Botanical Assessment For: Access Track To Pylon B16 Associated With The Proposed 2.5 km Eskom Robberg – Bitou Powerline And Substation, East Of The Bitou River, Near Plettenberg Bay

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Executive Summary

Eskom Holdings SOC (Pty) Ltd is proposing the construction of a 66KV substation and powerlines on Farm 305/16, adjacent to the Keurbooms-Bitou River, Plettenberg Bay, Western Cape. Powerlines emanating from this substation will need to be erected and are proposed to cross the Keurbooms-Bitou Estuary in a southeasterly direction parallel to and north of the N2 highway bridge. An access road needs to be constructed on Erf 448/5 in order to construct two pylons (B15 & B16) supporting these powelines.

The proposed access road will be temporary in nature and consist of a "twee-spoortjie" type design with a large median between parallel lanes for each wheel. Vegetation may have to be cleared but no soil will be disturbed. Vehicles will reverse out as no turning circle at the end of the track will be built. This report provides an assessment of the vegetation on the site, with particular emphasis on the vegetation situated in the pathway of the proposed access track, and assesses the potential impacts of this proposed development from a botanical perspective.

According to national-scale vegetation maps, the site lies within Garden Route Shale Fynbos, which is considered Endangered, and is also considered a Critical Biodiversity Area according to the Garden Route Initiative Fine-Scale Biodiversity Planning Project. However, on site assessment revealed that the site, and particularly the proposed route for the access track is highly degraded with clear evidence of past vegetation removal. The habitat itself within the proposed route is of little conservation value although there are several species of conservation value that should not be disturbed. These species are located adjacent to and not on the the proposed route. No Red Listed species were found, although a large protected milkwood is growing several metres from the end of the proposed access route.

Potential impacts resulting from the proposed development include habitat loss and mortality of vegetation, erosion, pollution and the facilitation of alien plant species' invasions. It is evident, however, that the proposed route by Eskom has been specifically chosen to utilise previously disturbed areas that have previously been cleared of vegetation and in doing so has reduced the severity of some of the likely impacts. These impacts are each assessed according to the construction, operation and decommissioning phases of the development.

The majority of impacts were considered to be negative and of *low* to *very low significance* prior to mitigation with the exception of the impact of invasive alien plant infestations once the access track is decommissioned which is considered to have a *medium significance*. However, with strict adherence to all mitigation measures, the significance of residual impacts are considered to be *very low* to *insignificant* and the cumulative impact of the proposed development is considered to be *low.*

One of the stated management objectives for the Garden Route Initiative Fine-Scale Biodiversity Planning Project is to rehabilitate any degraded areas to natural or near-natural states. An important mitigation measure once the track has been decommissioned is therefore to rehabilitate and re-vegetate the access track. This would include the immediate and routine removal of invasive alien plant species on Erf 448/5, several of which are listed under categories 1 and 2 of the Conservation of Agricultural Resources Act.

Contents

1 Introduction

Eskom Holdings SOC (Pty) Ltd is proposing the construction of a 66KV substation and powerlines on Farm 305/16, adjacent to the Keurbooms-Bitou River, Plettenberg Bay, Western Cape. Portions of these developments will lie below the 5-m contour and hence within the Estuarine Functional Zone of the Keurbooms-Bitou Estuary as defined in the National Biodiversity Assessment: Estuary Component (van Niekerk & Turpie 2011).

The location of the proposed substation will lie adjacent to the T-junction of the Main Road 390 (R340) and the National Road N2/8 (Figure 1). High-voltage powerlines supported by several pylons will connect the substation to the national grid, and will cross the Keurbooms-Bitou Estuary (Figure 1). One of these pylons (B16) will be installed below the 5-m contour within the estuarine functional zone of the Keurbooms estuary, situated on the 3-m contour approximately 20 m from the High Water Mark. Pylon B16 will in turn be connected to Pylon B15 which will be situated approximately 175 m south-east (Figure 2). In order to erect these two pylons, an access track needs to be constructed.

This access track will be temporary in nature and will emanate from the driveway of a farm located on Erf 448/12. The construction/access track would then run parallel to the N2 along the fence line within Erf 448/5 and terminate near Pylon B16 (Figure 2). The track would be no wider than 4 m, single in nature and will not have a turning circle at the end. It will be a “twee-spoortjie” type design with a large median between a pair of parallel strips for the wheels of the crane truck and 4x4 vehicles.

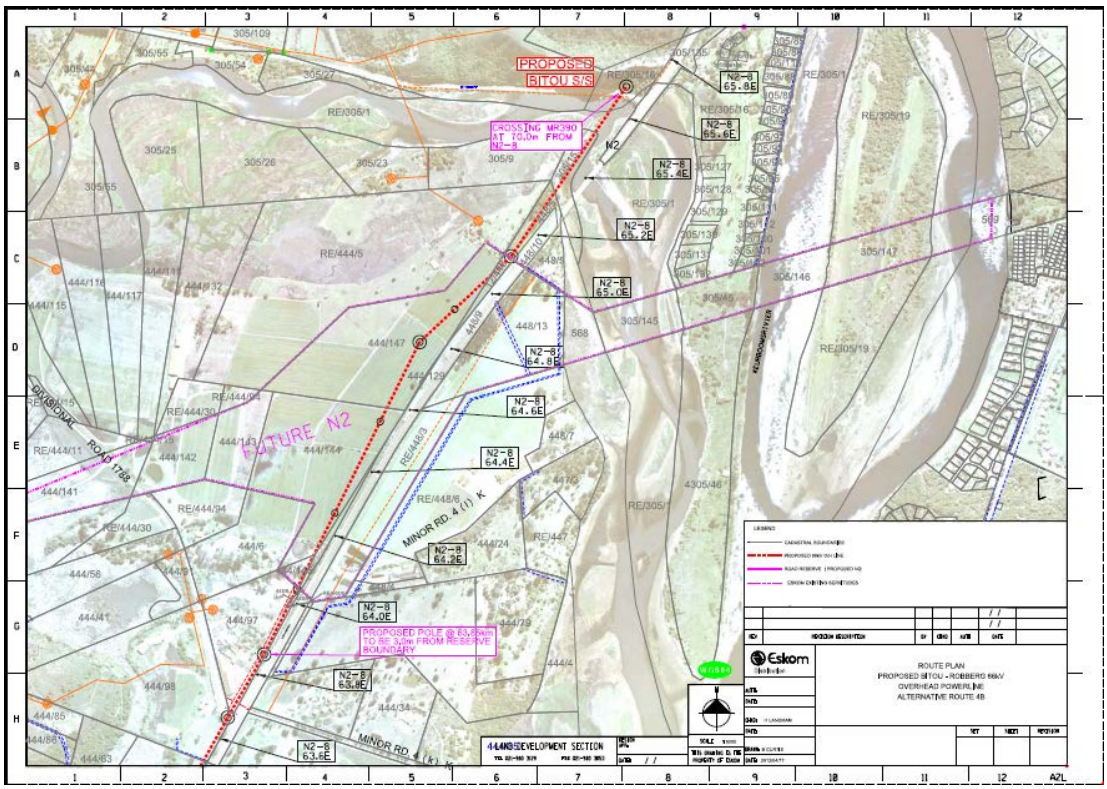


Figure 1. Site plan showing the direction of the proposed power line route (dotted red line) and supporting pylons.

