ\MXD\509264_Fig7-2_RomansrivierBA_Sensitivity17-35_A4L_14092017.mxd

Revision: B Date: 14 09 2017



Data Source: Chief Directorate: National Geospatial Information (CD:NGI) SANBI GIS Google Earth Imagery	
Scale: 1:15 000 @ A4	
Projection: TM	Datum: HH94
Central Meridian/Zone: Lo19	
Date: 14/09/2017	Compiled by: FUBM
Project No: 509264	Fig No: 7-3

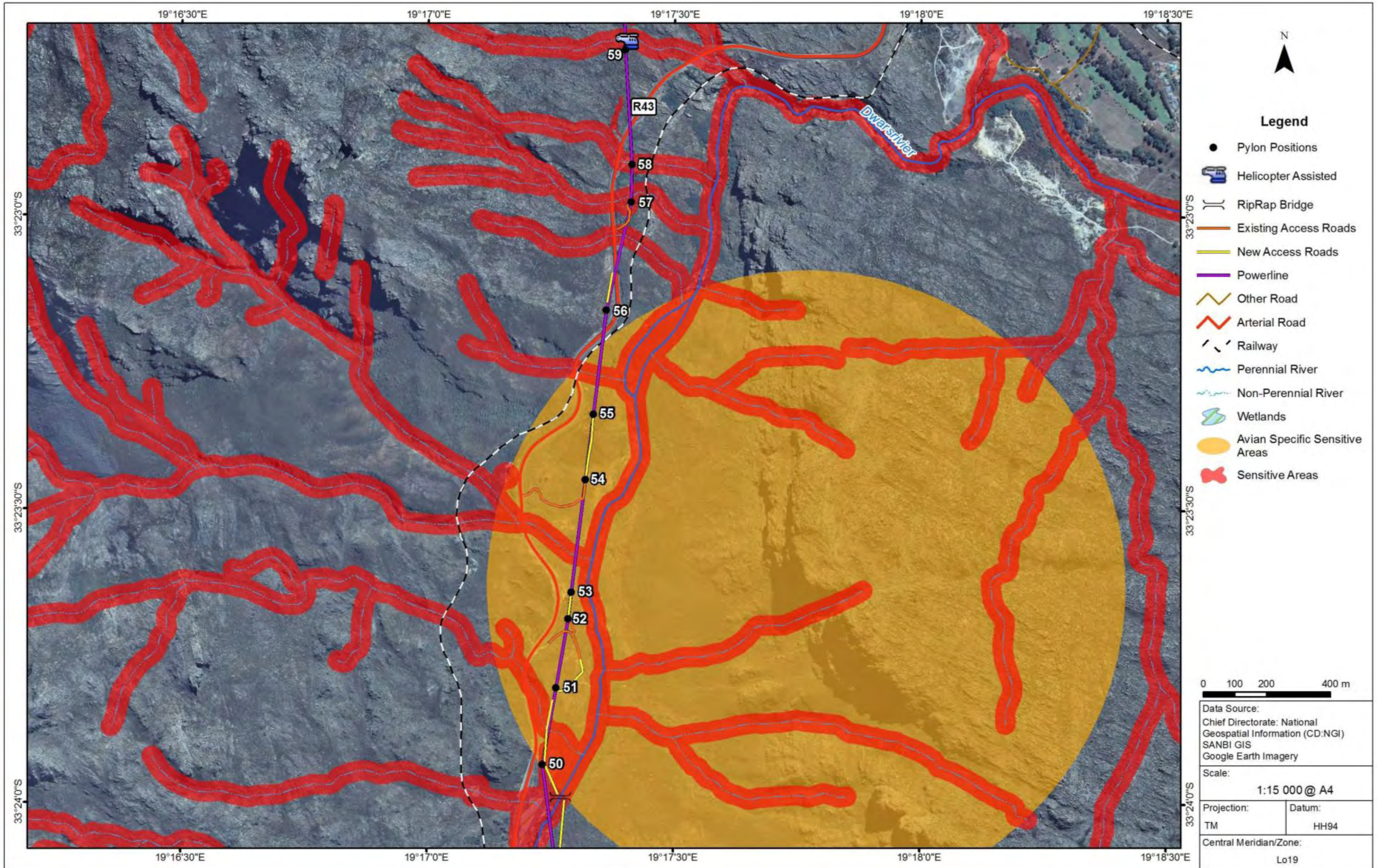
srk consulting

ROMANSRIVIER BA

SENSITIVE AREAS AND INFRASTRUCTURE LOCATIONS 36 – 49

Path: G:\New Proj\509264_RomansrivierBA\8GIS\GISPROJ\MXD\509264_Fig7-3_RomansrivierBA_Sensitivity36-49_A4L_14092017.mxd

