

19 May 2023

Attention:

SAVANNAH ENVIRONMENTAL (Pty) Ltd

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To whom it may concern:

ECOLOGICAL SPECIALIST INPUT FOR THE PART 1 AMENDMENT OF THE ENVIRONMENTAL AUTHORISATION (EA) FOR THE PROPOSED BOESMANLAND SOLAR FARM, PORTION 6 (A PORTION OF PORTION 2) FARM 62 ZUURWATER, AGGENEYS, NORTHERN CAPE PROVINCE.

Background

Boesmanland Solar Farm (Pty) Ltd is proposing to amend the Environmental Authorisation (EA) for the Boesmanland Solar Farm, by extending the EA validity by an additional ten (10) years. Extension of the validity of the EA will ensure that the EA remains valid for the undertaking of the authorised activities. The layout of the proposed project in relation to the watercourses is presented in Figure 1.

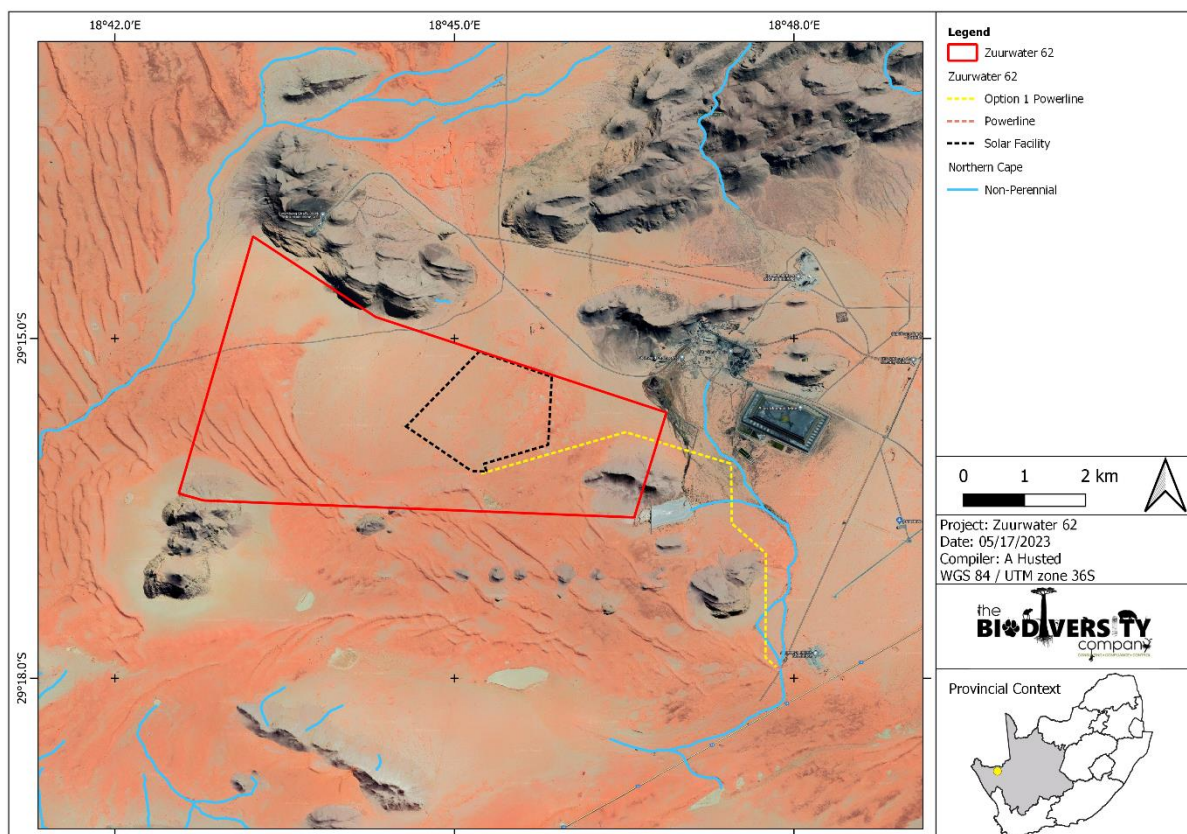


Figure 1: Proposed layout in relation to the watercourses

Savannah Environmental have been appointed as the Registered Environmental Assessment Practitioner (EAP) to prepare the Application. The EA Amendment will be completed in terms of Regulation 30(1)(a) of the Environmental Impact Assessment (EIA) Regulations, 2014, as amended, including additional specialist studies and public participation required by the DFFE. Condition 7 of the