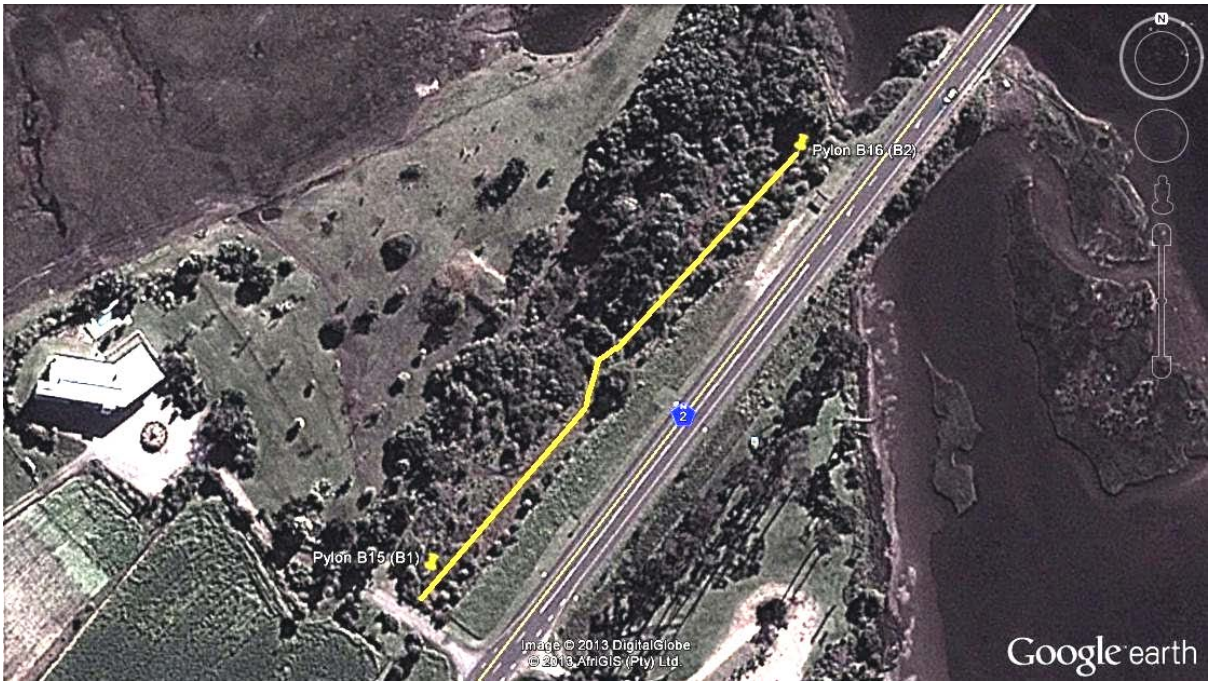


Figure 2. Pylons B15 and B16, and the route of the proposed access track shown in yellow.

Developing an access track would require the clearing and removal of vegetation. A botanical assessment was therefore commissioned as part of the Basic Assessment process associated with the proposed development.

This report includes the following components relating to the proposed development of an access track to construct pylons B15 and B16:

1. A description of the affected habitat and plant species on the site, along with any Red Data species or protected species found;
2. Identification of the vegetation type, its conservation significance and sensitivity;
3. Identification and assessment of impacts to the affected environment in accordance with standard methodology (extent, intensity, duration, consequence, probability, status and significance); and
4. Specialist mitigation measures with comprehensive method statements.

2 Methods of Assessment

The site for the proposed access track was visited on the 11 July 2013. A qualitative botanical survey was conducted of the area within the development footprint, and the immediate surrounding area directly adjacent to it. Dominant species were recorded and particular attention was given to identifying species and habitats of conservation concern (i.e. Red Listed or protected). A desktop study was also undertaken to evaluate the vegetation type of the area based on the broad-scale classification (1: 1 000 000) of Mucina & Rutherford (2006) and the fine-scale classification of vegetation units derived from the Garden Route Initiative Fine-Scale Biodiversity Planning (GRFBP) project (SANParks & C.A.P.E 2010) and the sites biodiversity and transformation status in terms of the GRFBP project (SANParks & Garden Route Initiative 2010a, 2010b).

3 Results

3.1 Habitat type and conservation status

The vegetation at the site lies within the Fynbos Biome, one of nine distinguishable large regions with similar kinds of organisms and climate (SANBI 2013b) (Figure 3). This biome characterises the Cape Floristic Region, which is one of only six floristic regions in the world. The Cape Floristic Region is the smallest of the six, but it is one of the richest supporting approximately 9000 plant species, most of which are found only in the Cape. In addition, parts of the surrounding area also consist of the Forest Biome, the scarcest of the nine biomes in South Africa. Agriculture, forestry and urban sprawl have threatened many of the species comprising these two biomes, and the Western Cape has some of the highest densities of Red-List plant species in the country (Figure 4).

At an intermediate scale (1: 1 000 000), the area lies within the Eastern Fynbos-Renosterveld Bioregion, whilst the vegetation type within the proposed development footprint consists of Garden Route Shale Fynbos for most of the route before becoming Cape Estuarine Salt Marsh towards Pylon B16 within the Estuarine Functional Zone (Robelo *et al*. 2006). However, at a much finer scale (1: 50 000), the track would run through Sedgefield Coastal Grassland and only boarders saltmarsh habitat according to the Garden Route Initiative Fine-Scale Biodiversity Planning project (GRFBP) (SANParks & Garden Route Initiative 2010).

On site inspection confirmed this and revealed that the site is a particularly well wooded example of Sedgefield Coastal Grassland habitat due to the presence of many bushes and small trees, possibly due to disruptions in various ecological processes responsible for maintaining grassland habitats.

At a national scale the conservation status of Garden Route Shale Fynbos is considered to be Endangered, whilst Cape Estuarine Saltmarsh is considered to be Least Threatened (Robelo *et al*. 2006). The GRFBP project considers the land which the access track will run through to be a Critical Biodiversity Area as the habitat is required as part of the Critical Biodiversity Area Network to achieve conservation targets (SANParks & Garden Route Initiative 2010).