Revision: B Date: 14 09 2017



srk consulting

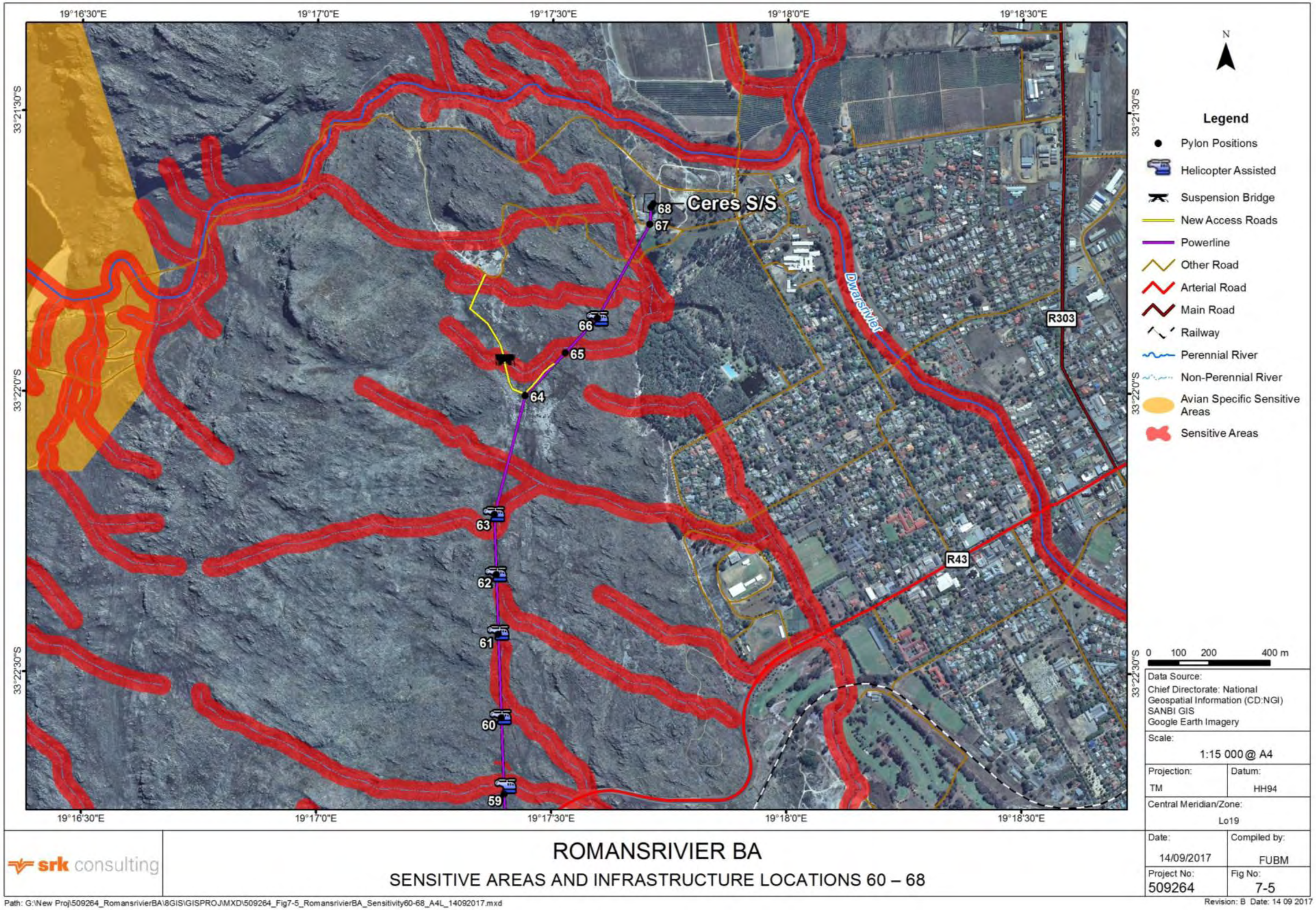
ROMANSRIVIER BA

SENSITIVE AREAS AND INFRASTRUCTURE LOCATIONS 50 – 59

Date:	Compiled by:
14/09/2017	FUBM
Project No: 509264	Fig No: 7-4

Path: G:\New Proj\509264_RomansrivierBA\8GIS\GISPROJ\MXD\509264_Fig7-4_RomansrivierBA_Sensitivity50-59_A4L_14092017.mxd

Revision: B Date: 14 09 2017


19°16'30"E
19°17'0"E
19°17'30"E
19°18'0"E
19°18'30"E
33°21'30"S
33°22'0"S
33°22'30"S
N
Ceres S/S
68
67
66
65
64
63
62
61
60
59
R303
R43
Dwarsrivier
Legend
Pylon Positions
Helicopter Assisted
Suspension Bridge
New Access Roads
Powerline
Other Road
Arterial Road
Main Road
Railway
Perennial River
Non-Perennial River
Avian Specific Sensitive Areas
Sensitive Areas
0 100 200 400 m
Data Source:
Chief Directorate: National Geospatial Information (CD:NGI)
SANBI GIS
Google Earth Imagery
Scale:
1:15 000 @ A4
Projection: TM
Datum: HH94
Central Meridian/Zone: Lo19
Date: 14/09/2017
Compiled by: FUBM
Project No: 509264
Fig No: 7-5
srk consulting
ROMANSRIVIER BA
SENSITIVE AREAS AND INFRASTRUCTURE LOCATIONS 60 – 68
Path: G:\New Proj\509264_RomansrivierBA\8GIS\GISPROJ\MXD\509264_Fig7-5_RomansrivierBA_Sensitivity60-68_A4L_14092017.mxd
Revision: B Date: 14 09 2017

7.1.3 Principal Findings

The project will entail so-called triple bottom line costs, i.e. social, environmental and economic costs. The triple bottom line concerns itself with environmental (taken to mean biophysical) sustainability, social equity and economic efficiency and is typically employed by companies seeking to report on their performance. The concept serves as a useful construct to frame the evaluation of environmental impacts of the project.

The challenge for DEA is to take a decision which is sustainable in the long term and which will probably entail trade-offs between social, environmental and economic costs and benefits. The trade-offs are documented in the report, which assesses environmental impacts and benefits and compares these to the No-Go alternative. SRK believes it will be instructive to reduce the decision factors to the key points which the authorities should consider. These points constitute the principal findings of the BA:

