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## PART C

### 8 SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES

If any specific environmental sensitivities/attributes are present on the site which require more specific impact management outcomes and actions, not included in the pre-approved generic EMPr template, to manage impacts, those impact management outcomes and impact management actions must be included in this section. These specific management controls must be referenced spatially and must include impact management outcomes and impact management actions. The management controls including impact management outcomes and impact management actions must be presented in the format of the preapproved generic EMPr template. This applies only to additional impact management outcomes and impact management actions that are necessary.

If Part C is applicable to the development as authorised in the EA, it is required to be submitted to the CA together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and the name and expertise of the EAP, including the curriculum vitae are to be included. Once approved, Part C forms part of the EMPr for the site and is legally binding.

This section will not be required should the site contain no specific environmental sensitivities or attributes.

Specific Environmental Attributes for the proposed development include (refer to sensitivity maps under Sub-section 2):

The mitigation measures provided by the Specialists through the Basic Assessment are included below:

#### 8.1. Agricultural production, potential and soils

<b>Project phase</b>	<b>Construction, Operation &amp; Decommissioning</b>
<b>Impact title</b>	Impact on Agriculture
<b>Impact description</b>	Impact on Agricultural Production, Potential and Soils
<b>Potential mitigation</b>	The only source of impact is minimal disturbance to the land (erosion and topsoil loss) during construction (and decommissioning). Land disturbance can be completely and easily mitigated through generic mitigation measures included in the EMPr. However, farmers frequently complain that these impacts occur because the EMPr is not adequately implemented and therefore a functional grieving mechanism must be initiated prior to construction commencing. A common complaint from farmers is that gates are left open by contractors. There is likely to be some nuisance disturbance to agricultural activities during construction. However, nuisance disturbances are highly unlikely to translate into a change in agricultural production and therefore do not constitute an agricultural impact as defined in the first paragraph of this section.

## 8.2. Terrestrial ecology

Table 1 Mitigation measures including requirements for timeframes, roles and responsibilities for the terrestrial study

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
<b>Management outcome: Vegetation and Habitats</b>				
Areas rated as High sensitivity outside of the direct project development areas should be declared as 'no-go' areas during the life of the project, and all efforts must be made to prevent access to these areas from construction workers and machinery. The infrastructure should be realigned to prioritise development within medium sensitivity areas. Mitigated development in High sensitivity areas is permissible. The OHL can span these High sensitivity areas.	Construction Phase	Project manager, Environmental Officer	Development footprint	Ongoing
Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible. All activities must be restricted to within the low/medium sensitivity areas. No further loss of high sensitivity areas should be permitted. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon.	Life of operation	Project manager, Environmental Officer	Areas of indigenous vegetation	Ongoing
Existing access routes, especially roads must be made use of.	Construction/Operational Phase	Environmental Officer & Design Engineer	Roads and paths used	Ongoing
All laydown, chemical toilets etc. should be restricted to medium sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated project areas.	Construction/Operational Phase	Environmental Officer & Design Engineer	Laydown areas	Ongoing
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood and wind events. This will also reduce the likelihood of encroachment by alien invasive plant species. All livestock must always be kept out of the project area, especially areas that have been recently re-planted	Operational phase	Environmental Officer & Contractor	Assess the state of rehabilitation and encroachment of alien vegetation	Quarterly for up to two years after the closure
A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath	Life of operation	Environmental Officer & Contractor	Spill events, Vehicles dripping.	Ongoing

vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them leaking and entering the environment. Construction activities and vehicles could cause spillages of lubricants, fuels and waste material potentially negatively affecting the functioning of the ecosystem. All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the project area.				
It should be made an offence for any staff to take/ bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.	Life of operation	Project manager, Environmental Officer	Any instances	Ongoing
A fire management plan needs to be complied and implemented to restrict the impact fire might have on the surrounding areas.	Life of operation	Environmental Officer & Contractor	Fire Management	During Phase
Any individual of the protected plants that are present needs a relocation or destruction permit in order for any individual that may be removed or destroyed due to the development. Hi visibility flags must be placed near any threatened/protected plants in order to avoid any damage or destruction of the species. If left undisturbed the sensitivity and importance of these species needs to be part of the environmental awareness program. Infrastructure, development areas and routes where protected plants cannot be avoided, these plants many being geophytes or small succulents should be removed from the soil and relocated/ re-planted in similar habitats where they should be able to resprout and flourish again. All protected and red-data plants should be relocated, and as many other geophytic species as possible.	Life of operation	Project manager, Environmental Officer	Protected Tree/Plant species	Ongoing
A pre-construction survey in the flowering season (July-September) should be conducted in order to ensure that a more comprehensive floral presence confirmation. For the threatened species that may not be destroyed, it is recommended that professional service providers that deal with plant search and rescue be used to remove such plants and use them either for later rehabilitation work or other conservation projects.	Planning Phase, Pre-Construction	Project manager, Environmental Officer & Contractor	Flora species	During Phase