First Issue Environmental Authorisation, Issued on the 16th of July 2013, DEA Reference 14/12/16/3/3/2/222 states that:

“This activity must commence within a period of three (3) years from the date of issue of this authorisation. If commencement of the activity does not occur within that period, the authorisation lapses and a new application for environmental authorisation must be made in order for the activity to be undertaken.”

Consequent amendments to extend the validity of the authorisation have been made as follows:

- 14/12/16/3/3/2/222/AM1 – authorised on the 22 February 2016 extending the validity to commence within two (2) years from the date of expiry of the EA issued on 16 July 2013.
- 14/12/16/3/3/2/222/AM2 – authorised on the 30 July 2018 extending the validity to the 16 July 2020.
- 14/12/16/3/3/2/222/AM3 – authorised on the 12 August 2020 extending the validity to the 16 July 2023 which states the following:

“This activity must commence within a period of ten (10) years from the date of issue of this authorisation (i.e. the EA lapses on 16 July 2023). If commencement of the activity does not occur within that period, the authorisation lapses and a new application for environmental authorisation must be made in order for the activity to be undertaken.”

The applicant, Boesmanland Solar Farm (Pty) Ltd thus requests that the Competent Authority amends Condition 7 of the original EA (Page 9) as amended (DFFE Reference: 14/12/16/3/3/2/222/AM3; dated 12 August 2020).

The Biodiversity Company was appointed to provide specialist inputs for this Amendment Application. This report is a component of the Ecological Assessment and the Scope of Work for this report is as follows:

- A single site visit to confirm the status of the environment compared to that at the time of the original assessment. This is required in order to make a statement as to whether the environment has changed since the original assessment supported by a site verification report.
- An indication as to whether the impact rating as provided in the initial assessment remains valid; if the mitigation measures provided in the initial assessment are still applicable; or if there are any new mitigation measures which need to be included into the EA, should the request to extend the commencement period be granted by the Department.
- An indication as to whether there are any new assessments/guidelines which are now relevant to the authorised development which were not undertaken as part of the initial assessment, must be taken into consideration and addressed in the report.
- A description and an assessment of any changes to the biophysical environment that has occurred since the initial EA was issued.
- A description and an assessment of the surrounding environment, in relation to new developments or changes in land use which might impact on the authorised project, the assessment must consider the following:
 - similar developments within a 30 km radius; and

- Identified cumulative impacts, and where possible the size of the identified impact must be quantified and indicated, i.e., hectares of cumulatively transformed land.







Assumptions and Limitations







It is assumed that the client has provided the specialist with all available data and information surrounding the project at the time of writing. The field survey for this assessment was undertaken during May 2023 which constitutes a late wet season survey. Accordingly, seasonality was not assessed.



Results

1. No aquatic ecology assessment was completed as part of the Environmental Impact Assessment (EIA) that was undertaken for the proposed construction of the Zuurwater 62, Boesmanland 75mw Solar Farm, Aggeneys, and was therefore **not available for review and consideration for this amendment**. Watercourses are only mentioned in the fauna and flora assessment (Simon Todd Consulting, 2013) from a mitigation perspective but not assessed.
2. The Biodiversity Company conducted a site assessment followed by a Sensitivity Verification in May 2023. The site assessments and site verifications undertaken in 2023 will therefore be used as the most recent source of information for the purposes of this amendment.
3. For the site verification the watercourses which may potentially be affected by the proposed activity were assessed. This was done to adequately assess the current state of these systems which was done to gain a holistic image of the system and which habitat may be affected. The selected sampling locations and the location of each crossing (access dependent) can be seen in Table 1.
4. Drainage systems were identified and delineated by Simon Todd Consulting (2013), with the ecological sensitivity of these systems determined to be very high. These systems will be avoided by the solar facility, but the alignment of the powerline does allow for encroachment into these systems (Figure 3). The following was stated in the ecological report: *“Due to the high infiltration capacity of the deep sands which characterize a large proportion of the site there are few drainage lines within the proposed development area. The drainage lines that are present have their origin in the rocky hills outside of the site. Within the proposed development area, the drainage lines are generally wide and open, with a flat sandy bed.”*

Table 1: Photos and co-ordinates for the sites sampled sites (May 2023)

Site	Upstream	Downstream
A8		
	29°15'16.28"S 18°45'45.57"E	
A7		
	29°15'18.51"S 18°45'38.90"E	
A5		
	29°15'28.60"S 18°45'20.98"E	

Site	Upstream	Downstream
A2		
	29°15'47.95"S 18°45'28.37"E	
A1		
	29°16'10.85"S 18°45'18.69"E	
DEP		
	29°16'26.16"S 18°45'19.73"E	

Site	Upstream	Downstream
D1		
	29°16'3.47"S 18°47'4.30"E	
D4		
	29°17'50.90"S 18°47'52.36"E	

5. Due to the ephemeral nature of the watercourses in the area, no assessments were conducted. This was due to the conditions experienced at the time of survey (May 2023) and therefore the ephemeral lotic systems contained insufficient water presence, depth or flow, multiple intended methods could not be applied and therefore the focus of this report was habitat preservation. This was not considered in the initial assessment and considered pertinent.
6. Based on conditions observed in the field and satellite imagery, drainage areas and aquatic features were delineated in order to identify all sensitive areas considered relevant to the aquatic habitat of the project area. This is presented below in Figure 2. Based on recommendations from Norman, 1996, Peterjohn & Correl, 1984, Blanché, 2002 and Palone & Todd, 1997, a 50 m buffer was assigned to these regions as a '**No Go**' area for all associated infrastructure of the proposed project.

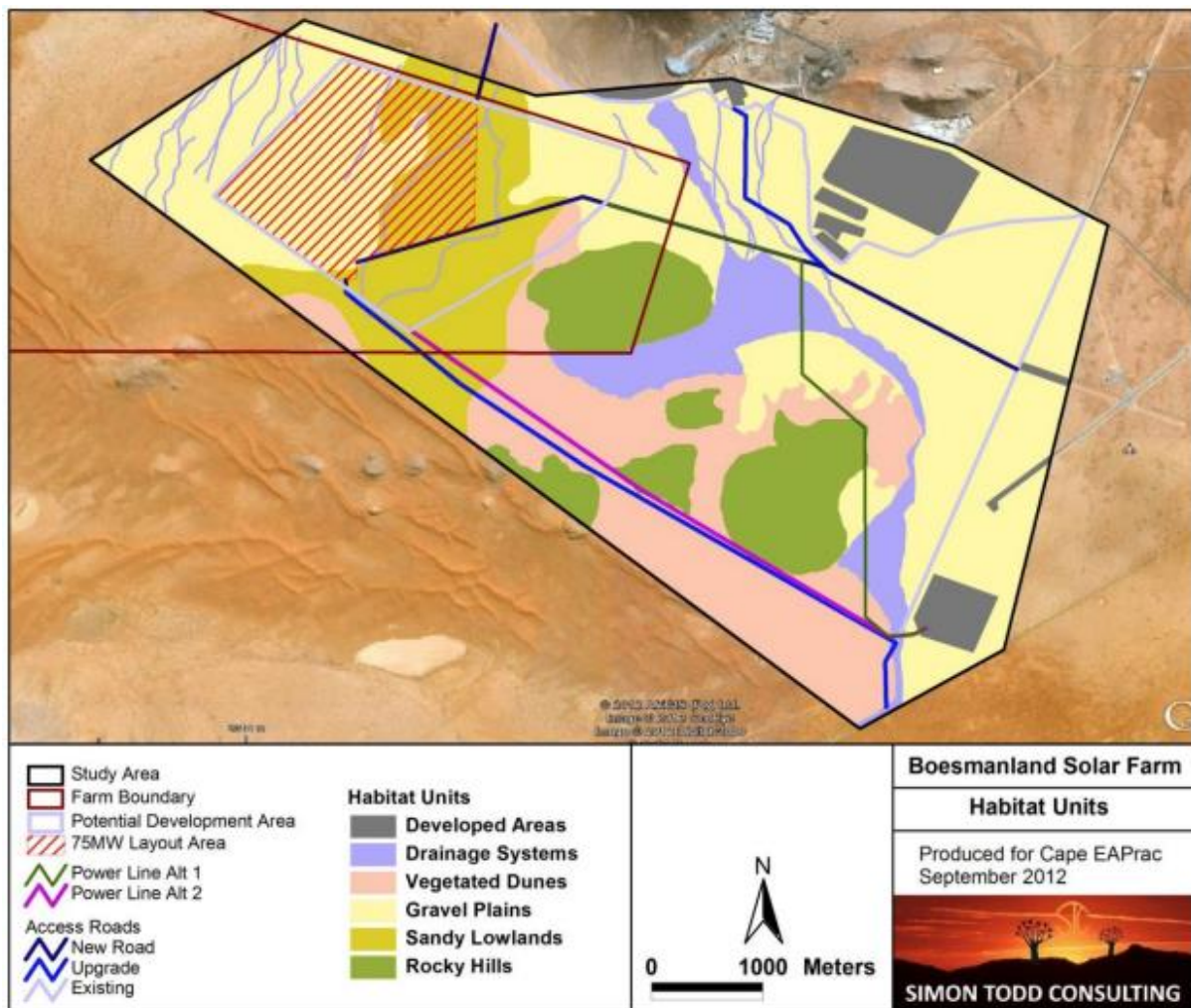
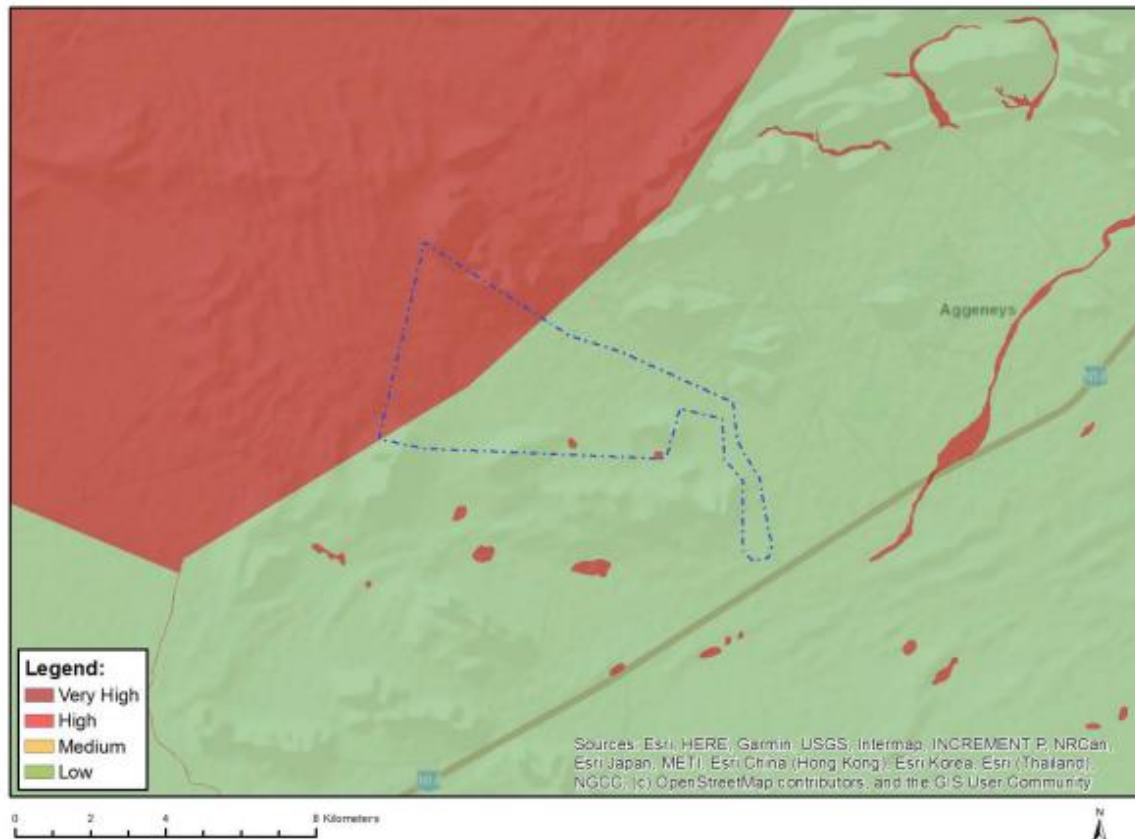


Figure 2: The habitat delineation for the project area (Simo Todd Consulting, 2013)

7. The National Web Based Environmental Screening Tool (NWBEST) has characterised the aquatic biodiversity theme sensitivity for the project area as “High” (Figure 3). This was due to the presence of FEPA subcatchments and wetlands for the Bushmanland Bioregion. The subcatchments are delineated for planning purposes, and no wetlands were identified for the PV project area. A depression wetland is located south of the proposed PV project area, however due to the distance and climatic conditions, no risks/impacts to the depression are anticipated.

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity
Very High	FEPA Subcatchment
Very High	Wetlands_Bushmanland Bioregion (Depression)

Figure 3: Aquatic Biodiversity Theme Sensitivity (National Web based Environmental Screening Tool)

- With no adequate risk assessment completed for the initial application for the consideration of impacts on watercourses an additional assessment was completed which is added in Table 4. This risk assessment can be used for the water use authorisation required for the powerline falling within the regulated areas. Based on the completed risk assessment all risks are found to be 'Low' with mitigation and therefore licencing can be completed under a General Authorisation under

Section 39 of the NWA (National Water Act) for water uses as defined in Section 21(c) or Section 21(i) (GN 509 of 2016). No water resources are expected for the solar facility.

9. A cumulative impact assessment was undertaken for the site assessed in context of the extent of the proposed project area; other developments in the area; and general habitat loss and transformation resulting from other activities in the area (all activities, as required for assessment of cumulative impacts including surrounding wind energy facilities, powerlines and associated infrastructure in the region). The impact table is presented in Table 2:

Table 2: Cumulative Impacts to aquatic biodiversity associated with the proposed project.

The development of the proposed infrastructure will contribute to cumulative habitat loss, habitat fragmentation at crossing points thereby impacting ecological processes in the region. Increases surface runoff from has the potential to increase water quality perturbations within the catchment.		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
<i>Extent</i>	Low (2)	Low (2)
<i>Duration</i>	Long term (4)	Permanent (5)
<i>Magnitude</i>	Low (4)	Low (4)
<i>Probability</i>	Highly probable (4)	Definite (5)
<i>Significance</i>	Medium	Medium
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Low	Low
<i>Irreplaceable loss of resources?</i>	No	No
<i>Can impacts be mitigated?</i>	Yes	
<i>Mitigation: Below</i>		
<i>Residual Impacts:</i>		
Will result in the following losses/impacts: <ul style="list-style-type: none">• Instream sedimentation• Erosion• Instream habitat fragmentation		

10. In order to manage the impacts effectively, the following mitigation management should be put into place as part of the EMPr for the general impacts associated with watercourses. The current EMPr (Cape Environmental Assessment Practitioners (Pty) Ltd, 2013) glossed over impacts related to the watercourses (specifically wetlands) and are not considered comprehensive enough. Table 4 presents mitigation measures to be implemented for the powerline in particular.

All prescribed mitigation measures and supporting recommendations presented will help to achieve an acceptable residual impact. These measures and recommendations will remain applicable for the requested amendment to the EA. To this end, these measures should be added to the EMPr.

As such, should the measures described above be implemented, it is the reasoned opinion of the specialist that the proposed layout as well as requested extension of the current EA be approved.

We trust you find the above in order. If there are any uncertainties or additional information required, please feel free to contact the undersigned.

Kind regards,



Andrew Husted
Freshwater Ecologist
The Biodiversity Company

APPENDICES

ENVIRONMENTAL IMPACT METHODOLOGY

The impact significance rating methodology, as provided by Nala, is guided by the requirements of the NEMA EIA Regulations 2014 (as amended).

Direct, indirect and cumulative impacts associated with the projects must be assessed in terms of the following criteria:

- » The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- » The **duration**, wherein it will be indicated whether:
 - * the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
 - * the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
 - * medium-term (5–15 years) – assigned a score of 3;
 - * long term (> 15 years) - assigned a score of 4; or
 - * permanent - assigned a score of 5;
- » The **magnitude**, quantified on a scale from 0-10, where 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- » The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1–5, where 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- » the **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- » the **status**, which will be described as either positive, negative or neutral.
- » the degree to which the impact can be reversed.

» the degree to which the impact may cause irreplaceable loss of resources.

» the *degree* to which the impact can be *mitigated*.

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

$$S = (E+D+M) P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

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

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

Example of Impact table summarising the significance of impacts (with and without mitigation)

Nature: [Outline and describe fully the impact anticipated as per the assessment undertaken]		
	Without mitigation	With mitigation
Extent	High (3)	Low (1)
Duration	Medium-term (3)	Medium-term (3)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (36)	Low (24)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	
Mitigation: "Mitigation", means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible. Provide a description of how these mitigation measures will be undertaken keeping the above definition in mind		
Residual Impacts: "Residual Risk", means the risk that will remain after all the recommended measures have been undertaken to mitigate the impact associated with the activity (Green Leaves III, 2014).		

DWS RISK ASSESSMENT METHODS:

The risk assessment will be completed in accordance with the requirements of the DWS General Authorisation (GA) in terms of Section 39 of the NWA for water uses as defined in Section 21(c) or Section 21(i) (GN 509 of 2016). The significance of the impact is calculated according to Table 3. The Department of Environmental Affairs (2013) mitigation hierarchy is presented in Figure 4 which indicates the procedure to follow when trying to mitigate any potential environmental impacts that may result from any activity. This is used when ascribing relevant mitigation measures. The installation of the powerline is considered to be permanent, and no decommissioning phase has been considered for the risk assessment.

Three levels of risk have been considered and determined for the overall risk assessment, these include low, moderate and high risk. No high risks are expected because the placement of powerline towers is likely to avoid the delineated watercourses, with most towers also expected to avoid the systems. In the event a tower is required to be placed in a watercourse or buffer, the impact is expected to be local and isolated. Moderate risk refers to watercourses that will be directly affected by the placement of infrastructure within these systems, or in close (< 30 m) proximity and pose an indirect risk. Low risks are systems more than 30 m from infrastructure (excluding the cables) that would be avoided, or systems that could be avoided if feasible. The medium risks were the priority for the risk assessment, focussing on the expected potential for these indirect risks. The significance of all post-mitigation risks was determined to be low.

Table 3: Significance ratings matrix

Rating	Class	Management Description
1 – 55	(L) Low Risk	Acceptable as is or consider requirement for mitigation. Impact to watercourses and resource quality small and easily mitigated. Wetlands may be excluded.
56 – 169	(M) Moderate Risk	Risk and impact on watercourses are notably and require mitigation measures on a higher level, which costs more and require specialist input. Wetlands are excluded.
170 – 300	(H) High Risk	Always involves wetlands. Watercourse(s) impacts by the activity are such that they impose a long-term threat on a large scale and lowering of the Reserve.

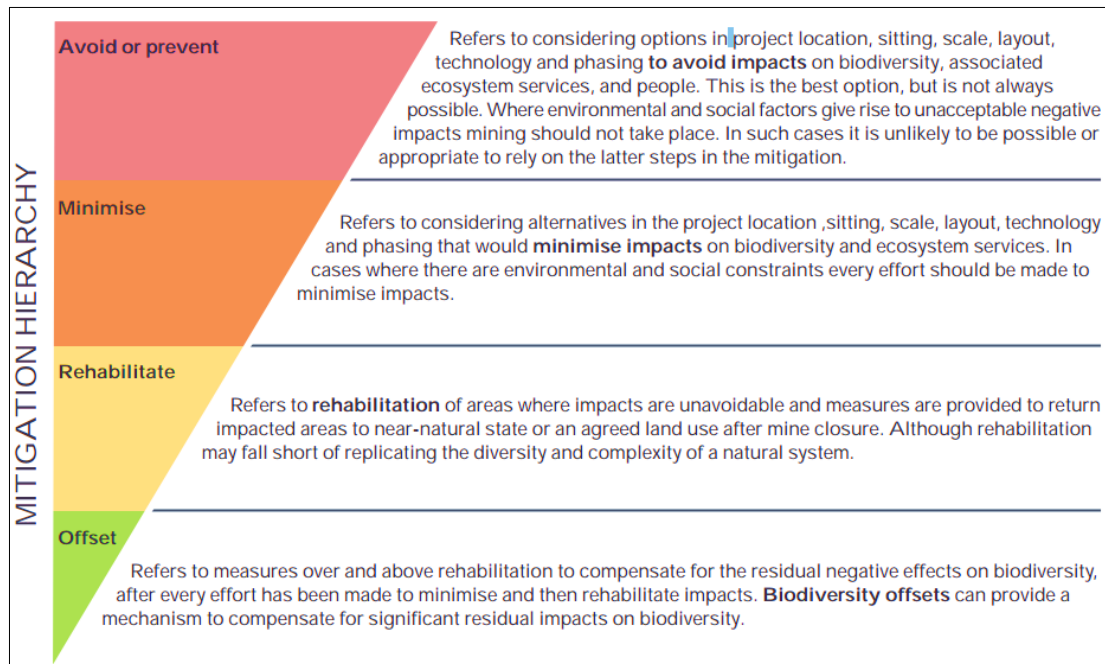


Figure 4: The mitigation hierarchy as described by the DEA (2013).

DWS RISK ASSESMENT:

Table 4: DWS Risk Impact Matrix for the proposed development

Activity	Aspect	Impact	Mitigation Scenario	Severity														Significance	Risk Rating	Control Measures
				Flow Regime	Water Quality	Habitat	Biota	Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood				
Construction																				
Clearing and preparation of powerline route including storage of equipment	Watercourses vegetation deterioration and soil exposure.	Disturbance and degradation of watercourse vegetation	Without	2	2	3	3	2.5	3	3	8.5	2	2	5	1	10	85	M	<ul style="list-style-type: none">• Avoid watercourses and buffers where feasible.• Implement a rehabilitation plan. Cleared areas must be rehabilitated and stabilised to avoid impacts to adjacent wetland and buffer areas.• Although the prescribed post-mitigation buffer as per the national buffer determination tool is 15 m attempt wherever possible to maintain a 30 m buffer on the delineated wetlands.• Reduce the disturbance footprint and the unnecessary clearing of vegetation when traversing the identified watercourses.• Make use of existing access routes as much as possible, before new routes are considered. Any selected “new” route must not encroach into the watercourses (without authorisation).	
			With	1	1	2	2	1.5	2	2	5.5	2	1	5	1	9	49.5	L		
		Increased bare surfaces, runoff and potential for erosion	Without	2	2	3	2	2.3	3	2	7.3	3	3	1	1	8	58	M	<ul style="list-style-type: none">• Keep tower excavation and soil heaps neat and tidy.• Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against wind.• Mixing of concrete must under no circumstances take place in any watercourse or their buffers. Scrape the area where mixing and storage of sand and concrete occurred to clean once finished.• Do not situate any of the construction	
			With	1	1	2	1	1.3	2	2	5.3	2	1	1	1	5	26.25	L		

Activity	Aspect	Impact	Mitigation Scenario	Severity														Risk Rating	Control Measures
				Flow Regime	Water Quality	Habitat	Biota	Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance		
		Introduction and spread of alien and invasive vegetation																	material laydown areas within any wetland or buffer area. Try adhere to a 30 m buffer in these instances. • No machinery should be allowed to parked in any watercourses or buffer areas.
			Without	1	1	3	3	2	2	2	6	3	3	5	1	12	72	M	• Promptly remove all alien and invasive plant species that may emerge during construction (i.e. weedy annuals and other alien forbs) must be removed.
			With	1	1	2	2	1.5	1	2	4.5	2	1	1	1	5	22.5	L	• Limit soil disturbance • The use of herbicides is not recommended in or near watercourses (opt for mechanical removal). • Appropriately stockpile topsoil cleared from the transmission line footprint. • Clearly demarcate transmission line construction footprint, and limit all activities to within this area. • Minimize unnecessary clearing of vegetation beyond the tower footprints and transmission line corridors. • Lightly till any disturbed soil around the tower footprint to avoid compaction.
Excavation, levelling and installation of	Soil disturbance, sedimentation	Increased sediment loads to downstream reaches	Without	2	2	2	3	2.3	2	2	6.3	3	3	1	1	8	50	L	• See mitigation for increased bare surfaces, runoff and potential for erosion
			With	1	1	1	1	1	1	2	4	2	1	1	1	5	20	L	• Re-instate topsoil and lightly till transmission tower disturbance footprint.

Activity	Aspect	Impact	Mitigation Scenario	Severity														Risk Rating	Control Measures
				Flow Regime	Water Quality	Habitat	Biota	Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance		
transmission towers.		Contamination of watercourses due to leaks and spillages from machinery, equipment & vehicles as well as Contamination and eutrophication of watercourses with human sewerage and litter.	Without	2	3	3	2	2.5	2	2	6.5	3	3	1	1	8	52	L	<ul style="list-style-type: none">• Make sure all excess consumables and building materials / rubble is removed from site and deposited at an appropriate waste facility.• Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) or construction materials on site (e.g. concrete) in such a way as to prevent them leaking and entering watercourses or buffer areas.• Mixing of concrete must under no circumstances take place within the watercourses or buffer areas.• Check for oil leaks, keep a tidy operation, and promptly clean up any spills or litter.• Provide appropriate sanitation facilities for workers during construction and service them regularly.• The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected must be disposed of at a licensed disposal facility;• The Contractor must be in possession of an emergency spill kit that must be complete and available at all times on site.• Any possible contamination of topsoil by hydrocarbons must be avoided. Any contaminated soil must be treated in situ or be placed in containers and removed from the site for disposal in a licensed facility;
			With	1	2	2	1	1.5	2	2	5.5	2	2	1	1	6	33	L	
Operation																			

Activity	Aspect	Impact	Mitigation Scenario	Severity														Risk Rating	Control Measures
				Flow Regime	Water Quality	Habitat	Biota	Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance		
Routine operation and maintenance of powerline route	Clearing of wetland vegetation beneath powerline	Degradation of wetland vegetation wetland vegetation.	Without	1	1	1	3	1.5	2	4	7.5	3	2	5	1	11	82.5	M	<ul style="list-style-type: none"> • Clear vegetation in line with the Eskom Environmental Procedure Document entitled "Procedure for vegetation clearance and maintenance within overhead powerline servitudes". • Avoid the use of herbicides and diesel to treat vegetation within the watercourses and buffers. • Make use of existing access routes as much as possible, before new routes are considered. Any selected "new" route must not encroach into the watercourses without authorisation. • In line with the Eskom Environmental Procedure Document entitled "Procedure for vegetation clearance and maintenance within overhead powerline servitudes" all alien vegetation along the transmission servitude should be managed in terms of the Regulation GNR.1048 of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983. By this Eskom is obliged to control category 1, 2 and 3 plants to the extent necessary to prevent or to contain the occurrence, establishment, growth, multiplication, propagation, regeneration and spreading such plants within servitude areas.
			With	1	1	1	2	1.3	2	4	7.3	2	1	1	1	5	36.25	L	
	Alien and Invasive species	Proliferation of alien and invasive species	Without	1	1	3	4	2.3	2	3	7.3	3	2	5	1	11	79.75	M	
			With	1	1	2	3	1.8	2	2	5.8	2	1	1	1	5	28.75	L	