1. Eskom intends to construct a new double circuit powerline (132kV and 66kV) from the Romansrivier substation to the Ceres substation through a portion of the Breede River Valley in the Western Cape.
2. The site extends numerous farms and properties.
3. The purpose of the project is to improve the reliability and capacity of the electrical supply to the Ceres region.
4. Key aspects of the project include the installation of the 20km powerline, the upgrade of existing and the construction of new access roads (including bridges and other watercourse crossings) and decommissioning the existing wood pole 66 kV line between the Romansriver and Ceres substations.
5. The powerline and access roads will cross a number of sensitive wetlands and watercourses, some of which in a near natural condition.
6. The conceptual designs for watercourse crossings have been selected based on the nature of the watercourses, ecological considerations and technical constraints. Final design of these structures is critical to the long-term sustainability of the project.
7. The project will lead to the clearance of approximately 5ha of mostly well represented and conserved vegetation, albeit in a protected area.
8. The project is located in a scenic valley that is well known for tourism.
9. The main economic activity of the region is agriculture.
10. Eskom investigated two routes for the proposed double circuit line between Romansriver and Ceres, the “mountain route” and the “river route”. Based on the outcomes of a financial and technical feasibility study, the mountain route was eliminated and only the river route has been presented as feasible to Eskom.
11. Specialists and EAP undertook detailed screening of the study area to assess baseline conditions. This study, followed by numerous iterations, informed the final assessed in this report.
12. Potential environmental aspects considered include air quality, noise, traffic, freshwater and terrestrial ecology, socio-economic, heritage and visual.
13. Key ecological impacts are associated with a loss in vegetation and the degradation of freshwater ecosystems. These impacts are mitigated to acceptable levels through the strict implementation of the EMPr.

14. Visual impacts are largely unavoidable, and of high significance. The potential for this to lead to a decline in tourism has been assessed to be of low significance.
15. The high socio-economic benefit of economic growth from increased electrical supply from this key infrastructure project is an important consideration, and is likely to exceed economic impacts of a potential decline in tourism.
16. The No-Go alternative implies that the powerline will not be constructed, significant impacts will not materialise and that reliable electrical supply to surrounding areas will not be secured.
17. A number of mitigation and monitoring measures have been identified to avoid, minimise and manage potential environmental impacts associated with the proposed development. These are further laid out in the EMPr.

7.2 Analysis of Need and Desirability of the Project

Best practice as well as the EIA Regulations, 2014 (Appendix 3 Section 3 [f]) requires that the need and desirability of a project (including viable alternatives) are considered and evaluated against the tenets of sustainability. This requires an analysis of the effect of the project on *social, economic and ecological* systems; and places emphasis on consideration of a project's *justification* not only in terms of financial viability (which is often implicit in a [private] proponent's intention to implement the project), but also in terms of the specific needs and interests of the community and the opportunity cost of development (DEA&DP, 2013).

The principles in NEMA (see Section 2.1.1) serve as a guide for the interpretation of the issue of "need", but do not conceive "need" as synonymous with the "general purpose and requirements" of the project. The latter might relate to the applicant's project motivation, while the "need" relates to the interests and needs of the broader public. In this regard, an important NEMA principle is that environmental management must ensure that the environment is "held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage" (DEA, 2014).

There are various proxies for assessing the need and desirability of a project, notably national and regional planning documents which enunciate the strategic needs and desires of broader society and communities: project alignment with these documents must therefore be considered and reported on in the EIA process. With the use of these documents or - where these planning documents are not available - using best judgment, the EAPs (and specialists) must consider the project's strategic context, or justification, in terms of the needs and interests of the broader community (DEA&DP, 2013).

The consideration of need and desirability in EIA decision-making therefore requires the consideration of the strategic context of the project along with broader societal needs and the public interest (DEA, 2017). However, it is important to note that projects which deviate from strategic plans are not necessarily undesirable. The DEA notes that more important are the social, economic and ecological impacts of the deviation, and "the burden of proof falls on the applicant (and the EAP) to show why the impacts…might be justifiable" (DEA, 2010).

The need of the project in terms of motivation for the project is discussed in Section 3.2. The desirability in terms of the different environmental aspects is discussed below.

- During the stakeholder engagement process for the local IDP, electricity was identified as a priority need for the municipality. More specifically, the main issue raised was constant power outages, notably in Wards 1 and 12.

  The project aims to secure supply to the area and meet growing demand for power, particularly in the agricultural sector.

