

WAG 'N BIETJIE 400KV MTS PROJECT

Construction of the Wag 'n Bietjie Main Transmission Substation (MTS) and a 132kv Powerline between the Wag 'n Bietjie MTS and the Vetlaagte MTS : Situated on a Portion of the Remaining Extent of Wagt en Bittje No 5; the Remaining Extent of Wag 'n Bietjie Annex C No 137; and the Remaining Extent of Vetlaagte No 4, De Aar, Northern Cape

Draft Basic Assessment Report

June 2022

Applicant

MTS Wag n Bietjie (Pty) Ltd (Reg No. 2015/270324/07)
Top Floor, Golf Park, 4 Raapenberg Rd, Mowbray, 7700
PostNet Suite #53 Private Bag X21 Howard Place, 7450

Care of:

Mulilo Renewable Energy Projects
The Director of Solar, Ms Warren Morse

warren@mulilo.com

Tel 021 685 3240 / 083 760 9586

and the Environmental Manager, Mr Andrew Pearson

Tel 084 722 4855 / andrew@mulilo.com

Compiled by

Landscape Dynamics Environmental Consultants

Contact persons: Annelize Erasmus (082 566 4530) & Susanna Nel (082 888 4060)

info@landscapedynamics.co.za



Western Cape Province- Cape Town Office

3 Palomino Close, Somerset West, 7130

021 855 0912 / 082 888 4060

info@landscapedynamics.co.za

susanna@landscapedynamics.co.za

Representation Offices

Limpopo Province

Mpumalanga Province

Kwazulu-Natal Province

Northern Cape Province

Gauteng Province- Pretoria (Head) Office

91 Wenning Street, Groenkloof, Pretoria, 0181

PO Box 947, Groenkloof, Pretoria, 0027

012 460 6043 / 082 566 4530

info@landscapedynamics.co.za

annelize@landscapedynamics.co.za

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LIST OF GENERAL ABBREVIATIONS

BAR	Basic Assessment Report
BID	Background Information Document
CBA	Critical Biodiversity Area
CEMP	Construction Environmental Management Plan
dBAR	Draft Basic Assessment Report
DEFF	National Department of Environment, Forestry & Fisheries
DSR	Draft Scoping Report
DWS	Department of Water & Sanitation
DMR	Department of Mineral Resources
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
ESA	Ecological Support Area
EWT	Endangered Wildlife Trust
fBAR	Final Basic Assessment Report
GA	General Authorisation
GNR	Government Notice Regulation
ha	Hectare(s)
HIA	Heritage Impact Assessment
IAPs	Interested and Affected Parties
IEM	Integrated Environmental Management ³ Cubic metres
Mamsl	Metres above mean sea level
n/a	Not applicable
NEMA	National Environmental Management Act, 1998 (Act No 107 of 1998)
NEMPAA	National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No 59 of 2008)
PIA	Palaeontological Impact Assessment
PPP	Public Participation Process/Programme
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SR	Scoping Report
PHRA	Provincial Heritage Resources Authority
PoS	Plan of Study
SIP	Strategic Infrastructure Project
TRF	Transnet Freight Rail
TS	Traction Station / Traction Substation
WUA	Water Use Authorisation
WULA	Water Use License Application

ELECTRICAL TERMS AND ABBREVIATIONS

BFD	Bird Flight Diverters
EGI	Electrical Grid Infrastructure
Eskom SOC	South Africa's Electricity Supply Commission (State Owned Company)
ICNIRP	International Commission for Non- Ionising Radiation Protection
IEP	Integrated Energy Plan
IRP	Integrated Resource Plan
ISEP	Integrated Strategic Electricity Planning
LiLo	Loop-in Loop-out (Powerlines)
MTS	Main Transmission Substation
NDP	Network Development Plan
NERSA	National Energy Regulator of South Africa
PV	Photovoltaic (solar panels)
REDZ	Renewable Energy Development Zone
REIPPP	Renewable Independent Power Producer Programme
SS	Substation
STC	Strategic Transmission Corridor

Voltage

kV	Kilovolt (1kV = 1 000V)
MVA	Mega Volt Ampère

Units of power

kW	Kilowatt (1kW= 1 000W)
MW	Megawatt (1MW=1 000kW)

EXECUTIVE SUMMARY

INTRODUCTION AND PURPOSE OF THE PROJECT

MTS Wag 'n Bietjie (Pty) Ltd ('the Applicant') has appointed Landscape Dynamics Environmental Consultants to apply for Environmental Authorisation for this Wag 'n Bietjie 400kV MTS Project with the Department of Forestry, Fisheries & Environment (DFFE), which is the Competent Authority for this project (refer to paragraph 1.1.2 below for more detail regarding the Competent Authority).

The existing Eskom Hydra MTS does not have enough capacity to fulfil the requirement of connecting all the electricity generated by numerous existing, planned and approved renewable energy developments to the national grid. The electrical infrastructure associated with the Wag 'n Bietjie 400kV MTS Project will connect the electricity generated from a number of renewable energy projects within the macro area to the Eskom national grid.

The Renewable Independent Power Producer Programme (REIPPP) was developed in support of the Department of Energy's Integrated Resource Plan (IRP) to take nationally appropriate carbon dioxide mitigation action to reduce emissions. The Wag 'n Bietjie MTS Project will form an integral part in some of the solar facilities in the De Aar macro area that will be bid in the next REIPPP round. The proposed MTS will also support and connect to the SEF's that received Environmental Authorisation and Preferred Bidder status. Bidding will not be possible without an authorised solution to feed the electricity into the national grid.

The following is confirmed and motivated in the Basic Assessment Report (BAR):

- It is the intention of the applicant to submit this proposed Wag 'n Bietjie 400kV MTS Project in future REIPPPP rounds and /or in similar procurement programmes related to the IRP.
- The DFFE is the competent authority for this application.
- Activity 9 of Listing Notice 2 is triggered, however, the project site falls within a Strategic Transmission Corridor (STC) which implies that a Basic Assessment process has to be undertaken and the shortened timeframe for approval or refusal of the Final BAR is 57 days (instead of 107 days).
- As per the DFFE's requirement in terms of Electrical Grid Infrastructure (EGI) within a STC, a pre-negotiated MTS Site and associated powerline routes must form part of the application. Proof of pre-negotiation of the MTS site, LILO 132kV Powerline Routes and Road Upgrade is provided in the BAR.

LOCALITY

The project area is situated between 9km and 11km south-east of the town of De Aar in the Northern Cape Province.

The following farms are directly affected by the proposed project:-

- The Remaining Extent of the Farm Wagt en Bittje No 5
- Portion 1 of the Farm Vetlaagte No 4
- The Remaining Extent of the Farm Vetlaagte No 4

PROJECT COMPONENTS

Infrastructure	Specifications
Development footprint (permanent infrastructure)	A 36-hectare site is required by Eskom to be authorised to allow for future expansion of the MTS. The Wag 'n Bietjie MTS facility will initially have a construction footprint of 10ha within this 36ha area.
Main Transmission Substation (MTS)	<ul style="list-style-type: none"> • Capacity : 400kV • Height of structures: <ul style="list-style-type: none"> Stringer strain beam: Up to 20m Tubular busbar: Up to 13m • Associated Infrastructure: <ul style="list-style-type: none"> ○ Lighting ○ Fencing ○ Buildings required for control, storage, operations and maintenance
Loop-In Loop-Out (LiLo)	The connection of the Wag 'n Bietjie 400kV MTS to the national grid will be via new loop-in loop-out 400kV power lines of approximately 600m total length that will connect into the existing 400kV Beta-Hydra 1 power line.
132kV MTS Connection Powerline(s)	<ul style="list-style-type: none"> • There exist different possible connection scenarios for Wag 'n Bietjie MTS to meet the connection requirements of renewable energy projects within the vicinity of De Aar to the national grid. • The connection scenarios are reliant on aspects such as grid capacity, Eskom requirements and the specific requirements of renewable energy projects connecting to the national grid via the MTS. • To cater for the possible connection scenarios the Applicant requires authorisation for the following connection infrastructure: <ul style="list-style-type: none"> • Up to a maximum of five adjacent 132kV overhead powerlines within the assessed corridor • Approximately 3,8km <ul style="list-style-type: none"> ○ Authorisation of a 300m wide corridor as assessed
Potential upgrades required at the Vetlaagte MTS	<ul style="list-style-type: none"> • 400kV and 132kV yard extensions • new 500MVA 400/132kV transformer • 400kV busbar extensions • 132kV busbar extensionnew 132kV feeder bay (maximum of five)
Access and internal roads	<ul style="list-style-type: none"> • The access road to the Wag 'n Bietjie MTS is an existing gravel road which will be upgraded to a maximum width of 8 meters. The total length of this road is approximately 3km. • Internal access roads within the MTS site of less than 8m wide will be constructed • An access route of approximately 6m wide will be constructed inside the 400kV LiLo line servitude. This road will be used for construction and later maintenance purposes. • An approximately 6m wide access road will be constructed along the line route for construction and maintenance purposes – this road will be inside the powerline servitude
Laydown area	<ul style="list-style-type: none"> • A temporary construction site area of approximately 14ha directly

	<p>adjacent to the MTS will be required.</p> <ul style="list-style-type: none"> • All temporary infrastructure will be rehabilitated following the completion of the construction phase, where it is not required for the operation phase.
Storage of diesel	<p>Diesel storage of less than 80m³ for the MTS for the following purposes:-</p> <ul style="list-style-type: none"> ○ During construction, diesel is required for construction vehicles as well as generators for the construction camp and commissioning whilst waiting for the Eskom grid connection works to be completed ○ During operations, diesel is required for Operations & Maintenance vehicles at the PV plants but also required for backup diesel generators at the substations. The Generators supply auxiliary power to the substation's protection and communications systems, should there be outages on the grid. This is an Eskom requirement together with a battery room at the substations to act as UPS for these critical systems.
Temporary Services	<p>During the construction phase, temporary sanitation facilities will be provided (i.e. chemical toilets) and these toilets will be regularly serviced by a licensed company.</p>

LEGAL REQUIREMENT

National Environmental Management Act (Act 107 of 1998)

This application is done in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations of December 2014, as amended in April 2017 (Government Notice Nr 326). Environmental Authorisation is requested for the following listed activities:

Listing Notice 1		
12	<p>The development of—</p> <ul style="list-style-type: none"> (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) <u>infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs—</u> <ul style="list-style-type: none"> (a) <u>within a watercourse;</u> (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; <p>excluding—</p> <ul style="list-style-type: none"> (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; 	<p>The 132kV powerline will cross the delineated watercourse for a length of 1,2km (1 200m) and will involve the construction of a service/ maintenance road within the servitude with a width not exceeding 8m. The total area affected will ultimately involve 9 600m².</p> <p>The existing access gravel road will cross the delineated watercourse for a length of 0,2km. The road will be upgraded and widened to a maximum of 12 m wide. The area that will thus be affected resulting from the access road upgrade will ultimately involve 2 400m².</p>

	<p>(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</p> <p>(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>(dd) where such development occurs within an urban area;</p> <p>(ee) where such development occurs within existing roads, road reserves or railway line reserves; or</p> <p>(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared</p>	
Nr 19	<p>The infilling or depositing of any material of more than 10m³ into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;-</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving—</p> <p>(a) will occur behind a development setback;</p> <p>(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;</p> <p>(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;</p> <p>(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or</p> <p>(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.</p>	<p>More than 10m³ will be deposited / removed from a watercourse resulting from construction of the main access road and the service/maintenance road within the 132kV powerline servitude. The exact volumes will be determined during the design phase of the project.</p>
24	<p>The development of a road—</p> <p>(i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or</p> <p>(ii) <u>with a reserve wider than 13,5 meters, or</u></p>	<p>An approximately 8m wide access road will be constructed along the line route for construction and maintenance purposes – this road will be inside the powerline servitude for the entire length of the line which is approximately 3,8km.</p>

	<p><u>where no reserve exists where the road is wider than 8 metres;</u> but excluding a road—</p> <ol style="list-style-type: none"> which is identified and included in activity 27 in Listing Notice 2 of 2014; where the entire road falls within an urban area; or which is 1 kilometre or shorter. 	<p>The existing access gravel road will cross the delineated watercourse for a length of 0,2km. The road will be upgraded and widened to a maximum of 12m wide. The length of this road is approximately 3km.</p>
27	<p>The clearance of an area of 1 hectares of more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for</p> <ol style="list-style-type: none"> The undertaking of a linear activity Maintenance purposes undertaken in accordance with a maintenance management plan 	<p>The MTS will be constructed in an area of approximately 10 hectares; thus indigenous vegetation of 1 hectare or more will be removed.</p>
28	<p>Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:</p> <ol style="list-style-type: none"> will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; <p>excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.</p>	<p>The MTS be constructed in an area of approximately 10 hectare and will be constructed on land recently and currently used for agricultural purposes – mostly for grazing.</p>
48	<p><u>The expansion of</u></p> <ol style="list-style-type: none"> <u>infrastructure or structures where the physical footprint is expanded by 100 square metres or more;</u> or dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100m² or more; <p><u>where such expansion occurs—</u></p> <ol style="list-style-type: none"> <u>within a watercourse;</u> in front of a development setback; or if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; 	<p>Infrastructure (existing gravel access road) of more than 100m² will be upgraded within a watercourse, The existing access gravel road will cross the delineated watercourse for a length of 0,2km. The road will be upgraded and widened to a maximum of 12m wide. The total area ultimately affected will involve 9 600m².</p>

	<p>excluding—</p> <p>(aa) the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p> <p>(bb) where such expansion activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</p> <p>(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>(dd) where such expansion occurs within an urban area; or</p> <p>(ee) where such expansion occurs within existing roads, road reserves or railway line reserves.</p>	
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56	<p><u>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre—</u></p> <p>(i) where the existing reserve is wider than 13,5 meters; or</p> <p>(ii) where no reserve exists, where the existing road is wider than 8 metres;</p> <p>excluding where widening or lengthening occur inside urban areas.</p>	<p>The existing access gravel road will be upgraded and widened to a maximum of 12m wide. Current road width differs between approximately 6 and 8 meters. The length of this road is approximately 3km.</p>
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Listing Notice 2

Even though Listing Notice 2 calls for a full Scoping and EIA to be undertaken, the project site falls within a Strategic Transmission Corridor which implies that a Basic Assessment process has to be undertaken regardless if Listing Notice 2 is being triggered or not.

9	<p>The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is —</p> <p>a) temporarily required to allow for maintenance of existing infrastructure;</p> <p>b) 2 kilometres or shorter in length;</p> <p>c) within an existing transmission line servitude; and</p> <p>d) will be removed within 18 months of the commencement of development.</p>	<ul style="list-style-type: none"> • A 400kV substation will be constructed outside an urban area. • The LiLo powerlines will also have a capacity of 400kV.
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15	<p>The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for</p> <ul style="list-style-type: none"> (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan 	<ul style="list-style-type: none"> • The substation will be constructed in an area of approximately 10 hectares, but authorisation is required for 36 hectares to adhere to Eskom requirement. • Indigenous vegetation of more than 20 hectares may thus be removed over time.
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The Basic Assessment process followed is summarised as follows:

Screening

- Purpose: Demarcating obvious no-go areas in order to inform the development proposal
- Key specialists (avifauna, aquatic, fauna & flora, heritage & agriculture)
- Site visit
- Compiled Initial Sensitivity Maps and Screening Reports

Background Information Document & Public Participation

- Purpose: obtaining public and government input /concerns/objections at start of project
- Compiled Background Information Document
- Distributed for a 30-day commenting period to all on IAP Register

Public Participation

- Purpose: public participation in line with NEMA Regulations and obtaining public input/objections/concerns
- Onsite notifications
- Newspaper advertisements

Specialist Studies

- Desktop assessments
- Site investigations
- Impact Assessment Reports / Statement Letters

Draft Basic Assessment Report and Public Participation

- Purpose: project detail, alternative assessment, responses to public input, impact assessment
- Compiled Draft Basic Assessment Report
- Distributed for a 30-day commenting period

We are here

Final Basic Assessment Report

- Purpose: Respond to public comment on the dBAR, incorporate comment into development proposal, finalise development proposal and layout
- fBAR may be distributed for a 30-day commenting period if substantial changes to the dBAR were made

Submission of Final Basic Assessment Report to DFFE

- Purpose: DFFE review for refusal / granting of Environmental Authorisation

Informing IAPs of the Environmental Authorisation

- Informing IAPs of the EA and their right to appeal
- 20-day appeal period

The National Water Act (Act No 36 of 1998)

The aquatic environment was investigated by the relevant specialist and it was concluded that disturbance will take place within the relevant delineated watercourses and Section 21(c) and/or 21(i) of the NWA will thus be triggered. It is therefore a requirement to apply for Water Use Authorisation (WUA) for this project to the Department of Water & Sanitation who is the administering body. The aquatic specialist for the project confirmed that General Authorisation (GA) will be applicable. The applicant is in the process of applying for the GA. This GA is only required for the 132kV powerline and the upgrade of the existing access road where it cross the delineated watercourse with buffer zones.

The National Heritage Resources Act (Act 25 of 1999)

The proposed project falls within the scope of Section 38 of the National Heritage Resources Act and the applicable activities include the following:

- any development or other activity which will change the character of a site exceeding 5 000m² in extent
- linear developments of 300m or longer.

The SA Heritage Resources Agency is the commenting authority in this regard and their comment will be included and addressed in the Final BAR.

ALTERNATIVES

Two MTS site alternatives with their associated powerline route corridors were assessed and are described in this Draft BAR. Sufficient motivation is given as to why the Preferred Site Alternative was put forward for negotiations with the landowner and is recommended for approval. The pre-negotiation agreements will be submitted with the Final BAR. **As per the DFFE requirement, further discussion regarding alternatives is however not required and impact will not be assessed further in the Final BAR.**

The following aspects regarding the alternatives considered are applicable to this project:

- *Location*
 - The preferred location of the MTS has been identified by the applicant as the most viable in terms of future planning in the macro area. The location of the Wag 'n Bietjie MTS is strategically placed relatively close to the Vetlaagte MTS but will connect via the proposed 400kV LiLo powerlines to the 400kV Beta-Hydra 1 powerline to feed into the existing Eskom Hydra MTS. The proposed Vetlaagte MTS will connect to the 400kV Perseus-Hydra power line, thereby connecting the Vetlaagte MTS to the existing Eskom Hydra MTS. The Wag 'n Bietjie MTS will enable the evacuation of the generated electricity from various solar and wind farms and will feed this electricity into the national Eskom grid. Note that this project includes LILO lines that will connect the MTS directly to the 400kV Beta-Hydra 1 Powerline that feeds electricity into the Eskom Hydra MTS.
 - The Wag 'n Bietjie MTS infrastructure therefore serves as a grid connection solution for renewable energy facilities which are intended to be bid (or have been bid) in current or future rounds of the REIPPP. The REIPPP forms part of the programmes assisting the IRP in reaching its goals. The DFFE is the competent authority for this application.

The location of the preferred 132kV powerline between the Wag 'n Bietjie MTS and the Vetlaagte MTS is the shortest route between the two facilities and runs as far a possible along the Wag 'n Bittje farm boundary. The crossing of the delineated water feature plus buffer zone (the wider floodplain area of a Brak River tributary), is not possible to avoid; therefore water use authorisation is required for the purpose of the 132kV powerline and the upgrade of the existing access road. These crossings have been confirmed acceptable with the implementation of appropriate mitigation measures from the aquatic specialist point of view.

- *Extent of the MTS site to be approved*

Even though a site of 10ha in extent was initially proposed for the MTS project area; Eskom confirmed their requirement for a larger area of 36ha to allow sufficient area for future expansion. The relevant specialists had been approached to consider the enlarged area which was already assessed as part of the study area of 275ha during the initial specialist investigations. No objections and/or concerns were raised for this enlarged area to be approved.

- *Design, technology and operational aspects*

The design, technology and operational aspects of substations and power lines are guided strictly by Eskom standards, stipulations and requirements and it is not within the ambit of the Applicant to change Eskom standards.

The Applicant is satisfied that the pre-negotiated MTS site and route meet the technical requirements for this project.

- *Environmental Considerations*

Support for MTS Site Alternative 1 was given by all the specialists (fauna & flora; aquatic; bird, agricultural and heritage specialists) on condition that proposed mitigation measures are implemented.

- *Landowner Consent*

The preferred MTS site alternative and proposed powerline routes were presented in the pre-negotiation agreement with the relevant landowners attached to the Basic Assessment Report in Appendix F(3)

- *Conclusion re alternative assessment*

There is no justification and/or restrictions from both a technical and environmental point of view to change the position of the MTS and associated powerline routes.

The DFFE SCREENING TOOL

Based on the DFFE Screening Tool Report, the site verification, specialist input and direct relevant experience from the EAPs, it was concluded that the following specialist studies were required for the project:-

- Terrestrial (Fauna & Flora) Impact Assessment
- Freshwater Impact Assessment
- Bird Impact Assessment
- Heritage & Archaeological Impact Assessment

- Palaeontological Assessment
- An Agricultural Impact Statement

Engineering input required was an Engineering Hydrological Assessment and Stormwater Management Plan.

All recommendations in terms of mitigation and planning form part of the EMPr.

ENVIRONMENTAL SPECIALISTS ASSESSMENTS & ENGINEERING REPORT

All the specialist studies summarised below concluded that the expected negative impacts associated with the project can be mitigated to acceptable levels.

Terrestrial Ecological Specialist Assessment (Fauna & Flora)

- Neither of the two regional vegetation types that occur on site and in surrounding areas are listed or of conservation concern.
- The entire site is within an Ecological Support Area (ESA), but this extends across vast distances in all areas close to De Aar. There are therefore no options outside of this ESA for the project.
- The protected tree *Boscia albitrunca* occurs regularly in specific parts of the site, namely within the low hills and rocky outcrops. This is within the assessment area, but not within the proposed MTS project footprint area. Therefore the proposed infrastructure does not affect any individuals of this species.
- No plant species of concern were found on site. One rare plant species *Tridentea virescens* could potentially occur in the general area but was not seen. It occurs across a very wide geographical area and loss of a small area of habitat will not affect the species.
- One Near Threatened reptile, the *Psammobates tentorius* (tent tortoise), was seen nearby but not within the project area. The animal is mobile and could occur anywhere in this general area, or further away. This species is threatened by general habitat loss and/or degradation across its entire range, which includes the entire arid parts of South Africa, extending into Namibia. Loss of a small area of habitat for the proposed projects will not adversely affect the species.
- Impacts of the proposed project components are relatively insignificant in comparison to the approved solar PV projects in neighbouring areas.
- Considering that the access road is existing and will only be upgraded, the proposed access road is also considered to be acceptable from an ecological (Terrestrial Biodiversity and Terrestrial Plants) perspective and can be approved following the implementation of relevant mitigation measures described in the specialist report

Aquatic Specialist Impact Assessment

The aquatic features within the study area comprise ephemeral unnamed tributaries of the Brak River. The Brak River is a seasonal tributary within the Lower Orange River System. The river flows approximately 5km to the north of the study area with a larger tributary crossing the eastern extent of the farm, flowing in a northerly direction to join the Brak River. Associated with these larger watercourses are wide floodplains and some depression wetlands. Roads and a few dams have been constructed within the wide floodplains. Erosion control measures have been constructed along the roads due to the high erosion potential in the floodplain. Smaller watercourses and drainage features drain into the larger river corridors.

A risk assessment as per requirement of the Department of Water & Sanitation has been undertaken to inform the water use authorisation process. Considering the scope of works proposed and the fact that there will be minimal works undertaken within the delineated aquatic features within the site, the risk of altering the ecological status of the adjacent aquatic features is considered to be low. It is thus recommended that the proposed activities fall within the ambit of General Authorisations for Section 21(c) and (i) water use activities.

Avifauna Specialist Impact Assessment

The area of habitat destruction associated with the footprint of the substation and the grid connection corridor are relatively small in extent compared to the proportion of untransformed habitat available in the area, and do not represent a fatal flaw that would prevent the proposed development from proceeding. A number of Red Data species and species vulnerable to collisions with power lines exist in the area broader area of the proposed power line corridor and the impact of collisions to birds has a low significance even with the implementation of mitigation measures. Many existing power lines traverse the area; therefore most of the potential impacts already exist in and around the project site. The proposed grid connection corridor is therefore unlikely to significantly contribute to the negative impacts that already exist in the area and unlikely to have a significant negative impact on species of conservation concern or the functioning and goals of the IBA.