**Management outcome: Fauna**

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
A qualified environmental control officer must be on site when construction begins. A site walk through is recommended by a suitably qualified ecologist prior to any construction activities, preferably during the wet season and any	Construction Phase	Environmental Officer, Contractor	Presence of any floral or faunal species.	During phase

SSC should be noted. In situations where the threatened and protected plants must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated				
The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments, <ul style="list-style-type: none"> <li>Signs must be put up to enforce this.</li> </ul>	Construction/Operational Phase	Project manager, Environmental Officer	Infringement into these areas	Ongoing
The duration of the construction should be minimized to as short term as possible, to reduce the period of disturbance on fauna.	Construction	Project manager, Environmental Officer & Design Engineer	Construction/Closure Phase	Ongoing
Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to amphibian species and nocturnal mammals	Construction/Operational Phase	Environmental Officer	Noise levels	Ongoing
No trapping, killing, or poisoning of any wildlife is to be allowed <ul style="list-style-type: none"> <li>Signs must be put up to enforce this;</li> </ul>	Life of operation	Environmental Officer	Evidence of trapping etc	Ongoing
Outside lighting should be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided and sodium vapor (green/red) lights should be used wherever possible.	Construction/Operational Phase	Project manager, Environmental Officer & Design Engineer	Light pollution and period of light.	Ongoing
All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited.	Life of operation	Health and Safety Officer	Compliance to the training.	Ongoing
Schedule activities and operations during least sensitive periods, to avoid migration, nesting and breeding seasons.	Life of operation	Project manager, Environmental Officer & Design Engineer	Activities should take place during the day in the case.	Ongoing
As far as possible power cables within the project area should be thoroughly insulated.	Planning and construction	Environmental Officer & Contractor, Engineer	Exposed cables	During phase
Eskom guidelines on impacts to avifaunal mitigation measures must be followed	Construction and Operational phase	Environmental Officer & Contractor, Engineer	Avifaunal SCC	Ongoing
Any exposed parts must be covered (insulated) to reduce electrocution risk	Planning and construction	Environmental Officer & Contractor, Engineer	Presence of electrocuted birds	During phase
All areas to be developed must be walked through prior to any activity to ensure no nests or fauna species are found in the area. Should any Species of Conservation Concern not move out of the area or their nest be found in the area a suitably qualified specialist must be consulted to advise on the correct actions to be taken.	Construction and Operational phase	Project manager, Environmental Officer	Presence of Nests and faunal species	Planning, Construction and Rehabilitation
Any holes/deep excavations must be dug and planted in a progressive manner and should not be left open overnight;	Planning and Construction	Environmental Officer & Contractor, Engineer	Presence of trapped animals and open holes	Ongoing

- Should the holes overnight they must be covered temporarily to ensure no small fauna species fall in.

**Management outcome: Alien species**

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Compilation of and implementation of an alien vegetation management plan.	Life of operation	Project manager, Environmental Officer & Contractor	Assess presence and encroachment of alien vegetation	Twice a year
The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprint of the roads must be kept to prescribed widths.	Construction/Operational Phase	Project manager, Environmental Officer & Contractor	Footprint Area	Life of operation
Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site	Life of operation	Environmental Officer & Health and Safety Officer	Presence of waste	Life of operation
A pest control plan must be put in place and implemented; it is imperative that poisons not be used due to the likely presence of SCCs	Life of operation	Environmental Officer & Health and Safety Officer	Evidence or presence of pests	Life of operation

**Management outcome: Dust**

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes wetting of exposed soft soil surfaces. <ul style="list-style-type: none"> <li>• No non environmentally friendly suppressants may be used as this could result in pollution of water sources</li> </ul>	Life of operation	Contractor	Dustfall	Dust monitoring program.