- The Environmental Policy adopted by the Witzenberg Municipality in their IDP aims to manage the environment in a sustainable manner through sustainable development, and contribute to the improvement of quality of life of all citizens of Witzenberg (IDP, 2012). This can be effected by, *inter alia*, establishing projects that ensure environmental sustainability and contribute to job creation and a better quality of life for all its citizens. The BAR assesses the environmental impacts of the project, and compares these to the potential benefits in order to inform authorities' decisions regarding the necessary approvals for the project. In this way, the Environmental Policy of the Municipality is fulfilled.

  Furthermore, the Environmental Policy aims to work with all relevant stakeholders and spheres of government in the spirit of good government. This is achieved for this project through the BA process.

- The Witzenberg SDF (2012) recognises that rural predominance and resource constraints place pressure on the Municipality's capacity to meet service infrastructure needs of the residents, and encourages the optimal utilisation of existing resources, including agricultural resources, and seeks to support intensive use of land by providing infrastructure and bulk services.

  The provision of additional electrical supply capacity and security of supply to users in Ceres is therefore directly in line with the objectives of the SDF for the local municipality.

- The project will directly contribute to SIP 10: Electricity transmission and distribution for all – and is therefore a strategically important project for economic development and service delivery.

7.3 Recommendations

The specific recommended mitigation and optimisation measures are presented in Chapter 6 and the EMPr (Appendix E) and key measures are summarised in Table 7-1 above. Eskom would need to implement these mitigation measures to demonstrate compliance and adherence to best practice. Although it is in theory possible that the potential impacts (or unintended consequences) of implementing mitigation and optimisation measures could offset their intended effect (for example, impacts of bridges), the layout and design of the project has been carefully considered, and site specific mitigation has been recommended to specifically address this possibility. The potential for such unintended consequences in the case of this project is considered low.

Key recommendations, which are considered essential, are:

1. Implement the EMPr (including site specific mitigation) to guide construction, operation and maintenance activities and to provide a framework for the ongoing assessment of environmental performance;
2. Appoint an Environmental Control Officer (ECO) to oversee the implementation of the EMPr and supervise any construction activities in particularly sensitive habitats;
3. Minimise the physical footprint of the development and areas disturbed by construction activities to the smallest extent possible, and avoid particularly sensitive habitats;
4. Rehabilitate all areas disturbed by construction activities (outside of infrastructure footprints);
5. Obtain other permits and authorisations as may be required, including, but not limited to
    a. Water Use Authorisations;
    b. Permits for the disturbance or translocation of species of conservation concern; and
    c. NEM:PAA approvals (to be confirmed).

7.4 Conclusion and Authorisation Opinion

This Draft BAR has identified and assessed the potential biophysical and socio-economic impacts associated with the proposed double circuit powerline and associated infrastructure in the Western Cape.

In terms of Section 31 (n) of NEMA, the EAP is required to provide an opinion as to whether the activity should or should not be authorised. In this section, a qualified opinion is ventured, and in this regard SRK believes that sufficient information is available for DEA to take a decision.

The double circuit powerline and associated infrastructure will result in unavoidable adverse biophysical impacts. Working on the assumption that Eskom is committed to ensuring that the EMPr is strictly implemented, none of these adverse impacts are considered unacceptably significant, however, visual impacts and economic benefits are key considerations.

In conclusion, and noting that the project is an important and strategic infrastructure project, SRK is of the opinion that on purely 'environmental' grounds (i.e. the project's potential socio-economic, cultural and biophysical implications) the application as it is currently articulated should **be approved,** provided the essential mitigation measures are implemented. Ultimately, however, the DEA will need to consider whether the project benefits outweigh the potential impacts.

7.5 Way Forward

This BAR is now available for public comment and SRK invites stakeholders to review the report and to participate in the public consultation process. An Executive Summary of this report has been distributed to registered stakeholders and is available from SRK on request (details below).

Copies of this report are also available for review at the following venues:

- John Steyn (Ceres) Public Library;
- Witzenberg Municipality in Ceres; and
- SRK's office in Rondebosch, Cape Town.