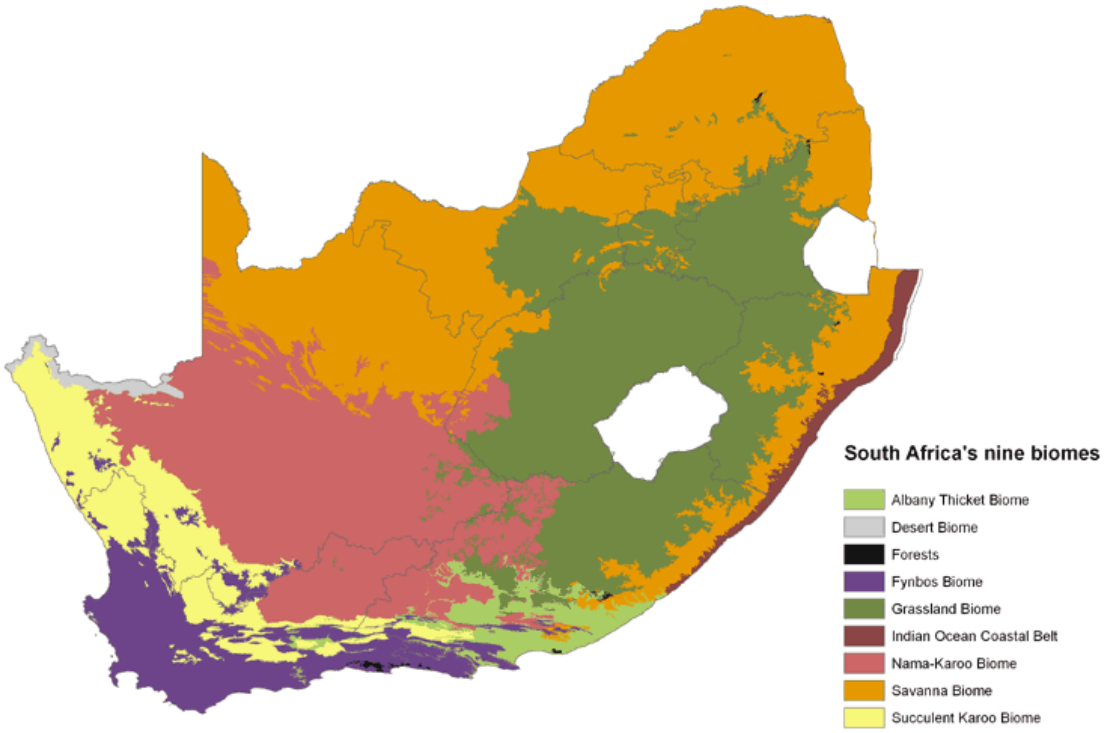


Figure 3. The nine biomes found in South Africa. (Source: SANBI 2013b).

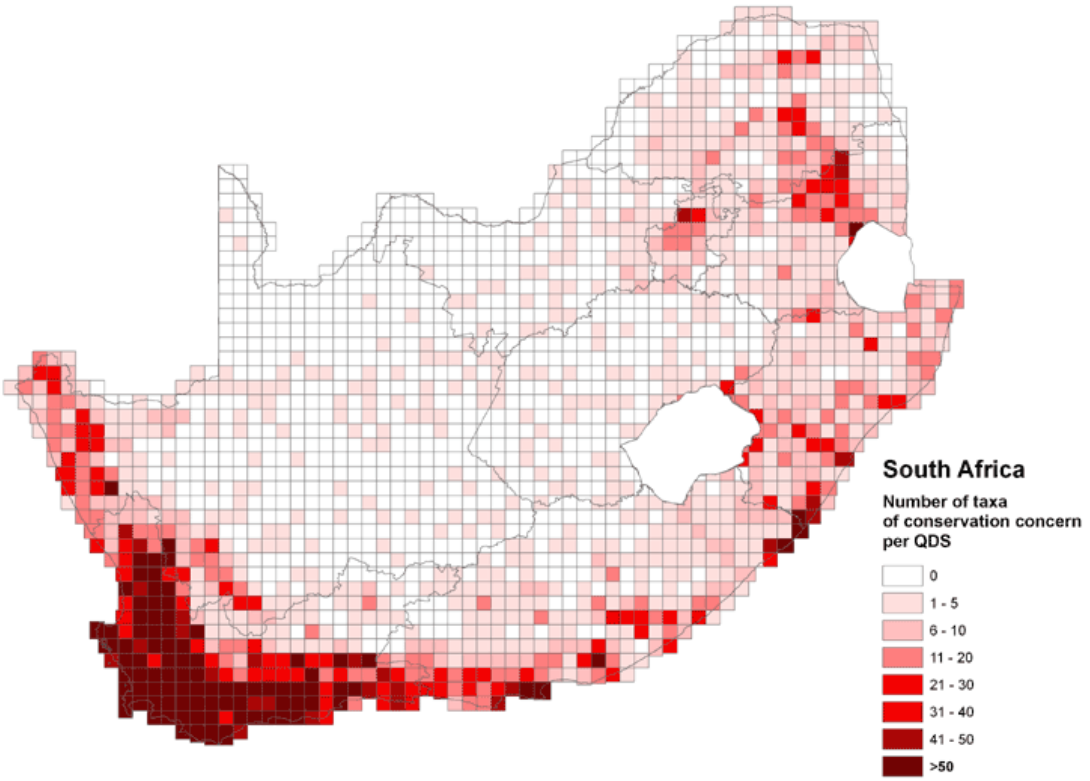


Figure 4. Numbers of plant taxa of conservation concern (Source: SANBI 2013b).

However, the GRFBP project also acknowledges that the site is degraded and specifies that the planning objectives for this area must be to maintain natural land, rehabilitate degraded land to a natural or near natural state and manage it for no further degradation (SANParks & Garden Route initiative 2010a). On site evaluation found that the route proposed for the access track will lie in already degraded and disturbed areas with clear signs of historical removal of natural vegetation and alien infestation.

4 Species composition in the path of the proposed route

The dominant species on site are described according to three sections (Sections 1-3, Figure 5) along the proposed route based on the physical structure and natural characteristics of the vegetation present.

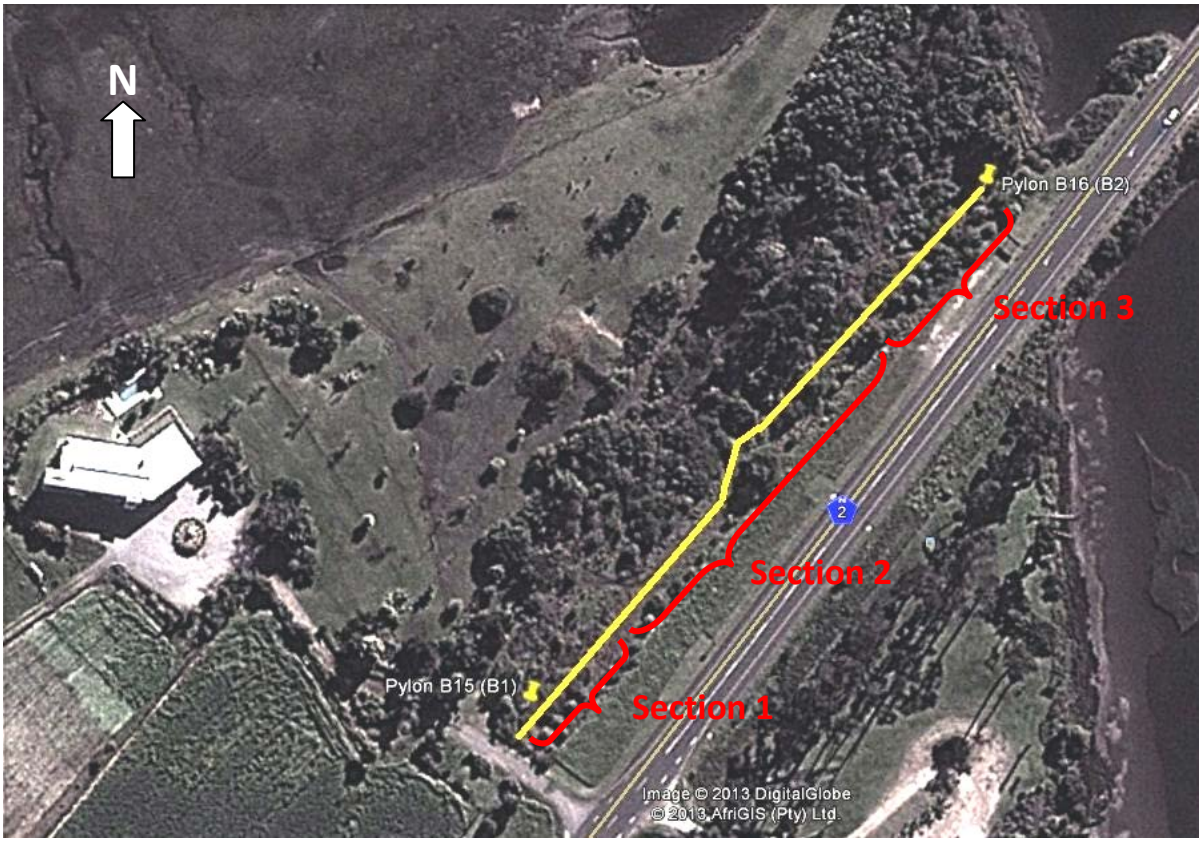


Figure 5. The three sections along the proposed route of the access road that were each assessed.

Section 1, the start of the proposed access road, extends from the farm driveway and into Erf 448/5 for roughly 30 m. This section was relatively dense with indigenous bushes, especially endemic *Rhus* species and comprised *Rhus glauca*, *R. crenata*, *R. lucida* forma *lucida* and *Buddleja salviifolia*. Ground cover was fairly sparse but included mainly *Panicum maximum* and the exotic grass *Pennisetum clandestinum*. Other exotic species present were a row of *Cinnamomum camphora* which have clearly been planted at intervals along the fence line and two plants of *Temoca stans*.

Adjacent vegetation also comprised various *Rhus* species as well as *Grewia occidentalis*. No Red List or Protected plant species were found in this section.

Figure 6. View of Section 1 along the proposed route looking in a south-westerly direction.

Figure 7. View of Section 2 looking north-east showing the generally sparse cover of vegetation characterising this section.

Section 2 was generally found to be highly disturbed with minimal basal cover and few bushes. A sparse ground cover of *Pennisetum clandestinum* characterised most of this section. Towards the end of this section in a north-easterly direction ground cover became denser with indigenous grasses including *Panicum maximum* and *Chloris gayana*.

There were however some small indigenous trees and shrubs including *Chrysanthemoides moniliferum*, *Erythrina caffra* and most importantly, two specimens of red candlewood *Pterocelastrus rostratus*. One of these *Pterocelastrus rostratus* was growing next to an *Erythrina caffra* at the point along the proposed route of the track where there is an inflection in the plans, possibly to avoid this tree or the beehive at the base of it. Indeed, the natural status of *P. rostratus* is declining and it should rather not be disturbed (Williams *et al.* 2008).

Besides the row of alien *C. camphora* along the fence, other invasive aliens found in this section included a single *Melia azedarach* (recently ring-barked but with fruit), *Acacia longifolia* and *Ricinus communis*. The vegetation adjacent to the route of the proposed track consists mainly of *Rhus* species, *Grewia occidentalis, Panicum maximum* and two alien species *Acacia longifolia* and *Acacia mearnsii*. No Red Data List or Protected species were found.

Figure 8. Close up of red candlewood *Pterocelastrus rostratus* in fruit.

Section 3 was denser and less open than Section 2, as a result of the encroachment of trees and bushes either side of a narrow strip that appears to have been cleared of vegetation in the past (Figure 9).

Figure 9. View of Section 3 looking in a north-easterly direction showing mainly ground cover of grasses with encroaching bushes and trees either side.

Figure 10. A colony of Cobra lilies *Chasmanthe aethiopica* growing along the margin of the proposed access track.

This section had relatively sparse ground cover of *Panicum maximum* and *Chloris gayana*. Along the proposed tracks northern margin were indigenous species of mainly *Rhus crenata, R. lucida*, *Chrysanthemoides moniliferum*, *Pterocelastrus rostratus* and a colony of endemic *Chasmanthe aethiopica* (Figure 10). Other less common species were *Scolopia zeyheri*, *Carissa bispinosa* and a large milkwood *Sideroxylon inerme* growing several metres past the end of the proposed route.

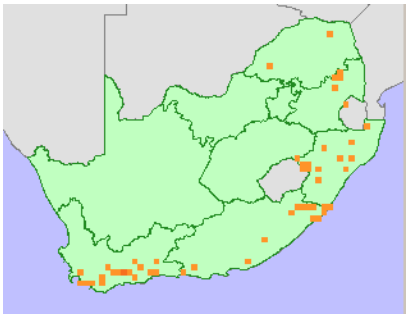
Several alien invasive species were also present including *C. camphora* and wattle *Acacia mearnsii*. No Red Data Listed species were detected, but a single protected milkwood tree *Sideroxylon inerme* was found several metres from the end of the proposed route.

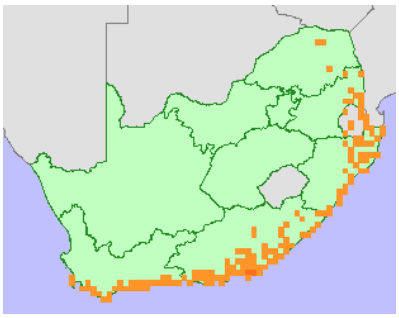
5 Botanical sensitivity

Although the site lies within a Critical Biodiversity Area and the habitat is listed as Endangered, the proposed route of the track lies within a highly degraded portion of this area/habitat where complete removal of vegetation has occurred in the past. No Red Listed species were found on site. However, the site does contain species of conservation importance that should not be disturbed. The locations of these species near the proposed route are shown in Figure 11, and geographic co-ordinates provided in Table 1.

Figure 11. Sensitive sites in the vicinity of the proposed access route.

Table 1. Sensitive sites, their plant species and geographic coordinates*.

Site (refer to Figure 11)	**Species**	**Geographic coordinates**		**Special attributes**
		Latitude	**Longitude**	
1	*Pterocelastrus rostratus*	-34.01107	23.38972	 Near endemic, restricted to forest and montane scrub in forest margins and on mountain sides. Bark used medicinally. National status declining and distribution limited. 
2	*Pterocelastrus rostratus*	-34.01080	23.39001	
3	*Pterocelastrus rostratus*	-34.01044	23.39036	
5	*Pterocelastrus rostratus*	-34.01017	23.39060	
4	*Chasmanthe aethiopica*	-34.01021	23.39059	 Endemic, restricted to coastal bush & forest margins in the southwestern and Eastern Cape. National status stable.

6	*Sideroxylon inerme*	-34.01007	23.39068	 Protected species in South Africa, restricted to coastal dune thicket and forests. 

***It should be noted that the plant species depicted above are presenting particular characteristics that may or may not be present during bush clearing and therefore the GPS coordinates provided should be used as the chief means of locating sensitive sites in conjunction with visual observations of the particular species of concern by the Contractor and Project Manager.**

6 Impact Assessment

Several negative impacts are likely to be experienced at the site due to the development of the temporary access track. These are assessed according to a standard impact methodology outlined in Appendix I for the construction phase and for the operational phase. A range of mitigation measures are imposed to limit the impact on the environment as far as possible.

6.1 Construction phase

Although most of the proposed route of the track appears to have been cleared of bushes and trees in the past, there are several areas along it where vegetation will have to be removed which will result in the mortality of certain indigenous species. The proposed route by Eskom has considered aspects pertaining to the present natural vegetation on the site and therefore the route in itself has limited impact (Table 2). There are however several plants of conservation value that should not be disturbed. These do not appear to be in the direct path of the access track – they are located along its periphery and therefore it should not be difficult to avoid these and to ensure they are not disturbed by labourers.

Table 2. Impact 1: Habitat destruction and mortality of vegetation.

	Extent	***Intensity***	***Duration***	***Consequence***	***Probability***	***Significance***	***Cumulative impact***	***Status***	***Confidence***
Without mitigation	Local **1**	Low **1**	Long-term **3 (Reversible)**	**Low 5**	Definite	**LOW**	**Low**	**– ve**	High
	Essential mitigation measures: • Vegetation removal and disturbance to be limited to the track only. • No storing of equipment or parking of vehicles outside of the proposed route of the track within Erf 448/5. • There are several sensitive areas with plants of particular conservation value that should not be disturbed in any manner. These locations must be clearly demarcated with hazard tape and cordoned off. See Table 1 for geographic co-ordinates of these plants/areas. • The mechanism to remove vegetation must not include any poisons due to the proximity of the route to the Bitou Estuary. • Vegetation should be removed in a manner that allows the roots of bushes and shrubs to remain in the ground as far as possible so that there is a chance of re-growth. Appropriate methods of vegetation removal would be the use of mowers, pangas and chainsaws. No bulldozing, grading or disturbance to soil should be permitted. • No workers allowed between the end of the proposed track and the estuary. • No access to or below the High Water Mark of the estuary. • No access to any areas off of the proposed access route. • All cleared alien vegetation must be removed from the site and taken to a suitable landfill area. • All cleared indigenous vegetation should be used to make mulch and applied in subsequent rehabilitation efforts during decommissioning. Mitigation measures regarding								

	the rehabilitation of the site are outlined further in Section 4.3 • There are several invasive alien species growing in the path of the proposed access route, directly adjacent to it and within the precinct of Erf 448/5 that are listed in Category 1 of the Conservation of Agricultural Resources Act. According to the Act the responsible landowner is under legal obligation to destroy these species immediately: - *Tecoma stans* - *Acacia longifolia* Furthermore, there are several alien invader species listed under Category 2 of the Act that should be destroyed as they are not being *grown under controlled conditions*: - *Acacia mearnsii* - *Ricinus communis* - *Melia azedarach* - *Pinus* spp. Optional mitigation measures: • The access track should run as close as possible to the fence but avoid any of the sensitive areas listed above (see Table 1). • The row of planted Camphor trees *Cinnamomum camphora* should be removed while they are still young as these are alien invasive species and grow exceptionally large (up to 25 m) and may interfere with high voltage lines. Currently *C. camphora* is listed under Category 1 of the Conservation of Agricultural Resources Act in Limpopo, KZN & Mpumalanga but is becoming a growing threat in the Western Cape.								
With mitigation	Local 1	Low 1	Medium-term **2 (Irreversible)**	Very low 4	Definite	**VERY LOW**	Low	-ve	High

As vegetation will be cleared and a concentrated increase in human activity experienced during the clearing of vegetation, there is risk of erosion (Table 3). However, the site is flat and the soils are relatively compact with reasonably high levels of organic matter that gives the area some resilience to erosion. The overall significance of this once mitigation is carried out is considered to be insignificant.

Table 3. Impact 2: Erosion resulting from the clearing of vegetation for the access track.

	Extent	***Intensity***	***Duration***	***Consequence***	***Probability***	***Significance***	***Cumulative impact***	***Status***	***Confidence***
Without mitigation	Local **1**	Low **1**	Long-term **3 (Reversible)**	**Low 5**	Possible	**VERY LOW**	**Low**	**– ve**	Medium
	Essential mitigation measures: • Removal of vegetation should be undertaken in a manner that allow the roots of bushes and shrubs to remain behind to keep the soil consolidated as far as possible. Appropriate methods include mowing and cutting of vegetation above ground with pangas and chain saws. • No disturbance to the soil by bulldozers or graders etc.								

	• Once the vegetation has been cleared the operation of constructing the pylons and erecting the powelines must be undertaken as soon as possible afterwards and as quickly as possible within 2 years of the vegetation being removed so that the track can be re-vegetated and rehabilitated.								
With mitigation	Local 1	Low 1	Medium-term 2	**Very low 4**	Possible	**INSIGNIFICANT**	**Low**	**-ve**	Medium

The presence of labourers usually increases the probability of littering (Table 4). In addition, the use of powersaws and vehicles requires the concomitant usage of oil and petrol which are both toxic to the environment if spilt in even small quantities. This is especially so due to the proximity of the site to the Keurbooms-Bitou Estuarine system. The probability of these impacts however can be minimised to acceptable levels.

Table 4. Impact 3: Pollution, either chemical or in the form of litter.

	Extent	***Intensity***	***Duration***	***Consequence***	***Probability***	***Significance***	***Cumulative impact***	***Status***	***Confidence***
Without mitigation	Local **1**	Low **1**	Short-term **1 (Reversible)**	**Very low 3**	Probable	**LOW**	**Low**	**– ve**	Medium
	Essential mitigation measures: • All chemicals such as petrol and oil should be responsibly contained and used, ideally oil and petrol should be left on the bakkies and powersaws refueled there. • All vehicles & machinery should be checked daily for oil and chemical leaks. No leaking machines to be allowed on site. • No area may be used as a toilet. However, a chemical toilet should be provided for all workers which should be located at least 32 m from the High Water Mark at a location already denuded of vegetation. • No littering or waste disposal except in dustbins. A dustbin for workers must be placed on board a vehicle and have a lid to ensure no material blows out. • All foreign material brought on to site to be removed during and once clearing is finished. • No burning of waste or cut vegetation on site. • Contractor in association with the Project Coordinator to ensure compliance of workers with good environmental practices and general conduct as per their environmental awareness induction training.								
With mitigation	Local 1	Low 1	Short-term 1 (Reversible)	**Very Low 3**	Possible	**INSIGNIFICANT**	Low	Neutral	Medium

6.2 Operational phase

With the exception of mortality to vegetation as a result of clearing, the same impacts described above during the construction phase are likely to occur during the temporary operation of the access track. Erosion resulting from the use of the tract is *possible* and likely to have a *very low* significance prior to mitigation but can be minimised further (Table 5).

Table 5. Impact 4: Erosion resulting from the use of the access track for construction of the pylons and stringing of powerlines.

	Extent	***Intensity***	***Duration***	***Consequence***	***Probability***	***Significance***	***Cumulative impact***	***Status***	***Confidence***
Without mitigation	Local **1**	Low **1**	Long-term **3 (Reversible)**	**Low 5**	Possible	**VERY LOW**	**Low**	**– ve**	Medium
	Essential mitigation measures: • Vehicles must keep to the access track at all times and reverse out. No turning at the end of the access track as per the plans for the access track • Although unlikely, if the site becomes muddy vehicles should not be driven on the access track until it has dried out. • Vehicles should be driven up and down the access track as little as is practically possible. • Usage of the track must be limited to within 2 years of the vegetation being cleared so that appropriate rehabilitation can commence within a reasonable time. •								
With mitigation	Local 1	Low 1	Medium-term **2**	**Very low 4**	Improbable	**INSIGNIFCANT**	**Low**	**-ve**	Medium

The presence of labourers and vehicles using the access track increases the risk of pollution (Table 5). This can be managed with appropriate mitigation to ensure that the significance of this potential impact is *insignificant*.

Table 6. Impact 5: Pollution, either chemical or in the form of litter.

	Extent	***Intensity***	***Duration***	***Consequence***	***Probability***	***Significance***	***Cumulative impact***	***Status***	***Confidence***
Without mitigation	Local **1**	Low **1**	Short-term **1 (Reversible)**	**Very low 3**	Probable	**LOW**	**Low**	**– ve**	Medium
	Essential mitigation measures: • All chemicals such as petrol and oil should be responsibly contained and used • All vehicles & machinery should be checked daily for oil and chemical leaks. No leaking machines to be allowed on site. • No area may be used as a toilet. However, a chemical toilet should be provided for all								

	workers which should be located at least 32 m from the High Water Mark at a location already denuded of vegetation. • No littering or waste disposal except in dustbins. A dustbin for workers must be placed on board a vehicle and have a lid to ensure no material blows out. • All foreign material brought on to site to be removed during and once the project is finished. • No burning of waste or fires on site. • Contractor in association with the Project Coordinator to ensure compliance of workers with good environmental practices and general conduct as per their environmental awareness induction training.								
With mitigation	Local 1	Low 1	Short-term 1 (Reversible)	**Very Low 3**	Possible	**INSIGNIFICANT**	Low	Neutral	Medium

6.3 Decommissioning phase

Once the two pylons have been constructed, the powerlines strung and the access track no longer used, two potential impacts are likely to occur over the area cleared of vegetation: erosion and invasion by alien vegetation. Although several short-term mitigation measures were affirmed during the construction and operational phases to minimise erosion at the site as far as possible, there is likely to still be potential for erosion after the construction phase and any residual chances of erosion should still be minimised as far as possible with further mitigation (Table 7).

Table 7. Impact 6: Erosion resulting from the development of the temporary access track after its use.

	Extent	***Intensity***	***Duration***	***Consequence***	***Probability***	***Significance***	***Cumulative impact***	***Status***	***Confidence***
Without mitigation	Local **1**	Low **1**	Long-term **3 (Reversible)**	**Low 5**	Possible	**VERY LOW**	**Low**	**– ve**	Medium
	Essential mitigation measures: • The track must be decommissioned within 2 years of the vegetation being cleared so that appropriate rehabilitation can commence within a reasonable time. • Rehabilitation of the site must include mitigation of any signs of early erosion and re-vegetation with appropriate vegetation indigenous to that habitat. • Rehabilitation must be undertaken under the guidance of a qualified rehabilitation ecologist. •								
With mitigation	Local 1	Low 1	Medium-term **2**	**Very low 4**	Improbable	**INSIGNIFCANT**	**Low**	**-ve**	Medium

As a result of the removal of vegetation, and the presence of highly invasive alien plant species at the site and in the wider area, there is a definite probability that alien plants may colonise the

cleared area thereby preventing indigenous species from returning. This would result in an impact of *medium significance* (Table 8). The above scenario has already occurred on the site due to previous disturbances and vegetation clearing operations. The area cleared therefore must be re-vegetated as part of a formal rehabilitation plan guided by a qualified rehabilitation ecologist. This is in accordance with the Garden Route Initiative Fine-Scale Biodiversity Planning projects management objectives for this piece of land (SANParks & Garden Route initiative 2010a).

Mitigation via rehabilitation would serve a dual purpose by minimising the impact caused by habitat destruction due to the clearing of vegetation assessed in Table 2 resulting from the construction phase, and would also decreasing the *intensity* and *probability* of invasive alien plant infestations once the operational phase if over.

Table 8. Impact 7: Alien plant infestations resulting from the proposed development.

	Extent	***Intensity***	***Duration***	***Consequence***	***Probability***	***Significance***	***Cumulative impact***	***Status***	***Confidence***
Without mitigation	Local **1**	Medium **2**	Long-term **3 (Reversible)**	**Medium 6**	Definite	**Medium**	**Low**	**– ve**	High
	Essential mitigation measures: • The area cleared of vegetation must form part of a holistic rehabilitation plan which should commence within 2 years of any vegetation being cleared. • The rehabilitation plan must undertake to re-vegetate the area with suitable indigenous vegetation from the area back to a natural or near-natural state in order to minimize the chance of alien plant infestations. • All alien vegetation must be removed periodically, at least once a year from the area cleared for the access track. • Alien plants to be removed mechanically and herbicides only to be used at distances of greater than 32 m from the estuary High Water Mark. • As mentioned above in Table 2, any other alien vegetation on Erf 448/5 should also be destroyed as many of these species are listed under Category 1 & 2 of the Conservation of Agricultural resources Act, and therefore, according to the Act, the landowner is under legal obligation to do so immediately.								
With mitigation	Local 1	Low 1	Medium-term 2	**Very Low 4**	Possible	**INSIGNIFICANT**	**Low**	**-ve**	High

7 Impact summary

The majority of impacts resulting from the proposed development are considered to be negative and of *low* to *very low significance* prior to mitigation with the exception of the impact of invasive alien plant infestations once the access track is decommissioned which is considered to have a *medium significance*. However, with strict adherence to all mitigation measures affirmed, the significance of residual impacts are considered to be *very low* to *insignificant* and the cumulative impact of the proposed development is considered to be *low* (Table 9).

Table 9. Summary of impacts before and after mitigation.

Phase	**Impact**	***Con-sequence***	***Probability***	**Significance**	***Cumulative impact***	***Status***	***Confidence***
Construction	**Impact 1**: Habitat destruction & mortality of vegetation	Low	Definite	**LOW**	Low	-ve	High
	With Mitigation	Very low	Definite	**VERY LOW**	Low	-ve	High
	Impact 2: Erosion	Low	Possible	**VERY LOW**	Low	– ve	Medium
	With Mitigation	Very low	Possible	**INSIGNIFICANT**	Low	-ve	Medium
	Impact 3: Pollution (Chemical & litter)	Very low	Probable	**LOW**	Low	– ve	Medium
	With Mitigation	Very Low	Possible	**INSIGNIFICANT**	Low	Neutral	Medium
Operational	**Impact 4**: Erosion	Low	Possible	**VERY LOW**	Low	– ve	Medium
	With Mitigation	Very low	Improbable	**INSIGNIFCANT**	Low	-ve	Medium
	Impact 5: Pollution (Chemical & litter)	Very low	Probable	**LOW**	Low	– ve	Medium
	With Mitigation	Very Low	Possible	**INSIGNIFICANT**	Low	Neutral	Medium
Decom-missioning	**Impact 6**: Erosion	Low	Possible	**VERY LOW**	Low	– ve	Medium
	With Mitigation	Very low	Improbable	**INSIGNIFCANT**	Low	-ve	Medium
	Impact 7:	Medium	Definite	**Medium**	Low	– ve	High

Phase	**Impact**	***Con-sequence***	***Probability***	**Significance**	***Cumulative impact***	***Status***	***Confidence***
	Alien plant infestations						
	With Mitigation	Very Low	Possible	**INSIGNIFICANT**	Low	-ve	High

8 Impact mitigation

The following is a list of *essential* mitigation measures pertaining to the development of the temporary access track:

- Vegetation removal and disturbance to be limited to the track only.
- No storing of equipment or parking of vehicles outside of the proposed route of the track within Erf 448/5.
- There are several sensitive areas with plants of particular conservation value that should not be disturbed in any manner. These locations must be clearly demarcated with hazard tape and cordoned off. See Table 1 for co-ordinates relating to these plants/areas.
- The mechanism to remove vegetation must not include any poisons due to the proximity of the route to the Bitou Estuary.
- Vegetation must be removed in a manner that allows the roots of bushes and shrubs to remain in the ground as far as possible so that there is a chance of re-growth. Appropriate methods of vegetation removal would be the use of mowers, pangas and chainsaws. No bulldozing, grading or disturbance of the soil should be permitted.
- No workers allowed between the end of the proposed track and the estuary.
- No access to or below the High Water Mark of the estuary.
- No access to any areas off of the proposed access route.
- All cleared alien vegetation must be removed from the site and taken to a suitable landfill area.
- All cleared indigenous vegetation should be used to make mulch and applied in subsequent rehabilitation efforts during decommissioning. Mitigation measures regarding the rehabilitation of the site are outlined further in Section 4.3
- There are several invasive alien species growing in the way of proposed access route, directly adjacent to it and within the precinct of Erf 448/5 that are listed in Category 1 of the Conservation of Agricultural Resources Act. According to the Act the responsible landowner is under legal obligation to destroy these species immediately:
  - *Tecoma stans*
  - *Acacia longifolia*

  Furthermore, there are several alien invader species listed under Category 2 of the Act that should be destroyed as they are not being *grown under controlled conditions*:

  - *Acacia mearnsii*
  - *Ricinus communis*
  - *Melia azedarach*
  - *Pinus* spp.

- Once the vegetation has been cleared the operation of constructing the pylons and erecting the powelines must be undertaken as soon as possible afterwards and as quickly as possible within 2 years of the vegetation being removed so that the track can be re-vegetated and rehabilitated.

- All chemicals such as petrol and oil should be responsibly contained and used, ideally oil and petrol should be left on the bakkies and powersaws refueled there.
- All vehicles & machinery should be checked daily for oil and chemical leaks. No leaking machines to be allowed on site.
- No area may be used as a toilet. However, a chemical toilet should be provided for all workers which should be located at least 32 m from the High Water Mark at a location already denuded of vegetation.
- No littering or waste disposal except in dustbins. A dustbin for workers must be placed on board a vehicle and have a lid to ensure no material blows out.
- All foreign material brought on to site to be removed during and once clearing is finished.
- No burning of waste or cut vegetation on site.
- Contractor in association with the Project Coordinator to ensure compliance of workers with good environmental practices and general conduct as per their environmental awareness induction training.
- Vehicles must keep to the access track at all times and reverse out. No turning at the end of the access track as per the plans for the access track
- Although unlikely, if the site becomes muddy vehicles should not be driven on the access track until it has dried out.
- Vehicles should be driven up and down the access track as little as is practically possible.
- Usage of the track must be limited to within 2 years of the vegetation being cleared so that appropriate rehabilitation can commence within a reasonable time.
- All chemicals such as petrol and oil should be responsibly contained and used
- All vehicles & machinery should be checked daily for oil and chemical leaks. No leaking machines to be allowed on site.
- Rehabilitation of the site must include mitigation of any signs of early erosion and re-vegetation with appropriate vegetation indigenous to that habitat.
- Rehabilitation must be undertaken under the guidance of a qualified rehabilitation ecologist.
- The rehabilitation plan must undertake to re-vegetate the area with suitable indigenous vegetation from the area back to a natural or near-natural state in order to minimize the chance of alien plant infestations.
- All alien vegetation must be removed periodically, at least once a year from the area cleared for the access track.
- Alien plants to be removed mechanically and herbicides only to be used at distances of greater than 32 m from the estuary High Water Mark.
- As mentioned above in Table 2, any other alien vegetation on Erf 448/5 should also be destroyed as many of these species are listed under Category 1 & 2 of the Conservation of Agricultural resources Act, and therefore, according to the Act, the landowner is under legal obligation to do so immediately.

The following is a list of optional mitigation measures:

- The access track should run as close as possible to the fence but avoid any sensitive areas listed above (see Table 1).
- The row of planted Camphor trees *Cinnamomum camphora* should be removed while they are still young as these are alien invasive species and grow exceptionally large (up to 25 m)

and may interfere with high voltage lines. Currently *C. camphora* is listed under Category 1 of the Conservation of Agricultural Resources Act in Limpopo, KZN & Mpumalanga but is becoming a growing threat in the Western Cape.

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10 Appendix I:

Impact rating methodology employed in this study

The significance of all potential impacts that would result from the proposed project is determined in order to assist decision-makers. The significance rating of impacts is considered by decision-makers, as shown below.

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

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 significance of each identified impact[1] was thus rated according to the methodology set out below:

Step 1 – Determine the **consequence** rating for the impact by determining the score for each of the three criteria (A-C) listed below and then **adding** them. The rationale for assigning a specific rating, and comments on the degree to which the impact may cause irreplaceable loss of resources and be irreversible, must be included in the narrative accompanying the impact rating:

Rating		Definition of Rating	Score
A. *Extent* – *the area over which the impact will be experienced*			
Local		Confined to project or study area or part thereof (e.g. limits of the concession area)	1
Regional		The region (e.g. the whole of Namaqualand coast)	2
(Inter) national		Significantly beyond Saldanha Bay and adjacent land areas	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 time frame for which the impact will be experienced and its reversibility*			
Short-term		Up to 2 years	1
Medium-term		2 to 15 years	2
Long-term		More than 15 years (state whether impact is irreversible)	3

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

Combined Score **(A+B+C)**	3 – 4	5	6	7	8 – 9

[1] This does not apply to minor impacts which can be logically grouped into a single assessment.

Consequence Rating	Very low	Low	Medium	High	Very high

Example 1:

Extent	***Intensity***	***Duration***	***Consequence***
Regional **2**	Medium **2**	Long-term **3**	**High** **7**

Step 2 – Assess the **probability** of the impact occurring according to the following definitions:

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

Example 2:

Extent	***Intensity***	***Duration***	***Consequence***	***Probability***
Regional **2**	Medium **2**	Long-term **3**	**High** **7**	Probable

Step 3 – Determine the overall **significance** of the impact as a combination of the **consequence** and **probability** ratings, as set out below:

		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**

Example 3:

Extent	***Intensity***	***Duration***	***Consequence***	***Probability***	***Significance***
Regional **2**	Medium **2**	Long-term **3**	**High** **7**	Probable	**HIGH**

Step 4 – Note the **status** of the impact (i.e. will the effect of the impact be negative or positive?)

Example 4:

Extent	***Intensity***	***Duration***	***Consequence***	***Probability***	***Significance***	***Status***
Regional **2**	Medium **2**	Long-term **3**	**High** **7**	Probable	**HIGH**	**– ve**

Step 5 – State the level of **confidence** in the assessment of the impact (high, medium or low).

Depending on the data available, a higher level of confidence may be attached to the assessment of some impacts than others. For example, if the assessment is based on extrapolated data, this may reduce the confidence level to low, noting that further groundtruthing is required to improve this.

Example 5:

Extent	*Intensity*	*Duration*	*Consequence*	*Probability*	*Significance*	*Status*	*Confidence*
Regional **2**	Medium **2**	Long-term **3**	**High** **7**	Probable	**HIGH**	**– ve**	High

Step 6 – Identify and describe practical **mitigation** and **optimisation** measures that can be implemented effectively to reduce or enhance the significance of the impact. Mitigation and optimisation measures must be described as either:

- **Essential**: must be implemented and are non-negotiable; and
- **Optional**: must be shown to have been considered and sound reasons provided by the proponent if not implemented.

Essential mitigation and optimisation measures must be inserted into the completed impact assessment table. The impact should be re-assessed with mitigation, by following Steps 1-5 again to demonstrate how the extent, intensity, duration and/or probability change after implementation of the proposed mitigation measures.

Example 6: A completed impact assessment table

	Extent	*Intensity*	*Duration*	*Consequence*	*Probability*	*Significance*	*Status*	*Confidence*
Without mitigation	Regional **2**	Medium **2**	Long-term **3**	**High** **7**	Probable	**HIGH**	**– ve**	High
Essential mitigation measures: • xxxxx • xxxxx								
With mitigation	Local 1	Low 1	Long-term 3	**Low** **5**	Improbable	**VERY LOW**	**– ve**	High

Step 7 – Prepare a summary table of all impact significance ratings as follows:

Impact	***Consequence***	***Probability***	**Significance**	***Status***	***Confidence***
Impact 1: XXXX	Medium	Improbable	**LOW**	–ve	High
With Mitigation	Low	Improbable	**VERY LOW**		High
Impact 2: XXXX	Very Low	Definite	**VERY LOW**	–ve	Medium
With Mitigation:	*Not applicable*				

Indicate whether the proposed development alternatives are environmentally suitable or unsuitable in terms of the respective impacts assessed by the relevant specialist and the environmentally preferred alternative.