**Management outcome: Waste management**

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Waste management must be a priority and all waste must be collected and stored effectively.	Life of operation	Environmental Officer & Contractor	Waste Removal	Weekly
Litter, spills, fuels, chemicals and human waste in and around the project area.	Construction/Closure Phase	Environmental Officer & Health and Safety Officer	Presence of Waste	Daily
A minimum of one toilet must be provided per 10 persons. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area.	Life of operation	Environmental Officer & Health and Safety Officer	Number of toilets per staff member. Waste levels	Daily

The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility	Life of operation	Environmental Officer & Health and Safety Officer	Availability of bins and the collection of the waste.	Ongoing
Where a registered disposal facility is not available close to the project area, the Contractor shall provide a method statement with regard to waste management. Under no circumstances may domestic waste be burned on site	Life of operation	Environmental Officer, Contractor & Health and Safety Officer	Collection/handling of the waste.	Ongoing
Refuse bins will be emptied and secured Temporary storage of domestic waste shall be in covered waste skips. Maximum domestic waste storage period will be 10 days.	Life of operation	Environmental Officer, Contractor & Health and Safety Officer	Management of bins and collection of waste	Ongoing, every 10 days
<b>Management outcome: Environmental awareness training</b>				
<b>Impact Management Actions</b>	<b>Implementation</b>		<b>Monitoring</b>	
	Phase	Responsible Party	Aspect	Frequency
All personnel and contractors to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of Red / Orange List species, their identification, conservation status and importance, biology, habitat requirements and management requirements the Environmental Authorisation and within the EMP. The avoidance and protection of the wetland areas must be included into a site induction. Contractors and employees must all undergo the induction and made aware of the "no-go" to be avoided.	Life of operation	Health and Safety Officer	Compliance to the training.	Ongoing
<b>Management outcome: Erosion</b>				
<b>Impact Management Actions</b>	<b>Implementation</b>		<b>Monitoring</b>	
	Phase	Responsible Party	Aspect	Frequency
Speed limits must be put in place to reduce erosion. <ul style="list-style-type: none"> <li>Reducing the dust generated by the listed activities above, especially the earth moving machinery, through wetting the soil surface and putting up signs to enforce speed limit as well as speed bumps built to force slow speeds;</li> <li>Signs must be put up to enforce this.</li> </ul>	Life of operation	Project manager, Environmental Officer	Water Runoff from road surfaces	Ongoing
Where possible, existing access routes and walking paths must be made use of.	Life of operation	Project manager, Environmental Officer	Routes used within the area	Ongoing
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events and strong winds.	Life of operation	Project manager, Environmental Officer	Re-establishment of indigenous vegetation	Progressively

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A stormwater management plan must be compiled and implemented, especially for where the road crosses the drainage feature.	Life of operation	Project manager, Environmental Officer	Management plan	Before construction phase: Ongoing
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### 8.3. Aquatic ecology

<b>Project phase</b>	<b>Construction, Operation &amp; Decommissioning</b>
<b>Impact title</b>	Loss of riparian system and disturbance of the alluvial watercourses in the construction, operational and decommissioning phases
<b>Impact description</b>	Should any of the proposed structures associated with the transmission line be placed within the delineated watercourse, a physical loss of associated vegetation as well damage to the bed and banks of the observed systems could occur. Although true aquatic obligate vegetation was seldom seen, any disturbance of these areas could result in disturbance of the systems resulting in erosion / sedimentation, loss of habitat and corridor (Ecological Support Area) fragmentation. These disturbances will be the greatest during the construction and again in the decommissioning phases as the related disturbances could result in loss and/or damaged vegetation, while to a lesser degree in the operation phase (i.e. as and when maintenance occurs).
<b>Potential mitigation</b>	<p><i>Mitigation measures to reduce residual risk or enhance opportunities:</i></p> <ul style="list-style-type: none"> <li>- A pre-construction walkthrough with an aquatic specialist is recommended and they can assist with the development of the stormwater management plan and Aquatic Rehabilitation and Monitoring plan, coupled to micro-siting of the final tower layout as required.</li> <li>- The layout planning has taken cognisance of the sensitivity layer as shown in Figure 1, to avoid these areas (towers) or where access is required, cross such areas using existing tracks / roads or where the impacts would be low or can easily be mitigated.</li> <li>- Due to the broad nature of the alluvial systems, towers would need to be placed in some of these areas, but it is recommended that no new permanent tracks to access these areas are created.</li> <li>- Vegetation clearing where required should occur in a phased manner in accordance with the construction programme to minimise erosion and/or run-off. Large tracts of bare soil will either cause dust pollution or quickly erode and then cause sedimentation in the lower portions of the catchment.</li> <li>- It is also advised that an Environmental Control Officer (ECO), with a good understanding of the local flora be appointed during the construction phase. The ECO should be able to make clear recommendations with regards to the re-vegetation of the newly completed / disturbed areas within aquatic environment, using selected species detailed in this report.</li> <li>- All alien plant re-growth, which is currently low within the greater region must be monitored and should it occur, these plants must be eradicated within the project footprints and especially in areas near the proposed crossings. <i>Prosopis</i> (alien invasive riparian tree) is prevalent in areas to the north of the site, thus care in transporting any material, while ensuring that such materials is free of alien seed, coupled with pre and post alien clearing must be stipulated in the EMPr.</li> </ul>
<b>Comment on ratings</b>	<p>The ratings assume that the ECO/specialist that during the micro sitting process, that with the contractor the allowable work areas are pegged out, with the remaining areas be considered No-go.</p> <p>The contractor must provide a method statement to the ECO for each specific watercourse crossing once the allowable working areas are pegged. This method statement, coupled to a detailed pre-works photo record will form part of the ECO annexures and be audited.</p>

<b>Project phase</b>	<b>Construction, Operation &amp; Decommissioning</b>
<b>Impact title</b>	Impact on riparian systems through the possible increase in surface water runoff on downstream riparian form and function, due to impacts to the hydrological regime such as alteration of surface run-off patterns



<b>Impact description</b>	<i>This could occur within the operational and decommissioning phases. When any of the hard or compacted surfaces (roads or substation areas) increase the volume and velocity of the surface runoff increases. This could impact the hydrological regime through the increase in flows that are concentrated in area, and as most plants are drought tolerant an increase in water will allow for other species to develop and outcompete typical plant species found within the region. This then affects the structure (i.e. larger taller grasses / shrubs / trees) and function (greater attenuation of flows, restricting any runoff from reaching downstream areas). The opposite can also happen. If flows are too concentrated with high velocities, scour and erosion results, with a complete reduction or disturbance of riparian habitat.</i>
<b>Potential mitigation</b>	Mitigation measures to reduce residual risk or enhance opportunities: - Vegetation clearing should occur in a phased manner in accordance with the construction programme to minimise erosion and/or run-off. Large tracts of bare soil will either cause dust pollution or quickly erode and then cause sedimentation in the lower portions of the catchment. - Any stormwater within the site must be handled in a suitable manner, i.e. trap sediments, and reduce flow velocities - No stormwater runoff must be allowed to discharge directly into any water course along roads, and flows should thus be allowed to dissipate over a broad area covered by natural vegetation. - Stormwater in the switching substation (not part of this application) must be managed using appropriate channels and swales when located within steep areas or have steep embankments
<b>Comment on ratings</b>	The ratings assume that the ECO/specialist that during the micro sitting process, that with the contractor the allowable work areas are pegged out, with the remaining areas be considered No-go.  The contractor must provide a method statement to the ECO for each specific watercourse crossing once the allowable working areas are pegged. This method statement, coupled to a detailed pre-works photo record will form part of the ECO annexures and be audited.

<b>Project phase</b>	<b>Construction, Operation &amp; Decommissioning</b>
<b>Impact title</b>	Increase in sedimentation and erosion within the development footprint
<b>Impact description</b>	Impacts include changes to the hydrological regime such as alteration of surface run-off patterns, runoff velocities and or volumes which could occur during the construction, operational and decommissioning phases
<b>Potential mitigation</b>	Mitigation measures to reduce residual risk or enhance opportunities: - Any stormwater within the site must be handled in a suitable manner, i.e. trap sediments and reduce flow velocities. Any management actions must be dealt with in the Stormwater Management Plan (SWMP), forming part of any WULA.
<b>Comment on ratings</b>	The ratings assume that the ECO/specialist that during the micro sitting process, that with the contractor the allowable work areas are pegged out, with the remaining areas be considered No-go.  The contractor must provide a method statement to the ECO for each specific watercourse crossing once the allowable working areas are pegged. This method statement, coupled to a detailed pre-works photo record will form part of the ECO annexures and be audited.

<b>Project phase</b>	<b>Construction, Operation &amp; Decommissioning</b>
<b>Impact title</b>	Impact on localized surface water quality
<b>Impact description</b>	During construction / decommissioning and to a limited degree the operational activities, chemical pollutants (hydrocarbons from equipment and vehicles, cleaning fluids, cement powder, wet cement, shutter-oil, etc.) associated with site-clearing machinery and construction activities could be washed downslope via the ephemeral systems

<b>Potential mitigation</b>	<p>Mitigation measures to reduce residual risk or enhance opportunities:</p> <ul style="list-style-type: none"> <li>- Strict use and management of all hazardous materials used on site in line with the specific material safety data sheets, e.g. fuels must be stored within a contained / banded site with the necessary and spill kits available.</li> <li>- Strict management of potential sources of pollution (e.g. litter, hydrocarbons from vehicles &amp; machinery, cement during construction, etc.).</li> <li>- Containment of all contaminated water by means of careful run-off management on the development site.</li> <li>- Appropriate ablution facilities should be provided for construction workers during construction and on-site staff during the operation of the facility.</li> <li>- Strict control over the behaviour of construction workers, with regard littering, use and storage of chemicals.</li> <li>- Working protocols incorporating pollution control measures (including approved method statements by the contractor) should be clearly set out in the Environmental Management Programme (EMPr) for the project and strictly enforced.</li> </ul>
<b>Comment on ratings</b>	<p>The ratings assume that the ECO/specialist that during the micro sitting process, that with the contractor the allowable work areas are pegged out, with the remaining areas be considered No-go.</p> <p>The contractor must provide a method statement to the ECO for each specific watercourse crossing once the allowable working areas are pegged. This method statement, coupled to a detailed pre-works photo record will form part of the ECO annexures and be audited.</p>

<b>Project phase</b>	<b>Construction, Operation &amp; Decommissioning</b>
<b>Impact title</b>	Overall cumulative impact
<b>Impact description</b>	<p>In the assessment of this project, several projects have been assessed by the report author within a 35km radius have been reviewed and or sites accessed during the course of travelling between the various projects of these potential projects, this report author has been involved in the initial EIA aquatic assessments or has managed / assisted with the WUL process for several of the projects.</p> <p>All of the projects have indicated that this is also their intention with regard mitigation, i.e. selecting the best possible routes to minimise the local and regional impacts and improving the drainage or hydrological conditions with these rivers the cumulative impact could be seen as a net benefit. However, the worse-case scenario has been assessed below, i.e. only the minimum of mitigation be implemented by the other projects, and that flows within these systems are sporadic. This is also coupled to fact the several existing transmission lines already occur within the region</p>
<b>Potential mitigation</b>	<p>Mitigation measures to reduce residual risk or enhance opportunities by local land owners and or Provincial / District Roads organizations within the study area:</p> <ul style="list-style-type: none"> <li>- Improve the current stormwater and energy dissipation features not currently found along the tracks and roads within the region</li> <li>- Install properly sized culverts with erosion protection measures at the present road / track crossings</li> </ul>
<b>Comment on ratings</b>	<p>The ratings assume that the ECO/specialist that during the micro sitting process, that with the contractor the allowable work areas are pegged out, with the remaining areas be considered No-go.</p> <p>The contractor must provide a method statement to the ECO for each specific watercourse crossing once the allowable working areas are pegged. This method statement, coupled to a detailed pre-works photo record will form part of the ECO annexures and be audited.</p>

As the proposed activities have the potential to create erosion the following recommendations are reiterated:

- Vegetation clearing should occur in in a phased manner in accordance with the construction programme to minimise erosion and/or run-off. Large tracts of bare soil will either cause dust pollution or quickly erode and then cause sedimentation in the lower portions of the catchment, and suitable dust and erosion control mitigation measures should be included in the EMPr.

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- All construction materials including fuels and oil should be stored in demarcated areas that are contained within berms / bunds to avoid spread of any contamination / leaks. Washing and cleaning of equipment should also be done in berms or bunds, to trap any cement / hazardous substances and prevent excessive soil erosion. Mechanical plant and bowsers must not be refuelled or serviced within or directly adjacent to any channel. It is therefore suggested that all construction camps, lay down areas, batching plants or areas and any stores should be located more than 50 m from any demarcated watercourses.
  - It is also advised that an Environmental Control Officer (ECO), with a good understanding of the local flora be appointed during the construction phase. The ECO should be able to make clear recommendations with regards to the re-vegetation of the newly completed / disturbed areas along aquatic features, using selected species detailed in this report.
  - All alien plant re-growth must be monitored and should these alien plants reoccur these plants should be re-eradicated. The scale of the operation does however not warrant the use of a Landscape Architect and / or Landscape Contractor.
  - It is further recommended from the project onset that all watercourse areas (inclusive of buffers) are included into any existing EMPr as reference, this to ensure a net benefit to the aquatic environment. This should form part of the suggested walk down as part of the final EMP preparation.

## 8.4. Avifauna

<b>Project phase</b>	<b>Construction</b>
<b>Impact title</b>	Displacement: Disturbance
<b>Impact description</b>	Displacement of priority species due to disturbance associated with construction of the OHL
<b>Potential mitigation</b>	Conduct a pre-construction inspection (avifaunal walk-through) of the final powerline alignment to identify priority species that may be breeding within the final footprint. If a SSC nest is occupied, the avifaunal specialist must consult with the contractor to find ways of minimising the potential disturbance to the breeding pair of eagles/birds during the construction period. This could include measures such as delaying some of the activities until after the breeding season.
<b>Comment on ratings</b>	The rating of Major Negative significance prior to mitigation is agreed with. Six priority nests have been identified in the primary POAI. Construction activities in close proximity to breeding locations will be a source of disturbance and could lead to temporary breeding failure or even permanent abandonment of nests. The timeous identification of nests and the timing of the construction activities to avoid disturbance during a critical phase of the breeding cycle will reduce the significance of this impact to moderate levels.

<b>Project phase</b>	<b>Construction</b>
<b>Impact title</b>	Displacement: Habitat Loss or Transformation
<b>Impact description</b>	Displacement of priority species due to habitat loss or transformation associated with construction of the OHL
<b>Potential mitigation</b>	Prevent unnecessary displacement of avifauna by ensuring that the rehabilitation of transformed areas is implemented where possible by an appropriately qualified rehabilitation specialist, according to the recommendations of the biodiversity specialist study.
<b>Comment on ratings</b>	The rating of Minor Negative significance prior to mitigation is agreed with. The direct habitat transformation is limited to the pole/tower footprints and the narrow access road/track under the powerline. The habitat in the PAOI is relatively uniform from a bird impact perspective. The loss of habitat will be a relatively small percentage of the habitat that regularly supports priority species and the resultant impact is likely to be fairly minimal.

<b>Project phase</b>	<b>Operation</b>
<b>Impact title</b>	Collision
<b>Impact description</b>	Mortality of priority species due to collisions with the OHL (regardless of voltage size and technology alternatives)
<b>Potential mitigation</b>	The entire length of powerline must be marked with Eskom approved bird flight diverters (BFDs). The bird flight diverters should be installed on the full span length on the earthwire (according to Eskom guidelines - five metres apart). Light and dark colour devices must be alternated to provide contrast against both dark and light backgrounds respectively. These devices must be installed as soon as the conductors and earthwires are strung.
<b>Comment on ratings</b>	The rating of Major Negative significance prior to mitigation is agreed with. Collisions are the biggest threat posed by high voltage powerlines to birds in southern Africa. Most heavily impacted upon are bustards, storks, cranes and various species of waterbirds, and to a lesser extent, vultures. Several large terrestrial birds occur within the primary POAI. The installation of Bird Flight Diverters on the earthwires that traverse key habitats will reduce the significance of this impact to moderate levels.

<b>Project phase</b>	<b>Operation</b>
<b>Impact title</b>	Electrocution
<b>Impact description</b>	Mortality of priority species due to electrocution on <b>132kV powerline infrastructure</b> using the single circuit, double circuit, steel lattice or standard steel monopole tower structures alternatives

<b>Potential mitigation</b>	<p>If the grid connection is constructed using a single circuit configuration, the only mitigation option is the construction of the powerline using the approved vulture friendly pole/tower design D-DT-7649 (Appendix 7) in accordance with the Distribution Technical Bulletin Reference Number 240-170000467.</p> <p>If the grid connection is constructed using a double circuit configuration, it is imperative that there is a minimum clearance of 1.8m between the jumpers and/or insulators and the horizontal earthed component on the lattice structure.</p> <p>Additional mitigation in the form of insulating sleeves on jumpers present on strain poles and terminal poles is also required (if possible), alternatively all jumpers must be suspended below the crossarms.</p>
<b>Comment on ratings</b>	<p>The rating of Moderate Negative significance prior to mitigation is agreed with. The only priority species capable of bridging the clearance distances of 132kV OHL infrastructure is the Cape Vulture, due to their size and gregarious nature. The low reporting rate for the species in the SABAP data suggests that the species is unlikely to occur regularly in the PAOI. However, pastoral activities feature prominently, so their sporadic occurrence cannot be ruled out. The construction of the powerline at a voltage &gt;132kV or using the appropriate vulture friendly structure will reduce the significance of this impact.</p>

<b>Project phase</b>	<b>Decommissioning</b>
<b>Impact title</b>	Displacement: Disturbance
<b>Impact description</b>	Displacement of priority species due to disturbance associated with decommissioning of the OHL
<b>Potential mitigation</b>	<p>Conduct an avifaunal inspection of the OHL prior to its decommissioning to identify nests on the poles/towers.</p> <p>A site-specific Decommissioning EMPr (DEMPr) must be implemented, which gives appropriate and detailed description of how construction activities must be conducted.</p>
<b>Comment on ratings</b>	<p>The rating of Moderate Negative significance prior to mitigation is agreed with. Decommissioning activities in close proximity to breeding locations will be a source of disturbance and could lead to temporary breeding failure or even permanent abandonment of nests. The timeous identification of nests and the timing of the decommissioning activities to avoid disturbance during a critical phase of the breeding cycle will reduce the significance of this impact to moderate levels.</p>

## 8.5. Heritage and archaeology

<b>Project phase</b>	<b>Construction</b>
<b>Impact title</b>	Pre-colonial and Colonial Archaeological Impact Assessment
<b>Impact description</b>	Possible impacts to archaeological sites and materials
<b>Potential mitigation</b>	<p>General:</p> <ul style="list-style-type: none"> <li>• Do not disturb any old stone kraals or ruins and do not remove stone from walls, or artefacts from the earth.</li> <li>• Report any chance discoveries of human remains to an archaeologist or a heritage authority.</li> </ul> <p>Specific:</p> <ul style="list-style-type: none"> <li>• Three archaeological sites require mitigation, in the form of artefact mapping, recording and collection by the archaeologist prior to the commencement of construction of the grid connections. These are: <ul style="list-style-type: none"> <li>• JG050-JG052 / GEB013-GEB014;</li> <li>• JG067-JG072 / GEB025; and</li> <li>• JG077.</li> </ul> </li> <li>• The following sites, each with the buffer described below, must be considered no-go areas during construction activities and those nearest the route alignments must be clearly marked as out of bounds: <ul style="list-style-type: none"> <li>• The possible Khoi kraals and shepherds' huts (JG040; JG064; JG066; JG081-JG090) – 40 m buffer centered on JG088;</li> <li>• The possible "wolwehok" (JG036) – 20 m buffer; and</li> <li>• The rock engraving (JG044) - 20 m buffer.</li> </ul> </li> </ul>

Comment on ratings	Ratings obtained from ACO Associates (Gribble and Euston-Browne, 2021, SAHRIS ID 570440).
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## 8.6. Palaeontology

Project phase	Construction
Impact title	Palaeontological Impact Assessment
Impact description	Possibility of encountering fossils during groundworks
Potential mitigation	<p>Implementation of a Chance Fossil Find Protocol</p> <ul style="list-style-type: none"> <li>• Reporting by the ECO of any chance fossil finds to SAHRA and their conservation (preferably in situ).</li> <li>• Recording and judicious sampling of significant chance fossil finds by a qualified palaeontologist, together with pertinent contextual data (stratigraphy, sedimentology, taphonomy) within the final footprint; and</li> <li>• Curation of any recovered fossil material within an approved repository (museum / university fossil collection) by a qualified palaeontologist.</li> </ul>
Comment on ratings	Ratings obtained from ACO Associates (Gribble and Euston-Browne, 2021, SAHRIS ID 570440).

## 8.7. Visual landscape

Project phase	Construction
Impact title	Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed grid connection infrastructure.
Impact description	Potential visual impact of construction activities on sensitive visual receptors in close proximity to the proposed grid connection infrastructure.
Potential mitigation	<ul style="list-style-type: none"> <li>• Planning: <ul style="list-style-type: none"> <li>– Retain and maintain natural vegetation immediately adjacent to the development footprint/servitude.</li> </ul> </li> <li>• Construction: <ul style="list-style-type: none"> <li>– Ensure that vegetation is not unnecessarily removed during the construction phase.</li> <li>– Plan the placement of lay-down areas (if required) and temporary construction equipment camps in order to minimise vegetation clearing (i.e. in already disturbed areas) wherever possible.</li> <li>– Restrict the activities and movement of construction workers and vehicles to the immediate construction area and existing access roads.</li> <li>– Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed of regularly at licensed waste facilities.</li> <li>– Reduce and control construction dust using appropriate and effective dust suppression techniques as and when required (i.e. whenever dust becomes apparent).</li> <li>– Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts.</li> </ul> </li> </ul> <p>Rehabilitate all disturbed areas immediately after the completion of construction works.</p>
Comment on ratings	A mitigating factor within this scenario is the very low occurrence of receptors within the receiving environment and within close proximity to the proposed infrastructure. Additionally, observers traveling along the secondary road will only be exposed to the visual intrusion for a short period of time. This reduces the probability of this impact occurring.

<b>Project phase</b>	<b>Operation</b>
<b>Impact title</b>	Visual impact on observers in close proximity to the proposed grid connection infrastructure.
<b>Impact description</b>	Potential visual impact on sensitive visual receptors located within a 0.5km radius of the grid connection infrastructure during the operational phase
<b>Potential mitigation</b>	<ul style="list-style-type: none"> <li>• Planning: <ul style="list-style-type: none"> <li>– Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint/servitude.</li> </ul> </li> <li>• Operations: <ul style="list-style-type: none"> <li>– Maintain the general appearance of the infrastructure.</li> </ul> </li> <li>• Decommissioning: <ul style="list-style-type: none"> <li>– Remove infrastructure not required for the post-decommissioning use. Rehabilitate all affected areas.</li> <li>– Consult an ecologist regarding rehabilitation specifications.</li> </ul> </li> </ul>
<b>Comment on ratings</b>	A mitigating factor within this scenario is the very low occurrence of receptors within the receiving environment. Observers traveling along the secondary road will only be exposed to the visual intrusion for a short period of time. Additionally, the proximity of existing powerlines and the Hydra Substation reduces the probability of this impact occurring as there is already an existing visual intrusion.

<b>Project phase</b>	<b>Operation</b>
<b>Impact title</b>	Visual impact on observers in close proximity to the proposed grid connection infrastructure.
<b>Impact description</b>	Potential visual impact on sensitive visual receptors within the region (1.5 – 3km radius) during the operation of the grid connection infrastructure.
<b>Potential mitigation</b>	<ul style="list-style-type: none"> <li>• Planning: <ul style="list-style-type: none"> <li>– Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint/servitude.</li> </ul> </li> <li>• Operations: <ul style="list-style-type: none"> <li>– Maintain the general appearance of the infrastructure.</li> </ul> </li> <li>• Decommissioning: <ul style="list-style-type: none"> <li>– Remove infrastructure not required for the post-decommissioning use. Rehabilitate all affected areas.</li> <li>– Consult an ecologist regarding rehabilitation specifications.</li> </ul> </li> </ul>
<b>Comment on ratings</b>	A mitigating factor within this scenario is the very low occurrence of receptors within the receiving environment. Observers traveling along the secondary road will only be exposed to the visual intrusion for a short period of time. Additionally, the proximity of existing powerlines and the Hydra Substation reduces the probability of this impact occurring as there is already an existing visual intrusion.

<b>Project phase</b>	<b>Construction &amp; Operation</b>
<b>Impact title</b>	The potential impact on the sense of place of the region.
<b>Impact description</b>	The potential visual impact of the proposed grid connection infrastructure on the sense of place of the region.
<b>Potential mitigation</b>	<ul style="list-style-type: none"> <li>• Planning: <ul style="list-style-type: none"> <li>– Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint/servitude.</li> </ul> </li> <li>• Operations: <ul style="list-style-type: none"> <li>– Maintain the general appearance of the infrastructure.</li> </ul> </li> <li>• Decommissioning: <ul style="list-style-type: none"> <li>– Remove infrastructure not required for the post-decommissioning use. Rehabilitate all affected areas.</li> <li>– Consult an ecologist regarding rehabilitation specifications.</li> </ul> </li> </ul>

<b>Comment on ratings</b>	The low incidence of visual receptors within this environment, the relatively remote location of the proposed powerline and the occurrence of numerous existing powerlines within close proximity reduces the probability of this impact occurring. However, the potential future development of neighbouring renewable energy projects may drastically change the overall visual impact on the sense of place within the region.
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<b>Project phase</b>	<b>Construction &amp; Operation</b>
<b>Impact title</b>	Cumulative visual impact of the proposed grid connection infrastructure on the visual quality of the landscape.
<b>Potential mitigation</b>	<ul style="list-style-type: none"> <li>• Planning: <ul style="list-style-type: none"> <li>– Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint/servitude.</li> </ul> </li> <li>• Operations: <ul style="list-style-type: none"> <li>– Maintain the general appearance of the infrastructure.</li> </ul> </li> <li>• Decommissioning: <ul style="list-style-type: none"> <li>– Remove infrastructure not required for the post-decommissioning use.</li> <li>Rehabilitate all affected areas.</li> <li>– Consult an ecologist regarding rehabilitation specifications.</li> </ul> </li> </ul>
<b>Comment on ratings</b>	Within the study area there are numerous existing power lines that all congregate at the Hydra Substation. The addition of the proposed powerline will contribute to the overall occurrence of industrial type infrastructure within the region. However, the low incidence of visual receptors within this environment and the relatively remote location of the proposed powerline reduces the probability of this impact occurring.