Comments on the BAR can be submitted to:

Amy Hill

Contact details:

SRK Consulting, Postnet Suite #206, Private Bag X18, Rondebosch, 7701, South Africa

Tel: + 27 21 659 3060

Fax: +27 21 685 7105

Email:ahill@srk.co.za

This BAR may be amended based on comments received from stakeholders. Stakeholders' comments on the BAR will assist DEA in making a decision regarding the application. The public is therefore urged to submit comment. If you require assistance in compiling and submitting comments, please contact us and we will ensure that you receive appropriate support.

Comments must be submitted by **23 October 2017** to be incorporated into the Final BAR.

Once stakeholders have commented on the information presented in the BAR, the Final BAR will be prepared and released for a second public comment period before being submitted to DEA for approval. Once a decision is taken by authorities, this decision will be communicated to registered IAPs.

Prepared by

Matthew Law

Senior Environmental Consultant

Amy Hill

Environmental Consultant

Reviewed by

Chris Dalgliesh CEAPSA

Principal Environmental Consultant and Partner

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

8 References

Canadian Environmental Protection Agency (no date). Reference Guide: Addressing Cumulative Environmental Effects. Available online: www.ceaa-acee.gc.ca/013/0001/0008/guide1_e.htm# Accessed: August 2007.

CapeNature (2017). Western Cape Biodiversity Spatial Plan. Available online: http://www.witzenberg.gov.za/download_document/855 Accessed: July 2017

DEA (2010). Guideline on Need and Desirability, Integrated Environmental Management Guideline Series 9, Department of Environmental Affairs (DEA), Pretoria.

DEA (2012). Public Participation Guideline. Available online: https://www.environment.gov.za/sites/default/files/gazetted_notices/nema_publicparticipationguideline_g35769gn807.pdf Accessed: July 2017

DEA (2017). Integrated Environmental Management Guideline: Guideline on Need and Desirability. Available online: https://www.environment.gov.za/sites/default/files/legislations/needanddesirabilityguideline2017.pdf Accessed: June 2017

DEA&DP (2013). EIA Guideline and Information Document Series. Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) Available online: http://www.capegateway.gov.za/eadp, accessed June 2013.

DEAT (2004) IEM Guideline 7, Cumulative effects assessment. Available online: https://www.environment.gov.za/sites/default/files/docs/series7_cumulative_effects_assessment.pdf Accessed: July 2017

DWAF (1999). Resource Directed Measures for Protection of Water Resources. Volume 3: River Ecosystems Version 1.0, Pretoria. Resource Directed Measures for Protection of Water Resources, Pretoria, South Africa.

Du Preez & Carruthers (2009). A Complete Guide to the Frogs of Southern Africa. Struik

DWS (2008). Hydrological Services - Surface Water (Data, Dams, Floods and Flows). Available online: http://www.dwa.gov.za/Hydrology/Default.aspx, accessed August 2017.

Government Gazette (2011). Department of Environmental Affairs, No. 1002 of 2011. Threatened Terrestrial Ecosystems in South Africa.

IDP (2012). Witzenberg Municipality Integrated Development Plan (2012 – 2017). Available online: http://bgis.sanbi.org/Document/Download/2418 Accessed: July 2017

Martin, G., Shaw, J., Smallie J. & Diamond, M. 2010. Bird's eye view – How birds see is key to avoiding power line collisions. Eskom Research Report. Report Nr: RES/RR/09/31613.

MERO (2015). Socio-economic Profile of the Witzenberg Municipality. Available online: http://www.elsenburg.com/gis/apps/agristats/ Accessed: July 2017

Mucina & Rutherford (2006). The Vegetation of South Africa. Lesotho & Swaziland. *Strelitzia 19*. South African National Biodiversity Institute, Pretoria.