While a number of Red Data species, and species vulnerable to habitat destruction and displacement exist in the area of the proposed development, the relatively small size of the development footprint makes it highly unlikely that the proposed development will have a significant negative impact on the avifauna in the area following the implementation of mitigation measures.

Overall, the impacts of the substation, powerline routes and the access road upgrade are unlikely to generate significant negative impacts on avifauna, therefore from an avifaunal perspective the proposed project can be authorised if the recommendations and mitigation measures are implemented accordingly.

Heritage Impact Assessment (Includes Archaeology and Palaeontology)

Archaeology

The overall archaeological sensitivity of the development area with regard to the preservation of Early, Middle and Later Stone Age archaeology as well as Khoe and San heritage, early colonial settlement is regarded as very high sensitivity. Despite this, the field assessment conducted for this project has demonstrated that the specific area proposed for development has low sensitivity for impacts to significant archaeological heritage.

Two archaeological sites of significance were identified in the field assessment. In order to ensure that the sites are not negatively impacted by the proposed development, it is recommended that a no-go development buffer of 30m is implemented around Site 004 (Still bay point, blades, hornfels, burnt bone, on top of dolerite outcrop with good views) and a no-go development buffer of 100m is implemented around Site 014 (Middle Stone Age (MSA) & Later Stone Age (LSA) with mainly LSA hornfels flakes and pottery).

These sites and their respective buffers should be indicated on site development maps during the construction phase of the project. Furthermore, during the operational phase of the projects, relevant staff of the facility should be made aware of these sites and proper training provided regarding appropriate behaviour at archaeological sites.

Palaeontology

Based on experience, other reports and the lack of any significant previously recorded fossils from the area, it is unlikely that any fossils would be preserved in the Tierberg Formation or Adelaide Subgroup. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found by the environmental officer, or other responsible person once excavations for foundations, infrastructure and amenities have commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample

Agricultural Compliance Statement

The conclusion of this assessment is that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site. This is substantiated by the following:

- Overhead transmission lines have no agricultural impact because all agricultural activities that are viable in this environment, can continue completely unhindered underneath transmission lines.
- The direct, permanent, physical footprint of the development that has any potential to interfere with agriculture, is entirely insignificant within this agricultural environment.
- The affected land has very limited agricultural potential.

The proposed upgrade of the existing access road will also have insignificant impact and will not change the original agricultural assessment in any way. No changes or additions to the mitigation measures for agricultural impacts that were recommended in the original assessment are required.

Hydrological Assessment and Outline of the Stormwater Management Plan

The purpose of the report provided was not to be a design report, but rather to provide guidance to ensure compliance by the eventual design, implementation and operational teams.

Prior to the detailed design stage and implementation, a physical high resolution topographical survey needs to be conducted. Based on this the development site drainage needs to be designed on this elevation basis, with the full consideration of the final infrastructure layout on site. The final infrastructural layout and drainage design mutually impact on each other and will therefore be an iterative process.

PUBLIC PARTICIPATION

The public participation process followed was approved by the DFFE on 13 December 2021 and the following actions were taken to date:

Initial advertising took place combined for the Wag 'n Bietjie MTS project and the four adjacent Vetlaagte Projects:

- ❖ Three laminated A2 onsite notifications had been placed on site on 19 October 2021 along public accessible roads & entrances to the two relevant properties.
- ❖ A newspaper advertisement was placed in Die Echo/Midland Nuus on 28 January 2022
- ❖ A comprehensive list of Interested & Affected Parties has been compiled and is being updated throughout the EIA process.

- ❖ A Background Information Document (BID) was prepared on 11 January 2022 (via email and/or registered post where e-mail addresses were not available) to everyone on the IAP list.

The Draft BAR (this document) has now been distributed for public review and input. Comment/objections received will be carefully assessed and addressed. The responses thereto will be included in the Final BAR. It is however not expected that objections will be received due to the numerous solar farm and associated infrastructure projects in the macro area.

IMPACT ASSESSMENT

The main potential negative impacts associated with the project are the following:

Expected Negative Impacts

Planning and Design Phase

- Permanent loss of agricultural land
- Risk of failure of structures
- Risk of erosion
- Impact on terrestrial and aquatic habitat
- Impact on avifauna

Construction Phase

- Impact on natural habitat
- Impact on avifauna
- Impact on aquatic environment
- Impact on heritage resources
- Impact on palaeontological resources
- Risk of groundwater pollution
- Risk of erosion
- Impact of an uncontrolled labour force
- Noise and dust (air quality)

Post- Construction / Operational Phase

- Continuous impact on natural habitat
- Impact on avifauna
- Impact on aquatic environment
- Risk of erosion
- Continuous risk of groundwater pollution

It was concluded that, after the application of proposed mitigation measures, all negative impacts can be mitigated to acceptable levels.

Expected positive impacts

- The need for this project relates directly to the need for new renewable energy projects in South Africa. This project will assist directly with reducing current generation capacity constraints in the country. The proposed electrical infrastructure associated with the Wag 'n Bietjie Project (400kV MTS and associated power lines) outside the town of De Aar in the Northern Cape, will connect the electricity generated from a number of authorised solar PV farms as well as other renewable energy projects within the macro area, to the Eskom national grid.
- The existing Eskom Hydra MTS does not have enough capacity to fulfil the requirement of connecting all the electricity generated by numerous existing, planned and approved renewable energy developments to the national grid. Without the proposed electrical infrastructure it will not be possible for new renewable projects to connect to the national grid in the De Aar area.
- All the advantages of additional, clean, renewable electrical supply to the national Eskom grid will be realised. An opportunity to reduce South Africa's very high carbon emissions will be utilised.
- Employment and business opportunities with the opportunity for skills development and on-site training will be created through the establishment of the Wag 'n Bietjie MTS and associated powerlines mostly during the construction phase.

ENVIRONMENTAL IMPACT STATEMENT

The following is concluded:-

- The proposed Wag 'n Bietjie MTS Project is planned in a legal, pro-active and structured manner taking all development components, potential and restrictions into account.
- All relevant legal requirements in terms of the Environmental Impact Assessment Regulations published in 2014, as amended were complied with. This Basic Assessment Report includes all relevant proceedings, findings and recommendations which resulted from this study.
- The specialist input obtained is comprehensive and effective in providing an assessment of the status quo of the study area, identifying potentially sensitive areas and issues of concern as well as identifying impacts that require re-consideration of alternatives.
- Significant and reasonable actions were taken to identify and notify all Interested & Affected Parties that include government departments, relevant authorities, general stakeholders and potentially affected landowners of the project. No objections had been received regarding this project.
- The infrastructure and preferred alternative as motivated and recommended for authorisation in this document will, after the application of mitigation measures, have a minimal and acceptable impact on the environment. This will be accomplished through the implementation of the mitigation measures specified in the Environmental Management Programme (EMPr) that is included as Appendix E of the Basic Assessment Report.
- The EAPs are confident that the infrastructure and route corridors presented are acceptable and viable. The assessment of additional alternative sites and/or routes is not justified.
- There is no reason from a technical, environmental and social perspective why the pre-negotiated Wag 'n Bietjie MTS Project could not be authorised.

RECOMMENDATIONS

It is recommended that Environmental Authorisation be granted to MTS Wag n Bietjie (Pty) Ltd for the Wag 'n Bietjie 400kV MTS Project which includes the construction of the Wag 'n Bietjie MTS, 400kV Loop-in Loop-Out

(LiLo) lines and an approximately 3,8km 132kv powerline between the Wag 'n Bietjie MTS and the Vetlaagte MTS with ancillary facilities that includes the upgrade of an existing gravel road.

It is recommended that the following be included in the Environmental Authorisation:

- The Wag 'n Bietjie MTS will affect 10ha; however, it is requested that a total area of 36ha required by Eskom for future expansion be authorised.
- A 132kV power line route corridor of 300m wide was assessed and it is requested that the *corridor* be approved as part of the environmental authorisation and not the servitude only. This will allow for reasonable adjustments within the corridor during the final design phase of this project without having to go through another environmental authorisation process. Only the required 31m wide servitude will be registered within the route corridor, not the entire corridor.
- The Environmental Management Programme must be approved and the implementation thereof should be a condition of authorisation. It is however recommended that the following plans be compiled and included as part of the EMPr before construction commences. Approval of these plans by the DFFE at this time is NOT required:
 - Geotechnical Assessment
 - Detailed Storm Water Management Plan
 - Alien Invasive Management Plan
 - Habitat Restoration Plan
- The Environmental Authorisation must be valid for a period of 10 years during which construction must commence.

CHAPTER 1: INTRODUCTION

1.1 Background

Wag 'n Bietjie (Pty) Ltd ("the Applicant") appointed Landscape Dynamics Environmental Consultants to apply for Environmental Authorisation for this Wag 'n Bietjie 400kV MTS Project with the Department of Forestry, Fisheries & Environment (DFFE), which is the Competent Authority for this project (refer to paragraph 1.1.2 below for more detail regarding the Competent Authority).

The project site is situated between approximately 8km and 11km to the southeast of De Aar in the Northern Cape Province.

1.1.1 Strategic Transmission Corridors

Government Gazette 41445, Notice Number 113 of 16 February 2018 identifies Strategic Transmission Corridors (STCs) within which a Basic Assessment process, instead of a full Scoping and EIA process, needs to be undertaken for electrical transmission infrastructure. The proposed Wag 'n Bietjie 400kV MTS Project falls within the Central STC and a Basic Assessment will therefore be undertaken.

1.1.2 Competent Authority

The Minister of Environmental Affairs (the Minister), published a notice on 1 July 2016 to clarify the concern regarding who the competent authority is for environmental authorisation (EA) applications for renewable energy projects.

In December 2009 at the United Nations Framework Convention on Climate Change (UNFCCC), the then President committed South Africa to take nationally appropriate Carbon Dioxide mitigation action to reduce emissions. This commitment was made in line with the Articles of the UNFCCC and is being implemented, among others, through the Department of Energy's (DoE) Integrated Resource Plan (IRP) 2010 – 2030.

Government Notice 779 in Government Gazette No. 40110 confirms that the Minister is the competent authority for activities which are identified as activities in terms of section 24(2)(a) of NEMA, which may not commence without an EA, and *which relates to the IRP* and any updates thereto.

In light of the above, it is imperative to clarify that the Minister is the competent authority for applications for EA for facilities or infrastructure, including its ancillary activities, that will form part of the IRP Programmes for technologies whose procurement processes have been determined under the Electricity Regulation Act, 2006 and / or the Electricity Regulations on New Generation Capacity as well as any future determinations that may be made.

The EA applications that will be dealt with by the Minister for the above-mentioned IRP Programmes include applications for:

- *new power lines, including ancillary activities;

- new substations, including ancillary activities;

provided that such application related to the electricity generation facility, substation or power lines will form / forms / formed part of the IRP Programmes.

*Ancillary activities' are those activities providing necessary support to the primary activity (power generation plant, substation or power line). For example, a new substation may need a road, a fence, an ablution facility, a parking area, etc.

The Wag 'n Bietjie MTS

The Wag 'n Bietjie MTS will enable the evacuation of the generated electricity from various solar and wind farms and will feed this electricity into the national Eskom grid. Note that this project includes LILLO lines that will connect the MTS directly to the 400kV Beta-Hydra 1 Powerline that feeds electricity into the Eskom Hydra MTS.

The Wag 'n Bietjie MTS infrastructure therefore serves as a grid connection solution for renewable energy facilities which are intended to be bid in future rounds of the REIPPP. The REIPPP forms part of the programmes assisting the IRP in reaching its goals.

South Africa committed to take nationally appropriate Carbon Dioxide mitigation action to reduce emissions. This commitment was made in line with the Articles of the UNFCCC and is being implemented, among others, through the Department of Energy's (DoE) Integrated Resource Plan (IRP) 2010 – 2030. The Minister is the competent authority for applications for EAs for facilities or infrastructure, including its ancillary activities that will form part of the Department of Energy's (DoE) Integrated Resource Plan (IRP) 2010 – 2030.

The Wag 'n Bietjie MTS will form an integral part in some of the solar facilities in the De Aar macro area. Bidding will not be possible without an authorised solution to feed the electricity into the national grid.

Due to the above it is clear that the Wag 'n Bietjie MTS is in support of the IRP and the intention to bid this project into the REIPPP (as an associated integral project component of various PV projects) is confirmed. This implies that the Department of Forestry, Fisheries & the Environment is the Competent Authority for this project.

1.1.3 DFFE Decision-making timeframe

As the proposed project site falls within the Central STC, the reduced timeframe in which the DFFE has to issue/refuse the EA of 57 days, instead of 107 days, applies.

1.2 The Basic Assessment Report

1.2.1 Objectives of the Basic Assessment Report

According to the NEMA Regulations' Appendix 1, the objective of the environmental impact assessment process is to, through a consultative process

- a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;

- b) identify the alternatives considered, including the activity, location, and technology alternatives;
- c) describe the need and desirability of the proposed alternatives;
- d) through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine—
 - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - (ii) the degree to which these impacts—
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be avoided, managed or mitigated; and
- e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on sites and location identified through the life of the activity to—
 - (i) identify and motivate a preferred site, activity and technology alternative;
 - (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and
 - (iii) identify residual risks that need to be managed and monitored.

1.2.2 Content of the Basic Assessment Report

According to the NEMA 2014 Regulations (as amended in April 2017), Appendix 1, Section 3, the Basic Assessment Report must contain the information that is necessary for the competent authority to consider and come to a decision on the application. The items are listed below with appropriate reference to the relevant Chapters in the BAR where the item is addressed.

Regulation Requirement	Section(s) in BAR where addressed
(a) details of <ul style="list-style-type: none"> (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae; 	Chapter 1, Paragraph 1.6 Appendix F
(b) the location of the activity, including: <ul style="list-style-type: none"> (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties; 	Chapter 2, Paragraph 2.3
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is <ul style="list-style-type: none"> (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or 	Chapter 2, Paragraph 2.2 Chapter 2, Paragraph 2.4

(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Appendix A
(d) a description of the scope of the proposed activity, including— (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure;	Chapter 1, Paragraph 1.3 Chapter 2, Paragraph 2.4
(e) a description of the policy and legislative context within which the development is proposed including— (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation (iii) and policy context, plans, guidelines, tools frameworks, and instruments;	Chapter 1, Paragraph 1.3
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Chapter 2, Paragraph 2.1
(g) a motivation for the preferred site, activity and technology alternative;	Chapter 3
(h) a full description of the process followed to reach the proposed preferred alternative within the site, including (i) details of all the alternatives considered; (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; (vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; (vii) positive and negative impacts that the proposed activity and alternatives	Chapter 3 Chapter 3 Chapter 5, Paragraph 5.2 Chapter 5, Paragraph 5.3 Chapter 3 Chapter 6 Chapter 6, Paragraph 6.1

<p>will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;</p> <p>(viii) the possible mitigation measures that could be applied and level of residual risk;</p> <p>(ix) the outcome of the site selection matrix;</p> <p>(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and</p> <p>(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;</p>	<p>Chapter 6, Paragraph 6.2</p> <p>Chapter 6, Paragraph 6.4</p> <p>Chapter 6, Paragraph 6.5</p> <p>Chapter 3.6</p>
<p>(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including—</p> <p>(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and</p> <p>(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;</p>	<p>Chapter 6, Paragraph 6.1</p> <p>Chapter 6, Paragraph 6.4</p> <p>Chapter 6, Paragraph 6.4</p>
<p>(j) an assessment of each identified potentially significant impact and risk, including—</p> <p>(i) cumulative impacts;</p> <p>(ii) the nature, significance and consequences of the impact and risk;</p> <p>(iii) the extent and duration of the impact and risk;</p> <p>(iv) the probability of the impact and risk occurring;</p> <p>(v) the degree to which the impact and risk can be reversed;</p> <p>(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and</p> <p>(vii) the degree to which the impact and risk can be avoided, managed or mitigated;</p>	<p>Chapter 6, Paragraph 6.4</p>
<p>(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;</p>	<p>Chapter 3</p> <p>Chapter 4, Paragraphs 4.2 & 4.3</p> <p>Appendix C</p>
<p>(l) an environmental impact statement which contains—</p> <p>(i) a summary of the key findings of the environmental impact assessment;</p> <p>(ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and</p> <p>(iii) a summary of the positive and negative impacts and risks of the proposed</p>	<p>Chapter 7, Paragraph 7.2</p>

activity and identified alternatives;	
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	Chapter 6
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Chapter 7, Paragraph 7.5
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Chapter 7.1 and included in specialist reports in Appendix C
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Chapter 7, Paragraph 7.3
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	Chapter 7, Paragraph 7.4
(r) an undertaking under oath or affirmation by the EAP in relation to (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	Chapter 7, Paragraph 7.6
(s) where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Not applicable
(t) any specific information that may be required by the competent authority; and	Chapter 5, Paragraph 5.4
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	Not applicable

Table 1 Content of the Basic Assessment Report

1.3 Legal Requirement

1.3.1 National Environmental Management Act (Act 107 of 1998)

This application is done in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations of December 2014, as amended in April 2017 (Government Notice Nr 326). Environmental Authorisation is requested for the following listed activities:

NEMA can be regarded as the most important piece of general environmental legislation. It provides a framework for environmental law reform and covers three areas, namely:

- Land, planning and development;
- Natural and cultural resources, use and conservation; and
- Pollution control and waste management.

The law is based on the concept of sustainable development. The objective of the NEMA is to provide for co-operative environmental governance through a series of principles relating to:

- The procedures for state decision-making on the environment; and
- The institutions of state which make those decisions.

NEMA principles serve as:

- A general framework for environmental planning;
- Guidelines according to which the state must exercise its environmental functions; and
- A guide to the interpretation of NEMA itself and of any other law relating to the environment.

NEMA principles are the following:

- Environmental management must put people and their needs first;
- Development must be socially, environmentally and economically sustainable;
- There should be equal access to environmental resources, benefits and services to meet basic human needs;
- Government should promote public participation when making decisions about the environment;
- Communities must be given environmental education;
- Workers have the right to refuse to do work that is harmful to their health or to the environment;
- Decisions must be taken in an open and transparent manner and there must be access to information;
- The role of youth and women in environmental management must be recognised;
- The person or company who pollutes the environment must pay to clean it up;
- The environment is held in trust by the state for the benefit of all South Africans; and
- The utmost caution should be used when permission for new developments is granted.

Chapter 2 of the NEMA

Chapter 2 of NEMA provides a number of principles that decision-makers have to consider when making decisions that may affect the environment, therefore, when a Competent Authority considers granting or refusing environmental authorisation based on an Environmental Impact Assessment, these principles must be taken into account.

The NEMA principles with which this application conforms are described as follows —

1. Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
2. Development must be socially, environmentally and economically sustainable.

3. Sustainable development requires the consideration of all relevant factors.

The social, economic and environmental impacts of activities, including disadvantages and benefits, were considered, assessed and evaluated, and informed decision-making by the authority is hereby made possible.

Section 23 of the NEMA

The stated objectives of Section 23 are to ensure integrated decision-making and co-operative governance so that NEMA's principles and the general objectives for integrated environmental management of activities can be achieved. The goals are to

- a) promote the integration of the principles of environmental management set out in section 2 into the making of all decisions which may have a significant effect on the environment;
- b) identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management set out in section 2;
- c) ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them;
- d) ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment;
- e) ensure the consideration of environmental attributes in management and decision-making which may have a significant effect on the environment; and
- f) identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section 2.

For this project the following actions were taken to reach the general objectives of Integrated Environmental Management as set out in Section 23 of NEMA:

- a) Applicable environmental, economic and social aspects have been assessed, thereby ensuring an integrated approach in order to balance the needs of all whom would be affected by this development.
- b) Impacts have been described, assessed and mitigation measures have been supplied in order to ensure that all identified impacts are mitigated to acceptable levels. Alternatives have been thoroughly assessed and the best possible solution represents this development proposal.
- c) The development proposal has to be evaluated and approved by DEFF and no construction may commence prior to the issuing of the Environmental Authorisation.
- d) The procedures which were followed during the public participation programme were based on the NEMA EIA Regulations, December 2014, as amended in April 2017.
- e) DEFF will take all information as represented in this report into consideration and may request further information should they feel that further studies/information is required before an informed decision can be made.
- f) The mitigation measures as supplied in this report together with the measures as per the Environmental Management Programme are deemed to be the best way to manage anticipated impacts.

By providing electricity whilst not impacting negatively on the environment, this project would contribute to a sustainable environment.

1.3.2 The National Water Act (Act No 36 of 1998)

The National Water Act (NWA) guides the management of water in South Africa as a common resource. The Act aims to regulate the use of water and activities which may impact on water resources through the categorisation of 'listed water uses' encompassing water extraction, flow attenuation within catchments as well

as the potential contamination of water resources. The Department of Water & Sanitation (DWS) is the administering body in this regard.

The aquatic environment was investigated by the relevant specialist and it was concluded that disturbance will take place within the relevant delineated watercourses and Section 21(c) and/or 21(i) of the NWA will thus be triggered. It is therefore a requirement to apply for Water Use Authorisation (WUA) for this project to the Department of Water & Sanitation who is the administering body. The aquatic specialist for the project confirmed that General Authorisation (GA) will be applicable. This will however only be done during the Design & Pre-Construction Phase of the development. This GA is only required for the 132kV powerline and the upgrade of the existing access road where it cross the delineated watercourse with buffer zones.

1.3.3 The National Heritage Resources Act (Act 25 of 1999)

The proposed project falls within the scope of Section 38 of the National Heritage Resources Act and the applicable activities are:

- any development or other activity which will change the character of a site exceeding 5000m² in extent
- linear developments of 300m or longer.

The authorisation process in terms of the NHRA forms part of the EIA process. A Heritage Impact Assessment has now been electronically submitted to the South Africa Heritage Resource Agency (SAHRA) via SAHRIS as well as to the Northern Cape Provincial Heritage Resources Authority as part of the public participation programme. Final comment from SAHRA will be included in the Final Basic Assessment Report.

1.3.4 Additional Acts, Frameworks and Guidelines

Pixley Ka Seme District Spatial Development Framework/ Land Development Plan 2013-2018

Provincial Development Regions and Corridors

Settlement patterns in the province are informed by economic development opportunities. Specific economic development regions and corridors developed over time responding to:

- a) environmental capital (soil potential, availability of water, minerals, etc.), and
- b) infrastructural capital (roads, bulk engineering infrastructure, electricity).

Development regions and corridors are formed by the clustering of nodes where the capacity of entities and stakeholders within these nodes are coming together to ensure leadership and institutional capacity to constitute regional equity. One of the development regions and corridors in the Northern Cape is the SOLAR CORRIDOR, which is a corridor stretching from Upington to Kakamas in the north to De Aar in the east.

SDF strategic focal points and priorities

One of the directives for the district is to support and focus development and investment along the identified Development Corridors. This project falls within the Solar Corridor and the electrical infrastructure that will be constructed will be to feed electricity generated by the solar PV plants into the national grid. Job creation and skills transfer will take place.

The proposed site is situated in very close proximity to the N10 highway and falls thus into the N10 Development Corridor as well.

Transport

The N10 is a major transport link between the Siyanda and Pixley Ka Seme District municipalities. It provides links between the Eastern Cape and Western Cape to Namibia with the potential for tourism and development. The areas along the N10 also provide a Solar corridor link between the two municipal areas.

Renewable Energy Hub

The Pixley Ka Seme District area with its abundance of sunshine and vast tracts of available land has been attracting considerable interest from solar energy investors. The high solar index of the area, as indicated by the Solar Index Diagram, provides many opportunities in terms of the development of renewable energy.

This was also acknowledged by the Northern Cape Government with the identification of the Renewable Energy Hub. The areas around the northern and eastern borders of the Pixley Ka Seme District Municipality, with a distance of 50 kilometres from the Orange River, forms part of this hub with the potential to stimulate special economic development zoned within the area that have the potential to stimulate industrial development.

The Pixley ka Seme District Municipality proactively took bold steps towards diversification of the District economy from one that relies on mining and agriculture. The *Pixley ka Seme District 2010 Investment and Renewable Energy Conference* was an important milestone aimed at 92 'Setting the District on a Growth Path' through innovative local economic development initiatives. The gains made in this emerging sector are a product of committed political and administrative leadership from District and local municipalities. **Taking a bird's eye view of the District, Pixley managed to declare itself as a Renewable Energy Hub seeking to attract foreign direct investments into solar**, wind, hydro and Biomass projects.

De Aar

De Aar is the capital of the Pixley Ka Seme District Municipality and the third largest town in the Northern Cape. It is centrally located regarding main railway lines between Johannesburg, Cape Town, Port Elizabeth and Namibia as well as tarred roads to surrounding towns. The railway junction was the second most important junction in South Africa, including 110km of railway lines and 29 rail-tracks.

De Aar is identified as the Urban Centre within Emthanjeni municipal area and also known as the main administration centre located on the N10 national route linking Namibia with the coastline of Port Elizabeth. De Aar is the third largest town in the Northern Cape and the name refers to underground water arteries with 69 boreholes supplying water to the town.

Solar projects with its associated infrastructure (electrical infrastructure to supply the national grid in the case of this project) constructed at the proposed development site is in line and in support of the economic planning and growth visions of the district as well as the town of De Aar.

Pixley Ka Seme District Municipality Integrated Development Plan 2017 - 2022

The economy in the Pixley ka Seme municipal area is characterised by, amongst other, the potential and impact of renewable energy resource generation. At least 20 000MW of renewable energy should be contracted by 2030 to be in support of the envisioned outcome of provincial environmental sustainability and resilience.

The favourable conditions for renewable energy generation are listed as a possible competitive advantage for the Municipality. The development of solar and wind farms is also listed as an *Opportunity* in the Municipal SWOT analysis (Strengths, Weaknesses, Opportunities, Threats). The strategic nature of the local resources is beneficial to serve as the catalyst for investment and identified development corridors should be explored to unlock the economic potential of not only the district, but also the Northern Cape Province.

The growth and development context in the district has also changed radically since 2013 (after it had been stagnant for decades) owing mainly to private and public investments in the area as a hub for renewable energy generation and astronomy, respectively.

A strategic objective of the District Municipality is to promote economic growth and to support the local municipalities in doing so. Allowing investment in renewable energy resource generation is definitely in support of the objective.

The development of electrical infrastructure as proposed will be in full support of the development and economic strategies as compiled in the IDP.

Environmental Management Framework(s)

The DFFE Screening Tool (attached in Appendix B) could not find any intersection with Environmental Management Frameworks relevant to this application.

Relevant Legislation and Standards

Title of legislation, policy or guideline	Applicability to Project	Regulating authority
National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations published in Government Notice No. R.982, December 2014, as amended in April 2017	Authorisation is required – refer to Paragraph 1.3.1 above	National Department of Environmental Affairs
The National Water Act, 1998 (Act No 36 of 1998)	Water use authorisation is required– refer to Paragraph 1.3.2 above	The Department of Water and Sanitation
National Heritage Resources Act, (NHRA), (Act 25 of 1999)	Comment must be obtained – refer to paragraph 1.3.3 above	South African Heritage Agency (SAHRA) and Limpopo HRA
National Environmental Management: Biodiversity Act (Act no 10 of 2004) NEMBA	This project does not fall within a CBA and authorisation in terms of this Act is not required.	National Department of Environmental Affairs
National Environmental Management: Waste Act (Act No. 59 of 2008) 2008	Authorisation is not required	Department of Environmental Affairs
Mineral and Petroleum Resources	Authorisation is not required	Department of Mineral

Development Act (No 28 of 2002)		Resources
Conservation of Agricultural Resources Act (43 of 1983)	Authorisation is not required	Department of Agriculture
National Forests Act (No 84 of 1998) and Government Notice 1339 of 6 August 1976 (promulgated under the Forest Act (No 122 of 1984) for protected tree species), the removal, relocation or pruning of any protected plants	Authorisation for the removal of protected flora is not required, since none is present on the proposed development site.	Department of Agriculture, Forestry and Fisheries
Fencing Act (No 31 of 1963): Amended by the Agricultural Laws Rationalisation Act, Act No 72 of 1998	Authorisation is not required	South African Government
<u>South African National Standard</u> Civil Engineering Standards and Publications	To be implemented in the design, construction and operational phases of the project.	South African Bureau of Standards
National Development Plan (NDP) (2030)	To be considered	SA National Government

Table 2 Relevant Legislation and Standards

1.4 DFFE Screening Tool

The Screening Tool Report dated 28 April 2022 is attached as Addendum B (2). The document identified potential environmental Sensitivities within the proposed development area. These identified sensitivities are indicative only and verification was done by the EAPs and the relevant specialists.

Verification of the DFFE Screening Tool Report

Impact Assessment	Motivation for Specialist Input Obtained
Agricultural Theme <i>Classification in terms of the Screening Tool:- Medium Sensitivity</i>	<p>It was confirmed that the agricultural impact and the amount of agricultural land loss resulting from the development is insignificant in the context with the agricultural environment. The affected land has very limited agricultural potential.</p> <p>An <i>Agricultural Compliance Statement</i> was supplied by Mr Johann Lanz and is summarised in Chapter 4 and included under Appendix C(5) of the Basic Assessment Report.</p>
Animal Species Assessment <i>Classification in terms of the Screening Tool:- Medium Sensitivity</i>	<p>A <i>Terrestrial Ecological Assessment</i> was undertaken by Dr David Hoare and is summarised in Chapter 4 and included under Appendix C(1) of the Basic Assessment Report.</p> <p>An <i>Avi-Fauna Impact Study</i> was undertaken by Dr Owen Davies and Ms Ashlin Bodashing from Arcus Consultancy Services and is summarised in Chapter 4 and included under Appendix C(3) of the Basic Assessment Report.</p>
Aquatic Biodiversity Impact Assessment <i>Classification in terms of the Screening Tool:- Very High Sensitivity</i>	<p>An <i>Aquatic Impact Assessment</i> was undertaken by Dr Toni Belcher done and is summarised in Chapter 4 and included under Appendix C(2) of the Basic Assessment Report.</p> <p>Engineering input was obtained as an <i>Engineering Hydrological Assessment and</i></p>

	<i>Stormwater Management Plan</i> , also summarised in Chapter 4 and included under Appendix C(6) of the Basic Assessment Report.
Archaeological and Cultural Heritage Impact Assessment <i>Classification in terms of the Screening Tool:- Low Sensitivity</i>	Even though the classification is indicated as a <u>low sensitivity</u> , <i>Heritage and Archaeological Impact Assessments</i> were undertaken by Ms Jenna Lavin (CTS Heritage) because relevant listed activities in terms of the National Heritage Resources Act (Act 25 of 1999) are triggered. The findings of these assessments are summarised in Chapter 4 and included under Appendix C(4) of the Basic Assessment Report.
Palaeontology Theme <i>Classification in terms of the Screening Tool:- Very High Sensitivity</i>	A <i>Palaeontological Impact Assessment</i> was undertaken by Prof Marion Bamford. The findings of her assessment are summarised in Chapter 4 and included under Appendix C(4) of the Basic Assessment Report.
Civil Aviation Assessment <i>Classification in terms of the Screening Tool:- High Sensitivity</i>	The De Aar Military Airport is located 8,6km west of De Aar. The proposed MTS Project grid connection which lies between 9km and 11 km south-east of De Aar will not impact on this facility. The De Aar Airport is situated between 7km and 10km east of the proposed project and will also not be affected by the proposed project. No specialist input is recommended. Relevant obstacle approval for the towers and pylons will be obtained from the SA Civil Aviation Authority (CAA) during the design phase of the project, prior to commencement of construction.
Defence Theme <i>Classification in terms of the Screening Tool:- Low Sensitivity</i>	The closest defence facility to the site is the South African Defence Department Ammunition Depot and School of Munitions, De Aar. This is situated 3,8km west of De Aar. The De Aar Military Airport is located 8,6km west of De Aar. The proposed MTS Project grid connection which lies between 9km and 11 km south-east of De Aar will not impact on these facilities. No specialist input is recommended.
Plant Species Theme <i>Classification in terms of the Screening Tool:- Low Sensitivity</i>	A <i>Terrestrial Ecological Assessment</i> was undertaken by Dr David Hoare and is summarised in Chapter 4 and included under Appendix C(1) of the Basic Assessment Report.
Terrestrial Biodiversity Theme <i>Classification in terms of the Screening Tool:- Very High Sensitivity</i>	A <i>Terrestrial Ecological Assessment</i> was undertaken by Dr David Hoare and is summarised in Chapter 4 and included under Appendix C(1) of the Basic Assessment Report.
Geotechnical Assessment	A geotechnical study will be undertaken during the design phase of the project to confirm the geotechnical constraints associated with the site. Appropriate specifications in terms of materials and foundations will then be provided to inform the detail design of the MTS facility. Specific requirement in terms of pylon positions and foundations will also be supplied for both the LiLo and the 132kV powerlines. No obvious significant geotechnical constraints (i.e. dolomite) occur on site. The EAP proposes that a geotechnical study during the application for Environmental Authorisation phase of the project will not impact on the viability of the project and is therefore not required as part of the studies for Environmental Authorisation.

Table 3 Verification of DFFE Screening Tool Report

ased on the DFFE Screening Tool Report, and direct relevant experience from the EAPs, it was concluded

that the following specialist studies were required for the project:-

- Terrestrial (Fauna & Flora) Impact Assessment
- Freshwater Impact Assessment
- Bird Impact Assessment
- Heritage & Archaeological Impact Assessment
- Palaeontological Assessment
- An Agricultural Impact Statement

Engineering input was obtained for an Engineering Hydrological Assessment and Stormwater Management Plan.

1.5 Basic Site Screening Assessment

A Basic Site Screening Assessment (mostly desktop) was undertaken to highlight the most obvious sensitivities of the proposed development site. The purpose of this assessment was to identify any environmental attributes that could significantly impact on the overall viability of the project as well as to guide the alternative site selection process right at the onset of the project.

This Basic Assessment Screening Assessment is attached under Appendix B and is summarised below. Please note that the assessment was done combined for the Vetlaagte 400kV MTS Project and the Wag 'n Bietjie 400kV Project. The summary below refers however only to the Wag 'n Bietjie 400kV MTS Project.

Specialists Basic Screening Results

Fauna & Flora

The fauna & flora constraints are the small rocky outcrops and rocky areas scattered throughout the site. It is possible that they may have higher diversity than surrounding areas, and also may possibly contain the protected tree *Boscia albitrunca* although this is not definite and should be confirmed during the site visit and final assessment. It is however preferable to treat these outcrops and rocky areas as no-go areas.

Avifauna

The two assessment areas are in general of **low** avifaunal sensitivity, with large areas of **very low** sensitivity. Impacts would be reduced if the development footprint could be placed within the very low sensitivity areas and avoiding the low sensitivity areas. However, from an avifaunal perspective there isn't a great concern if that is not practically possible. The primary reasons for the difference between low and very low sensitivity areas are:

- the slightly elevated areas may be utilised by Ludwig's Bustard for displaying (albeit with a low likelihood) and
- the drainage area may be used as a flyway or allow for the movement of smaller species across the landscape.

Aquatic

- Even though the floodplain covers a very large area of the two farms, these areas are not seen as total no-go areas, i.e. there are existing pylons within the floodplain.

- Any development within the 1 in 100 year flood line will however require some mitigation from flood damage and in terms of stormwater related management measures, which should be addressed in detail in the Impact Assessment Report.
- Additional buffers around the floodplain areas will most probably not be needed, but this will be confirmed during the site visit. Water Use Authorisation will be required for the Wag 'n Bietjie MTS Project due to the proposed crossing of the overhead powerline of the flood plain area.

Heritage and Palaeontology

The eastern side of the Wag 'n Bietjie assessment area is amongst dolerite outcrops and is more sensitive than the rest of the site. The ground is also not level and would be more expensive to develop. It was recommended that this demarcated zone be avoided, but smaller foot print infrastructure will however be acceptable (e.g. powerlines). It was recommended that a full HIA be undertaken.

Combined Initial Environmental Sensitivity Map

The below is the Combined Initial Environmental Sensitivity Map (for both Vetlaagte MTS Project and the Wag 'n Bietjie MTS Project) which was refined during the specialist assessments described under Chapter 4 and provided in Appendix 4 of this report.

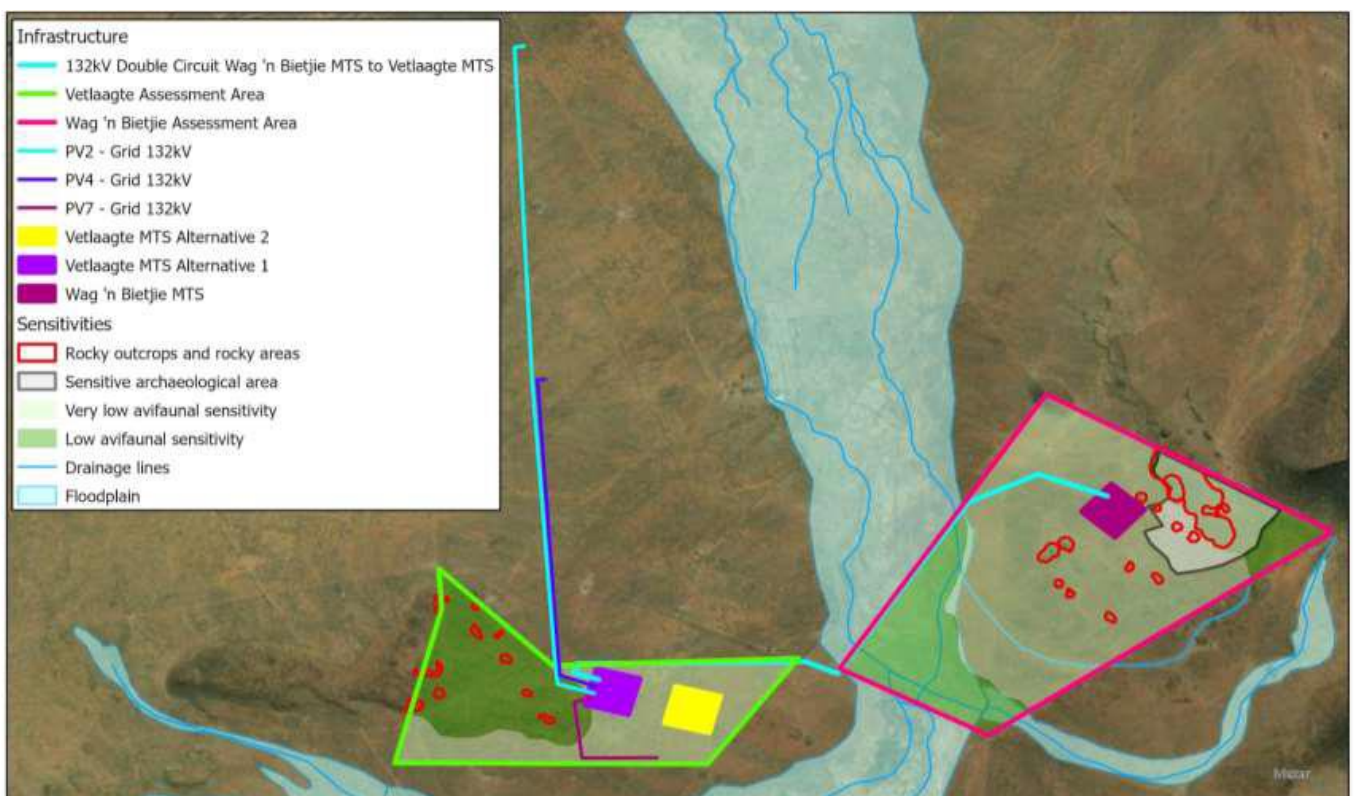


Figure 1 Combined Initial Environmental Sensitivity Map resulting from the Basic Screening Assessment

1.6 Details and Expertise of the Environmental Assessment Practitioner

Landscape Dynamics Environmental Consultants (Pty) Ltd had been appointed by MTS Wag n Bietjie (Pty) Ltd for the application for Environmental Authorisation for this proposed Wag 'n Bietjie 400kV MTS Project. Landscape Dynamics is an environmental consultancy firm established in May 1997. The main line of

business since that time up to the present is the compilation of environmental impact assessments. Landscape Dynamics has a broad client base from both the private and government sectors which has developed over the past 25 years of professional services supplied. The operating base for Landscape Dynamics is the entire South Africa; with offices and/or local representation in Gauteng, the Western Cape, Mpumalanga and Kwa-Zulu Natal.

The Environmental Assessment Practitioners (EAPs) for this project are Ms Annelize Erasmus and Ms Susanna Nel. Both EAPs are registered with EAPASA. The Landscape Dynamics Company Profile with the relevant condensed Curriculum Vitae's is attached in Appendix F1.

1.7 Project Team

The impact that this project might have on the environment can only be effectively assessed if all the environmental project components are satisfactorily identified and considered. A multi-disciplinary approach is therefore required for this basic Environmental Impact Assessment process.

The EIA Project Team members are the following (Company Profile & CV's of the EAPs and the Declaration of Interest of the specialists are attached in Appendix F(1) and F(2) respectively:

Company Name	Contact Person(s)	Responsibility and/or Project Component
Landscape Dynamics Environmental Consultants	Ms Annelize Erasmus Ms Susanna Nel	<ul style="list-style-type: none"> ○ EIA Project Management ○ EAPs ○ Public Participation Programme
David Hoare Consulting (Pty) Ltd	Dr David Hoare	Fauna & Flora Impact Assessment
BlueScience (Pty) Ltd	Dr Toni Belcher	Aquatic Impact Assessment
David Hoare Consulting (Pty) Ltd	Ms Jenna Lavin	Heritage Impact Assessment
Prof Marion Bamford Palaeo-Botanist	Prof Marion Bamford	Palaeontological Impact Statement
Arcus Consultancy Services South Africa (Pty) Ltd	Dr Owen Davies Ms Ashlin Bodashing	Avifauna Impact Assessment
Johann Lanz Soil Scientist	Mr Johann Lanz	Agricultural Impact Statement
Afrimage Photography	Mr Albert Froneman	Mapping and GIS support
Matukane Consulting Engineers	Mr Erik Pretorius	Stormwater Management

Table 4 Environmental Project Team

The EIA Project Team is supported by the following team members from within Mulilo Renewable Project Developments (Pty) Ltd, on behalf of the Applicant, wag 'n Bietjie MTS (Pty) Ltd:

Contact Person	Responsibility
Mr Warren Morse	Director: Solar & Energy Storage
Mr Andrew Pearson	Environmental Manager
Mr Ryan David Anderson	Permitting Manager
Mr Johan Janse van Rensburg	Project Engineer
Mr Gerhard Mc Namara	Project Engineer
Mr Constantin Hatzilambros	Project Manager

Table 5 Project Team on behalf of the Applicant

1.8 Project Schedule

Activity	Date
Date of Site Visit by Landscape Dynamics	February 2022
Date specialist studies completed and submitted	April & May 2022
Public Participation & advertising	
<ul style="list-style-type: none"> Placement of newspaper ad 	28 January 2022
<ul style="list-style-type: none"> Placement of onsite ads 	19 October 2022
<ul style="list-style-type: none"> Distribution of the Background Information Document 	11 January 2022
<ul style="list-style-type: none"> Draft BAR sent to IAPs (30 day-commenting) 	28 June 2022
Submission of Draft BAR and Application Form to DFFE	8 July 2022
Last day for comment on Draft BAR	8 August 2022
Submission of Final BAR to DFFE	15 August 2022
Date EA received (57 days decision making time frame)	12 October 2022
Notification to all I&AP's of EA and right to appeal	12 October 2022

Table 6 Project Schedule

CHAPTER 2: PROJECT INFORMATION

2.1 Need and Desirability

NEED

The need for this project relates directly to the need for new renewable energy projects in South Africa. This project will assist directly with reducing current generation capacity constraints in the country. The proposed electrical infrastructure (400kV MTS and associated power lines), just south-east outside the town of De Aar in the Northern Cape, will connect the electricity generated from a number of authorised solar PV farms as well as other renewable energy projects within the macro area, to the Eskom national grid. Without this new electrical infrastructure it will be difficult for new renewable projects to connect to the national grid in the De Aar area. The REIPPP was developed in support of the IRP and the Wag 'n Bietjie 400kV MTS Project will form an integral part of some of the solar facilities in the De Aar macro area that will be bid in future REIPPP rounds and/or in similar procurement programmes related to the IRP.

The need for the project can further be justified when reviewing the South African **Integrated Resource Plan (IRP) 2019** which was gazetted by the Minister of Mineral Resources and Energy, Mr Gwede Mantashe, on 18 October 2019, updating the energy forecast for South Africa from the current period to the year 2030.

In summary, it is an electricity capacity plan which aims to provide an indication of the country's electricity demand, how this demand will be supplied and what it will cost. The IRP 2019 further states the following on renewables:

- “South Africa continues to pursue a diversified energy mix that reduces reliance on a single or a few primary energy sources. The extent of decommissioning of the existing coal fleet due to end of design life, could provide space for a completely different energy mix relative to the current mix. In the period prior to 2030, the system requirements are largely for incremental capacity addition (modular) and flexible technology, to complement the existing installed inflexible capacity.”
- “Renewable Energy: Solar PV, and wind present an opportunity to diversify the electricity mix, to produce distributed generation and to provide off-grid electricity. Renewable technologies also present huge potential for the creation of new industries, job creation and localisation across the value chain.”

DESIRABILITY

The following table addresses further issues as highlighted in the DFFE Need & Desirability Guidelines (2014).

Is this project part of a **national programme** to address an issue of national concern or importance?

Reliable, consistent power supply is a major concern in South Africa, and the project (if built) will contribute towards much needed electricity supply. Furthermore, the electricity grid has become extremely constrained in the Northern Cape which is preventing more renewable energy projects coming online in areas with favourable resources. This has multiple direct negative impacts to the country being,

- *less new generation capacity being brought online to fill the current supply deficit,*
- *higher electricity tariffs from new renewable energy projects which are forced to be located in regions with less favourable resources,*
- *reduced economic activity in the communities which are in dire need of economic support.*

The project is necessary to connect more renewable energy generation projects to the national grid in support of the IRP 2019.

Do location factors favour this land use (associated with the development proposal) at this place? (This relates to the contextualisation of the proposed land use on the proposed site within its broader context.)

The proposed electrical infrastructure development is perfectly situated because

- *It is within / directly adjacent to authorised solar PV farms and existing electrical infrastructure of the same format*
- *The entire project area falls within a Strategic Transmission Corridor*
- *The site is situated in the Solar Corridor as demarcated by the Pixley Ka Seme municipality*

Will the development proposal or the land use associated with the development proposal applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?

The development proposal (or the land use associated with the development proposal applied for) will not significantly impact on sensitive natural and cultural areas. The development proposal was assessed by the following specialists:

- *Fauna & Flora specialist*
- *Aquatic specialist*
- *Ornithologist*
- *Heritage consultant*
- *Agricultural Specialist*
- *Consulting engineer (stormwater)*

It was concluded that all impacts can be mitigated to acceptable levels and that the project could go ahead on condition that the Environmental Management Programme (EMPr) (attached as Appendix E) should be implemented at all times.

Will the development impact on people's health and well-being (e.g., in terms of noise, odours, visual character and 'sense of place', etc.)?

Dust and noise will be created during the construction phase but mitigation measures are in place to minimise these temporary impacts. The development is situated on rural farm land which lowers the significance of impact associated with noise and dust.

The proposed electrical infrastructure development will alter the visual character and sense of place in a negative way, but when seen in context with the seven authorised PV plants, as well as other existing

operational large scale renewable energy project (wind and solar) in the broader area, the addition of the development as proposed will be acceptable in terms of visual impact.

Is the development the best practicable environmental option for this land/site?

The, 'environment' should be seen as the sum total of one's surroundings, which include the natural, social and economic environments. Taking all constraints into account, the development as proposed underlines the principles as advocated by the term 'triple bottom line' (people, planet, profit) and this development proposal is in support of the goals of economic, social and ecological integration and sustainability.

What will the benefits be to society in general and to the local communities?

The proposed development will contribute to, amongst others, energy security and blackout relief, benefiting the entire South Africa. Temporary and permanent employment opportunities will be created not only for this project but for the associated renewable energy projects that would be able to connect in the area as a result of this project where the work force should as far as possible be sourced from the local communities.

Will the benefits of the proposed land use/development outweigh the negative impacts of it?

Negative impacts associated with the proposed development could be mitigated to levels that will be acceptable within the receiving environment. The positive impact of energy security, blackout relief, increase capacity, reduction in the need to use diesel and other fossil fuels for peaking and baseload power far outweighs the negative impact that this project could have.

Describe how the **general objectives of Integrated Environmental Management as set out in Section 23 of the NEMA have been taken into account:**

Current procedures and/or organisational structures are not necessarily achieving integrated decision-making and/or co-operative governance and, as a result, there is a failure to properly achieve the objectives of IEM as set out in Section 23 of NEMA. EIA's however often focus on the immediate harm a project will cause rather than any benefits it might create in the long term to sustainable development.

The stated objectives of Section 23 are to ensure integrated decision-making and co-operative governance so that NEMA's principles and the general objectives for integrated environmental management of activities can be achieved. The goals are to

- a) promote the integration of the principles of environmental management set out in section 2 into the making of all decisions which may have a significant effect on the environment;*
- b) identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management set out in section 2;*
- c) ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them;*
- d) ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment;*
- e) ensure the consideration of environmental attributes in management and decision-making which may have a significant effect on the environment; and*
- f) identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section 2.*

For this project the following actions were taken to reach the general objectives of Integrated Environmental Management as set out in Section 23 of NEMA:

- a) Applicable environmental, economic and social aspects have been assessed, thereby ensuring an integrated approach in order to balance the needs of all whom would be affected by this development.
- b) Mitigation measures have been supplied in the EMPr in order to ensure that all identified impacts are mitigated to acceptable levels.
- c) The EA application has to be evaluated and approved by the DFFE and no construction may commence prior to the issuing of the Environmental Authorisation.
- d) The procedures which are followed during the public participation programme are based on the NEMA EIA Regulations 2014, as amended.
- e) The DFFE will take all information as represented in this report into consideration and may request further information should they feel that further studies/information is required before an informed decision can be made.
- f) The project team (inclusive of the specialists) is confident that the mitigation measures as supplied in the EMPr are reasonable and will be the best way to manage anticipated impacts.

Describe how the principles of environmental management as set out in Section 2 of the NEMA have been taken into account

Chapter 2 of NEMA provides a number of principles that decision-makers have to consider when making decisions that may affect the environment, therefore, when a Competent Authority considers granting or refusing environmental authorisation based on an Environmental Impact Assessment, these principles must be taken into account.

The NEMA principles with which this application conforms are described as follows —

1. Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
2. Development must be socially, environmentally and economically sustainable.
3. Sustainable development requires the consideration of all relevant factors.

The social, economic and environmental impacts of activities, including disadvantages and benefits, were considered, assessed and evaluated, and informed decision-making by the authority is hereby made possible.

Table 7 Desirability of the project in terms of the DFFE Need & Desirability Guidelines (2014)

2.2 Locality and Regional Context

The project area is situated between 9km and 11km south-east of the town of De Aar in the Northern Cape Province. The locality map provided below is also attached as Appendix (1).

LOCALITY MAP - Wag 'n Bietjie MTS Project
(on the Remaining Extent of the Farm Wagt en Bittje No 5, De Aar, Northern Cape Province)

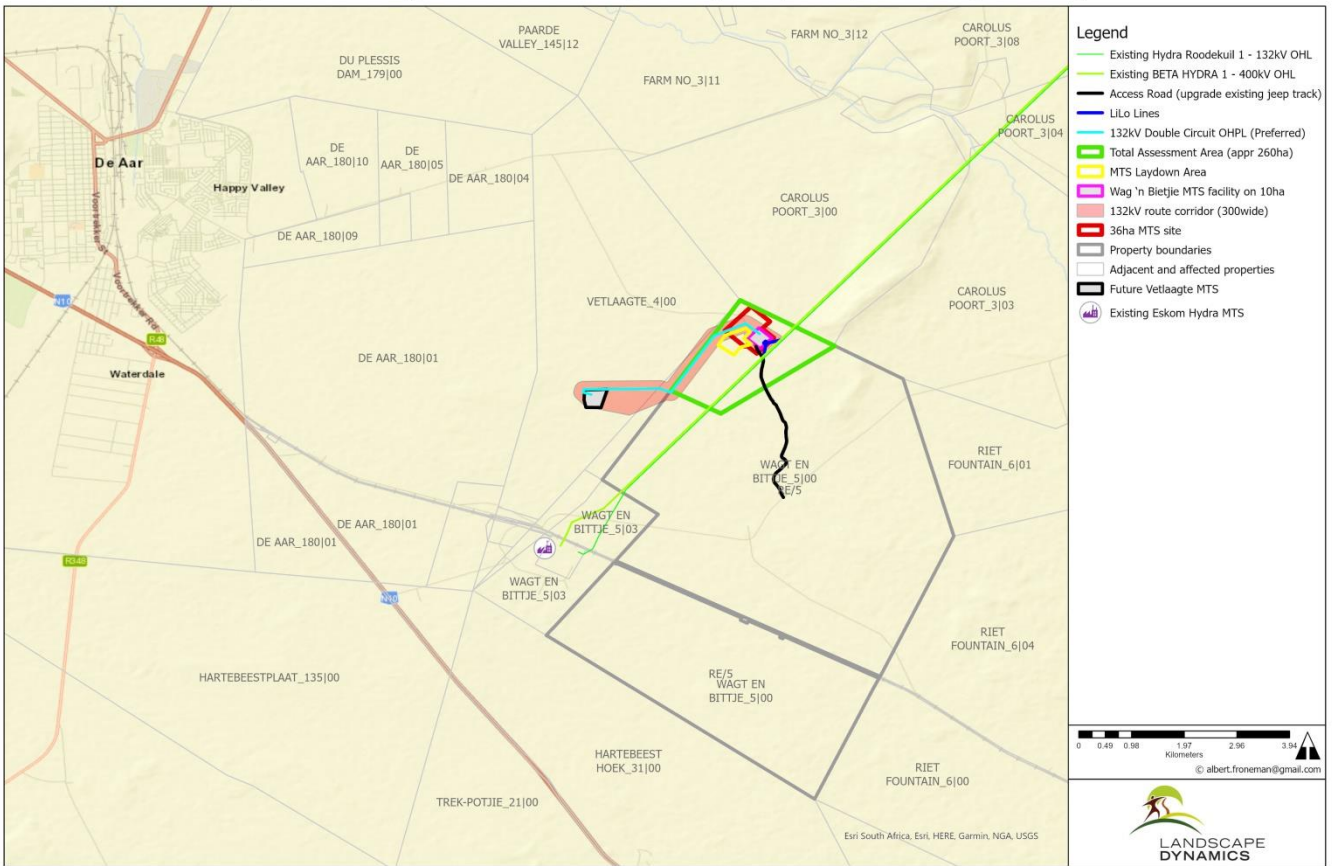


Figure 2 Locality Map

2.3 Properties Descriptions

The following farms are directly affected by the proposed project:-

- The Remaining Extent of the Farm Wagt en Bittje No 5
- Portion 1 of the Farm Vetlaagte No 4
- The Remaining Extent of the Farm Vetlaagte No 4

Key to the SG 21 Digit Codes

Major region				Minor region				Farm / Erf number								Portion number				
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

The following SG21 Digit Code are relevant to the Wag 'n Bietjie MTS 400kV Project

C	0	5	7	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0
C	0	5	7	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4
C	0	5	7	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0

2.4 Project Description

The project components are listed as follows:

Infrastructure	Specifications
Development footprint (permanent infrastructure)	A 36-hectare site is required by Eskom to be authorised to allow for future expansion of the MTS. The Wag 'n Bietjie MTS facility will initially have a construction footprint of 10ha within this 36ha area.
Main Transmission Substation (MTS)	<ul style="list-style-type: none"> • Capacity : 400kV • Height of structures: <ul style="list-style-type: none"> Stringer strain beam: Up to 20m Tubular busbar: Up to 13m • Associated Infrastructure: <ul style="list-style-type: none"> ○ Lighting ○ Fencing ○ Buildings required for control, storage, operations and maintenance
Loop-In Loop-Out (LiLo)	The connection of the Wag 'n Bietjie 400kV MTS to the national grid will be via new loop-in loop-out 400kV power lines of approximately 600m total length that will connect into the existing 400kV Beta-Hydra 1 power line.
132kV MTS Connection Powerline(s)	<ul style="list-style-type: none"> • There exist different possible connection scenarios for Wag 'n Bietjie MTS to meet the connection requirements of renewable energy projects within the vicinity of De Aar to the national grid. • The connection scenarios are reliant on aspects such as grid capacity, Eskom requirements and the specific requirements of renewable energy projects connecting to the national grid via the MTS. • To cater for the possible connection scenarios the Applicant requires authorisation for the following connection infrastructure: <ul style="list-style-type: none"> • Up to a maximum of five adjacent 132kV overhead powerlines within the assessed corridor • Approximately 3,8km <ul style="list-style-type: none"> ○ Authorisation of a 300m wide corridor as assessed
Potential upgrades required at the Vetlaagte MTS	<ul style="list-style-type: none"> • 400kV and 132kV yard extensions • new 500MVA 400/132kV transformer • 400kV busbar extensions • 132kV busbar extension <ul style="list-style-type: none"> ○ new 132kV feeder bay (maximum of five)
Access and internal roads	<ul style="list-style-type: none"> • The access road to the Wag 'n Bietjie MTS is an existing gravel road which will be upgraded to a maximum width of 8 meters. The total length of this road is approximately 3km. • Internal access roads within the MTS site of less than 8m wide will be constructed • An access route of approximately 6m wide will be constructed inside the 400kV LiLo line servitude. This road will be used for construction and later maintenance purposes. • An approximately 6m wide access road will be constructed along the line route for construction and maintenance purposes – this road will be inside the powerline servitude

Laydown area	<ul style="list-style-type: none"> • A temporary construction site area of approximately 14ha directly adjacent to the MTS will be required. • All temporary infrastructure will be rehabilitated following the completion of the construction phase, where it is not required for the operation phase.
Storage of diesel	<p>Diesel storage of less than 80m³ for the MTS for the following purposes:-</p> <ul style="list-style-type: none"> ○ During construction, diesel is required for construction vehicles as well as generators for the construction camp and commissioning whilst waiting for the Eskom grid connection works to be completed ○ During operations, diesel is required for Operations & Maintenance vehicles at the PV plants but also required for backup diesel generators at the substations. The Generators supply auxiliary power to the substation's protection and communications systems, should there be outages on the grid. This is an Eskom requirement together with a battery room at the substations to act as UPS for these critical systems.
Temporary Services	During the construction phase, temporary sanitation facilities will be provided (i.e. chemical toilets) and these toilets will be regularly serviced by a licensed company.

Table 8 Project Components

2.5 Project Coordinates

MTS Site – 4 corners

NW:	30°41'14.65"S	24° 5'35.20"E
NE:	30°41'14.21"S	24° 5'48.93"E
SE:	30°41'25.25"S	24° 5'45.08"E
SW:	30°41'25.11"S	24° 5'35.96"E

400kV LiLo Lines Bend Coordinates

1	400kV LiLo	24° 7' 23.27" E	30° 40' 54.15" S
2	400kV LiLo	24° 7' 23.27" E	30° 40' 54.15" S
3	400kV LiLo	24° 7' 23.27" E	30° 40' 54.15" S
4	400kV LiLo	24° 7' 23.27" E	30° 40' 54.15" S
5	400kV LiLo	24° 7' 23.27" E	30° 40' 54.15" S
6	400kV LiLo	24° 7' 23.27" E	30° 40' 54.15" S

132kV Double Circuit OHPL 250m Coordinates

1	Wag 'n Bietjie MTS	24° 7' 20.98" E	30° 40' 40.75" S
2	132kV Double Circuit OHPL Wag 'n Bietjie MTS - Verlaagte MTS (Preferred)	24° 7' 13.86" E	30° 40' 35.46" S
3	132kV Double Circuit OHPL Wag 'n Bietjie MTS - Verlaagte MTS (Preferred)	24° 7' 5.57" E	30° 40' 37.12" S
4	132kV Double Circuit OHPL Wag 'n Bietjie MTS - Verlaagte MTS (Preferred)	24° 6' 57.00" E	30° 40' 40.44" S
5	132kV Double Circuit OHPL Wag 'n Bietjie MTS - Verlaagte MTS (Preferred)	24° 6' 50.44" E	30° 40' 45.81" S
6	132kV Double Circuit OHPL Wag 'n Bietjie MTS - Verlaagte MTS (Preferred)	24° 6' 45.25" E	30° 40' 52.58" S
7	132kV Double Circuit OHPL Wag 'n Bietjie MTS - Verlaagte MTS (Preferred)	24° 6' 40.06" E	30° 40' 59.35" S
8	132kV Double Circuit OHPL Wag 'n Bietjie MTS - Verlaagte MTS (Preferred)	24° 6' 34.87" E	30° 41' 6.11" S

9	132kV Double Circuit OHPL Wag 'n Bietjie MTS - Verlaagte MTS (Preferred)	24° 6' 29.68" E	30° 41' 12.88" S
10	132kV Double Circuit OHPL Wag 'n Bietjie MTS - Verlaagte MTS (Preferred)	24° 6' 22.72" E	30° 41' 14.53" S
11	132kV Double Circuit OHPL Wag 'n Bietjie MTS - Verlaagte MTS (Preferred)	24° 6' 13.50" E	30° 41' 13.89" S
12	132kV Double Circuit OHPL Wag 'n Bietjie MTS - Verlaagte MTS (Preferred)	24° 6' 4.11" E	30° 41' 13.97" S
13	132kV Double Circuit OHPL Wag 'n Bietjie MTS - Verlaagte MTS (Preferred)	24° 5' 54.71" E	30° 41' 14.05" S
14	132kV Double Circuit OHPL Wag 'n Bietjie MTS - Verlaagte MTS (Preferred)	24° 5' 45.32" E	30° 41' 14.14" S
15	132kV Double Circuit OHPL Wag 'n Bietjie MTS - Verlaagte MTS (Preferred)	24° 5' 35.93" E	30° 41' 14.22" S
16	Verlaagte MTS	24° 5' 48.51"E	30° 41' 16.68"S

Access Road 250m coordinates

1	Turn-off	24° 7' 35.39" E	30° 42' 19.58" S
2	Access Road	24° 7' 31.36" E	30° 42' 12.30" S
3	Access Road	24° 7' 30.76" E	30° 42' 4.94" S
4	Access Road	24° 7' 36.95" E	30° 41' 58.92" S
5	Access Road	24° 7' 35.19" E	30° 41' 51.95" S
6	Access Road	24° 7' 37.14" E	30° 41' 44.12" S
7	Access Road	24° 7' 36.92" E	30° 41' 36.06" S
8	Access Road	24° 7' 33.41" E	30° 41' 28.71" S
9	Access Road	24° 7' 29.07" E	30° 41' 21.66" S
10	Access Road	24° 7' 24.85" E	30° 41' 14.43" S
11	Access Road	24° 7' 21.88" E	30° 41' 6.75" S
12	Access Road	24° 7' 22.95" E	30° 40' 58.72" S
13	Access Road	24° 7' 20.26" E	30° 40' 51.27" S
14	Wag 'n Bietjie MTS entrance	24° 7' 18.71" E	30° 40' 48.27" S

2.6 Technical Information

Refer to Appendix A for engineering drawings of typical layouts of a 400kV Main Transmission Substation.

CHAPTER 3: ALTERNATIVES

3.1 Alternatives assessed in the Draft BAR

Two MTS site alternatives with their associated powerline route corridors were assessed and are described in this Draft BAR. Sufficient motivation is given as to why the Preferred Site Alternative was put forward for negotiations with the landowner and is recommended for approval. *The pre-negotiation agreements of the preferred alternative (MTS Site and Powerline Routes) is included in this report as Appendix F(3).*

The Wag 'n Bietjie 400kV Project alternatives considered are indicated in the yellow block as per map below.

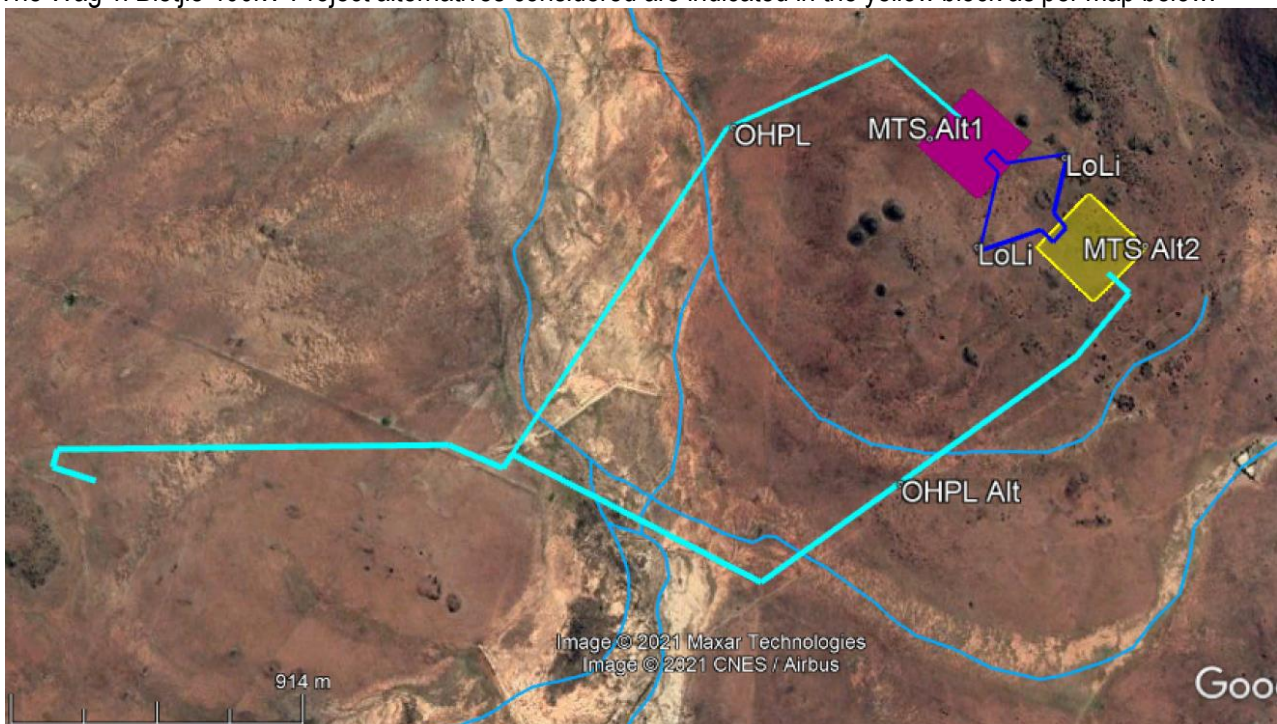


Figure 3 Map with MTS Site and Route Alternatives considered

The following aspects regarding the alternatives considered are applicable to this project :

- *Location*
The preferred location of the MTS has been identified by the applicant as the most viable in terms of future planning in the macro area. The location of the Wag 'n Bietjie MTS is strategically placed relatively close to the Vetlaagte MTS but will connect via the proposed 400kV LiLo powerlines to the 400kV Beta-Hydra 1 powerline to feed into the existing Eskom Hydra MTS. The proposed Vetlaagte MTS will connect to the 400kV Perseus-Hydra power line, thereby connecting the Vetlaagte MTS to the existing Eskom Hydra MTS.

The location of the preferred 132kV powerline between the Wag 'n Bietjie MTS and the Vetlaagte MTS is the shortest route between the two facilities and runs as far as possible along the Wag 'n Bietjie farm

boundary. The crossing of the delineated water feature plus buffer zone (the wider floodplain area of a Brak River tributary), is not possible to avoid; therefore water use authorisation is required for the purpose of the construction of the 132kV powerline and the upgrade of the existing access gravel road. These two crossings has been confirmed acceptable with the implementation of appropriate mitigation measures from the aquatic specialist point of view.

- *Extent of the MTS site to be approved*

Even though a site of 10ha in extent was initially proposed for the MTS project area; Eskom confirmed their requirement for a larger area of 36ha to allow sufficient area for future expansion. The relevant specialists had been approached to consider the enlarged area which was already assessed as part of the study area of 275ha during the initial specialist investigations. No objections and/or concerns were raised for this enlarged area to be approved.

Motivation provided by Mr John Geeringh, Senior Consultant Environmental Management, Grid Planning: Land and Rights, Eskom Transmission Division:

As a standard Eskom requires a 600 x 600m (36ha) site for a 400kV MTS so that it can be developed to a 4 x 500 MVA Transformer station. Any new MTS must also be developed in such a way that it can be utilised for connection of various users, i.e. generators and load customers. It must therefore be accessible to connect 9 to 12 x 132kV bays to such a station and no collector stations should be developed closer than 2km from an MTS site to ensure that access to the site is not blocked off.

Furthermore, the extended 36ha site has been communicated with the relevant specialists and they confirmed their support for approval of the larger area of 36ha as compared to the previously proposed 10ha MTS site.

- *Design, technology and operational aspects*

The design, technology and operational aspects of substations and power lines are guided strictly by Eskom standards, stipulations and requirements and it is not within the ambit of the Applicant to change Eskom standards.

The following Eskom policies will be adhered to and compliance will form part of the conditions of the EMPR:

- Renewable Energy Generation Plant Setbacks to Eskom Infrastructure, dated 15 September 2020
- Standard Eskom requirements for work in or near Eskom servitudes
- LES and SE inputs for new substations to IPP requirement, dated 3 March 2022

The Applicant is satisfied that the pre-negotiated MTS site and associated powerline routes meet the technical requirements for this project.

- *Environmental Considerations*

Support for the preferred MTS Site and associated powerline routes Alternative 1 was given by all the specialists (terrestrial fauna & flora; avifauna, aquatic; heritage and agricultural specialists) on condition that proposed mitigation measures are implemented.

- *Landowner Consent*

The preferred MTS site alternative and proposed powerline routes were presented in the pre-negotiation agreement with the relevant landowners attached to the Basic Assessment Report in Appendix F(3).

- *Conclusion re alternative assessment*

There is no justification and/or restrictions from both a technical and environmental point of view to change the proposed position of the MTS and associated powerline routes.

3.5 DFFE policy regarding alternative assessments

This application forms part of an Electricity Grid Infrastructure (EGI). When applying for electrical infrastructure that forms part of an EGI, no alternatives must for part of the report. Paragraph 5 of Government Notice (GN) No. 145 of Government Gazette (GG) 44191 of 26 February 2021 (GN 145) indicates that the applicant must submit a pre-negotiated route with the application for environmental authorisation, which means that only one route is submitted with the application without alternatives.

The following is confirmed:

- A pre-negotiated MTS Site and powerline routes forms part of this application.
- As per above DFFE requirement, further discussion regarding alternatives is not required and impact of alternatives will not be assessed any further in this BAR.

3.6 Pre-negotiated MTS site with associated powerline routes

The agreement between the applicant and landowner indicating the pre-negotiated MTS site and line route is attached under Appendix F.

3.7 The No Go Alternative

This is the “do nothing” alternative. Under these circumstances the MTS and associated power lines will not be constructed and there would obviously be no changes to the environment.

This is the “do nothing” alternative. Under these circumstances the MTS and associated powerlines will not be constructed and there would obviously be no changes to the environment.

Existing, authorised and future solar farms will not be able to connect effectively to the national grid. The existing Hydra MTS is currently running at capacity.

All the advantages of additional, clean, renewable electrical supply to the national Eskom grid will not be realised. A lost opportunity to reduce South Africa’s very high carbon emissions would represent a huge negative social cost.

Temporary and permanent employment opportunities that would have been created by the construction of the solar PV farms and electrical infrastructure will be forgone, another negative social cost that can be ill-afforded by South Africa which has a current unemployment rate of 34,9% as calculated in the third quarter of 2021.

It is concluded that the No-Go option is not a viable alternative and will not be assessed further during

this Basic Assessment process.

3.8 Conclusion of Alternatives

Component	MTS Site & Powerline Routes Alternative 1	MTS Site and Powerline Routes Alternative 2
Technical Preference	Preferred	Acceptable
Landowner Consent	Pre-negotiation agreement is provided	Not presented to landowner
Terrestrial Ecological Impact	Preferred	Acceptable
Avifauna impact	Both alternatives are acceptable, no preference	Both alternatives are acceptable, no preference
Aquatic environment	Both alternatives are acceptable, no preference	Both alternatives are acceptable, no preference
Heritage Impact	Preferred	Not acceptable
Palaeontological Impact	Both alternatives are acceptable, no preference	Both alternatives are acceptable, no preference
Agricultural Impact	Both alternatives are acceptable, no preference	Both alternatives are acceptable, no preference

Figure 4 Alternative Assessment Table

From the above, it is clear that the preferred MTS site and associate powerline routes presented in the Pre-Negotiation agreement are acceptable from both an environmental and technical perspective.

This MTS site and associated powerline alternatives were negotiated with the relevant landowners and the pre-negotiation agreement is attached as Appendix F(3).

As per DFFE requirement, only the pre-negotiated MTS site and associated powerline routes are being put forward for environmental authorisation in the Final BAR. No alternatives will be assessed in the Final BAR.

CHAPTER 4: RECEIVING ENVIRONMENT & SPECIALIST STUDIES

4.1 General Description of the Study Area

General

The proposed Wag 'n Bietjie 400kV MTS Project lies between approximately 9km and 11 km south-east of the town of De Aar, in the Northern Cape Province. De Aar is surrounded by agricultural areas that are mostly used for livestock grazing. The area also includes a number of operational and proposed renewable energy projects. Three operational solar farms lie north and northwest of the project areas, the operational 144MW Longyuan Mulilo de Aar 2 North wind farm lies on the plateau north east of the proposed MTS, while the operational 100MW Longyuan Mulilo De Aar Maanharberg 1 wind farm lies approximately 10 km south west of De Aar.

Several Eskom powerlines and substations occur in the broader area of which the Hydra Substation is the most significant and is approximately 5km southwest of the proposed Wag 'n Bietjie MTS development site.

Topography

The majority of the landscape consists of flat to slightly undulating plains with shallow valleys that are drained by tributaries of the Brak River, a northward-flowing tributary of the Lower Orange River. Occasional low hills occur in the wider study area. The elevation of the study area ranges from approximately 1250 to 1300 m.a.s.l.

Climate, Hydrology and Geohydrology

At De Aar, the summers are hot; the winters are short, cold, and windy; and it is dry and mostly clear year-round. Average temperatures vary from 16°C in June/July to 32°C in January and February. The wet season occurs from mid-November to mid-April with February, tending to be the wettest month and July the driest month. The mean annual rainfall for the area is 282 mm.

Due to the climatic conditions of the area, the smaller watercourses and the wetland areas that occur in the area are ephemeral (non-perennial), only containing water for short periods, immediately following local rainfall events. A dominant feature of the larger rivers is the alluvial floodplains that are characterised by multiple channels that are interchangeably used during higher flow events. These sandy floodplains tend to have mostly bare beds, with vegetation occurring in clumps along the bed and more densely along the banks. The ephemeral watercourses are highly dependent on groundwater discharge.

Also as a result of the low rainfall, the area has been mapped as a Strategic Water Source Area for groundwater (De Aar Region). A major fractured aquifer occurs within the area. The water table typically occurring at depths of about 8m below ground level and the yield of the aquifer is less than 2 litres a second. Both the surface and groundwater quality tend to be slightly brackish. The estimated groundwater recharge in the area is 12.3 mm/a. The aquifer is of medium susceptibility and vulnerability.

Geology and Soils

The geology of the study area can be described as being underlain by flat-lying sedimentary rocks of the Karoo Supergroup, which have been intruded by innumerable sills and dykes of dolerite. The overlying soils are variable from shallow to deep, red-yellow apedal, freely draining soils to very shallow Glenrosa and Mispah forms. The soils in the study site are primarily red soils of a restricted soil depth, excessive drainage, high erodibility and low fertility. Calcrete soils are also prevalent as a result of the climatic conditions and underlying parent material.

4.2 Biophysical Environment

4.2.1 Terrestrial Ecological Specialist Assessment (Fauna & Flora)

A Terrestrial Ecological Specialist Assessment was undertaken by Dr David Hoare from Dabid Hoare Consulting (Pty) Ltd and is attached as Appendix E(1). A summary thereof follows below.

4.2.1.1 Flora

There are two regional vegetation types in the study area, namely Northern Upper Karoo which occurs throughout the site, and Besemkaree Koppies Shrubland, which occurs in the hills directly to the east of the proposed MTS site. The conservation status of both the Northern Upper Karoo and Besemkaree Koppies Shrubland is Least Concern. Neither vegetation type is listed in The National List of Ecosystems that are Threatened and need of protection (GN1002 of 2011), published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004).

The Northern Cape CBA map included in Appendix B(3) classifies the natural vegetation of the province according to conservation value in decreasing value, as follows:

- Protected
- Critical Biodiversity Area One (Irreplaceable Areas)
- Critical Biodiversity Area Two (Important Areas))
- Ecological Support Area Other Natural Area

The entire site falls within an Ecological Support Area.

There is one protected tree species that has a geographical distribution that includes the study area, *Boscia albitrunca* (Shepherd's Tree / Witgatboom / !Xhi). A number of individuals were found within the low hills on site. This is within the Wag 'n Bietjie 400kv MTS Project assessment area, but outside the footprint of the proposed infrastructure (proposed MTS and powerlines).

4.2.1.2 Fauna

There is one animal species flagged for the site in the DFFE Online Screening Tool output, namely *Neotis ludwigii* (Ludwig's Bustard), listed as Endangered. A specialist avifaunal assessment forms a separate component of the environmental assessment application and is addressed in Paragraph 4.3. However, the habitat for this species is considered here as part of the general ecological assessment. Ludwig's Bustard occurs in flat, open, semi-arid shrublands, including in the Nama-Karoo. The study area forms part of the general area of occurrence for this species and is near the core high density distribution range for the species (Taylor et al. 2015). All habitat on site is therefore potentially suitable for this species. Habitat loss due to the current project will be relatively insignificant.

Other listed animal species that could possibly occur in the study area are mostly small carnivores, including Black-footed Cat (Vulnerable) and Brown Hyaena (Near Threatened), both mobile species that will move away from any human disturbance. The Tent Tortoise (*Psammobates tentorius*), listed as Near Threatened, has been previously recorded nearby and could occur on site.

Conclusion of the Terrestrial Ecological Specialist Assessment

- Impacts of the proposed project components are relatively insignificant in comparison to the approved solar PV projects in neighbouring areas.
- Considering that the access road is existing and will only be upgraded, the proposed access road is also considered to be acceptable from an ecological (Terrestrial Biodiversity and Terrestrial Plants) perspective and can be approved following the implementation of relevant mitigation measures described in the specialist report

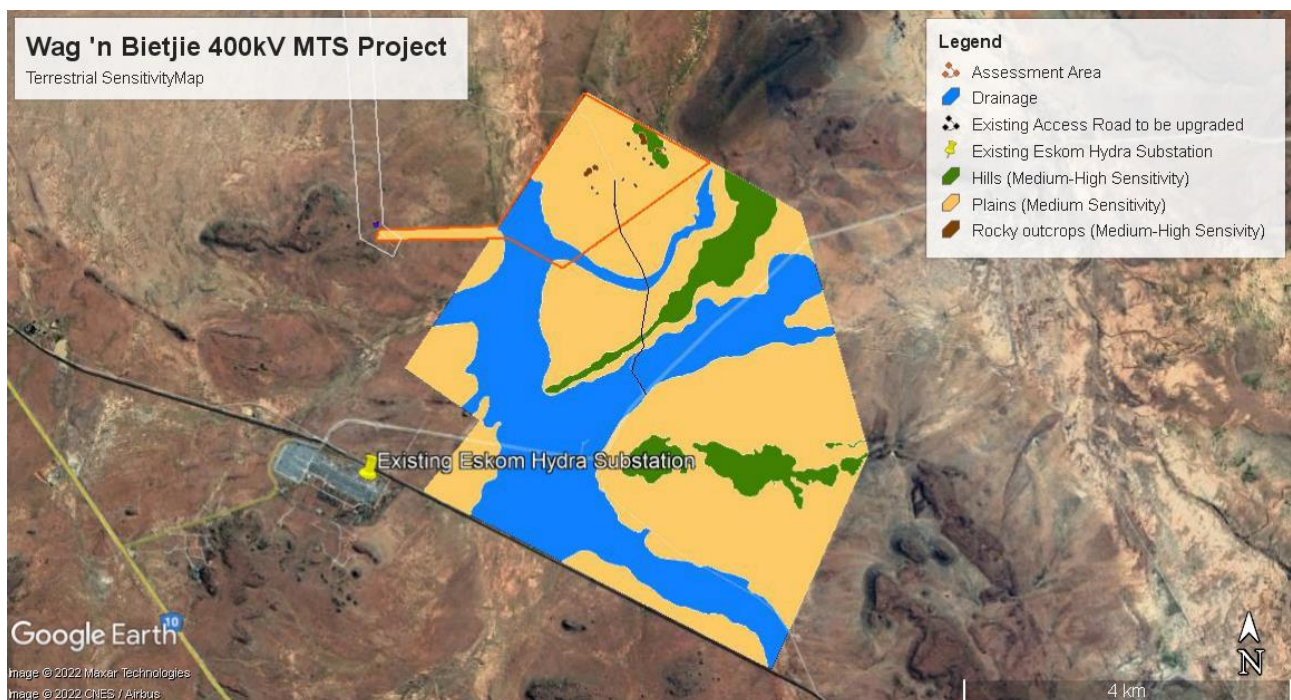


Figure 5 Terrestrial Sensitivity Map of Project Area (indicated in an orange line)



Figure 6 Terrestrial Sensitivity Map of MTS site with LiLo Powerlines

4.2.2 Aquatic Specialist Impact Assessment

An *Aquatic Specialist Impact Assessment* was undertaken by BlueScience (Pty) Ltd, represented by Ms Toni Belcher, and is attached under Appendix C. A summary thereof follows below.

Conclusion of the Aquatic Specialist Impact Assessment

The aquatic features within the study area comprise ephemeral unnamed tributaries of the Brak River. The Brak River is a seasonal tributary within the Lower Orange River System. The river flows approximately 5km to the north of the study area with a larger tributary crossing the eastern extent of the farm, flowing in a northerly direction to join the Brak River. Associated with these larger watercourses are wide floodplains and some depression wetlands. Roads and a few dams have been constructed within the wide floodplains. Erosion control measures have been constructed along the roads due to the high erosion potential in the floodplain. Smaller watercourses and drainage features drain into the larger river corridors.

A risk assessment as per requirement of the Department of Water & Sanitation has been undertaken to inform the water use authorisation process. Considering the scope of works proposed and the fact that there will be minimal works undertaken within the delineated aquatic features within the site, the risk of altering the

ecological status of the adjacent aquatic features is considered to be low. It is thus recommended that the proposed activities fall within the ambit of General Authorisations for Section 21(c) and (i) water use activities.

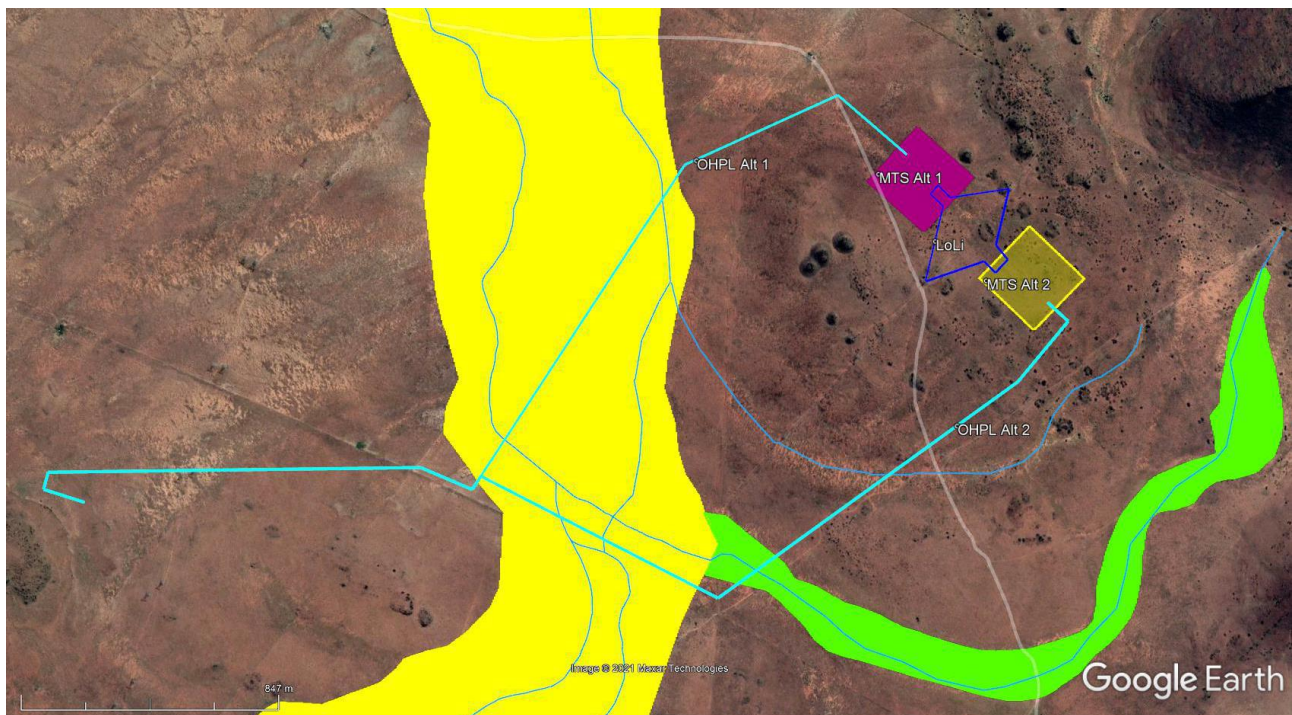


Figure 7 Aquatic Sensitivities Map

4.2.3 Avifauna Specialist Assessment

The area of habitat destruction associated with the footprint of the substation and the grid connection corridor are relatively small in extent compared to the proportion of untransformed habitat available in the area, and do not represent a fatal flaw that would prevent the proposed development from proceeding. A number of Red Data species, and species vulnerable to collisions with power lines exist in the area broader area of the proposed power line corridor and the impact of collisions to birds has a low significance even with the implementation of mitigation measures. Many existing power lines traverse the area, therefore most of the potential impacts already exist in and around the project site. The proposed grid connection corridor is therefore unlikely to significantly contribute to the negative impacts that already exist in the area and unlikely to have a significant negative impact on species of conservation concern or the functioning and goals of the IBA.

Appropriate bird flight diverters, or flappers should be attached to the full length of the proposed power line to increase its visibility. A recent study on the efficacy of line marking devices to reduce power line collision mortality for large terrestrial birds in the Karoo12 found that line markings, such as bird flight diverters (BFDs) reduced overall bird mortality by 51% and Blue Crane mortality by 92%, but was not effective for bustards. The study concluded that line marking should be widely deployed, but alternative mitigation measures are urgently required for bustards that are threatened all over the world by collisions. One mitigation measure that may reduce the probability of collisions includes the placement of novel overhead power lines adjacent and parallel to existing overhead power lines to increase the overall visibility of both lines, this may be more effective if the support pylons are placed in a staggered manner between those of the adjacent line. While a number of Red Data species, and species vulnerable to habitat destruction and displacement exist in the area of the proposed development, the relatively small size of the development footprint makes it highly unlikely that the proposed

development will have a significant negative impact on the avifauna in the area following the implementation of mitigation measures.

Conclusion of the Avifauna Impact Assessment

Overall, the impacts of the substation and grid connection are unlikely to generate significant negative impacts on avifauna, therefore from an avifaunal perspective the proposed project can be authorised if the recommendations and mitigation measures are implemented accordingly.

The access road falls within an area of low to very low avifaunal sensitivity and is therefore likely to result in insignificant negative impacts on the avifauna in the area and does not change the impact ratings determined by the Avifaunal Specialist Assessment. Considering the fact that the road is existing and will only be upgraded, the proposed access road is considered acceptable from an avifaunal perspective and can be approved following the implementation of relevant mitigation measures described in the Avifaunal Specialist Report.

4.3 Cultural / Historical Environment

4.3.1 Heritage Impact Assessment

A Heritage (including Archaeology) Impact Assessment was undertaken by CTS Heritage, represented by Ms Jenna Lavin and is attached under Appendix C(4)(a) and C(4)(b). The Palaeontological Impact Assessment was undertaken by Prof Marion Bamford and is included as Appendix C(4)(c). The key findings are summarised below.

4.3.2 Archaeological Specialist Study

Over 25 archaeological observations were made on Wag 'n Bietjie. Hornfels dominated the assemblages with smaller components of CCS and siltstones. While the vast majority of the scatters were made during the Middle Stone Age, there was also a relatively clear Later Stone Age presence in the study area. Many examples of blade forms were found which is typical of the Still Bay period (>70 000 years BP) and the neighbouring Vetlaagte farm was also surveyed whilst conducting an HIA for a similar solar PV facility there. Relatively dense Later Stone Age sites were found on the far eastern end of Wag 'n Bietjie and these date within the last 2000 years due to the presence of pottery in these sites.

The increasing density of material as one moved eastwards was probably due to the shortening distance from the Brakrivier which runs around Caroluspoort (4km northeast of Wag 'n Bietjie). This is the closest source of reliable water in the area.

Two sites warranted protection with an interesting scatter of Still Bay tools on top of a dolerite outcrop with excellent views of the surrounding area. It is highly unlikely this area will be developed and it is recommended that infrastructure is not placed on this outcrop. Another site was found warranting a IIB rating with pottery, bone and an extensive stone tool assemblage in amongst the dolerite outcrops on the eastern end of the property. Again, this site has been demarcated as sensitive and the project team has been advised to avoid this area when finalising the layouts. A minimum buffer of 100m is recommended from this site (Wag n Bietjie 014).

The rest of the observations are typical of the area and are ubiquitously distributed in low densities of less than 5 artefacts per observation.

Much of the archaeological material will be well conserved within a series of areas that can't be developed for the solar PV arrays while the flat, grassy plains that are ideal for the solar PV facilities are also the areas with the lowest archaeological sensitivity.

Conclusion of the Archaeological Impact Assessment

There is no objection to the proposed development in terms of impacts to heritage resources on condition that

- Alternative 1 for the MTS is preferred from a heritage perspective.
- A no-go development buffer of 30m is implemented around Site 004 and a no-go development buffer of 100m is implemented around Site 014.
- These heritage sites and their respective buffers should be indicated on site development maps during the construction phase of the project.
- During the construction phase of the project, contactors and labourers must be made aware of these sites and proper training provided regarding appropriate behaviour at archaeological sites must take place.
- During the operational phase of the project, relevant staff of the facility should be made aware of these sites and proper training provided regarding appropriate behaviour at archaeological sites must take place.
- Should any buried archaeological resources or human remains or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. The South African Heritage Resources Agency (SAHRA) must be contacted immediately in order to determine an appropriate way forward.

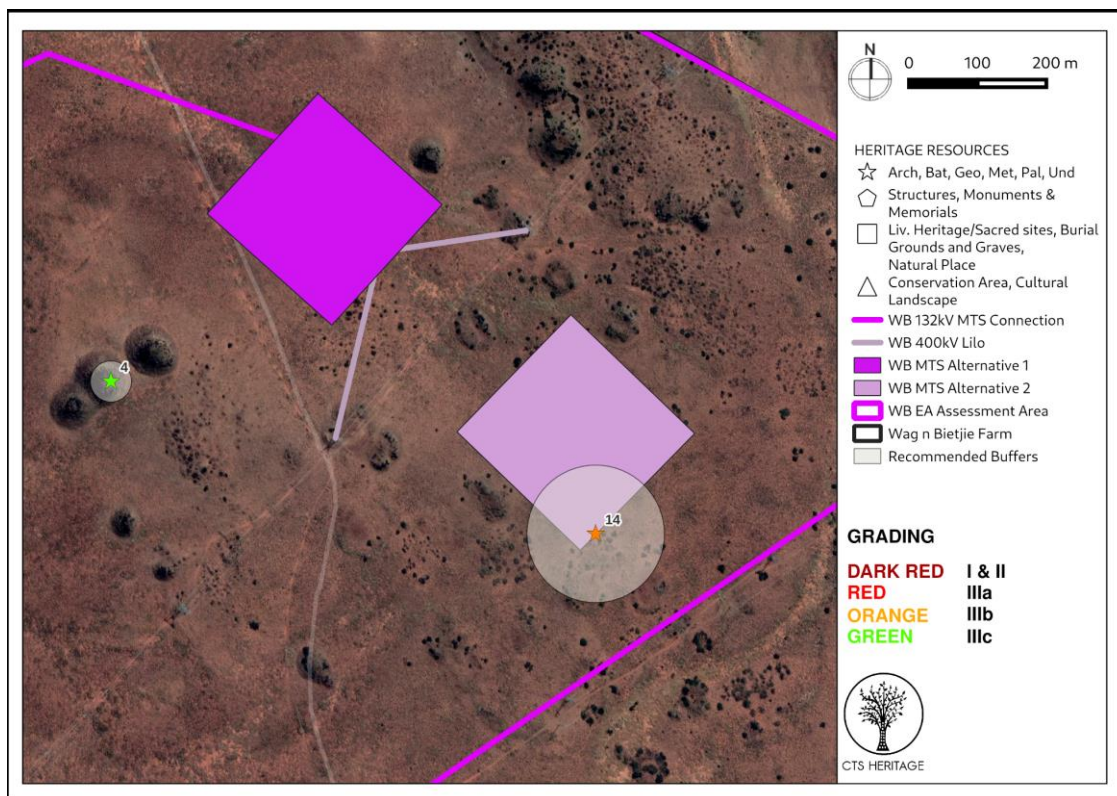


Figure 8 Heritage Sensitivity Map

4.3.3 Palaeontological Impact Assessment

The proposed sites and routes lie on the non-fossiliferous Jurassic dolerite, moderately sensitive Quaternary alluvium highly sensitive Tierberg Formation (Ecca Group, Karoo Supergroup, with plants and silicified wood fragments, and the very highly sensitive Adelaide Subgroup (Beaufort Group, Karoo Supergroup with possible vertebrate bones).

Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are the correct type and age to contain fossils. Taking account the defined criteria, the potential impact to fossil heritage resources is low. Based on the geology of the area and the palaeontological record it can be assumed that the formation and layout of the dolomites, sandstones, shales and sands are typical for the country and some do contain fossil plant, insect, invertebrate and vertebrate material. The sands of the Quaternary period would not preserve fossils and no fossils had been observed during the site visit undertaken by the heritage impact specialist. It is unknown what lies below the surface.

Based on experience, other reports undertaken in the macro area and the lack of any significant previously recorded fossils from the area, it is unlikely that any fossils would be preserved in the Tierberg Formation or Adelaide Subgroup.

Conclusion of the Paleontological Impact Assessment

No further palaeontological impact assessment is required unless fossils are found by the developer/environmental officer/other designated responsible person once excavations/drilling activities have commenced in which case the Chance Fossil Finds Procedure must be implemented for the duration of construction activities.

4.4 Combined Environmental Sensitivity Map

Also refer to Appendix B4 for a copy of the map.

This map confirms the following:

- The proposed MTS site and 400kV LiLo Powerlines are situated outside all environmentally sensitive components.
- The 132V powerline and proposed access road upgrade will cross the delineated watercourse with buffer zones. Water Use Authorisation is however required.

ENVIRONMENTAL SENSITIVITY MAP - Wag 'n Bietjie MTS Project
 (on the Remaining Extent of the Farm Wagt en Bittje No 5, De Aar, Northern Cape Province)

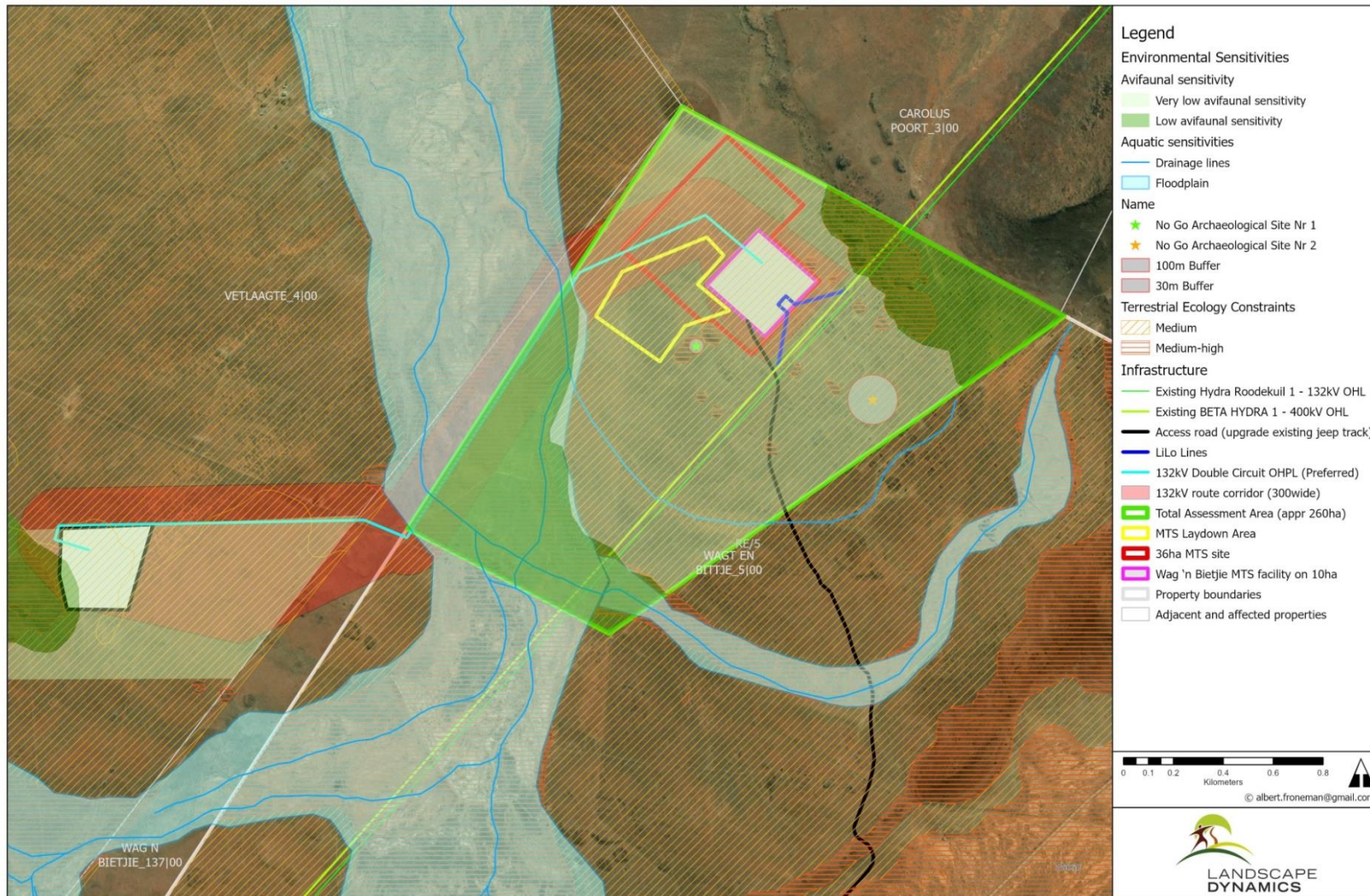


Figure 9 Combined Environmental Sensitivity Map

4.5 Hydrological Assessment and Outline of the Stormwater Management Plan

A *Hydrological Assessment & Storm Water Management Plan (SWMP)* was compiled by Matukane & Associates Consulting Engineers, represented by Mr Erik Pretorius, attached as Appendix C(6), and is summarised below.

This SWMP Report provided is not a design report; guidance is given to ensure compliance by the eventual design-implementation- and operational teams. The main objectives are

- To minimise risk of on site and / or downstream damage due to hydrological impact. This includes exposure to runoff associated with normal rain, as well as during more extreme flood events.
- To minimise the risk of on site and / or downstream contamination through storm water due to products and waste on site.
- It needs to consider the impact of rain on the site, the impact of water entering the site from higher ground and the impact of water leaving the site.

CHAPTER 5: PUBLIC PARTICIPATION

5.1 Objectives of the Public Participation Programme

The main aim of public participation is to ensure transparency throughout the EA application process. The objectives of public participation in this BAR are the following:

- To identify all potentially directly and indirectly affected stakeholders, government departments, municipalities and landowners;
- To communicate the proposed project in an objective manner with the aim to obtain informed input;
- To assist the Interested & Affected Parties (IAPs) with the identification of issues of concern, and providing suggestions for enhanced benefits and alternatives;
- To obtain the local knowledge and experience of IAPs;
- To ensure that all reasonable alternatives are identified for assessment.
- To communicate the proceedings and findings of the specialist studies;
- To ensure that informed comment is possible;
- To ensure that all concerns, comment and objections raised are appropriately and satisfactorily documented and addressed.

5.2 Public Participation Process Followed

All applicable public participation documentation is attached under Appendix D. The Public Participation Process followed was approved by DFFE on 13 December 2021.

The following actions were taken as part of the Public Participation Process

- *Landowner, Government Departments, Municipalities and other IAPs*
An IAP List was compiled which includes the directly affected landowners, adjacent landowners, municipalities, government departments and other applicable organisations. A Background Information Document, with a request for input was sent to everyone on 11 January 2022; a 30-day commenting period applied (refer to Appendix D for proof thereof).
- *Onsite notification*
Three A2 laminated onsite notices were placed on 19 October 2020 at the following places (refer to Appendix D for proof thereof):
 - At the northern fence of the Vetlaagte No 4.
 - At the southern entrance to the Vetlaagte No 4 in close proximity to the existing Hydra Main Transmission Substation
 - At the entrance to Wag en Bittjie Nr 5

- *Newspaper advertisement*
A newspaper advertisement was placed in a local newspaper, The Echo/Midland News and published on 28 January 2022 (refer to Appendix D for proof thereof).
- *Background Information Document*
A Background Information Document (BID) was distributed to everyone on the IAP Register for a 30-day commenting period (13 January 2022 – 14 February 2022) (refer to Appendix D for proof thereof).
- *Distribution of the Draft BAR*
The Draft BAR has been distributed as follows:
 - The Draft BAR has been distributed for a 30-day (excluding holidays) commenting period.
 - All IAPs have received an email with the Executive Summary and Draft BAR as an attachment. A link to the Draft BAR and all the Appendixes was made available on the Landscape Dynamics website (www.landscapedynamics.co.za) – detailed instructions on how to access these documents were provided in the said email. Where no e-mail addresses are available, notification letters with the Executive Summary of the Draft BAR attached were sent via registered post.
 - The Application Form together with the Draft BAR was submitted to the DFFE for comment via their online system.
- *Final BAR*
Comment received on the Draft BAR will be addressed in the Final BAR.

5.3 Communication during the Initial Advertising Period up to the Distribution of the BAR

A Background Information Document (BID) was distributed to all IAPs and a 30-day commenting period (11 Jan – 10 Feb 2022) applied.

Comment was received only from the following stakeholders:-

- ❖ Agri Northern Cape, received from the Manager Mr Petus Boshoff via e-mail on 11 January 2022.
- ❖ Transnet, from Ms Chantell Bruintjies, received from Rail Network Transnet Freight Rail via e-mail on 7 February 2022.
- ❖ The South African Civil Aviation Authority (CAA) from the Obstacle Inspector, PANS-OPS Section, received via e-mail on 12 January 2022.
- ❖ The South African Heritage Resources, from the Heritage Office, Ms Natasha Higgitt received via the SAHRIS website on 10 February 2022

Stakeholder	Comments with Responses from the EAPs
Agri Northern Cape	<p>The distribution of the BID email was sent to the Manager, Mr Petrus Boshoff. He forwarded the email to the following addresses nicoljansenn@gmail.com ontvangs@agrink.co.za and requested that the email be forwarded to the Chairperson.</p> <p>Response from Landscape Dynamics No further comment was received and the IAP Register was updated with the two emails as mentioned above.</p>

<p>Transnet</p>	<p>Ms Chantell Bruintjies forwarded the email to Vincent Matabane for his attention but no further comment from Transnet was received.</p> <p>Response from Landscape Dynamics The IAP Register was updated with Mr Matabane's contact details.</p>
<p>SA Civil Aviation Authority</p>	<p>SACAA is required to follow International Standards and Requirements in order to keep a database on <i>Obstacles</i> and it is therefore required to follow the Obstacle application process.</p> <p>There is a SACAA process whereby permission is applied for with regards to obstacles which could pose an aviation hazard.</p> <p>Response from Landscape Dynamics The Applicant confirmed that the CAA application process will be followed after the issuing of the EA but before construction commences. This stipulation is also included in the EMPr.</p>
<p>The South African Heritage Resources Agency</p>	<p>Interim comment (CaseID: 17776) was provided as follows:-</p> <ul style="list-style-type: none"> • The SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit notes the pending assessment of the impact to heritage resources to be undertaken as part of the BAR process and requests that the assessment comply with section 38(3) of the NHRA. The Heritage Impact Assessment (HIA) must contain a field-based archaeological component that must be conducted by a qualified archaeologist and the report comply with the SAHRA 2007 Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment Reports. • Furthermore, the proposed development is located within an area of very high, high and moderate Palaeontological Sensitivity as per the SAHRIS Palaeo-Sensitivity map. As such, a field-based Palaeontological Impact Assessment (PIA) must be undertaken by a qualified palaeontologist. The report must comply with the 2012 Minimum Standards: Palaeontological Components of Heritage Impact Assessments. • Any other heritage resources as defined in section 3 of the NHRA that may be impacted, such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewsapes must also be assessed. • Further comments will be issued upon receipt of the above reports and the draft BAR with all appendices. <p>Response from Landscape Dynamics Heritage Impact and Palaeontological Assessments were undertaken as per SAHRA requirement. These reports had been submitted with the Draft BAR for comment to SAHRA.</p>

Table 9 Comment received during the Initial Advertising Period

5.4 Comment received on the Draft Basic Assessment Report

All written comment received on the Draft BAR will be summarised and addressed in the Final BAR.

5.5 Conclusion of the Public Participation Programme

The main objective of the Public Participation Programme undertaken for this project was to identify a viable development site that is not only acceptable from an ecological point of view, but also from a landowner and public perspective.

Initial input received during the public participation process was taken into consideration when the final site and route was selected, which was pre-negotiated with the landowner and presented in this report.

A final conclusion of the Public Participation Programme will be made once the comment on the Draft BAR has been received.

CHAPTER 6: IMPACT ASSESSMENT & MITIGATION

6.1 Methods Used to Identify Impacts

Environmental issues and impacts have been identified through the following means:

- Evaluation and consideration of relevant existing environmental data and information;
- Review of the BAR reports of the authorised solar PV farms;
- Information as obtained from the specialists appointed for this project;
- Correspondence with Interested and Affected Parties, including directly affected landowners, general stakeholders and relevant authorities;
- Consultation with the EAP Team, supported by the Mulilo Project Team;
- The general knowledge and extensive experience of the Environmental Consultants in the field of Environmental Impact Assessments.

6.2 List of Impacts Associated with the Development

6.2.1 *Expected Negative Impacts*

Expected Negative Impacts

Planning and Design Phase

- Permanent loss of agricultural land
- Risk of failure of structures
- Risk of erosion
- Impact on terrestrial and aquatic habitat
- Impact on avifauna

Construction Phase

- Impact on natural habitat
- Impact on avifauna
- Impact on aquatic environment
- Impact on heritage resources
- Impact on palaeontological resources
- Risk of groundwater pollution
- Risk of erosion
- Impact of an uncontrolled labour force
- Noise and dust (air quality)

Post- Construction / Operational Phase

- Continuous impact on natural habitat
- Impact on avifauna

- Impact on aquatic environment
- Risk of erosion
- Continuous risk of groundwater pollution

6.2.2 Expected Positive Impacts

- The need for this project relates directly to the need for new renewable energy projects in South Africa. This project will assist directly with reducing current generation capacity constraints in the country. The proposed electrical infrastructure associated with the Wag 'n Bietjie Project (400kV MTS and associated power lines) outside the town of De Aar in the Northern Cape, will connect the electricity generated from a number of authorised solar PV farms as well as other renewable energy projects within the macro area, to the Eskom national grid.
- The existing Eskom Hydra MTS does not have enough capacity to fulfil the requirement off connecting all the electricity generated by numerous existing, planned and approved renewable energy developments to the national grid. Without the proposed electrical infrastructure it will not be possible for new renewable projects to connect to the national grid in the De Aar area.
- All the advantages of additional, clean, renewable electrical supply to the national Eskom grid will be realised. An opportunity to reduce South Africa's very high carbon emissions will be utilised.
- Employment and business opportunities with the opportunity for skills development and on-site training will be created through the establishment of the Wag 'n Bietjie MTS and associated powerlines mostly during the construction phase.

6.2.3 Cumulative impact

Cumulative impacts of a development may become significant if seen in context with impacts that emanates from other developments within the macro area.

The potential cumulative impacts for this project should be considered together with the potential impacts associated with the exiting, approved and planned renewable energy facilities and associated infrastructure in the macro area. The cumulative impact of additional electrical structures that this project may cause is considered to be low/negligible – this was also confirmed during the assessments made by the specialists appointed for this project. It is therefore concluded that the addition of the electrical infrastructure as proposed will have a minimal cumulative impact within the area.

6.3 Generic Eskom Environmental Management Programme (EMPr)

On 22 March 2019 a *Generic Environmental Management Programme* was promulgated in terms of Section 24 of NEMA and gazetted as Government Notice No 435. This EMPr is applicable where application is made for Environmental Authorisation for substations and overhead electricity transmission and distribution infrastructure as identified in terms of

- Activity 11 or 47 of EIA Regulations Listing Notice 1 of 2014, as amended, or for
- Activity 9 of EIA Regulations Listing Notice 2 of 2014, as amended;
- and any other listed and specified activities necessary for the realisation of such infrastructure.

The EMPr which forms part of the Basic Assessment Report is a legally binding document and contains general as well as site specific mitigation measures / management actions to lessen the impact that this development may have on the environment.

In order to prevent duplication between the Impact Assessment Tables as given below and the mitigation measures / management actions as provided in the EMPr (it is a 131 page document), reference will be made to the generic EMPr where the mentioned impacts are being addressed.

Site specific mitigation measures are provided in Appendix E(2) of the EMPr.

6.4 Environmental Impact Assessment

The Environmental Impact Assessment Tables include descriptions of expected impacts on the different environmental components as well as proposed mitigation measures / management actions to minimise those impacts to acceptable levels. These mitigation measures are also included in the EMPr.

6.4.1 Methodology Used in Ranking of Impacts

Impacts are evaluated and assessed in terms of the following criteria:

Extent of impact	Explanation of extent
Site	Impacts limited to construction site and direct surrounding area
Local	Impacts affecting environmental elements within the local area / district
Regional	Impacts affecting environmental elements within the province
National	Impacts affecting environmental elements on a national level

Duration of impact	Explanation of duration
Short term	0 - 5 years. The impact is reversible in less than 5 years.
Medium term	5 - 15 years. The impact is reversible in less than 15 years.
Long term	>15 years, but where the impacts will cease if the project is decommissioned
Permanent	The impact will continue indefinitely and is irreversible.

Probability of impact	Explanation of Probability
Unlikely	The chance of the impact occurring is extremely low
Possible	The impact may occur
Probable	The impact will very likely occur
Definite	Impact will certainly occur

Reversibility of impact	Explanation of Reversibility Ratings
Low	The affected environment will not be able to recover from the impact - permanently modified
Medium	The affected environment will only recover from the impact with significant intervention
High	The affected environmental will be able to recover from the impact

Significance of impact	Explanation of Significance
None	There is no impact at all
Low	Impact is negligible or is of a low order and is likely to have little real effect
Moderate	Impact is real but not substantial
High	Impact is substantial
Very high	Impact is very high and can therefore influence the viability of the project

DESIGN AND PRE-CONSTRUCTION PHASE

PERMANENT LOSS OF AGRICULTURAL LAND

Impact Description

Land currently zoned “agriculture” will be lost for future farming practices. The impact should be considered in context with the following:

- Grazing of both sheep and game is the dominant agricultural land use in the area. Grazing capacity of the site is fairly low at 20 hectares per large stock unit.
- There is no cultivation in or near the project site and the surrounding area is confined to small, isolated patches of pasture or fodder crops around farmsteads.
- Overhead transmission lines have no agricultural impact because all agricultural activities that are viable in this environment, can continue completely unhindered underneath powerlines.
- The direct, permanent, physical footprint of the development that has any potential to interfere with agriculture, is significantly small within an agricultural environment of large farms with low density grazing. The total MTS site of 36ha te itself will involve 10ha
- The affected land has very limited agricultural potential. The proposed development will have insignificant agricultural impact and should therefore be acceptable in terms of its impact on the agricultural production capability of the site.
- The only sources of impact are the loss of 36 hectares of grazing land and minimal disturbance to the land (erosion and topsoil loss) during construction and decommissioning. Land disturbance can be completely and fairly easily mitigated through generic mitigation measures.

Cumulative impact description

- The agricultural impact and the amount of agricultural land loss resulting from the proposed development is totally insignificant in the context of the agricultural environment.
- The cumulative impact of loss of agricultural land use can confidently be labelled as insignificant and not having an unacceptable negative impact on the agricultural production capability of the area.
- In terms of cumulative impact, the proposed development is acceptable and it is therefore recommended that it be approved.

Mitigation

- Specific mitigation measures to address erosion and topsoil loss are provided under the heading below Risk for erosion.
- Refer to the generic EMPr for general measures to address erosion and prevent loss of topsoil.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Permanent loss of agricultural land	Site	Permanent	Definite	Low	Low	Low

<p>Impact on Irreplaceable Resources <i>(after mitigation)</i></p> <p>If yes, please explain</p> <p>The loss of agriculture is permanent, but when considered on light of the low agricultural potential of the land, the impact is insignificant.</p>	Yes	NO
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<p>Cumulative impact rating <i>(after mitigation)</i></p> <p>If high, please explain</p>	Low	Medium	High
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RISK OF FAILURE OF STRUCTURES

Impact Description

Poor design and non-compliance with relevant legal requirement will result in structural failures and subsequent leaks with resultant negative impact that include:

- electrocution of personnel
- veld fires
- damage to property
- groundwater pollution

This impact is associated with the MTS; the diesel storage facility as well as the construction of the powerlines and the road upgrade.

Cumulative impact description

- Impact will be severe if any personnel member is electrocuted as a result of negligence and/or structural failure.
- Impact could be significant since it could extend to adjacent properties (i.e. veld fires) and could cause damage to other solar facilities and farm structures and the macro area in terms of disruption of electricity supply.
- Failure of the diesel tank installation will cause groundwater pollution.

Mitigation

- Continuous communication should take place with Eskom to ensure compliance with their most recent policies, design standards and specifications. The following Eskom policies must be adhered to and compliance must form part of the conditions of the EMPr :
 - Renewable Energy Generation Plant Setbacks to Eskom Infrastructure, dated 15 September 2020
 - Standard Eskom requirements for work in or near Eskom servitudes
 - LES and SE inputs for new substations to IPP requirement, dated 3 March 2022
- The approved substation site should be 600m x 600m (36 hectares) to allow best for future expansion.
- A Safety Officer must be appointed to ensure compliance with the Occupational Health and Safety Act, No 181 of 1993, as amended (Responsibilities must include the provision of Personal Protective Equipment, the undertaking of safety inspections, safety awareness training, etc.)
- A Fire Management Plan must be compiled.

Diesel Storage Facility (Design considerations)-

- Compliance with SANS 10089-1:2008; Part 1: Storage and distribution of petroleum products in above-ground installations must be done.
- Provision must be made for a thick reinforced concrete spillage containment slab laid to fall to a catch pit connected to an oil/grease separator
- The storage tank must be fully contained within the bunded area to contain spillage of hydrocarbons and contaminated rainwater and prevent the ingress of hydrocarbon spillages and contaminated rainwater into the ground or surface water.
- Spillages from the tank bund must be retained and released in a controlled manner to an oil separator.
- Allowance must be made for the removal of hazardous substances to an appropriate waste facility.
- Spillages of hydrocarbons and contaminated water must be collected from the following areas :
 - Diesel tank bunded area
 - Product receiving station and receiving pipelines
 - Vehicle servicing area
- Hydrocarbon (oil, diesel, petrol) waste as well as hydrocarbon containing material must be regarded as hazardous waste and separated from general waste.
- All hazardous substances at the site must be adequately stored and accurately identified, recorded and labelled prior to removal to a registered hazardous waste facility.

Geotechnical Studies

A geotechnical study must be undertaken to confirm the geotechnical constraints associated with the site. Appropriate specifications in terms of materials and foundations must be provided to inform the detail design of the MTS facility. Specific requirement in terms of pylon positions and foundations must also be supplied for both the LiLo and the 132kV powerlines.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Risk of failure of structures	Local	Short Term	Possible	High	Medium to Very High	Low

Impact on Irreplaceable Resources (after mitigation) If yes, please explain	Yes	NO
Cumulative impact rating (after mitigation) If high, please explain	LOW	Medium High

RISK OF EROSION TO BE ADDRESSED DURING THE DESIGN PHASE

Impact Description

- It is necessary to ensure that measures are in place to prevent uncontrolled stormwater with subsequent erosion causing damage to electrical infrastructure and roads and a loss of soil.
- The proposed development area is situated close to the top of the sub-catchment near the watershed. The site is mostly subjected to accumulated flood water originating mostly from precipitation on the site.
- Surface flood water in such flat areas drains slowly and is prone to ponding. Ponding water can be harmful to infrastructure and detrimental to operations.
- Appropriate onsite drainage is required in context with the following:
 - High value of MTS infrastructure.
 - The severe consequences in not reaching operational targets and the potential of oncontractual penalties and loss of income.
 - The strategic importance of power supply into the Eskom distribution network.
- Poor stormwater planning where trucks are serviced and diesel is stored could result in groundwater contamination.

Cumulative impact description

The development footprint is small relatively small compared to the approved Du Plessis Dam Solar PV and the other renewable energy projects in the macro area and the cumulative impact is therefore expected to be of low/negligible significance.

Mitigation

General mitigation measures

- The plan must generally ensure the following :
 - Compliance with applicable regulations
 - Implementation of appropriate design measures that will allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows.
 - Drainage measures must promote the dissipation of stormwater run-off.
 - Prevent off-site migration of contaminated storm water or increased soil erosion.
 - Contaminated stormwater must be separated from general stormwater.

Specific mitigation measures proposed for the Wag 'n Bietjies 400kV MTS Project

- Prior to the detailed design stage and implementation, a physical high resolution topographical survey needs to be conducted. Based on this, the development site drainage needs to be designed on this elevation basis, with the full consideration of the final infrastructure layout on site. The final infrastructural layout and drainage design mutually impact on each other and will therefore be an iterative process.
- The Stormwater Management Plan must specifically address the MTS Site; the diesel storage facility and the upgrade of the existing access gravel road.
- Where practically feasible, the design and construction of cut-off trenches and outlet drains is recommended to prevent water from higher ground to flow onto the site. Cut-off trenches should run approximately parallel to the upper contour onsite.
- Allowance must be made in the design to approximately equal the concentration time under natural conditions to minimise the flow impact downstream.
- It is proposed that a cut-off drainage furrow be constructed on the south-eastern boundary of the MTS site to prevent water from outside to flow onto the development site. The site will then not be subjected to flooding from any higher land.
- It is recommended that suitable diversion canals be installed as required approximately parallel to contours to lead accumulated water out from the site.
- Diverted flow must be disposed of into a flood channel (drainage line) in such a way that the energy is dissipated suitably to prevent erosion or the deposit of suspended material at the disposal point.
- The on-site systems must be carefully designed using contour following canals and storm water canals, in order to follow natural flow patterns in such a way that :
 - Flood water within the limits of 1:100-year floods are contained.
 - Erosion is prevented.
 - Infrastructural damage is prevented.

- To limit future maintenance cost, the on-site drainage canal slope and profile must be designed in such a way that neither erosion of the trenches nor the deposit of material occurs.
- It is recommended that only the essential portion of land be cleared of vegetation. Vegetation, even though sparse, serves a very important function to limit erosion through the dissipation of energy as physical objects in the flow path, and by their roots binding the soil.
- At all points where transmission lines and associated service roads traverse streams, Water Use Licencing in terms of Section 21c) of the National Water Act is compulsory. The essence of these is to install sufficient mitigation measures to ensure that the integrity of any such downstream areas of the relevant drainage lines is not affected adversely.
- The stormwater management plan must specifically ensure that contaminated water from the vehicle servicing area and diesel storage facility is separated from the general stormwater. Untreated contaminated water may not be allowed to be disposed of onto adjacent land.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Risk of erosion	Site	Short term	Possible	High	Moderate	Low

Impact on Irreplaceable Resources (<i>after mitigation</i>) If yes, please explain	Yes	NO
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Cumulative impact rating (<i>after mitigation</i>) If high, please explain	NONE	Medium	High
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IMPACT ON TERRESTRIAL AND AQUATIC HABITAT TO BE ADDRESSED DURING THE DESIGN & PRE-CONSTRUCTION PHASE

Impact Description

In order to ensure that the proposed project is developed in an environmental sustainable manner, it is necessary to identify means to implement the EMPr, provide guidelines/specifications in terms of the design and compile relevant managements plan(s). etc. These measures must be implemented prior to commencement of construction to ensure effective implementation of the Environmental Authorisation and the EMPr. Without the implementation of these measures impact could be moderate to high.

Cumulative impact description

None for the design phase.

Mitigation

Water Use Authorisation

Because disturbance will take place within the relevant delineated watercourses; Section 21(c) and 21(i) of the NWA are triggered. Water Use Authorisation must be obtained. The aquatic specialist confirmed that General Authorisation (GA) will be applicable. This GA is only required for the 132kV powerline and the upgrade of the existing access road where it cross the delineated watercourse with buffer zones.

Appointment of Contractors

- The EA, Generic EMPR and the Site Specific EMPR must form part of the tender documents.

Appointment of an Environmental Control Officer

- To be responsible to monitor that all requirements in terms of the Site-Specific and Generic EMPR are implemented during the construction phase.
- The ECO must confirm that all requirement as per the Environmental Authorisation is adhered to, i.e. actions required prior to commencement of construction.
- To ensure Environmental Awareness Training takes place.

Demarcation of areas

Clear demarcation must take place by method to be determined between the ECO and the Contractor of the following areas:

- Laydown Area
- Two heritage sites with buffer zones as per heritage impact study.
- The outside boundaries of the buffer zones of the delineated watercourse where it will be affected by the 132kV Powerline and the access road upgrade.

Alien Invasive Management

Appoint an ecologist to compile an Alien Invasive Management Plan for implementation during the construction and the operation phases of the project.

Habitat Restoration/Rehabilitation Plan

Appoint an ecologist to compile a Habitat Restoration/Rehabilitation Plan for implementation before the end of the construction phase, prior to the operational phase.

Project Site Layout

The project site layout as proposed which was guided by the Combined Environmental Sensitivity Map (included I Appendix B(4) of the BAR may not be amended without appropriate consideration of relevant environmental (ecological & heritage) sensitivities and relevant approvals.

No development is allowed within the two identified heritage sites with their recommended buffers.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Terrestrial and Aquatic Habitat	Site	Short term	Possible	High	Moderate	Low

Impact on Irreplaceable Resources (after mitigation) If yes, please explain	Yes	NO
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Cumulative impact rating (after mitigation) If high, please explain	NONE	Medium	High
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IMPACT ON AVIFAUNA TO BE ADDRESSED DURING THE DESIGN PHASE

Impact Description

The key impacts associated with powerlines and birds which must be integrated with the design of the structures are mortalities resulting from electrocution and collisions during the operational phase of the project.

Cumulative impact description

The development footprint is relatively small compared to other renewable energy projects in the macro area and the cumulative impact is therefore expected to be of low/negligible significance.

Mitigation

The engineering design of the powerlines must accommodate the following:

- The most appropriate and up-to-date marking devices must be selected in consultation with the Endangered Wildlife Trust (EWT) Wildlife and Energy Programme.
- Appropriate marking devices must be attached on all spans of all new power lines in accordance with installation guidelines to increase visibility.
- The pylons to be constructed must have bird deterrent devices mounted on relevant parts of the structure where necessary to reduce the chances of electrocution.

- Pylon positions of the proposed lines should be staggered between the pylon positions of the existing, adjacent overhead power line where practically possible to increase visibility of both lines to flying birds.
- Perimeter or security fences should be spaced a minimum of 2.5m apart if double-layered fencing is installed to prevent entrapment of larger bodied birds that may find themselves between the fences.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Impact on Avifauna to address during the design phase	Local	Permanent	Possible	Medium	Moderate	Low

Impact on Irreplaceable Resources (<i>after mitigation</i>) If yes, please explain	Yes	NO
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Cumulative impact rating (<i>after mitigation</i>) If high, please explain	NONE	Medium	High
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CONSTRUCTION PHASE

IMPACT ON NATURAL HABITAT DURING THE CONSTRUCTION PHASE

Impact description

Loss of habitat due to clearing:

- Loss of natural habitat
- Loss of individuals of protected trees, protected plants or other listed species
- Loss of faunal habitat

Cumulative impact description

- Cumulative loss of habitat due to all project components
- Cumulative loss of individuals of listed and protected plant and tree species due to all project components
- Cumulative loss of individuals or habitat of sensitive fauna species due to all project components

Mitigation

- Minimise vegetation clearing and disturbance to footprint areas only.
- Compile a rehabilitation programme and rehabilitate disturbed areas.
- Compile and implement Alien Invasive Management Plan.
- Limit access to sensitive areas during construction.
- Undertake monitoring to evaluate whether further measures are required.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Loss of natural habitat due to clearing	Site	Permanent	Definite	Low	Moderate	Moderate
Loss of individuals of protected trees, protected plants or other	Site	Medium	Possible	Medium	Low	Low

listed species						
Loss of faunal habitat	Site	Medium	Possible	Medium	Low	Low
Impact on Irreplaceable Resources (<i>after</i> mitigation) If yes, please explain					Yes	NO
Cumulative impact rating (<i>after</i> mitigation) If high, please explain			LOW	MEDIUM (loss of habitat)	High	

IMPACT ON AVIFAUNA DURING THE CONSTRUCTION PHASE

Impact Description

Impact 1: Habitat destruction during construction

- The clearing of vegetation will result in the permanent loss of habitats for birds.
- There will also be temporary loss of habitats (that may be rehabilitated following construction) for the construction of access roads and construction camps/laydown areas etc.
- This may have an impact on birds breeding, foraging and roosting, and may also result in species being displaced, from the immediate area.

Impact 2: Disturbance and displacement during construction

Disturbances and noise from staff and construction activities can impact on certain sensitive species, both on and beyond the project site, particularly whilst feeding and breeding. This may result in these species being displaced, either temporarily (i.e. for some period during the construction activity) or permanently (i.e. they are disturbed and do not return), from the project site.

Mitigation :

Habitat destruction

- Existing roads should be used where possible. The minimum footprint areas of infrastructure should be used wherever possible;
- Infrastructure should be placed in areas with the lowest sensitivity ratings where practically possible;
- Temporary access roads should be kept to a minimum in order to limit direct vegetation loss and habitat fragmentation, and all vehicles should adhere to clearly defined and demarcated roads, no off-road driving should be allowed;
- A site-specific Construction Environmental Management Plan ('CEMP') must be implemented, which gives appropriate and detailed description of how construction activities must be conducted to reduce unnecessary destruction of habitat. All contractors are to adhere to the CEMP and should apply good environmental practice during construction; and

Following construction, rehabilitation of all areas disturbed (e.g. temporary access tracks and laydown areas) must be undertaken and to this end a habitat restoration plan is to be included within the CEMP.

Disturbance and displacement during construction

- A Site-specific CEMP must be implemented, which gives appropriate and detailed description of how construction activities must be conducted to reduce unnecessary destruction of habitat. All contractors are to adhere to the CEMP and should apply good environmental practice during construction;
- The appointed ECO must be trained by an avifaunal specialist to identify the potential Red Data species as well as the signs that indicate possible breeding by these species. The ECO must then, during his/her regular audits/site visits, make a concerted effort to look out for breeding activities of Red Data species, and such effort may include the training of construction staff (e.g. in Toolbox talks) to identify Red Data species, followed by regular questioning of staff as to the regular whereabouts on site of these species; and
- If any of the Red Data species are confirmed to be breeding (e.g. if a nest site is found) within 500 m of construction activities, an avifaunal specialist is to be contacted and called to site immediately for further assessment of the situation and instruction on how to proceed.

Cumulative Impact Description

A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other nearby activities as a result of the proposed development. The cumulative impact of habitat

destruction was considered together with habitat destruction associated with the approved Vetlaagte solar PV facilities nearby as well as other renewable energy facilities in the broader area. Two operational wind energy facilities occur in the vicinity, Longyuan Mulilo De Aar 1 Wind Energy Facility (100MW), located approximately 13 km west of the project site, and Longyuan Mulilo De Aar 2 North Wind Energy Facility (140MW) located approximately 20 km to the north. All of these consist of additional electrical infrastructure including facility substations and power lines. There is also at least one other proposed wind energy facility nearby (e.g. Zingesele WEF).

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Habitat destruction	Site	Long Term	Definite	High	Moderate	Low
Disturbance and displacement	Site	Short term-permanent	Probable	High	Moderate	Low

Impact on Irreplaceable Resources (after mitigation)	YES	NO
<p><u>Habitat destruction</u> During the construction phase of the substation, some habitat destruction and alteration inevitably takes place. However, the habitats associated with the development footprint can be rehabilitated.</p> <p><u>Disturbance and displacement</u> As the species likely to be disturbed and displaced have suitable habitat beyond the project site, the cumulative impact of disturbance and displacement of birds is therefore expected to be of Low significance.</p>	YES	NO

Cumulative impact rating (after mitigation)	LOW	Medium	High
<p>Much of the cumulative impact risk already exists in the area and it is unlikely that the proposed development will significantly contribute to the negative impact on bird habitat. The development footprint is relatively small and the habitats present are widespread in the area and not unique to the site. Therefore the cumulative impact of habitat destruction is therefore expected to be of Low significance.</p>	LOW	Medium	High

IMPACT ON AQUATIC HABITAT DURING THE CONSTRUCTION PHASE

Impact Description

Degradation of the ecological condition of aquatic ecosystems and water quality impacts:-

Construction of the Main Transmission Substation, Loop in Loop out powerlines and the OHPL will require disturbance of the surface area and removal of vegetation cover for clearing and preparation of the various project component footprints at each of the sites. The construction of some of the OHPL pylons will be within the wide floodplain of the Brak River Tributary and will have the largest potential impact for the project but if located within already disturbed areas where there is existing structures or disturbance, the potential impact would be reduced to being of low significance.

Only a limited amount of water is utilised during construction for the batching of cement for the construction activities. Concrete foundations will need to be constructed. A construction camp with a temporary laydown area and the concrete batching plant would likely need to be placed within the site for the construction works. There is thus also the potential for some water quality impacts associated with the batching of concrete, from hydrocarbon spills or associated with the other construction activities on the site. The location of the substation alternatives and other works are located sufficiently far from the delineated aquatic features that they do not pose any significant risk to the aquatic features

Cumulative impact description

Degradation of the ecological condition of aquatic ecosystems

Mitigation

Wag 'n Bietjie 400kV MTS Project

DRAFT BASIC ASSESSMENT REPORT

Compiled by Landscape Dynamics Environmental Consultants, June 2022

- The recommended buffers of between 30m and 50m between the delineated aquatic ecosystems and all the proposed project activities should be maintained. Any works within the aquatic features should be within existing disturbed areas.
- Clearing of indigenous vegetation should not take place within the aquatic features and the recommended buffers.
- The existing road infrastructure to access new infrastructure should be utilised as far as possible to minimise the overall disturbance.
- During the construction phase, site management must be undertaken at the laydown and construction sites. This should specifically address on-site stormwater management and prevention of pollution measures from any potential pollution sources during construction activities such as hydrocarbon spills.
- Any stormwater that does arise within the construction sites must be handled appropriately to trap sediments and reduce flow velocities.
- The conditions of the Water Use Authorisation must form part of the EMPR.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
<u>132kV Powerline</u> Disturbance of aquatic habitat; water quality impacts	Site	Short term	Possible	High	Low	Low
<u>MTS Site & LiLo</u> Disturbance of aquatic habitat; water quality impacts	site	Short	Unlikely	High	Low	None

Impact on Irreplaceable Resources (after mitigation) If yes, please explain	Yes	NO
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Cumulative impact rating (after mitigation) If high, please explain	VERY LOW TO NONE	Medium	High
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IMPACT ON HERITAGE RESOURCES DURING THE CONSTRUCTION PHASE

Impact Description

26 archaeological sites of low scientific significance were identified within the area proposed for development. Two heritage resources of significance were identified and may be impacted.

Cumulative impact description

Destruction or negative impact to significant archaeological heritage

Mitigation

- A no-go development buffer of 30m is implemented around Site 004 and a no-go development buffer of 100m is implemented around Site 014 – refer to the table below. These sites and their respective buffers should be indicated on site development maps and must be managed as No Go areas.
- Furthermore, during the operational phase of the projects, relevant staff of the facility should be made aware of these sites and proper training provided regarding appropriate behaviour at archaeological sites.

Detail of heritage sites to protect

Site name	Description	Coordinates	Mitigation
Wag 'n Bietjie 004	Still bay point, blades, hornfels, burnt bone, on top of dolerite outcrop with good views	-30.68097 & 24.11972	30m No Go Buffer
Wag 'n Bietjie 014	LSA and MSA site with mainly LSA hornfels flakes and pottery	-30.68296 24.12708	100m No Go Buffer

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Impact on archaeology	Site	Permanent	Possible	Low	Moderate	Low

Impact on Irreplaceable Resources (after mitigation) If yes, please explain Artefacts cannot be repaired or replaced but their loss is inconsequential in heritage terms.	YES	No
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Cumulative impact rating (after mitigation) If high, please explain	LOW	Medium	High
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IMPACT ON PALAEOLOGICAL RESOURCES DURING THE CONSTRUCTION PHASE

Impact Description

It is possible that palaeontological resources may be impacted by the proposed development. Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are the correct age and type to preserve fossils. Since there is a small chance that fossils may be disturbed a Fossil Chance Find Protocol is recommended. Taking account of the defined criteria, the potential impact to fossil heritage resources is extremely low.

Cumulative impact description

Destruction or negative impact to significant palaeontological heritage within the macro area.

Mitigation

Should fossils be discovered by the contractor, developer, environmental control officer or other designated responsible person once excavations for foundations have commenced, a palaeontologist should be called to assess and collect a representative sample.

The Chance Fossil Finds Procedure is required only if fossils are observed on the surface and when drilling/excavations commence.

The **Chance Fossil Finds Procedure** must be implemented during the course of construction activities:

- When excavations begin underground rocks are exposed, the rocks must be given a cursory inspection by the ECO (or other designated person). Any fossiliferous material (plants, insects, bone, coal, tracks, plant impressions) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
- Photographs of similar fossils are provided under Appendix C of the EMPR to assist in recognising the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones.
- Photographs of the putative fossils must be sent to a palaeontologist for a preliminary assessment.
- If the above-mentioned palaeontologist found any possible fossil material, a qualified palaeontologist should visit the site to inspect the selected material and check the dumps where feasible.
- Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
- If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
- If no fossils are found and the excavations have finished then no further monitoring is required.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
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Impact on Palaeontological Resources	Site	Permanent	Possible	Low	Moderate	None
Impact on Irreplaceable Resources (after mitigation) If yes, please explain					Yes	NO
Cumulative impact rating (after mitigation) If high, please explain				LOW	Medium	High

RISK OF GROUNDWATER POLLUTION DURING THE CONSTRUCTION PHASE

Impact Description

- The risk for groundwater pollution during the construction period is generally associated with oil spills resulting from construction vehicles and placement of engineering structure.
- Poor waste management could result in unnecessary impact on groundwater and natural habitat.
- Should ineffective construction techniques and methods be used, it could lead the structural failure with associated risk to the environment.
- Increased risk for soil, groundwater and surface water pollution results mostly from poor waste management.
- Increased risk for spillages – associated with construction activities, maintenance and repair of vehicles, etc.

Cumulative impact description

Not applicable

Mitigation

Strict measures must be implemented :

- Emergency incident reporting and remedial measures must be in place.
- Adequate oil containment precautions must be taken.
- A bio-remediation contractor must be appointed to rehabilitate large oil spills. The regional officer of the Department of Water & Sanitation will advise in this regard.
- Small oil spills must be cleaned immediately with an oil spill kit.
- Proper maintenance procedures for vehicles and equipment must be followed.
- Servicing of vehicles may only take place in designated areas, in this case on a concrete surface within the switching station site.
- Drip trays should be used during the servicing of vehicles. The content thereof must be disposed in accordance with relevant hazardous material disposal requirement.
- Measures to contain accidental spills must be readily available on site (spill kits).
- All hazardous substance spills must be reported to the Contractor and the ECO, recorded and investigated.

Waste Management Procedures must include the following:-

- General household waste (i.e. strict control over labourers; no burning or burying of waste; provision of dustbin and garbage bags; regular removal preferably by municipal waste removal; etc.)
- Construction waste (i.e. stringent daily clean-up and either disposal at registered waste site or preferably sold for recycling purposes)
- Sewage waste (labourers to be provided with proper ablution facilities- chemical toilets must be provided and serviced by a reputable outside company; no effluent to be dumped on adjacent land). Written proof of servicing of the chemical toilets must be obtained and kept on site in the ECO file.
- Hazardous waste (i.e. oil contaminated waste to be moved to registered hazardous waste landfill site; adequate storage and labelling of hazardous materials on site). Stormwater should not be discharged into the working areas and it should be ensured that stormwater leaving the footprint of the proposed development areas is not contaminated by any substance, whether that substance is solid, liquid, vapour or any combination thereof. Way slips or written proof of disposal at an appropriately registered waste facility must be obtained and kept on site in die ECO File.
- Refer to the *Generic EMP*

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Risk of groundwater pollution	Local	Medium	Possible	High	Moderate	Low
Impact on Irreplaceable Resources (after mitigation) If yes, please explain					Yes	NO
Cumulative impact rating (after mitigation) If high, please explain				LOW	Medium	High

RISK OF EROSION DURING THE CONSTRUCTION PHASE

Impact Description

- To cause the loss of soil by erosion is an offence under the Soil Conservation Act, Act No 76 of 1969.
- The impact will occur where large areas of land are exposed and where stormwater is allowed to cascade freely across the site.
- Construction vehicles and insufficient construction roads could also result in erosion.

Cumulative impact description

Medium (erosion may spread), however the application of mitigation measures will minimise this impact to acceptable levels.

Mitigation

- It is recommended that access and service roads, as well as stormwater systems are constructed at the commencement of the construction phase to ensure that suitable stormwater management measures are in place at the least additional cost.
- These permanent routes must be used also for construction purposes. In order to preserve the natural state of the surface and vegetation as far as practically possible, off-road driving should be restricted to the absolute essential.
- Space for lay-down areas for construction material and for construction facilities is restricted on site. The flowing should however be taken into account:
 - Temporary or permanent soil stockpiles should be placed in such a way to minimize the impact on surface flow.
 - High resolution site survey data must be used to design stormwater ditches to direct surface flood water past any stockpiles.
- Site clearing should be limited to the essential.
- Construction waste must be collected and stored safely for disposal in accordance with the relevant waste regulations, protocols, and product specifications.
- Care must be taken not to leave any waste on site that can lead to future contamination of the site or the downstream area.
- Training with regards to stormwater management of construction personnel must be undertaken as part of their induction.
- Refer to the *Generic EMP*

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Increased risk of erosion	Local	Medium	Possible	High	Moderate	Low

Impact on Irreplaceable Resources (after mitigation) If yes, please explain	Yes	NO
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Cumulative impact rating (after mitigation) If high, please explain	LOW	Medium	High
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IMPACT OF AN UNCONTROLLED LABOUR FORCE

Impact Description

- An influx of workers could result in an increased risk for crime and safety to the adjacent landowners.
- Uncontrolled labourers would cause disturbance to and destruction of natural habitat i.e. through placement of snares, cutting

trees of firewood, etc.

- Damage to the farmers' property can have a severe economic as well as environmental impact.

Cumulative impact description

When seen in context with other developments within the area, the cumulative impact could be significant severe. However, when mitigation measures have been applied the impact will be reduced to acceptable levels.

Mitigation

- Labourers should be trained in general principles of environmental awareness by the ECO that includes the following :
 - Removal of agricultural products is prohibited.
 - No plants may be collected.
 - No firewood may be collected.
 - No open fires are to be made.
 - No wandering on adjacent properties is allowed.
 - No access to the watercourse areas is allowed.
 - No watercourse may be used for any purpose (i.e. drinking water, washing, laundry, etc.)
 - The veld may not be used for any toilet needs.
 - Secure accommodation facilities must be provided for guarding personnel (if applicable).
 - Supervision of labourers must at all times take place.
- Also refer to the *Generic EMPr*

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Uncontrolled labour force	Local	Short	Possible	High	Moderate	Low

Impact on Irreplaceable Resources (after mitigation) If yes, please explain	Yes	NO
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Cumulative impact rating (after mitigation) If high, please explain	LOW	Medium	High
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IMPACTS ASSOCIATED WITH CONSTRUCTION ACTIVITIES SUCH AS NOISE AND DUST (AIR QUALITY)

Impact Description

Construction activities are generally associated with noise and dust. This impact should however be considered in context with the rural nature of the surrounding areas as well as the remoteness of the site.

Cumulative impact description

The cumulative impact for noise and dust will be minimal due to the remoteness of the site.

Mitigation

- Refer to the *Generic EMPr*

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Noise	Site	Short	Possible	High	Low	None
Dust	Site	Short	Possible	High	Low	None

Impact on Irreplaceable Resources (after mitigation) If yes, please explain	Yes	NO
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Cumulative impact rating (after mitigation) If high, please explain	LOW	Medium	High
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POST-CONSTRUCTION & OPERATIONAL PHASE

CONTINUOUS IMPACT ON THE NATURAL HABITAT

Impact Description

Invasion by alien invasive plant species as a result of disturbance (equal risk for both options).

Cumulative impact description

Cumulative invasion due to all project components is possible.

Mitigation

- The Alien Invasive Management Plan compiled during the Design & Pre-Construction Phase must be implemented.
- Invasive alien plant growth and signs of erosion should be monitored on an ongoing basis to ensure that the disturbed areas do not become infested with invasive alien plants.
- Refer to the *Generic EMP*

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Continuous impact on the natural habitat	Local	Long Term	Probable	Medium	Moderate	Low

Impact on Irreplaceable Resources (after mitigation) If yes, please explain	Yes	NO
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Cumulative impact rating (after mitigation) If high, please explain	LOW	Medium	High
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IMPACT ON AVIFAUNA DURING THE OPERATIONAL PHASE

Impact Description

Disturbance and Displacement

Displacement of priority species or Red Data species due to disturbance associated with operational activities such as maintenance.

Electrocution during operation

Electrocution refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components.

Overhead power line infrastructure with a capacity of 132 kV or more do not generally pose a risk of electrocution due to the large size of the clearances between the electrical infrastructure components. Electrocutions are therefore more likely for larger species whose wingspan is able to bridge the gap such as eagles or vultures. Various large raptors (such as Martial Eagle, Verreaux's Eagle and potentially vultures), susceptible to electrocution (particularly in the absence of safe and mitigated structures) may occur in the broader project area.

Electrocutions within the proposed substation are possible but should not affect the more sensitive Red Data species, as these species are unlikely to use the infrastructure within the substation yard for perching, nesting or roosting. The electrocution risk is considered to be of low probability and therefore low significance, the impact can be further reduced if mitigation measures are adhered to.

Collision of Powerlines during Operation

Birds in flight collide with overhead cables (conductors or earth wires) whilst in midflight. This occurs when birds don't see the cables until it is too late to take evasive action.

Cumulative Impact Description

A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other nearby activities as a result of the proposed development. The cumulative impact of habitat destruction was considered together with habitat destruction associated with the approved Vetlaagte solar PV facilities nearby as well as other renewable energy facilities in the broader area. Two operational wind energy facilities occur in the vicinity, Longyuan Mulilo De Aar 1 Wind Energy Facility (100MW), located approximately 13 km west of the project site and Longyuan Mulilo De Aar 2 North Wind Energy Facility (140MW) located approximately 20 km to the north. All of these consist of additional electrical infrastructure including facility substations and power lines. There is also at least one other proposed wind energy facility nearby (e.g. Zingesele WEF).

Mitigation

Mitigation: Disturbance and Displacement

- A site specific Operational Environmental Management Plan (OEMP) must be implemented, which gives appropriate and detailed description of how the running of activities must be conducted to reduce unnecessary disturbance to birds;
- Environmental manager to oversee activities and ensure that the site-specific operation environmental management plan (OEMP) is implemented and enforced;
- All vehicles should adhere to clearly defined and demarcated roads, no off-road driving should be allowed;
- Speed limits (30 km/h) should be strictly enforced to reduce unnecessary noise;
- The movement of personnel should be restricted to the access roads on the project site; and
- No dogs or cats other than those of the landowners should be allowed on site.

Mitigation: Electrocution during operation

- Bird perch deterrents and physical exclusion barriers, frames and covers may reduce incidence of birds perching and nesting on infrastructure;

- Insulating, covering or isolating hardware may reduce electrocutions and outages;
- Electrocutions to be monitored and recorded, and reported to the Endangered Wildlife Trust's (EWT) Wildlife and Energy Programme (WEP) to determine if further mitigation action is required;
- No nests may be removed, without first consulting EWT; and
- Any mortalities must be reported to the EWT.

Mitigation: Collision of Powerlines during Operation

- There is opportunity to potentially reduce the risk of collision with the LILLO lines by attaching flappers and bird flight diverters (BFDs) where practically possible – as was confirmed to be addressed during the Design Phase of the project;
- Attach appropriate marking devices on all spans of all new power lines in accordance with installation guidelines to increase visibility;
- Flappers and BFDs must be maintained and replaced where necessary, for the life span of the project;
- Pylon positions of the proposed line should be staggered between the pylon positions of the existing, adjacent overhead power line where practically possible to increase visibility of both lines;
- An operational monitoring programme must be implemented and include regular monitoring (i.e. quarterly) of the entire length of the power lines for collision incidents for the lifespan of the project; and
- Collision incidents must be recorded and reported to the Endangered Wildlife Trust (EWT).

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Disturbance and Displacement	Local	Long term	Possible	High	Moderate	Low
Electrocution during operation	Site	Long term	Possible	Low	Moderate	Low
Collision of Powerlines during Operation	Local	Long term	Possible	Low	Low	Low

<p>Impact on Irreplaceable Resources (after mitigation)</p> <p>If yes, please explain</p> <p><u>Disturbance and Displacement</u> Disturbance and displacement will remain an impact for the duration of the operational life-time of the facility. Disturbance and displacement due to operational activity associated with overhead power line is not expected to be significant as routine maintenance of existing transmission infrastructure already occurs along the existing servitude and any birds that remain in the area are likely to be habituated to the operational activity associated with the approved solar PV facilities across the site.</p> <p><u>Electrocution during operation</u> As effective mitigations are available and assuming all new electrical infrastructure associated with the surrounding developments will be constructed using safe 'bird friendly' design, the cumulative impact of electrocution is expected to be of Low significance.</p> <p><u>Collision of Powerlines during Operation</u> The position of the proposed overhead power line adjacent and parallel to existing lines if at all applicable may increase the overall visibility of both overhead power lines and reduce the risk of collision.</p>				Yes	NO
<p>Cumulative impact rating (after mitigation)</p> <p>If high, please explain</p>		LOW	Medium		

IMPACT ON AQUATIC HABITAT DURING THE OPERATION PHASE

Impact Description

Degradation of the ecological condition of aquatic ecosystems; modification of flow; erosion; and alien vegetation invasion in aquatic features

Cumulative impact description

Aquatic ecosystem deterioration can take place.

Mitigation

- Invasive alien plant growth and signs of erosion should be monitored on an ongoing basis to ensure that the disturbed areas do not become infested with invasive alien plants.
- Stormwater run-off infrastructure must be designed to mitigate the flow impacts of any stormwater leaving developed areas. The run-off should rather be dissipated over a broad area covered by natural vegetation or managed using appropriate shaping with berms, channels and swales.
- Should any erosion features develop, they should be stabilised as soon as possible.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Impact on Aquatic Habitat	Site	Short term	Unlikely	High	Low	None

Impact on Irreplaceable Resources (<i>after mitigation</i>) If yes, please explain	Yes	NO
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Cumulative impact rating (<i>after mitigation</i>) If high, please explain	VERY LOW TO NONE	Medium	High
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RISK OF EROSION DURING THE OPERATIONAL PHASE

Impact Description

Diligence in stormwater management is essential and a full-time task, even during dry periods. Any lack of care may lead to the slow degrading of the site, rendering it susceptible to severe damage in the event of unexpected flooding, and subsequent potential damage to equipment on site due to gradual erosion due to normal rainfall events, or by unexpected huge damage due to random extreme flood events.

Cumulative impact description

The development footprint is small relatively small compared to the renewable energy projects in the macro area and the cumulative impact is therefore expected to be of low/negligible significance.

Mitigation

- Training with regards to stormwater management of site personnel must be undertaken as part of their induction. Refreshment training must be undertaken periodically.
- Regular conditional inspections of all storm water infrastructure are required.
- Inspection data must be recorded and accumulated for tracking purposes. Regular reporting should be a scheduled management task.
- Any item that may be found to be out of order, for instance accumulation of settled sand in a trench, or erosion, must be addressed and corrected without delay to keep the storm water system in a good and fully functional condition. Record must be kept on all repairs.
- Specific attention must be given to inspection during and after any rain and/or flood event to curb any damage that may occur.
- The conditions of the Water Use Authorisation obtained during the Design & Pre-Construction Phase in terms of monitoring, maintenance, repair and reporting must be complied with. It is essential to make this a key responsibility of the relevant management manager.

- Also refer to the Generic EMPr.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Risk of Erosion	Local	Medium	Likely	High	High	Low

Impact on Irreplaceable Resources (<i>after mitigation</i>) If yes, please explain	Yes	NO
Cumulative impact rating (<i>after mitigation</i>) If high, please explain	LOW	Medium High

CONTINUOUS RISK FOR GROUNDWATER POLLUTION DURING THE OPERATIONAL PHASE

Impact Description

Spillages could occur with increased risk for groundwater pollution. This could typically happen during the transfer of petroleum product from road tanker to the storage tanks or during the servicing of maintenance and inspection vehicles. Leaks could occur with resultant pollution of groundwater. This would typically occur if structural failure happens or if appropriate waste management procedures are not followed.

Cumulative impact description

Impact is localised and no cumulative impact is expected.

Mitigation

- Prevent impact rather than manage impact:
 - Permanent staff as well as maintenance and inspection personnel must be appropriately trained in terms of waste management, specifically with regards to hazardous waste, inclusive of risk associated with the diesel storage facility, vehicle maintenance, etc. Appropriate Personal Protective Equipment (PPE) must at all times be provided.
 - Spillages of hydrocarbons and contaminated water must be collected from the following areas :
 - Diesel tank bunded area
 - Product receiving station and receiving pipelines.
 - The storage tank must be fully contained within the bunded area to contain spillage of hydrocarbons and contaminated rainwater and prevent the ingress of hydrocarbon spillages and contaminated rainwater into the ground or surface water.
 - Spillages from the tank bund must be retained and released in a controlled manner to an oil separator from where it could be temporarily stored and
 - The storage tank must be fully contained within the bunded area to contain spillage of hydrocarbons and contaminated rainwater and prevent the ingress of hydrocarbon spillages and contaminated rainwater into the ground or surface water.
 - Provision must be made for a thick reinforced concrete spillage containment slab laid to fall to a catch pit connected to an oil/grease separator.
 - Spillages of hydrocarbons and contaminated water must be collected from the following areas :
 - Diesel tank bunded area
 - Product receiving station and receiving pipelines
 - Vehicle servicing area
 - Proper maintenance procedures for vehicles and equipment must be followed.
 - Servicing of vehicles may only take place in designated areas, in this case on a concrete surface within the switching station site.
 - Drip trays should be used during the servicing of vehicles. The content thereof must be disposed in accordance with relevant hazardous material disposal requirement.
 - As part of routine maintenance, the Applicant must undertake regular engineering inspections of the tank, tank valves and pumps to ensure that there are no leaks.
- Hydrocarbon (oil, diesel, petrol) waste as well as hydrocarbon containing material must be regarded as hazardous waste and separated from general waste.
- All hazardous substances at the site must be adequately stored and accurately identified, recorded and labelled prior to removal

to a registered hazardous waste facility.

- Provide measures for emergency incident reporting and remedial measures and personnel must be appropriately trained.
- A bio-remediation contractor must be appointed to rehabilitate large oil spills. The regional officer of the Department of Water & Sanitation will advise in this regard.
- Small oil spills must be cleaned immediately with an oil spill kit. Measures to contain accidental spills must always be readily available on site (spill kits).
- All hazardous substance spills must be reported to the Contractor and the ECO, recorded and investigated.
- Follow acceptable maintenance and operational practises to ensure consistent, effective and safe performance of the infrastructure
- Also refer to the *Generic EMPr*.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Risk for Groundwater pollution	Site	Short term	Possible	High	Moderate	None

Impact on Irreplaceable Resources (after mitigation) If yes, please explain	Yes	NO
Cumulative impact rating (after mitigation) If high, please explain	LOW	Medium High

6.4.2 Environmental Management Programme

The main objectives of the EMPr are to identify actions and mitigation measures to minimise expected negative impact and enhance positive impact during all development phases (design/pre-construction, construction, and post-construction/operation) in terms of community issues, construction site preparation, construction workers, habitat protection, security, etc. Communication channels and contact details must also be provided.

According to the NEMA 2014 Regulations, as amended Appendix 4, an EMPr must comply with section 24N of the Act and includes:

- details of (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;
- a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;
- a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;
- a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-
 - planning and design;
 - pre-construction activities;
 - construction activities;
 - rehabilitation of the environment after construction and where applicable post closure; and
 - where relevant, operation activities;

- (e) a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);
- (f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to
 - (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
 - (ii) comply with any prescribed environmental management standards or practices;
 - (iii) comply with any applicable provisions of the Act regarding closure, where applicable;
 - (iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;
- (g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);
- (h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);
- (i) an indication of the persons who will be responsible for the implementation of the impact management actions;
- (j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;
- (k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);
- (l) a program for reporting on compliance, taking into account the requirements as prescribed by the regulations;
- (m) an environmental awareness plan describing the manner in which-
 - (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and
 - (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and
- (n) any specific information that may be required by the competent authority.

Identified impacts and mitigation / management outcomes will be monitored through the application of the Environmental Management Programme (EMPr) that is included as Appendix E of this Basic Assessment Report.

6.5 Conclusion of Impact Assessment

- As can be seen from the Environmental Impact Assessment Table provided above, while some potential impacts had a moderate significance rating prior to mitigation, all identified impacts can be mitigated to acceptable levels (i.e. LOW to VERY HIGH significance).
- The impacts assessed include issues raised by the different specialists as well as other impacts as identified by the EAP.
- All natural, social and cultural functions and processes will be able to continue *after* mitigation measures have been applied.
- No substantial impact *after* mitigation has been applied is expected to occur.
- The impacts after mitigation has been applied can, in general, be seen as minimal.

- All the mitigation measures are deemed feasible, and realistic to implement, and are included in the Environmental Management Programme, which means that the Applicant is legally bound to follow the recommendations should EA be granted.

CHAPTER 7: CONCLUSION

7.1 Assumptions, Uncertainties, and Gaps in Knowledge

Assumptions

It is assumed that all documentation and information obtained from the different stakeholders, professional team members and specialists are accurate, unbiased and valid.

Uncertainties

The development proposal in relation to its environment was thoroughly investigated by various specialists and professionals and there are therefore no uncertainties with regards to the development as proposed.

Gaps in knowledge

Extensive relevant specialist and engineering studies were undertaken for this project and it is unlikely that any missing information could influence the outcome of the proposed Wag 'n Bietjie 400kV MTS Project.

7.2 Environmental Impact Statement

Specialist studies, landowner negotiations, public participation and a thorough impact assessment were undertaken for this project and the following is applicable:

Specialist studies

Ecological Assessment

- Neither of the two regional vegetation types that occur on site and in surrounding areas are listed or of conservation concern.
- The entire site is within an Ecological Support Area (ESA), but this extends across vast distances in all areas close to De Aar.
- The protected tree, *Boscia albitrunca*, occurs regularly within the low hills and rocky outcrops. However, proposed infrastructure does not affect any individuals of this species.
- No plant species of concern were found on site.
- One Near Threatened reptile, the Tent Tortoise (*Psammobates tentorius*), was found on site. Loss of a small area of habitat for the proposed projects will not adversely affect the species.
- **Impacts are relatively insignificant** in comparison to the approved solar PV projects within which they will be located.

Freshwater features

- This assessment has found the larger aquatic features on-site to be of moderate sensitivity and the smaller features to be of low sensitivity.

- The proposed activities will be more than 370m away from the mapped aquatic ecosystems and their recommended buffers and are thus **unlikely to have any impact on the aquatic features**.

Bird Impact Assessment

- The area of habitat destruction associated with the substation is relatively small in extent compared to the proportion of untransformed habitat available in the area, and do not represent a fatal flaw that would prevent the proposed development from proceeding.
- While a number of Red Data species, and species vulnerable to habitat destruction and displacement, exist within the area the relatively small size of the development footprint makes it highly unlikely that the proposed development will have a significant negative impact following the implementation of mitigation measures.
- The cumulative impacts of the proposed project together with proposed similar developments (i.e. electrical infrastructure developments) within a 20 km radius is likely to have a low overall significance.
- Overall, the impacts of the substation are **unlikely to generate significant negative impacts** on avifauna.

Heritage Impact Assessment

- The proposed development area has **low sensitivity for impacts to significant archaeological heritage**.
- It unlikely that any fossils would be preserved in the Tierberg Formation or Adelaide Subgroup. Nonetheless, a Fossil Chance Find Protocol was added to the EMP. **No further palaeontological studies are required** unless fossils are found during the construction period (unlikely).

Public Participation

- The public participation programme was conducted in terms of Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations 2014, as amended.
- Input received during the public participation process was taken into consideration when the final site extent and associated powerline routes were selected, which was pre-negotiated with the landowner and presented in this report.
- Comments received were all satisfactorily addressed and the EAPs are confident that the pre-negotiated MTS site; 400kV LILO powerlines and 132kV powerline route are the best option for this development proposal and is acceptable from a stakeholder point of view.
- If any substantial changes are required resulting from the distribution of the Draft BAR; it will again be circulated for comment for a further 30-day commenting period.

A Combined Environmental Sensitivity Map is provided as Appendix B(4). It confirms the following in terms of the preferred MTS site and associated powerline routes:-

- Terrestrial Biodiversity – No constraints, general mitigation measures are proposed
- Aquatics - General mitigation measures are proposed and Water Use Authorisation is required
- Avi-fauna – No constraints, general mitigation measures are proposed
- Heritage Impact – Mitigation measures are proposed to protect the heritage sites identified
- Palaeontology – No constraints but a Chance Find Protocol Procedure is proposed
- Agriculture – No constraints, general mitigation measures are proposed

Impact Assessment

Summary of the impact assessment tables

DESIGN AND PRE-CONSTRUCTION PHASE

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Permanent loss of agricultural land	Site	Permanent	Definite	Low	Low	Low
Risk of failure of structures	Local	Short Term	Possible	High	Medium to Very High	Low
Risk of erosion	Site	Short term	Possible	High	Moderate	Low
Terrestrial and Aquatic Habitat	Site	Short term	Possible	High	Moderate	Low
Impact on Avifauna to address during the design phase	Local	Permanent	Possible	Medium	Moderate	Low

CONSTRUCTION PHASE

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Loss of natural habitat due to clearing	Site	Permanent	Definite	Low	Moderate	Moderate
Loss of individuals of protected trees, protected plants or other listed species	Site	Medium	Possible	Medium	Low	Low
Loss of faunal habitat	Site	Medium	Possible	Medium	Low	Low
Avifauna: Habitat destruction	Site	Long Term	Definite	High	Moderate	Low
Avifauna: Disturbance and displacement	Site	Short term-permanent	Probable	High	Moderate	Low
132kV Powerline Disturbance of aquatic habitat; water quality impacts	Site	Short term	Possible	High	Low	Low
MTS Site & LiLo Disturbance of aquatic habitat; water quality impacts	site	Short	Unlikely	High	Low	None
Impact on archaeology	Site	Permanent	Possible	Low	Moderate	Low
Impact on Palaeontological Resources	Site	Permanent	Possibe	Low	Moderate	None
Risk of groundwater pollution	Local	Medium	Possible	High	Moderate	Low
Increased risk of erosion	Local	Medium	Possible	High	Moderate	Low
Uncontrolled labour force	Local	Short	Possible	High	Moderate	Low
Noise	Site	Short	Possible	High	Low	None
Dust	Site	Short	Possible	High	Low	None

POST-CONSTRUCTION & OPERATIONAL PHASE

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
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Continuous impact on the natural habitat	Local	Long Term	Probable	Medium	Moderate	Low
Avifauna: Disturbance and Displacement	Local	Long term	Possible	High	Moderate	Low
Avifauna: Electrocution during operation	Site	Long term	Possible	Low	Moderate	Low
Avifauna: Collision of Powerlines during Operation	Local	Long term	Possible	Low	Low	Low
Impact on Aquatic Habitat	Site	Short term	Unlikely	High	Low	None
Risk of Erosion	Local	Medium	Likely	High	High	Low
Risk for Groundwater pollution	Site	Short term	Possible	High	Moderate	None

Conclusion of Environmental Impact Statement

- All identified impacts were assessed before and after mitigation have been applied. While some potential impacts had a moderate or high significance rating prior to mitigation, all identified impacts can be mitigated to acceptable levels (i.e. Low or Very Low significance).
- The impacts assessed include issues raised by the different specialists as well as other relevant impact identified by the EAP.
- All natural, social and cultural functions and processes will be able to continue *after* mitigation measures have been applied.
- No substantial impact *after* mitigation has been applied is expected to occur.

All the mitigation measures are considered practical to implement, and are included in the Environmental Management Programme, which means that the Applicant is legally bound to follow the recommendations should EA be granted.

7.3 Why the Activity Should, or Should Not be Authorised

The following is confirmed and effectively motivated in the BAR:

- The Wag 'n Bietjie MTS will enable the evacuation of the generated electricity from various solar and wind farms and will feed this electricity into the national Eskom grid. Note that this project includes LILO lines that will connect the MTS directly to the 400kV Beta-Hydra 1 Powerline that feeds electricity into the Eskom Hydra MTS.
- The Wag 'n Bietjie MTS infrastructure therefore serves as a grid connection solution for renewable energy facilities which are intended to be bid (or have been bid) in current or future rounds of the REIPPP. The REIPPP forms part of the programmes assisting the IRP in reaching its goals. The DFFE is the competent authority for this application.
- Activity 9 of Listing Notice 2 is triggered, however, the project site falls within a Strategic Transmission Corridor (STC) which implies that a Basic Assessment process has to be undertaken and the shortened timeframe for approval or refusal of the Final BAR is 57 days (instead of 107 days).

- As per DFFE requirement in terms of Electrical Grid Infrastructure (EGI) within a STC, a pre-negotiated MTS Site and associated powerline routes must form part of the application. Proof of pre-negotiation of the MTS site, LILO 132kV Powerline Routes and Road Upgrade is provided in the BAR.

It is the professional and objective opinion of the independent EAPs that the project can be authorised because of the following:

- All reasonable actions were taken to identify relevant environmental components.
- The specialist input obtained is comprehensive and effective in providing an assessment of the status quo of the study area, identifying potentially sensitive areas and issues of concern as well as identifying impact that require re-consideration of alternatives.
- Significant and reasonable actions were taken to identify and notify all Interested & Affected Parties that include government departments, relevant authorities, general stakeholders and potentially affected landowners of the project. Extensive and continuous communication with the IAPs took place.
- The BAR includes all proceedings, findings and recommendations which result from this study.
- All relevant legal requirement in terms of the Environmental Impact Assessment Regulations published in 2014, as amended were complied with.

7.4 Environmental Authorisation

7.4.1 Period for which the EA is required

The EA must be valid for a period of 10 years during which construction must commence.

7.4.2 Date on which the activity will be concluded

The Eskom Power Purchase Agreement (PPA) period is normally 20 years, but may be longer in the future and could be increased to 25 years. Construction will be approximately 2-3 years and decommissioning approximately 2 years.

The activity will therefore be concluded approximately 30 years after construction has commenced.

7.5 Recommendation by the Environmental Assessment Practitioner

It is recommended that Environmental Authorisation be granted to the applicant, the MTS Wag 'n Bietjie (Pty) Ltd, for the Wag 'n Bietjie MTS Project which includes the construction of the Wag 'n Bietjie MTS, 400kV Loop-in Loop-Out (LiLo) lines and an approximately 3,8km 132kv powerline between the Wag 'n Bietjie MTS and the Vetlaagte MTS with ancillary facilities.

It is recommended that the following be included in the Environmental Authorisation:

- The Wag 'n Bietjie MTS will affect 10ha; however, it is requested that a total area of 36ha required by Eskom for future expansion be authorised.

- A 132kV power line route corridor of 300m was assessed and it is requested that the *corridor* be approved as part of the environmental authorisation and not the servitude only. This will allow for reasonable adjustments within the corridor during the final design phase of this project without having to go through another environmental authorisation process. Only the required 31m wide servitude will be registered within the route corridor, not the entire corridor.
- The Environmental Management Programme must be approved and the implementation thereof should be a condition of authorisation. It is however recommended that the following plans be compiled and included as part of the EMPr before construction commences. Approval of these plans by the DFFE at this time is NOT required:
 - Geotechnical Assessment
 - Detailed Storm Water Management Plan
 - Alien Invasive Management Plan
 - Habitat Restoration Plan
- The Environmental Authorisation must be valid for a period of 10 years during which construction must commence.

7.6 Affirmation by the Environmental Assessment Practitioner

I, Annelize Erasmus, herewith affirm the following:

- The information contained in this report is to the best of our knowledge and experience correct.
- All relevant comment and input provided by the stakeholders and IAPs are included and addressed in this BAR.
- Input and recommendations from the specialist reports are provided in and integrated with the BAR.
- All information made available by the EAP to IAPs and any responses thereto as well as comment and input from IAPs are provided in the BAR.



Annelize Erasmus

Date: 22 June 2022

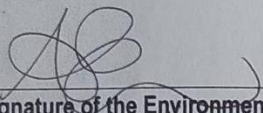
A copy of this affirmation was certified by a Commissioner of Oaths and is included on the following page.

UNDERTAKING UNDER OATH / AFFIRMATION

WAG 'n BIETJIE 400kV MTS PROJECT

I, Annelize Erasmus, swear under oath / affirm the following:

- The information contained in this report is to the best of my knowledge and experience correct.
- All relevant comment and input provided by the stakeholders and IAPs are included and addressed in this BAR.
- Input and recommendations from the specialist reports are provided in and integrated with the BAR.
- All information made available by the EAP to IAPs and any responses thereto as well as comment and input from IAPs are provided in the BAR.

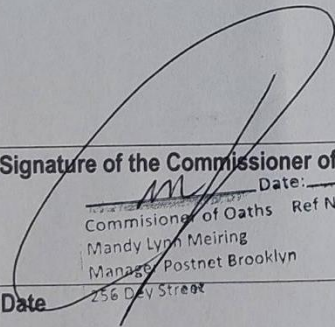

Signature of the Environmental Assessment Practitioner

Landscape Dynamics Environmental Consultants (Pty) Ltd

Name of Company

22 June 2022

Date


Signature of the Commissioner of Oaths

Date: 22/06/2022

Commissioner of Oaths Ref No: 9/1/8/2 Pretoria
Mandy Lynn Meiring
Manager Postnet Brooklyn
11 November 2009

Date

256 Day Street