PSDF (2014). Western Cape Provincial Spatial Development Framework. Available online: https://www.westerncape.gov.za/eadp/sites/eadp.westerncape.gov.za/files/your-resource-library/2014%20Provincial%20Spatial%20Development%20Framework%20%28PSDF%29_0.pdf Accessed: July 2017

SABAP2 (2017). The South African Bird Atlasing Project 2. Avai;lable online: http://sabap2.adu.org.za Accessed: July 2017

StatsSA (2011). 2011 South African Household Census. Available online: http://www.statssa.gov.za Accessed: July 2017

SDF (2012). Witzenberg Municipality Spatial Development Framework. Available online: http://www.witzenberg.gov.za/sites/default/files/documents/Witzenberg%20Complete%20SDF.pdf Accessed: July 2017

Shaw, J.M. 2013. Power line collisions in the Karoo: Conserving Ludwig's Bustard. Unpublished PhD thesis. Percy FitzPatrick Institute of African Ornithology, Department of Biological Sciences, Faculty of Science University of Cape Town May 2013.

Todd (2012). Environmental Impact Assessment for the Establishment of the Wolseley Wind Farm – Fauna and Flora Impact Report. Available online: https://projects.gibb.co.za/Portals/3/App%20E3_Wolseley%20Ecology%20Nov2012.pdf Accessed: July 2017

Van Rooyen, C. 2004. Report on vulture interactions with powerlines in southern Africa: 1996 to 2003. In: Monadjem, A., Anderson, M.D., Piper, S.E. & Boshoff, A.F. (Eds). The vultures of Southern Africa-Quo Vadis? Proceedings of a workshop on vulture research and conservation in southern Africa. Birds of Prey Working Group, Johannesburg.

WCDoA (2017). CapeFarmMapper. Available online: https://gis.elsenburg.com/apps/cfm/, accessed July 2017.

WCG (2013). Western Cape Government Department of Agriculture, AgriStats. Available online: http://www.elsenburg.com/gis/apps/agristats/ Accessed: July 2017

Young (2000). First Draft Gamsberg Zinc Project: Specialist Study Report: Visual Environment. Newtown Landscape Architects, 10 March 2000.

Appendices

Appendix A:

Curriculum Vitae of the EAP

Appendix B:

Technical Feasibility Report

Appendix C:

Written Description of Access Routes

Appendix D:

Site Observations

Appendix E:

Environmental Management Plan

Appendix F:

Specialist Studies

Appendix F1:

Freshwater Ecological Impact Assessment

Appendix F2:

Botanical Impact Assessment

Appendix F3:

Faunal Comment

Appendix F4:

Avifaunal Impact Assessment

Appendix F5:

Integrated Heritage Impact Assessment

Appendix F6:

Visual Impact Assessment

Appendix G:

Stakeholder Database

Appendix H:

Notes of Eskom Meetings with Stakeholders

Appendix I:

Location of Infrastructure in Relation to Watercourse Buffers

SRK Report Distribution Record

Report No.

Copy No.

Name/Title	Company	Copy	Date	Authorised by
Chief Directorate	DEA	1 HC + CD	September 2016	M. Law
Elkerine Rossouw	BOCMA	2 HC + CD	September 2016	M. Law
Adri La Meyer	DEA&DP	3 HC + CD	September 2016	M. Law
Thabo Sefike	Department of Agriculture	4 HC + CD	September 2016	M. Law
Andrew September	HWC	CD	September 2016	M. Law
Alana Duffell-Canham	CapeNature	5 HC + CD	September 2016	M. Law
M. Mganjo	Cape Winelands District Municipality	6 HC + CD	September 2016	M. Law
David Nasson	Witzenberg Local Municipality	7 - 8 HC + CD	September 2016	M. Law
The Librarian	John Steyn Public Library	9 HC	September 2016	M. Law
Madre Delport	Eskom	CD	September 2016	M. Law
Matthew Law	SRK Consulting	CD	September 2016	M. Law
SRK Library	SRK Consulting	CD	September 2016	M. Law

Approval Signature: