

Appendix A: Maps

Development of a 400kV
loop-in-loop-out Powerline
to the Eskom Garona Substation and
Expansion of the Eskom Garona Substation,
Groblershoop,
!Kheis Local Municipality

Locality Map

Legend

- FER/GAR 400kV loop
In Powerline (~1.5Kms)
- GAR/LEW 400kV Loop
Out Powerline (~1.5Kms)
- Existing Eskom
Garona-Aries 400kV
Powerline
- Existing Eskom Ferrum-
Garona 400kV
Powerline
- Proposed New Garona
substation expansion
area (~3.3ha)
- Existing Garona
substation area
- Cadastral

Scale 1:10000

Source:
ESRI
CSG: DALRRD

0 0,125 0,25 0,5 Kms



**BOKPOORT
CSP
PLANT**

**BOKPOORT 390
PORTION 0**

**BOKPOORT 390
PORTION 9**

**ROOILYF 389
PORTION 0**

**BOKPOORT 390
PORTION 4**

Loop-In Point

Loop-Out Point

Garona
Substation

Sishen-Saldhana Iron Ore Railway

BOKPOORT 390 PORTION 5

To Groblershoop













**BOKPOORT 390
PORTION 9**

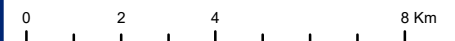


Development of a 400kV loop-in-loop-out Powerline to the Eskom Garona Substation and Expansion of the Eskom Garona Substation, Groblershoop, !Kheis Local Municipality

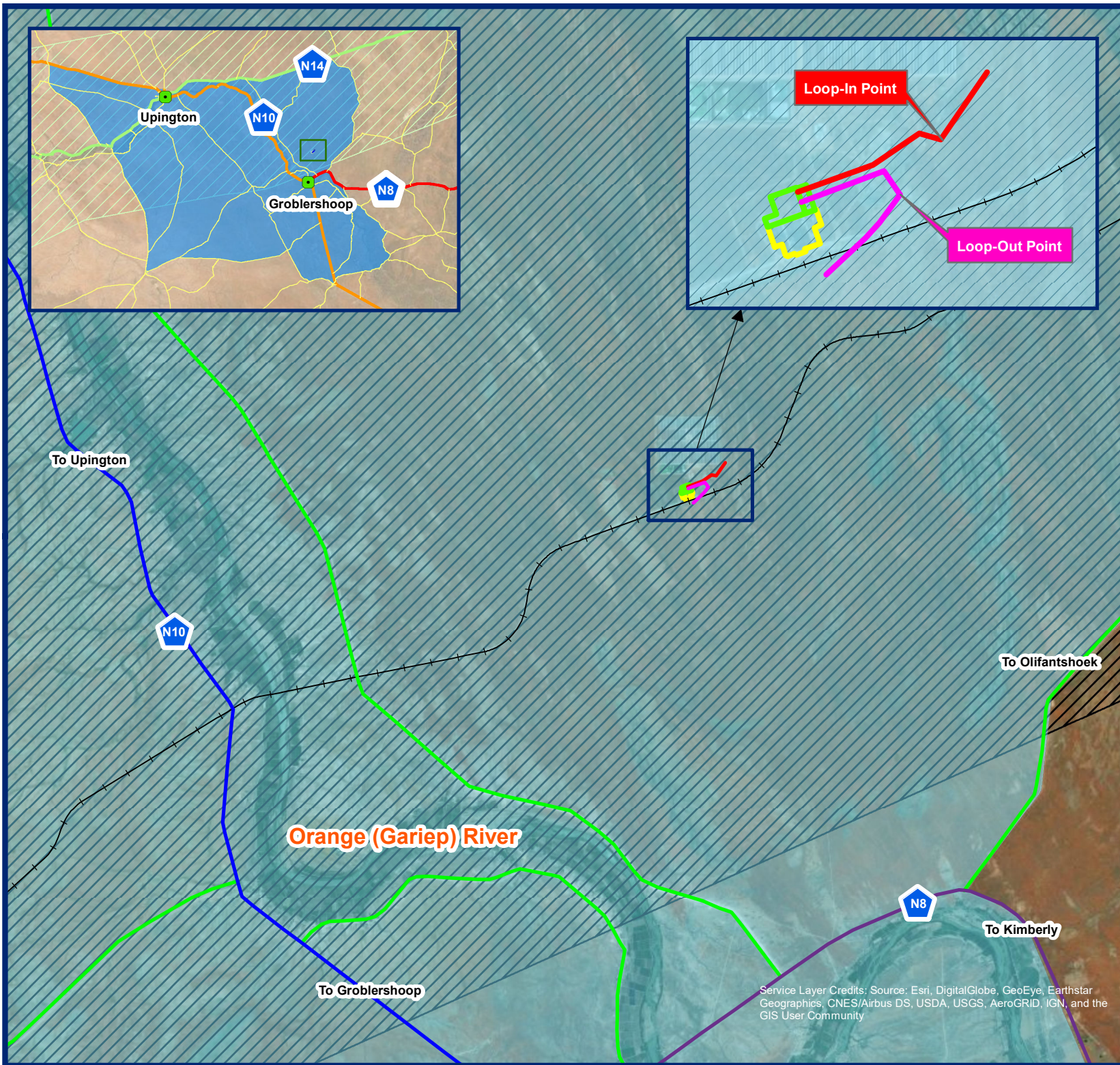
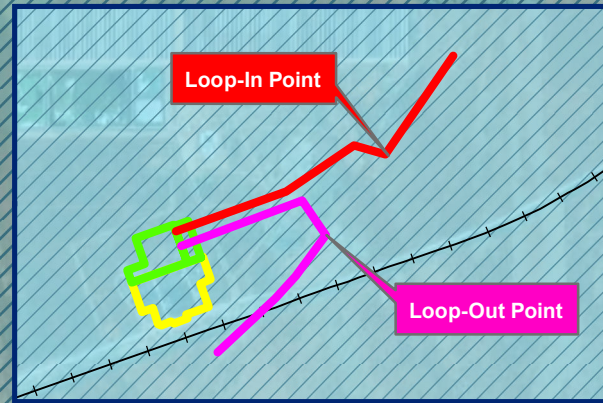
Renewable Energy Development Zone and Strategic Transmission Corridor Map

Legend

-  Provincial
-  National
-  Secondary
-  FER/GAR Line 400kV Loop In Powerline
-  GAR/LEW Line 400kV Loop Out Powerline
-  Sishen-Saldhana Iron Ore Railway
-  Proposed New Garona substation expansion area
-  Existing Garona substation area
-  Renewable Energy Development Zone
-  Upington - REDZ7
-  Power Corridor
-  Northern corridor



Scale 1:160000

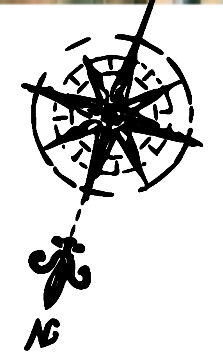


Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





LINE DESIGN CRITERIA
 Tower Type & Config: 517 & 518 Lattice 400kV Series
 Min Ground Clearance: 8.1m
 Min Road Clearance: 9.3m
 Wind Pressure @ 15°C: 1050Pa
 Shape Factor: 1.0
 Gust Factor: 1.0
 Min Cond Temp: -5°C
 Max Cond Temp: 60°C
 Strength Factor: 1.0 (Steel, Tested - SANS 10280:2013)
 Cond Type: Triple Tern ACSR
 Cond Stringing Criteria: 40% UTS @ -5°C, Initial C = 1800 @ 15°C Final;
 E/wire Type: OPGW & Horse ACSR
 E/wire Stringing Criteria: 40% UTS @ -5°C, Initial C = 2100 @ 15°C Final;



MACE
technologies

UNIT 7, PROBUILD COMMERCIAL PK
 JAMES CRESCENT
 HALF WAY HOUSE
 MIDRAND, 1685

Tel: (011) 905 8303
 Fax: (011) 905 8304
 Cell: 084 852 2641
 e-mail: mace@mactech.co.za
 web: mactech.co.za



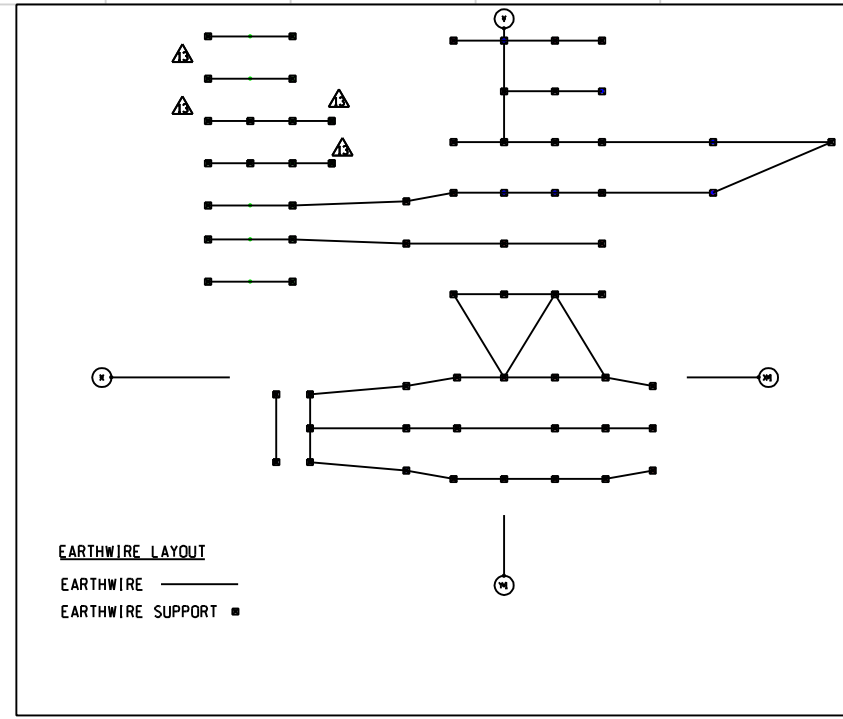
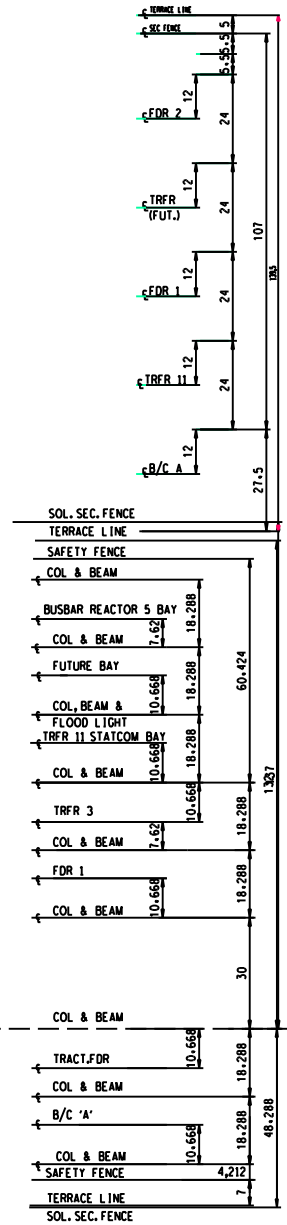
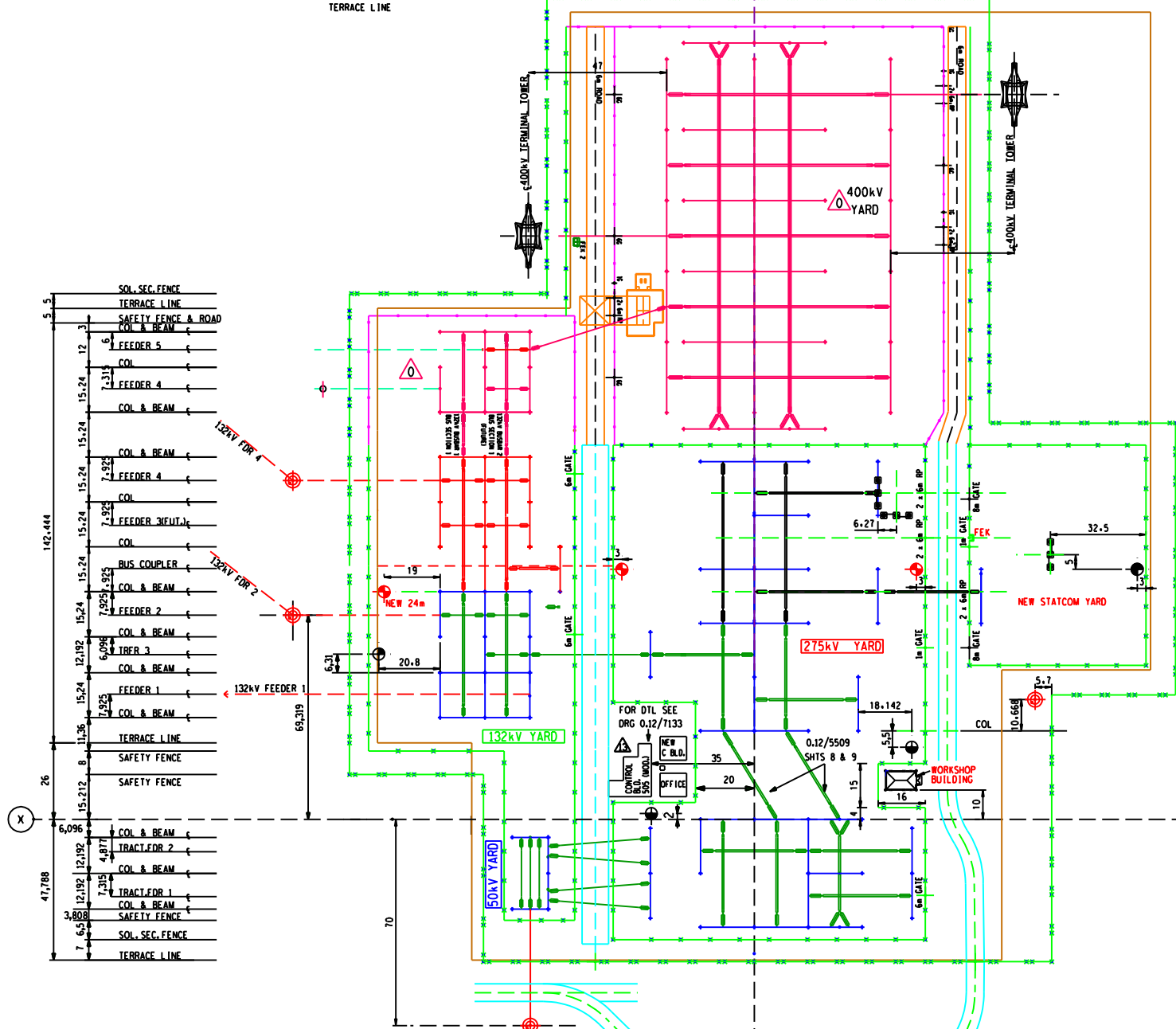
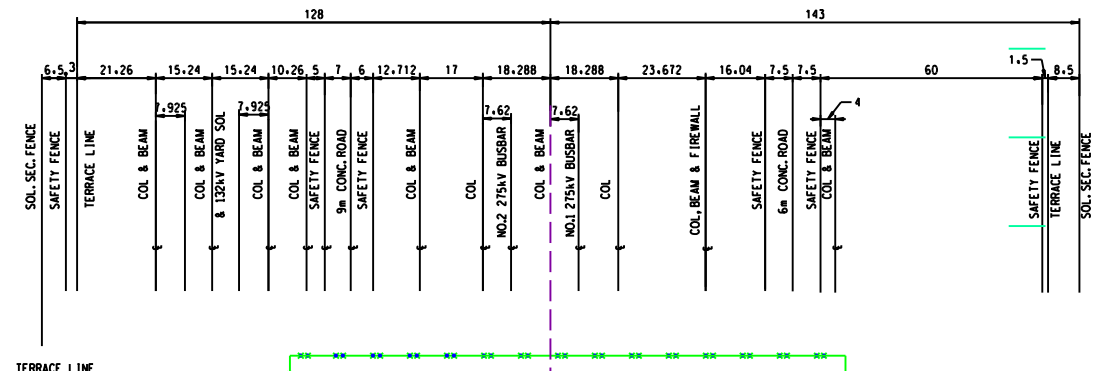
25.0 m Horiz. Scale

REV	DATE	DESCRIPTION	BY	CHKD	APPROVED
0	13/5/21	First Issue	A.M.	L.H.	

CONTRACT: GARONA 400kV LILO

TITLE: FERRUM - GARONA & GARONA - NIEWEHOOP 400kV LILO ROUTE

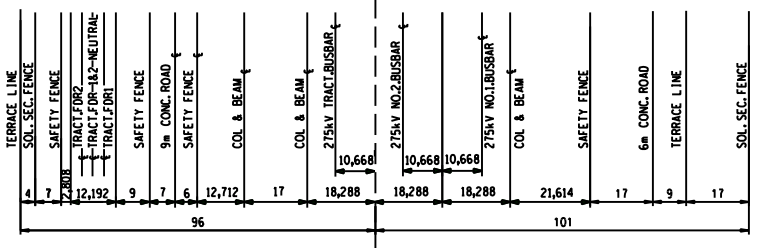
DRAWN	A.M.	DATE	13/05/2021	DRG. No.	REV.
CHECKED	L.H. <td>SCALE</td> <td>See Scales</td> <td>OHL2107-21</td> <td>0</td>	SCALE	See Scales	OHL2107-21	0
		SHT	1 OF 1	A1	



BUSBAR CONDUCTOR SIZE	
275kV BUSBAR	2x800mm ²
132kV BUSBAR	2x800mm ²
50kV BUSBAR	2x800mm ²
275kV BUSBAR	2x400mm ²
400kV BUSBAR	3x800mm ²

TENSION PER CONDUCTOR	
275kV BUSBARS	8kN
275kV STRINGERS	4kN
50kV STRINGERS/BUSBARS	4kN
132kV BUSBARS	8kN
132kV STRINGER (1 COND/D)	4kN
132kV STRINGER (2 COND/D)	2kN
EARTHWIRE	2kN
400kV BUSBARS	8kN
400kV STRINGERS	8kN

- NOTES:
 FOR CONTOURS, CO-ORDINATES AND CORNER POINTS - SEE DRG 0.12/5169
- ⦿ INDICATES 24m FLOODLIGHT MAST
 - ⦿ INDICATES 18m FLOODLIGHT MAST
 - ⦿ INDICATES 14m FLOODLIGHT MAST
 - ⦿ INDICATES NC9 COLUMN
 - FEK - FIRE EQUIPMENT KIOSK



**CONCEPT DESIGN
 NOT FOR CONSTRUCTION**
 ORIGINAL DWG #: 0.12/5498 REV 15

0	400kV YARD ADDED, 132kV BUSBAR EXTENDED TO INCLUDE BUS SECTION, FOR 5 & TRFR II					C3	STATION ELECTRIC
REV	REVISION DESCRIPTION	DRAWN	CHD	AUTH (SUBS)	DATE		Fer21P12-SE- REF DRAWINGS
	DESIGN CHECKED						
	DESIGN APPROVED						
SUBSTATION DESIGN		Eskom		Eskom Holdings SOC Ltd Reg No 2002/015527/30			
SECONDARY PLANT		GARONA KEY PLAN					
DESIGN CHECKED							
DATE:	DATE:	© GARO21P05-SE-C4					
DATE:	DATE:						
SCALE:		SHEET NUMBER		REVISION			
		-		0			

Development of a 400kV loop-in-loop-out Powerline to the Eskom Garona Substation and Expansion of the Eskom Garona Substation, Groblershoop, !Kheis Local Municipality

Sensitivity Map


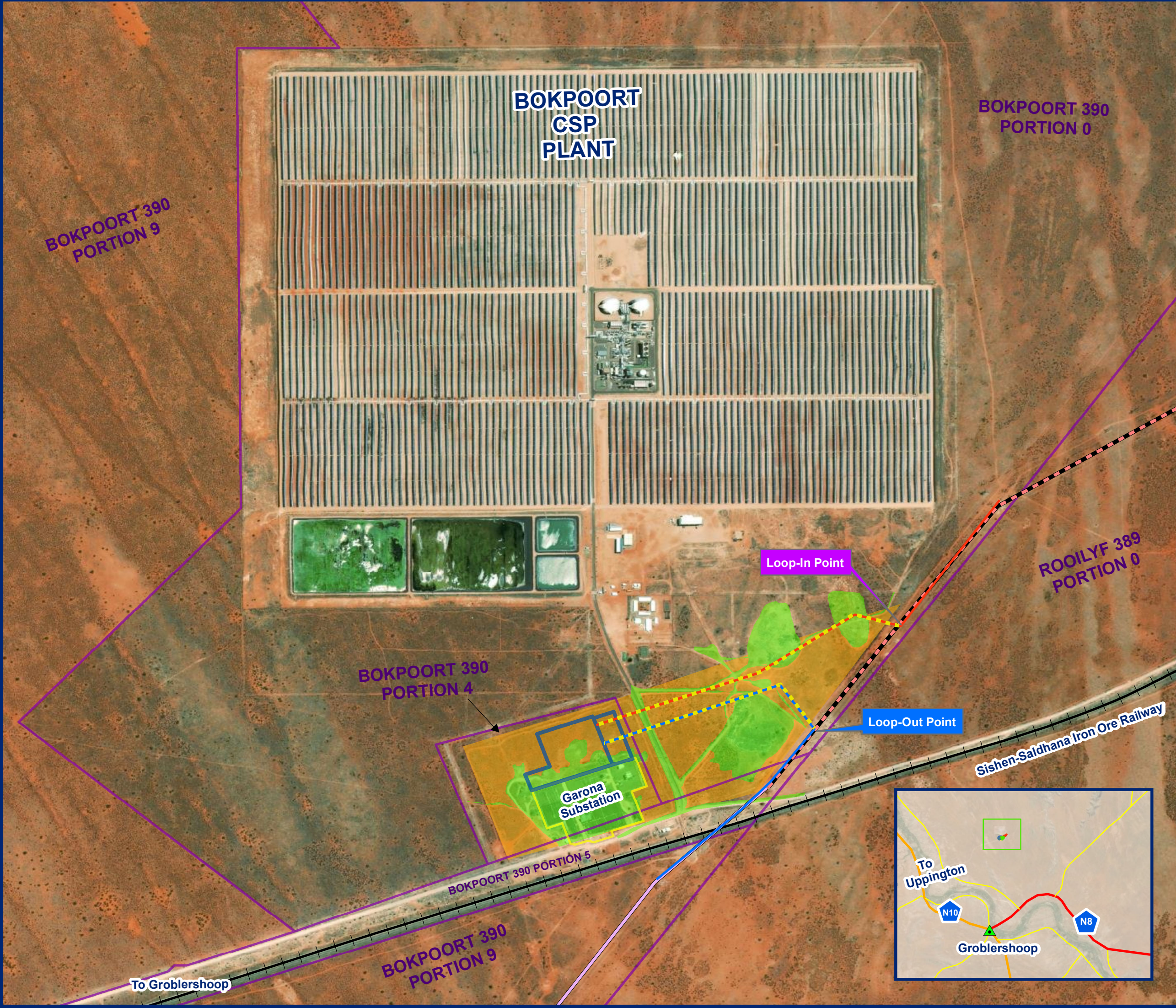
Legend

- - - Avifaunal Collision Mitigation Sections
 - FER/GAR 400kV loop In Powerline (~1.5Kms)
 - GAR/LEW 400kV Loop Out Powerline (~1.5Kms)
 - Existing Eskom Garona-Aries 400kV Powerline
 - Existing Eskom Ferrum-Garona 400kV Powerline
 - Proposed New Garona substation expansion area (~3.3ha)
 - Existing Garona substation area
 - Cadastral
- Ecological Sensitivity Class**
- Medium
 - Low

Scale 1:10000

Source: ESRI, CSG: DALRRD

0 0,125 0,25 0,5 Kms

Listing Notice 1

Activity 27 - The clearance of an area of 1ha or more, but less than 20ha of indigenous vegetation, except where such clearance of indigenous vegetation.

Activity 28 - Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture on or after 01 April 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 ha.

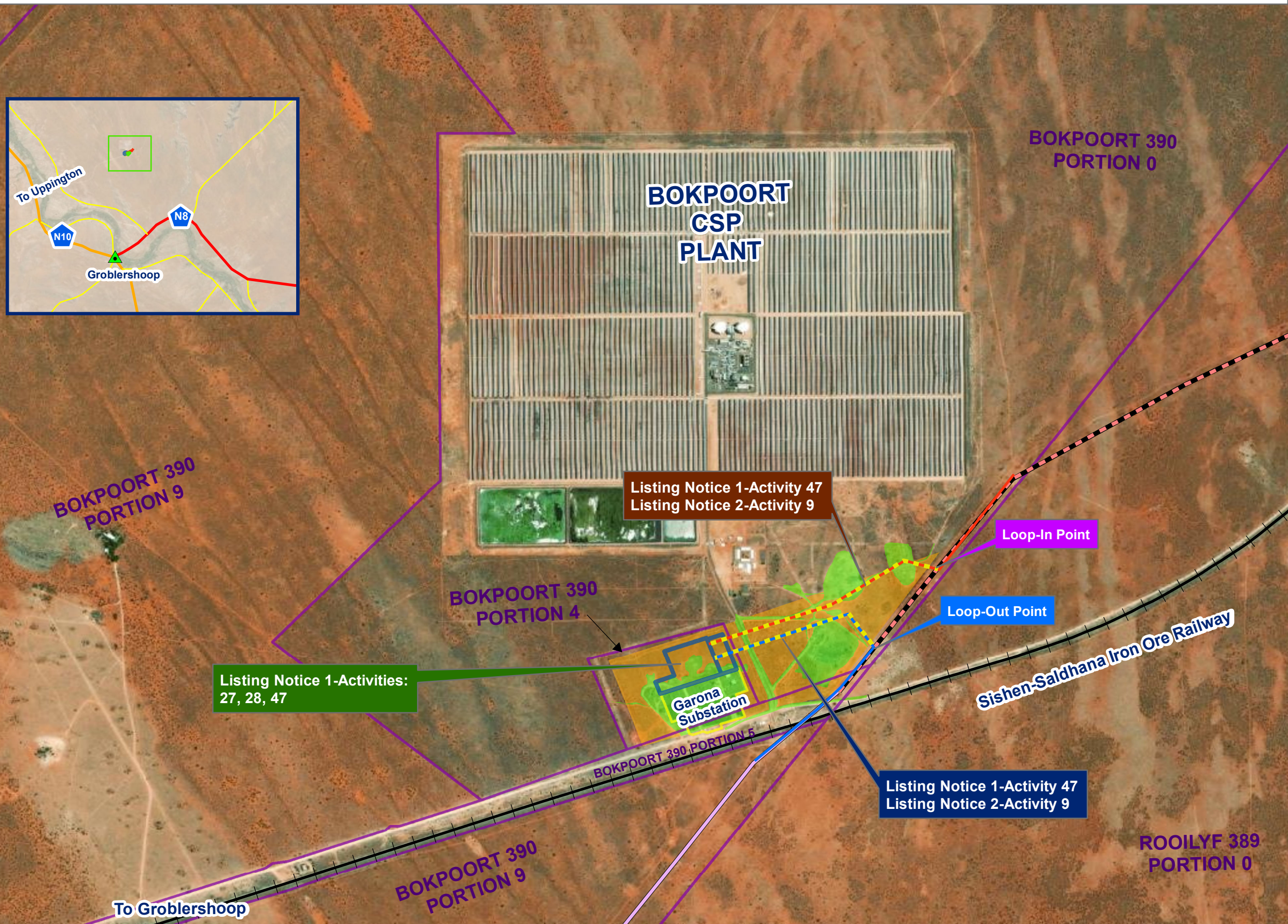
Activity 47 - The expansion of facilities or infrastructure for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.

Listing Notice 2

Activity 9 - 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.

Development of a 400kV loop-in-loop-out Powerline to the Eskom Garona Substation and Expansion of the Eskom Garona Substation, Groblershoop, !Kheis Local Municipality

Listing Notices Annotated Map



Legend

- Avifaunal Collision Mitigation Sections (Yellow dashed line)
- FER/GAR 400kV loop In Powerline (~1.5Kms) (Red solid line)
- GAR/LEW 400kV Loop Out Powerline (~1.5Kms) (Blue solid line)
- Existing Eskom Garona-Aries 400kV Powerline (Purple solid line)
- Existing Eskom Ferrum-Garona 400kV Powerline (Black dashed line with red dashes)
- Proposed New Garona substation expansion area (~3.3ha) (Blue outline)
- Existing Garona substation area (Yellow outline)
- Cadastral (Purple outline)
- Ecological Sensitivity Class**
 - Medium (Yellow box)
 - Low (Green box)

Scale 1:15000

Source: ESRI, CSG: DALRRD



**Appendix B:
Pre-application Minutes and Approval of Public
Participation Plan**

[Redacted]

[Redacted]

Subject: RE: ACWA Project DAO - 400kV infrastructure
Date: Friday, 18 June 2021 14:06:02

Dear Malcom

Please note that the Minutes and PP Plan for the above referenced project is approved. Please include a copy of this approval, the minutes of the meeting and the PP Plan with your submission of application.

We concur that a Basic Assessment Process must be followed.

[Redacted]

Subject: RE: ACWA Project DAO - 400kV infrastructure

Hallo Herman

My below e-mail to you refer

Did you have a change to look at the documents provided?

Project DAO is quite a critical project as mentioned in our pre-application consultation and your feedback is much appreciated

Kind regards

[Redacted]

Subject: FW: ACWA Project DAO - 400kV infrastructure

Hi Herman

Trust you are doing well

Do you have any feedback for me on the below e-mail and confirmation?

Kind regards

[Redacted]

Sent: 07 June 2021 08:40

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
Subject: ACWA Project DAO - 400kV infrastructure

Hi Herman

I attach the following information for you:

- a. The draft minutes of our pre-application meeting for the Department's approval;
- b. The map as discussed/required in our meeting which depicts the scope;
- c. The PP Plan;
- d. Google images of the substation site in 2004 and 2016 (this will show you how upgrades to the substation took place over time). ACWA now propose a further extension as indicated in blue in our App B map
- e. The previous EA / RoDs as referred to in Appendix A - Table

At this stage and by looking at the facts, we as the EAP are confident that a new Basic Assessment process will be required for the loop in / out lines as well as the substation extension. The DFFE's confirmation in this regard would be much appreciated

Should you have any follow up clarification questions, please feel free to send them to me and I will relay it to the team on our side

Kind regards

Malcolm Roods
Environmental Consultant

[REDACTED]
[REDACTED]
[REDACTED]



This email and any attachments are intended solely for the use of the addressee(s); disclosure or copying by others than the intended person(s) is strictly prohibited. If you have received this email in error, please treat this email as confidential, notify the sender and delete all copies of the email immediately

Disclaimer

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Minutes

**Royal HaskoningDHV (Pty) Ltd
Southern Africa**

Present: Coenrad Agenbach (CA) (Department of Forestry, Fisheries and the Environment);
Herman Alberts (HA) (Department of Forestry, Fisheries and the Environment);
Malcolm Roods (MR) (Royal HaskoningDHV);
Prashika Reddy (PR) Royal HaskoningDHV);
Seshni Govender (SG) (Royal HaskoningDHV);
Lusani Madali (LM) (ACWA Power Energy Africa);
Phumi Maake (PM) (ACWA Power Energy Africa)

Apologies: Muhammed Essop-Department of Forestry, Fisheries and the Environment

From: Malcolm Roods

Date: 01 June 2021

Location: Virtual Meeting via Microsoft Teams-Various Locations

Copy:

Our reference: MD4195-RHD-ZZ-XX-MI-YE-0001

Classification: Project related

Enclosures:

Subject: Pre-application meeting for the ACWA Project DAO Grid Infrastructure Requirements

Number	Details
1	CA welcomed everyone to the meeting and a round of introductions was done. One apology noted on behalf of Muhammed Essop
2	Background: Project DAO forms part of the the Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP) that was awarded to ACWA Power as a preferred bidder to as well as being granted as a Strategic Infrastructure Project.
3	Purpose: The purpose of the meeting to discuss the Grid Infrastructure requirements for ACWA Power to evacuate the power generated from their PV Plants into the national Grid. The scope of the project includes a loop in loop out 400kV Powerline to the Garona Substation and the extension of the Garona Substation to accommodate this additional power.
4	Discussion: Eskom would be the applicant for this application but as they have expressed issues with finding ACWA Power will be undertaking this work on behalf of Eskom. MR stated that there have been a number of Environmental Authorisations/Record of Decisions issued over the years for Ferrum/ Garona Powerlines, Garona Substation and the Aries Powerlines, A table has been compiled to summarise all the authorisations for this project area.

Number

Details

A NEMA EA was issued for the Proposed installation of 155km 400kV line between Ferrum and Garona substations in 2013 as well as an ECA RoD was issued for the Proposed Garona-Aries 400kV transmission line and upgrade of the existing Garona Substation in 2007, which was determined to be valid as construction of the respective lines and expansion of the Garona substation commenced.

MR stated that the question to the department is based on the information and history provided will the proposed new 400kv and extension/upgrade of the Garona substation be subject to a new Basic Assessment study or can this fall in the ambit of an amendment to the approved authorisations.

CA stated that due to the complexity and history of the project, the department will not be able to provide a response during this meeting as they require additional information in terms of a map indicating what has been authorised and been built as well as the new infrastructure and footprints. CA stated that the legalities of what is being proposed will need to be properly investigated as this may have an implication to the lenders and the department would be more comfortable taking a bit more time to provide a response to avoid any conflicts in the future. CA further stated that an interpretation Query will also need to be submitted to cross reference all the EAs and RoDs issued for the projects associated with the powerlines and the Garona Substation.

CA confirmed that if a new process is to be conducted then it would most likely be a Basic Assessment Process, noting that it is within the Renewable Energy Development Zone and the Strategic Transmission Power Corridor.

5

Way Forward:

Royal HaskoningDHV/ACWA Power

- Clear indication of what has been built and authorised as well as where the new infrastructure is going to be on a map
- Proper Project Description
- Submit all EAs/RoD's issued for the project area

Department of Forestry, Fisheries and the Environment:

- Based on the information provided a response will be provided
- An Interpretation Query will be sent in order to determine the legality of the process

6

Post Discussion- Royal HaskoningDHV & ACWA Power

Based on the advice received and looking at the mapping, a new proposal has been put forward that a new Basic Assessment process will be conducted for the new 400kV Powerline and the upgrade/extension to the Garona Substation.

Department of Environment, Forestry and Fisheries
Integrated Environmental Authorisations

ROYAL HASKONINGDHV (PTY) LTD

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Country Club Estate
Woodmead
Johannesburg
2191

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+27 11 798 6005 **F**
Johannesburg@rhdhv.com **E**
royalhaskoningdhv.com **W**

Date:	03 June 2021	Contact name:	Malcolm Roods
Your reference:		Telephone:	071 674 7091
Our reference:	MD4195-RHD-ZZ-XX-CO-Z-0001	Email:	malcolm.roods@rhdhv.com
Classification:	Project related		

Public Participation Plan: Development of a 400kV loop in loop out Powerline to the Eskom Garona Substation and Expansion of the Eskom Garona Substation, Groblershoop, !Kheis Local Municipality

Dear Sirs/Mams

In September 2020, the Department of Mineral Resources and Energy (DMRE) released a request for proposal as part of the Risk Mitigation Independent Power Producer Procurement Programme to reduce the current load shedding periods being experienced by the country. In responding to the request, ACWA Power Energy Africa Pty Ltd (ACWA Power) submitted a bid for 150MWe under the name "Project DAO".

A meeting was held with Eskom Holdings SOC Limited with regards to connection to the grid once Project DAO is in operation. Eskom has planned multiple-grid strengthening projects across the country and due to the timelines they are not able within their budget and timelines to meet these stringent timelines. As such, they have asked the Applicant (ACWA Power) to undertake this process which is the basis of this application.

The Project will entail the following:

- Upstream scope of work at Garona Substation:
 - Establish a 400kV busbar at the Garona Substation,
 - Establish and equip 2 x 400 kV feeder bays.
 - Loop in and out of Ferrum – Nieuwehoop 400kV lines (approx. 2 x 1.1km) into the Garona Substation.
- Shared scope of work at Garona Substation:
 - Extend the 132kV busbar at Garona Substation (to accommodate the 400/132kV transformer) - area of expansion proposed at the substation would be +/- 1 to 1.5ha,
 - Install a 500MVA 400/132kV transformer with associated transformer bays, and
 - Provide space for 1 future 400/132 kV transformer.

- Dedicated scope of work at Garona Substation:
 - Equip and commission the 1x 132kV feeder bay.

As per Government Gazette 43412 GN R. 650 Disaster Management Act (57/2002): Directions Regarding Measures to Address, Prevent and Combat the Spread of COVID-19 Relating to National Environmental Management Permits and Licences: Annexure 2 and 3 published on 5 June 2020, the DFFE requires a Public Participation (PP) Plan to be approved for an application for Environmental Authorisation that requires public participation.

PP is a process that is designed to enable all Interested and Affected parties (I&APs) to voice their opinion and/or concerns which enables the practitioner to evaluate all aspects of the proposed development, with the objective of improving the project by maximising its benefits while minimising its adverse effects.

I&APs include all interested stakeholders, technical specialists, and the various relevant organs of state who work together to produce better decisions.

The primary aims of the PP process are:

- to inform I&APs and key stakeholders of the proposed application and environmental studies;
- to initiate meaningful and timeous participation of I&APs;
- to identify issues and concerns of key stakeholders and I&APs with regards to the development;
- to promote transparency and an understanding of the project and its potential environmental (social and biophysical) impacts (both positive and negative);
- to provide information used for decision-making;
- to provide a structure for liaison and communication with I&APs and key stakeholders;
- to ensure inclusivity (the needs, interests and values of I&APs must be considered in the decision-making process);
- to focus on issues relevant to the project, and issues considered important by I&APs and key stakeholders; and
- to provide responses to I&AP queries.

The public participation process must adhere to the requirements of Regulations 41 and 42 (GN R.326). Further, a Public Participation guideline in terms of NEMA was issued by the DEA in 2017, of which provisions will also be implemented.

PUBLIC PARTICIPATION PLAN

1. Identification of I&APs

An I&AP database is already available due to previous projects undertaken on the same property. The I&AP database will be updated with new I&APs requesting to be registered and will be maintained throughout the duration of the project. All registered I&APs on the database will be informed of the project, review period as well as outcome of the decision issued by DFFE on the above-mentioned Basic Assessment process.

2. Advertisement

In compliance with the EIA Regulations 2014 (as amended in 2017), notification of the revised layout and EMPr and period for review will be advertised in the Gemsbok Newspaper. Hard copies of the draft cBAR and EMPr will be made available at the !Kheis Municipal Library and !Kheis Local Municipality for review and comment.

3. Review of the Draft Consultation Basic Assessment Report

The draft consultation Basic Assessment report (cBAR) and Environmental Management Programme (EMPr) will be made available electronically for review for 30 days, via the Royal HaskoningDHV Website as well as via email: <https://www.royalhaskoningdhv.com/en/south-africa/projects/environmental-reports>.

At the time of compilation of this document adjusted level 2 restriction Covid-19 restrictions are in place, therefore it is proposed that hard copies of the draft cBAR and EMPr be made available at the !Kheis Municipal Library and !Kheis Local Municipality for review and comment. These locations have been chosen as they are required to ensure that Covid-19 regulations and protocols are in place according to the Disaster Management Act, 2002.

Should the Covid-19 restrictions increase, the PP Plan will be adjusted with guidance from the DFFE to accommodate these restrictions whilst ensuring a robust and transparent process is conducted.

4. Meetings

No meetings are proposed for the project, however, should any I&AP specifically request a meeting, this will be held virtually.

5. Comments and Responses Report (CRR)

A CRR will be compiled with any comments and issues received and responded to which will form part of the submission of the final layout and EMPr to the Department.

Comments must be forwarded either via email, letter, by hand or via phone calls (documented in a letter or email thereafter) to:

Seshni Govender

PO Box, 867, Gallo Manor, 2052

Tel: 087 352 1592, Email: Seshni.govender@rhdhv.com

6. Environmental Authorisation

On receipt of the EA (positive or negative) for the proposed project, I&APs registered on the project database will be informed of this decision and its associated terms and conditions as well as the appeal process by email correspondence. An advert will be placed in the local newspaper in the Gemsbok Newspaper notifying I&APs of the decision.

Kind Regards
Malcolm Roods
EAP

Appendix C: Specialist Reports

**Appendix C1:
Biodiversity and Offset Feasibility
Investigation and Recommendations from the
Northern Cape Department Agriculture,
Environmental Affairs, Rural Development &
Land Reform (DAERL)**



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

File Reference Number: NEAS Reference Number: Date Received:	(For official use only) DEA/EIA/
--	-------------------------------------

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

TERRESTRIAL BIODIVERSITY ASSESSMENT REPORT FOR THE ACWA BOKPOORT SOLAR GARONA SUBSTATION EXPANSION

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at <https://www.environment.gov.za/documents/forms>.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:

Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:

Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

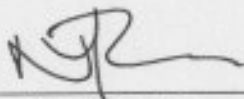
1. SPECIALIST INFORMATION

Specialist Company Name:	Birch Eco Serv cc TA Ecological Management Services		
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	Level 4	Percentage Procurement recognition: 100%
Specialist name:	Natalie Birch		
Specialist Qualifications:	PhD Botany, BSc (Hons) Wildlife Management		
Professional affiliation/registration:	SACNASP Registration Number: 400117/05		
Physical address:	36 Hugo Street Monument Heights, Kimberley		
Postal address:	P.O. Box 110470, Hadison Park		
Postal code:	8306	Cell:	083 406 9730
Telephone:	054 832 1561	Fax:	NA
E-mail:	birch@hinet.co.za		

2. DECLARATION BY THE SPECIALIST

I, Natalie Birch, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the Specialist

Ecological Management Services

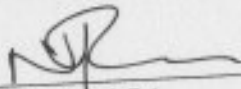
Name of Company:

5 July 2021

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, Natalie Birch, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.



Signature of the Specialist

Ecological Management Services

Name of Company

5 July 2021

Date



Signature of the Commissioner of Oaths

5 July 2021

Date


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TERRESTRIAL BIODIVERSITY ASSESSMENT REPORT FOR THE ACWA BOKPOORT SOLAR GARONA SUBSTATION EXPANSION NORTHERN CAPE

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July 2021

DECLARATION OF CONSULTANT

I Natalie Birch declare that I –

- act as the independent specialist in this study;
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2017;
- do not have and will not have any vested interest in the activity proceeding;
- have no, and will not engage in, conflicting interests in the undertaking of the activity;
- undertake to disclose, to the competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the Environmental Impact Assessment Regulations, 2017;
- will provide the competent authority with access to all information at my disposal regarding the study.

A handwritten signature in black ink, appearing to be 'NB' with a flourish extending to the right.

Natalie Birch Pr. Sci. Nat 400117/05

July 2021

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Appendix 2 – Regional conservation planning

Appendix 3 – Details of Specialist

ABBREVIATIONS

ADE	Aquifer Dependent Ecosystems
BGIS	Biodiversity Geographical Information System
CBA	Critical Biodiversity Area
CITES	Convention on International Trade in Endangered Species
DAERL	Department of Agriculture, Environmental Affairs, Rural Development and Land Reform
EIA	Environmental Impact Assessment
ESA	Ecological Support Area
EWT	Endangered Wildlife Trust
FEPA	Freshwater Ecosystem Priority Areas
GPS	Global Positioning System
GWC	Griqualand West Centre of Endemism
IUCN	International Union for Conservation of Nature
NCNCA	Northern Cape Nature Conservation Act
NEM:BA	National Environmental Management: Biodiversity Act
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Areas assessment
NPAES	National Protected Areas Expansion Strategy
PESEIS	Present Ecological State, Ecological Importance & Ecological Sensitivity
QDS	Quarter Degree Squares
SABAP	South African Bird Atlas Project
SABIF	South African Biodiversity Information Facility
SANBI	South African National Biodiversity Institute
SARCA	Southern African Reptile Conservation Assessment
SCC	Species of Conservation Concern
TOPS	Threatened or Protected Species

1 INTRODUCTION

ACWA Power Energy Africa (Pty) Ltd (hereafter referred to as ACWA Power) applied for several Environmental Authorisations (EA) for a solar power project located on the property Bokpoort, near Groblershoop in the Northern Cape. In June 2011, an authorisation was granted by the Department of Environmental Affairs (DEA) for a 75 MW Concentrated Solar Power (CSP) parabolic trough development, and construction was completed in July 2013. Subsequent to the completion of the CSP development, ACWA Power has considered and applied for several additions to the project, which included (inter alia) the proposed development of 10 Photo Voltaic plants, variations of Battery Energy Storage Systems (BESS) and Internal Combustion Engines (ICE). As a result of this solar development there is a requirement for an expansion of the Garona Substation and a 400kV loop-in loop-out. An application has been submitted by Eskom SoC Ltd to apply for Environmental Authorisation for this expansion as part of the ACWA Power project. Ecological Management Services has been appointed to undertake the Biodiversity specialist study required as part of the impact assessment process for the expansion project.

The Garona Substation expansion project (preferred option) will include the following project components:

- Establish a 400 kV busbar at Garona Substation,
- Establish and equip 2 x 400 kV feeder bays.
- Loop in and out of Ferrum – Nieuwehoop 400 kV lines (approx. 2 x 1 km) into Garona Substation.
- Extend the 132 kV busbar at Garona Substation (to accommodate the 400/132 kV transformer),
- Install a 500 MVA 400/132kV transformer with associated transformer bays, and
- Provide space for 1 future 400/132 kV transformer.
- Equip and commission the 1x 132 kV feeder bay

Work at Project DAO Substation:

- Establish a 400 kV busbar at DAO Substation,
- Establish and equip 2 x 400 kV feeder bays.
- Loop in and out of Ferrum – Nieuwehoop 400 kV line (existing).
- Install a 500 MVA 400/132kV transformer with associated transformer bays
- Equip and commission the 1 x 132kV feeder bay.
- Provide space for 1 future 400/132 kV transformer.

Towers

The existing Ferrum Nieuwehoop line use the following structures.

529ZA Guyed cross rope suspension tower,

520B Guyed-vee suspension tower,

518D Self-supporting (45 – 75 degrees) strain tower,

518E self supporting suspension transposition tower,

517A self-supporting suspension tower,

517E self-supporting (0 – 35 degrees) strain tower and

517F Self-supporting (35 – 60 degrees) strain and 0 degrees terminal tower

A self supporting tower will need to be used for the tie in with the following configuration:

518D Self-supporting (45 – 75 degrees) strain tower

517A self-supporting suspension tower

517E self-supporting (0 – 35 degrees) strain tower

517F Self-supporting (35 – 60 degrees) strain and 0 degrees terminal tower

Servitude requirements:

The servitude width for a 400 kV powerline is 55 m (27,5m on either side). The servitude is required to ensure the safe construction, maintenance and operation of the line, and thereby entitles Eskom Transmission Division certain rights (e.g. unrestricted access).

An alternative option has being investigated as part of the project. This option will only require the project to build a substation on the Project site with a 400kV loop in and loop out toward the Ferum-Niewenhoudt line (which runs adjacent to the project site). It will not require any pylons/towers to be constructed in any unauthorised areas. The exact same scope will be facilitated within the project site boundary as option 1.

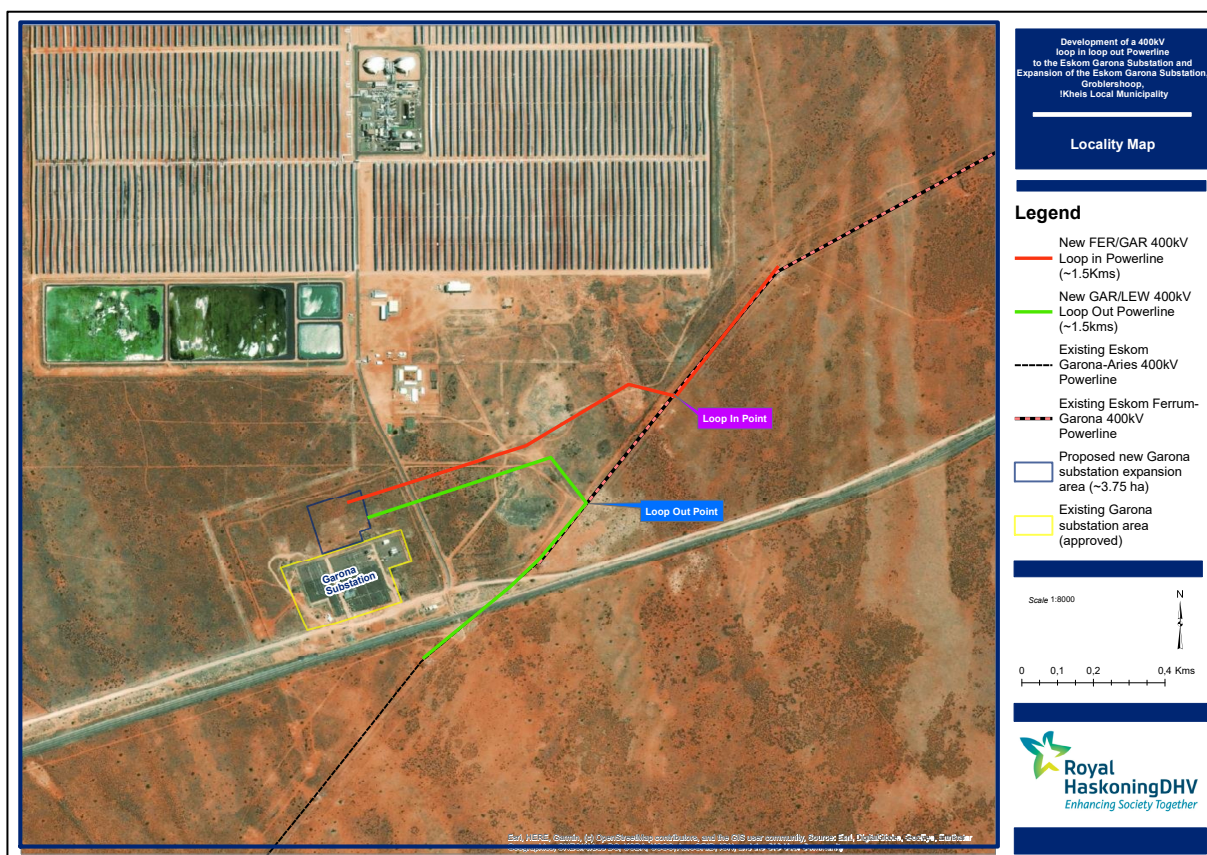


Figure 1 Locality of the development areas within the proposed project site

1.1 Terms of Reference and Scope of work

The scope of work for this study includes

- A comprehensive desktop investigation to identify potential floral species of special concern, this includes all IUCN listed species, TOPS listed species and species listed in schedule 1 and 2 of the NCNCA. These were identified through the SANBI POSA database as well as other available literature.
- A review of all previous biodiversity survey reports of the property to determine vegetation type and distribution. Collate a list all floral species of special concern that have been recorded in the area and that could potentially occur on site.
- A desktop review to determine what red data faunal species could potentially occur within the study site. The habitat requirements of each red data species that could potentially occur on-site to be compared with the vegetation description.
- Once the overall potential for occurrence of each red data species has been identified, each habitat type (based on the vegetation description and any factors identified as relevant to fauna) was ranked in terms of conservation importance, as well as ecological sensitivity.
- The sites importance in terms of regional sensitivity was also be assessed
- The report complies with the NEMA Appendix 6 requirements and the protocol for specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity.

1.2 Data Sourcing and Review

The data sources consulted and used where necessary in the study includes the following;

Vegetation:

- Vegetation types and their conservation status were extracted from the South African National Vegetation Map (South African National Biodiversity Institute, 2006-2018)) as well as previous biodiversity studies undertaken for the Bokpoort site.
- Information on plant and animal species recorded for the Quarter Degree Squares (QDS), was extracted from various databases including POSA, information was also extracted from biodiversity studies and walk through surveys conducted in the area for the Solar development.
- The IUCN conservation status of the floral species was also extracted from the database and is based on the Threatened Species Programme, Red List of South African Plants (2020).
- Threatened Ecosystem data was extracted from the NBA Threat Status and Protection Level list (SANBI 2018).
- Freshwater and wetland information was extracted from the National Freshwater Ecosystem Priority Areas assessment, NFEPA (Nel et al. 2011).
- Important catchments and protected areas expansion areas were extracted from the National Protected Areas Expansion Strategy 2016 (NPAES).

Fauna

- Lists of mammals, reptiles and amphibians which are likely to occur at the site were derived based on distribution records from the literature and various spatial databases (eg ADU Atlas projects and BGIS databases) as well as recording taken as part of previous biodiversity studies and walk through surveys.
- Literature consulted includes Branch (1988) and Alexander and Marais (2007) *Bates et al.* (2014) for reptiles, Du Preez and Carruthers (2009) for amphibians, Friedmann and Daly (2004) and Skinner and Chimimba (2005) for mammals.
- Bird species list for the area was extracted from the SABAP 1 and SABAP 2 databases and the specialist avifaunal study conducted for the area. Birdlife South Africa's Important Bird Areas was also consulted to ascertain if the site falls within the range of any range-restricted or globally threatened species.
- The faunal species lists provided are based on species which are known to occur in the broad geographical area, as well as a preliminary assessment of the availability and quality of suitable habitat at the site. For each species, the likelihood that it occurs at the site was rated according to the following scale:
 - **Low:** The available habitat does not appear to be suitable for the species and it is unlikely that the species occurs at the site.
 - **Medium:** The habitat is broadly suitable or marginal and the species may occur at the site.
 - **High:** There is an abundance of suitable habitat at the site and it is highly probable that the species occurs there.
 - **Definite:** Species that were directly or indirectly (scat, characteristic diggings, burrows etc.) observed at the site.
- The conservation status of each species is also listed, based on the IUCN Red List Categories and Criteria version 3.1 (2021-1) (See below) and where species have not been assessed under these criteria, the CITES status is reported where possible. These lists are adequate for mammals and amphibians, the majority of which have been assessed, however the majority of reptiles have not been assessed and therefore, it is not adequate to assess the potential impact of the development on reptiles, based on those with a listed conservation status alone. In order to address this shortcoming, the distribution of reptiles was also taken into account such that any narrow endemics or species with highly specialized habitat requirements occurring at the site were noted.

The IUCN Red List Categories for fauna and flora. Species that fall within the categories in red and orange below are of conservation concern.

IUCN Red List Category

Critically Endangered (CR)

Endangered (EN)

Vulnerable (VU)

Near Threatened (NT)

Critically Rare

Rare

Declining

Data Deficient - Insufficient Information (DDD)

Data Deficient - Taxonomically Problematic (DDT)

Least Concern

A number of specialist biodiversity reports have been undertaken for the Bokpoort project these were consulted to ensure all information previously collected from the area was utilised for the compilation of this report.

The following is provided in Accordance with NEMA Appendix 6, and the protocol for specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity (Government Gazette 43110, 20 March 2020)

Section	NEMA 2014 Regs – Appendix 6 (1) Requirement	Position in Report
1	A specialist report prepared in terms of these Regulations must contain—	
(a)	Details of -	
	(i) the specialist who prepared the report; and	Cover page
	(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	Appendix 3
(b)	a declaration that the person is independent in a form as may be specified by the competent authority;	Page 2
(c)	an indication of the scope of, and the purpose for which, the report was prepared;	Section 1.1
(d)	the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 3
(e)	a description of the methodology adopted in preparing the report or carrying out the specialised process;	Section 3
(f)	the specific identified sensitivities of the site related to the activity and its associated structures and infrastructure;	Section 4.3, 4.7 and Section 5
(g)	an identification of any areas to be avoided, including buffers;	Section 5
(h)	a map superimposing the activity including the associated structures and infrastructure on the environmental sensitive of the site including areas to be avoided, including buffers;	Section 5
(i)	a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.3

(j)	a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment;	Section 6 and 7
(k)	any mitigation measures for inclusion in the EMPr;	Section 6 & 7
(l)	any conditions for inclusion in the environmental authorization;	Section 7
(m)	any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 6 & 7
(n)	a reasoned opinion- <ul style="list-style-type: none"> (i) as to whether the proposed activity or portions thereof should be authorized and (ii) if the opinion is that the proposed activity of portion thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan; 	Section 7
(o)	a description of any consultation process that was undertaken during the course of preparing the specialist report;	N/A
(p)	a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	N/A at this stage,
(q)	any other information requested by the competent authority.	N/A at this stage

1.3 Assumptions and Limitations

The largest limitation with a desktop survey is the inability to confirm a particular species presence and/or number on site. There have been numerous studies within the surrounding area, and the area has been comprehensively surveyed as part of the solar project development. There is sufficient information collected from the area to inform the impact assessment process for the proposed development. However it is assumed that prior to any clearing an additional walk through survey will be conducted to confirm the exact number of species of conservation concern that will be directly affected as a result of this development. This information will be necessary for the required permit applications.

2 Regulatory and Legislative Overview

A summary of the relevant portions of the Acts which govern the activities and potential impacts to the environment associated with the development are listed below. Provided that standard mitigation and impact avoidance measures are implemented, not all the activities listed in the Acts below would actually be triggered.

National Environmental Management Act (NEMA) (Act No 107, 1998):

NEMA requires that measures are taken that "prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development." In addition:

- That the disturbance of ecosystems and loss of biological diversity are avoided, or where they cannot be altogether avoided, are minimised and remedied;
- That a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and
- Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

National Environmental Management: Biodiversity Act (NEM:BA) (Act 10 of 2004):

The National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA) provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The Draft National List of Threatened Ecosystems (Notice 1477 of 2009, Government Gazette No 32689, 6 November 2009) has been gazetted for public comment. The list of threatened terrestrial ecosystems supersedes the information regarding terrestrial ecosystem status in the NSBA 2004. In terms of the EIA regulations, a basic assessment report is required for the transformation or removal of indigenous vegetation in a critically endangered or endangered ecosystem regardless of the extent of transformation that will occur. However, all of the vegetation types within and surrounding the study site are classified as Least Threatened.

NEM:BA also deals with endangered, threatened and otherwise controlled species, under the TOPS Regulations (Threatened or Protected Species Regulations). The Act provides for listing of species as threatened or protected, under one of the following categories:

- **Critically Endangered:** any indigenous species facing an extremely high risk of extinction in the wild in the immediate future.
- **Endangered:** any indigenous species facing a high risk of extinction in the wild in the near future, although it is not a critically endangered species.
- **Vulnerable:** any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future; although it is not a critically endangered species or an endangered species.

- **Protected species:** any species which is of such high conservation value or national importance that it requires national protection. Species listed in this category include, among others, species listed in terms of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

A TOPS permit is required for any activities involving any TOPS listed species.

National Forests Act (No. 84 of 1998):

The National Forests Act provides for the protection of forests as well as specific tree species, quoting directly from the Act: “no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a license or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated”. A permit is required for the destruction or transplant or transport of any protected tree species.

National Veld and Forest Fire Act (Act No. 101 of 1998)

The purpose of this Act is to prevent and combat veld, forest and mountain fires. The Act provides for a variety of institutions, methods and practices for achieving the purpose such as the formation of fire protection associations. It also places responsibility on landowners to develop and maintain firebreaks as well as be sufficiently prepared to combat veld fires in terms of equipment as well as suitably trained personnel.

Conservation of Agricultural Resources Act (Act 43 of 1983):

The Conservation of Agricultural Resources Act provides for the regulation of control over the utilisation of the natural agricultural resources in order to promote the conservation of soil, water and vegetation and provides for combating weeds and invader plant species. The Conservation of Agricultural Resources Act defines different categories of alien plants and those listed under Category 1 are prohibited and must be controlled while those listed under Category 2 must be grown within a demarcated area under permit. Category 3 plants includes ornamental plants that may no longer be planted but existing plants may remain provided that all reasonable steps are taken to prevent the spreading thereof, except within the floodline of water courses and wetlands.

Northern Cape Nature Conservation Act, No. 9 of 2009: (NCNCA)

The Northern Cape Nature Conservation Act provides inter alia for the sustainable utilisation of wild animals, aquatic biota and plants as well as permitting and trade regulations regarding wild fauna and flora within the province. In terms of this act the following section may be relevant with regards to any security fencing the development may require.

Manipulation of boundary fences 19. No Person may –

- (a) erect, alter remove or partly remove or cause to be erected, altered removed or partly removed, any fence, whether on a common boundary or on such person's own property, in such a manner that any wild animal which as a result thereof gains access or may gain access

to the property or a camp on the property, cannot escape or is likely not to be able to escape therefrom;

The Act also lists protected fauna and flora under 3 schedules ranging from Endangered (Schedule 1), protected (schedule 2) to common (schedule 3). The majority of mammals, reptiles and amphibians are listed under Schedule 2, except for listed species which are under Schedule 1. A permit is required for any activities which involve species listed under schedule 1 or 2. A permit obtainable from the DAERL permit office in Kimberly would be required for the site clearing. A permit would also be required to destroy or translocate any nationally or provincially listed species from the site. A single permit, which covers all of these permitting requirements as well as meets TOPS regulations, is used.

3 Methodology

A comprehensive literature review was undertaken, data was collected from relevant data bases, specialist surveys and walk through surveys undertaken for this area.

Satellite images were used to identify homogenous vegetation/habitat units within the study area. The presence of sensitive habitats such as wetlands or pans and unique edaphic environments such as rocky outcrops or quartz patches were noted. This information was cross referenced to the specialist surveys to determine specific habitat types. The area surrounding the Garona Substation was surveyed by the author of this report during the walk through survey for the PV development in April 2021, information gathered during that survey was used to inform this report.

A desktop survey was undertaken to determine the red data reptile, amphibian, mammalian and bird species occurring in the quarter degree square in which the study area falls. The likelihood of red data species occurring on-site has been determined using the i) distribution maps in reference books and ii) a comparison of the habitat described from other surveys.

Criteria used in the assessment of impacts

The methodology used in the assessment of the identified impacts is provided in appendix 1

4 Description of the Affected Environment

4.1 Broadscale Vegetation Patterns

The study area falls within the Bushmanland Bioregion of the Nama-Karoo Biome and on the edge of the Kalahari Duneveld Bioregion of the Savanna Biome (Mucina & Rutherford 2006). According to the vegetation classification of Mucina & Rutherford (2006, BGIS vegetation map updated 2018), there are two vegetation types present within the development footprint –Kalahari Karroid Shrubland and Gordonia Duneveld.

Gordonia duneveld typically occurs on the undulating dunes. It is an open shrubland with grasslands on the ridges and Grey Camel Thorn, *Vachellia haematoxylon* (formerly known as *Acacia haematoxylon*) on the dunes slopes, *Senegalia mellifera* is prominent on the lower slopes and Three thorn, *Rhigozum trichotomum* is found in the interdune streets. The Kalahari Karroid Shrubland typically forms belts alternating with belts of Gordonia Duneveld, it is characterised by low karroid shrubland on flat gravel plains.

The western section of the substation area falls within the Gordonia Duneveld while the eastern section where the planned expansion and the 400kV loop-in loop-out will be positioned falls within the Kalahari Karroid Shrubland.

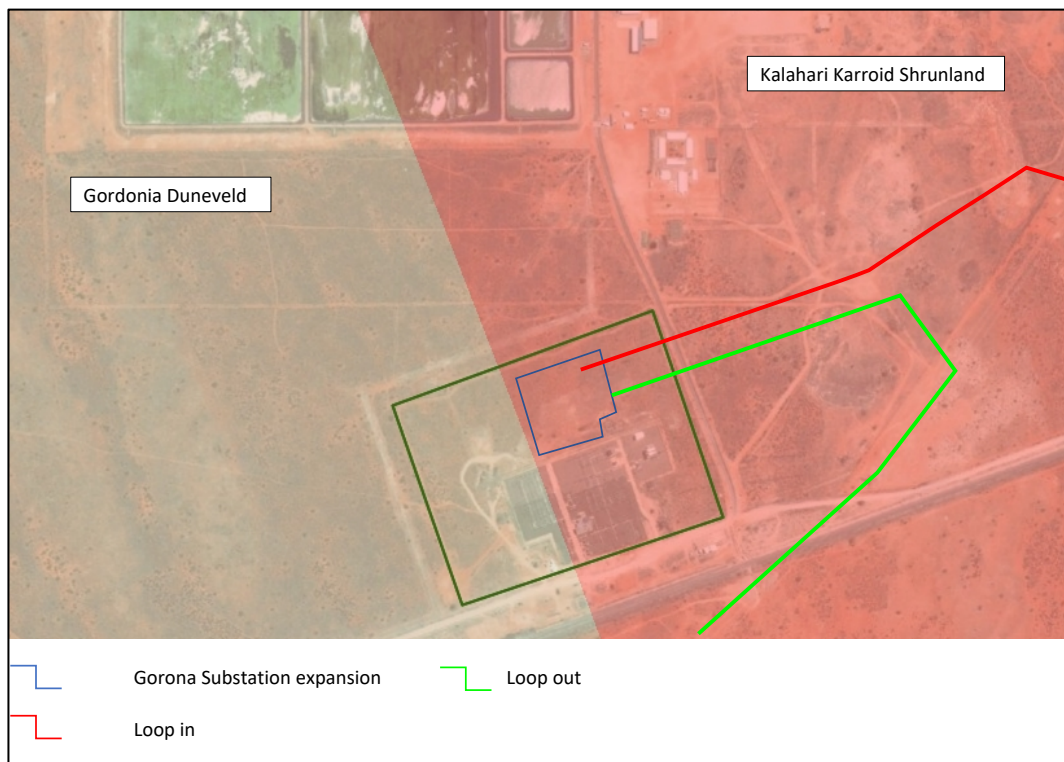


Figure 3 Broadscale vegetation types within the proposed development area.

4.2 Plant Community Descriptions

Within the greater area, calcareous low shrub plains and open shrub plains occur.

The calcareous low shrub plains is characterised by low shrubs and grasses, the underlying soils consist of whitish calcareous and compact sandy soils that are grey-brown in colour. Prominent species include the grasses *Enneapogon desvauxii*, *Eragrostis obtusa*, *Eragrostis truncata*, *Fingerhuthia africana*, *Stipagrostis ciliata*, the shrub *Salsola etoshensis* and the forbs *Pentzia calcarea*, *Eriocephalus spinescens*, *Monechma genistifolium* subsp. *australe*, *Geigeria* sp. *Boscia albitrunca* is one of the few tall shrubs within this vegetation unit.

Open shrub plains typically consists of shrubs and scattered trees on sandy, red soils with a well-developed herbaceous layer. The species diversity is relatively low, and includes taller woody species such as *Senegalia mellifera*, *Parkinsonia africana*, *Grewia flava* and *Boscia albitrunca*. Scattered individuals of *Vachellia erioloba* are also present within the landscape. Low shrubs include *Lebeckia linearifolia*, *Lycium bosciifolium*, *Rhigozum trichotomum* and *Salsola etoshensis*. Conspicuous grass species include *Schmidtia kalahariensis*, *Eragrostis lehmanniana* and *Stipagrostis ciliata*.

The majority of the proposed development footprint, consists of open shrub plains



Figure 4 Examples of the calcareous low shrub (left) and open shrub plains (right)

Much of the proposed development area has some form of disturbance in it, such as roads, fences infrastructure, and is already highly fragmented.

4.3 Critical Biodiversity Areas & Broad-Scale Processes

The Kalahari Karroid Shrubland is listed as Least Concerned (NBA 2018). It is not well conserved, with only a small amount (0.1%) formally conserved within the Augrabies National Park. The total extent of this vegetation type is 8582,553 Square Km, with 8291.594 Square Km occurring within the ZF Mgcauwu District Municipality of which 8,267.590 square Km is considered to be in good condition (99% within the district). It is listed as a high conservation priority within the District Municipalities Environmental Management Framework (EMF), and its target is set at 21%.

The Gordonia duneveld is listed as Least Concerned (NBA 2018). It is considered to be moderately protected with 14.8% formally conserved, in the Kgalagadi Transfrontier Park. The total extent of this vegetation type is 37035,7065 Sq Km and 99.8% is considered to be in good condition, the target is set at 16%.

The study area falls within the Griqualand West Centre of Endemism (GWC) (Van Wyk & Smith, 2001). A centre of plant endemism is an area with high concentrations of plant species with very restricted distributions, known as endemics. Centres of endemism are important because it is these areas, which if conserved, would safeguard the greatest number of plant species. They are extremely vulnerable; relatively small disturbances in a centre of endemism may easily pose a serious threat to its many range-

restricted species. The GWC is one of the 84 African centres of endemism and one of 14 centres in southern Africa, and these centres are of global conservation significance. The GWC is considered a priority in the Northern Cape, as the number of threats to the area is increasing rapidly and it has been little researched and is poorly understood. Furthermore, this centre of endemism is extremely poorly conserved, and is a national conservation priority.



Figure 5 The extent of the Grikualand West Centre of Endemism (GWC) (Van Wyk & Smith, 2001)

The study area does not fall within a Freshwater Ecosystem Priority Area (FEPA) but it does fall within a fish support area. The study area does not overlap with any Important Bird Areas, protected area or critical biodiversity area (CBA). In addition, the site is homogeneous and there are no unique or rare habitats or ecosystems within or in close proximity to the site

4.4 Populations of Sensitive and/or Threatened Floral & Faunal Species

Much of the proposed development footprint has already been disturbed by the existing substation infrastructure, roads and fences which has resulted in disturbance to the floral and faunal population on site. Disturbances that alter the natural environment have two effects namely, it may cause the loss of certain species due to the destruction of habitat. It may also cause the influx of other species previously unable to colonise an area owing to lack of suitable habitat or because they have been excluded through competition.

There are however a number of species of special concern that have been noted to occur in the area immediately surrounding the proposed development area and these have been noted for the purposes of this report.

Floral species of conservation concern

A number of botanical surveys conducted in the area have identified a number of plant SCC these are listed in the table below. No critically endangered, endangered, vulnerable, near threatened, critically rare, rare or declining plant species have been recorded, although two species have been categorised as DDT - Data Deficient - Taxonomically Problematic.

Species	Legislation	Conservation status	Potential of occurrence within and around proposed development area
<i>Vachellia erioloba</i>	National Forests Act 1998	Protected (LC)	High suitable habitat
<i>Vachellia haematoxylon</i>	National Forests Act 1998	Protected (LC)	High suitable habitat
<i>Boscia albitrunca</i>	National Forests Act 1998 NCNCA 2004	Protected (LC) Schedule 2	High suitable habitat
<i>Aloe claviflora</i>	NCNCA 2004	Schedule 2 (LC)	Moderate limited suitable habitat
<i>Acanthopsis hoffmannseggiana</i>	NA	DDT	Moderate limited suitable habitat
<i>Euphorbia Davyi</i>	NCNCA 2004	Schedule 2 (LC)	Moderate limited suitable habitat
<i>Hoodia gordonii</i>	NCNCA 2004 TOPS	Schedule 1 Schedule 1B (DDT)	High suitable habitat
<i>Ruschia divaricata</i>	NCNCA 2004	Schedule 2 (LC)	Moderate limited suitable habitat

Table 1. Summary of the floral species of conservation concern (SCC) that may occur on site or in the adjacent area

A number of specialist faunal studies have been conducted across the area, the results of which are discussed below.

Reptiles Species of Conservation Concern

No critically endangered, endangered, vulnerable, near threatened, critically rare, rare or declining terrapin, tortoises, snakes or lizards were identified as occurring in the quarter degree square 2821DB, based on the distribution maps available in the South African Red Data Book for reptiles (Bates *et. al.* 2014) and The Southern African Reptile Conservation Assessment (SARCA). The conservation status was cross checked on the SABI and IUCN websites to determine most recent status listing for these species. Some of the reptiles that have been recorded in the area are protected under the NCNCA schedule 1 & 2, these are listed in the table below. The *Agama atra* (Southern Rock Agama) was noted during the faunal surveys, this species is classified as Near endemic, although it is not listed as protected.

Species	Common Name	Status	Permit applicable Legislation
<i>Pedioplanis lineoocellata</i>	Spotted Sand Lizard	LC Protected	NCNCA Schedule 2
<i>Psammobates oculifer</i>	Serrated tent Tortoise	LC Protected	NCNCA Schedule 2
<i>Pedioplanis inornata</i>	Plain sand lizard	LC Protected	NCNCA Schedule 2
<i>Varanus albigularis albigularis</i>	Rock Monitor	LC Protected	NCNCA Schedule 2

Table 2. Summary of the reptile species that are protected under the NCNCA

Amphibians of Conservation Concern

No critically endangered, endangered, vulnerable, near threatened, critically rare, rare or declining amphibians were identified as occurring in the quarter degree square 2821DB, based on the distribution maps available in the South African Red Data Book for amphibians (Minter *et al.*, 2004) Du Preez and Carruthers (2009) and the South African Frog Atlas project. No amphibians have been confirmed to occur in or around the site.

Birds of Conservation Concern

A list of all birds of conservation occurring in the quarter degree square 2821DB, was extracted from the SABAP 1 and SABAP 2 databases and Birdlife South Africa's Important Bird Areas and from the Red Data Book of Birds (Taylor *et al* 2015) with the distribution being confirmed in Roberts – Birds of Southern Africa, 7th edition (Hockey *et al.*, 2005). The IUCN status(2021-1) is also presented in the table. Based on an evaluation of the habitat requirements, the potential of these critically endangered, endangered, vulnerable, near threatened, critically rare, rare or declining species to occur either on-site or within 500m of the property boundary is provided in the Table below.

Common Name	Scientific Name	Conservation Status (*Regional, Global)	Suitable Habitat requirements ¹	Potential for Occurrence in area surrounding development site
Martial Eagle	<i>Polemaetus bellicosus</i>	Endangered <i>Endangered</i>	Woodland, savannah or grassland with clumps of large trees or power pylons for nest sites	High – Sufficient habitat in surrounding areas.
Secretary bird	<i>Sagittarius serpentarius</i>	Vulnerable <i>Endangered</i>	Requires open grassland with scattered trees, shrubland, open Mixed Savannah.	Medium – Patches of open savannah will accommodate this species in surrounding area.
Kori Bustard	<i>Ardeotis kori</i>	Near Threatened <i>Near Threatened</i>	Dry thornveld grassland, arid scrub requires the cover of some trees	Medium – Moderate to high shrub density throughout the surrounding area
Black stork	<i>Ciconia nigra</i>	Vulnerable <i>Least Concern</i>	Marshes, dams rivers and estuaries breeds in mountainous regions	Low – No suitable habitat in surrounding area
Lappetfaced Vulture	<i>Torgos tracheliotos</i>	Endangered <i>Endangered</i>	Savannah; semi arid regions closely associated with <i>Vachellia</i> spp, <i>Bosica albitrunca</i> and <i>Terminalia pruniodes</i>	High Suitable habitat in surrounding areas
Ludwig's Bustard	<i>Neotis ludwigii</i>	Endangered <i>Endangered</i>	Requires semi-arid dwarf shrublands, occasionally visiting the southern Kalahari.	High – Sufficient habitat in surrounding areas
Lanner Falcon	<i>Falco biarmicus</i>	Vulnerable <i>Least Concern</i>	Lanner Falcons are generally a cliff nesting bird, but have adapted to using the disused nests of Black and Pied crows, situated either in trees or on power lines For foraging purposes, Lanner Falcons utilise a wide range of habitats, from semi desert to woodland, agricultural land and also occurs in cities, but appear to prefer open habitats	High – Sufficient habitat in surrounding areas
Verreaux's Eagle	<i>Aquila verreauxii</i>	Vulnerable <i>Least Concern</i>	Verreaux's Eagle is a solitary nester that builds a massive stick structure on a rocky	High – Has been recorded north east of the site

¹ Habitat requirements determined using the following reference material: Harrison *et al.*, 1997a; Harrison *et al.*, 1997b; ; Hockey *et al.*, 2005

Common Name	Scientific Name	Conservation Status (*Regional, Global)	Suitable Habitat requirements ¹	Potential for Occurrence in area surrounding development site
			outcrop or cliff, or more rarely in a tree or on a power pylon	
Abdim's Stork	<i>Ciconia abdimii</i>	Near Threatened <i>Least Concern</i>	Abdim's Stork is normally found in grasslands, sparsely wooded savannah, near pans and in cultivated fields	Medium – limited suitable habitat in area surrounding site

Table 3. Bird species of conservation concern identified as occurring in the quarter degree square and the potential for occurrence on the proposed site

The development footprint does not constitute critical habitat for any of the bird SCC, nor are they directly dependent on the proposed development footprint with respect to foraging or nesting.

Mammals of Conservation Concern

A list of all red data mammal species occurring in the quarter degree square, was extrapolated from the Red Data Book for Mammals (EWT, 2004) and the MammalMAP, the Mammal Atlas of Africa database. Based on an evaluation of the habitat requirements (EWT, 2004; Skinner and Chimimba, 2005), the potential of these critically endangered, endangered, vulnerable, near threatened, critically rare, rare or declining species to occur either on-site or within 500m of the property boundary is provided in the Table below.

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS	SUITABLE HABITAT ON-SITE ²	POTENTIAL FOR OCCURRENCE IN AREA SURROUNDING THE DEVELOPMENT SITE
Dent's Horseshoe Bat	<i>Rhinolophus denti</i>	Near threatened	Limited – Requires substantial cover such as caves and rock crevices.	Low –As the landscape in the immediate area is flat and does not offer suitable roosting habitat for this species, it is unlikely that this species would have colonised the adjacent areas.
Pangolin	<i>Smutsia temminckii</i>	Vulnerable (protected TOPS)	Moderate – Some suitable habitat in surrounding areas	Low – Unlikely to occur within the immediate surrounds of the site
Brown Hyaena	<i>Parahyaena brunnea</i>	Near Threatened (protected TOPS)	Moderate – Suitable habitat but a lot of disturbance in the area	Low – Unlikely to occur within the immediate surrounds of the site but may traverse the greater area
Cape Clawless Otter	<i>Aonyx capensis</i>	Near Threatened (protected TOPS)	None – No suitable habitat on site or within the immediate surrounds	Low – Site is too far removed from the river area

Table 4. Mammal species of conservation concern identified as occurring in the quarter degree square and the potential for occurrence on the proposed site

² Habitat requirements determined using the following reference material: Skinner and Smithers, 1990; EWT, 2004; Skinner and Chimimba, 2005

There are a number of mammals that have a conservation status of least concern which are protected under TOPS and/or the NCNCA that have been confirmed to occur in or around the site, these are listed in the table below.

Species	Common Name	Status	Permit applicable Legislation
<i>Otocyon megalotis</i>	Bat-eared Fox	LC Protected	NCNCA Schedule 1
<i>Cynictis penicillata</i>	Yellow Mongoose	LC Protected	NCNCA Schedule 2
<i>Galerella sanguinea</i>	Slender Mongoose	LC Protected	NCNCA Schedule 2
<i>Lepus capensis</i>	Cape Hare	LC Protected	NCNCA schedule 2
<i>Lepus saxatilis</i>	Scrub Hare	LC Protected	NCNCA Schedule 2
<i>Ictonyx striatus</i>	Striped Polecat	LC Protected	NCNCA Schedule 1
<i>Mellivora capensis</i>	Honey Badger	LC Protected	NCNCA Schedule 1 & TOPS
<i>Orycteropus afer</i>	Aardvark	LC Protected	NCNCA Schedule 1

Table 5. Summary of the mammal species that are protected under the NCNCA

Invertebrates of Conservation Concern

No invertebrate SCC were recorded on or around the site during previous biodiversity surveys, although two species *Alfredectes browni* (Browns Shieldback) and *Lepidochrysops penningtoni* (Pennington's Blue) are noted as possibly occurring in the area. Both these species are listed as Data Deficient.

4.5 Alien Invasive Species

The Conservation of Agricultural Resources Act (CARA) regulates and restricts the propagation, harbouring and sale of invasive alien plant and weed species listed in a set of Regulations published in terms of the Act. CARA was amended in 2001 and is administered by the National Department of Agriculture.

The National Environmental Management: Biodiversity Act (NEMBA – Act no. 10 of 2004) regulates all invasive organisms in South Africa, including a wide range of fauna and flora. All listed IAPs are divided into four categories in accordance with the Government Gazette Notice No. 40166 of July 2016 as listed below:

- **Category 1a (PROHIBITED): Listed Invasive Species**

A person in control of a Category 1a Listed Invasive Species must comply with the provisions of section 73(2) of the Act; immediately take steps to combat or eradicate listed invasive species in compliance with sections 75(1), (2) and (3) of the Act; and allow an authorised official from the Department to enter onto land to monitor, assist with or implement the combatting or eradication of the listed invasive species.

- **Category 1b (PROHIBITED / Exempted if in Possession or Under control): Listed Invasive Species**

A person in control of a Category 1 b Listed Invasive Species must control the listed invasive species in compliance with sections 75(1), (2) and (3) of the Act. A person contemplated in sub-regulation (2) must allow an authorised official from the Department to enter onto the land to

monitor, assist with or implement the control of the listed invasive species, or compliance with the Invasive Species Management Programme contemplated in section 75(4) of the Act.

- **Category 2 (PERMIT REQUIRED): Listed Invasive Species**

Category 2 Listed Invasive Species are those species listed by notice in terms of section 70(1)(a) of the Act as species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit, as the case may be. A landowner on whose land a Category 2 Listed Invasive Species occurs or person in possession of a permit, must ensure that the specimens of the species do not spread outside of the land or the area specified in the Notice or permit. Unless otherwise specified in the Notice, any species listed as a Category 2 Listed Invasive Species that occurs outside the specified area contemplated in sub-regulation (1), must, for purposes of these regulations, be considered to be a Category 1 b Listed Invasive Species and must be managed according to Regulation 3. Notwithstanding the specific exemptions relating to existing plantations in respect of Listed Invasive Plant Species published in Government Gazette No. 37886, Notice 599 of 1 August 2014 (as amended), any person or organ of state must ensure that the specimens of such Listed Invasive Plant Species do not spread outside of the land over which they have control.

- **Category 3 (PROHIBITED): Listed Invasive Species**

Category 3 Listed Invasive Species are species that are listed by notice in terms of section 70(1)(a) of the Act, as species which are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A of the Act, as specified in the Notice. Any plant species identified as a Category 3 Listed Invasive Species that occurs in riparian areas, must, for the purposes of these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to regulation 3.

Species		Category
<i>Argemone mexicana</i>	Yellow flowered Mexican Poppy	1b
<i>Prosopis cf. glandulosa</i>	Mesquite	3
<i>Datura ferox</i>	Fierce Thorn apple	1
<i>Xanthium spinosum</i>	Spiny cocklebur	1b
<i>Salsola kali</i>	Tumbleweed	1b

Table 6. Alien invasive species that occur in the area.

5 Site Sensitivity

The classification of areas into different sensitivity classes is based on information collected at various levels. This includes the national conservation status of the vegetation, the presence of species of special concern and the condition of the vegetation

Vegetation types can be categorised according to their conservation status, which is in turn, assessed according to the degree of the transformation relative to the expected extent of each vegetation type. The status of a habitat or vegetation type is based on how much of its original area still remains intact relative to various thresholds. Sensitivity of habitats and sites within the area can be assessed using a combination of criteria as follows:

	Criterion	Definition
1	Conservation status of untransformed habitats occurring in the study area	The extent of each vegetation type occurring within the study area that is conserved and/or transformed relative to a targeted amount required for conservation
2	Presence and number of Red Data species and other species of special concern	Presence or potential presence of Red Data species within habitats
3	Within-habitat species richness of flora and the between-habitat (beta) diversity of the site	Presence or potential presence of Red Data Species within habitats.
4	The type or nature of topography of the site, ie presence of ridges koppies etc	Steepness and/or nature of topography in the study area.
5	The type and nature of important ecological processes on site, especially hydrological processes, ie wetlands drainage lines etc.	Habitats and/or terrain features that represent ecological processes such as water-flow migration routes etc.

In order to advise the impact assessment and the proposed mitigation, a sensitivity map has been generated for the property using a number of criteria. In order to quantify and detail the sensitive areas in terms of the criteria used to assess sensitivity, the site was demarcated into a number of manageable blocks. A table was created to list each of the sensitivity criteria and a value assigned to each criteria. Each block was then assessed in terms of its relative sensitivity value. This produced a quantifiable sensitivity map. The criteria used to assess the sensitivity included;

Current state of degradation	1 = (80-100% degraded), Very degraded, highly transformed 2 = (60 -79% degraded), moderately transformed 3 = (40 – 59%) degraded, some transformation 4 = (20 -39% degraded, slightly transformed 5 = (0-19%) degraded Good condition
Slope & drainage	1 = Flat 2 = Gently undulating 3 = Slight slope 4 = Slope less than 5° 5 = Slope 5° or greater
Potential for erosion	1= Low 2 = Medium

	3 = High
Presence of Red Data Species	0 = No
	1 = Yes
Suitable habitat for RD species	0 = No
	1 = Yes
Potential habitat fragmentation	1 = Low
	2 = Low – moderate
	3 = Moderate
	4 = Moderate - high
	5 = High
Importance to biodiversity& Ecosystem Functioning	
	1 = Low
	2 = Low – moderate
	3 = Moderate
	4 = Moderate - high
	5 = High

Areas have been classified as follows:

- **Low (0-9)** sensitivity areas are already highly transformed and/or already contain development. Any development in these areas will not have a significant environmental impact.
- **Medium (10-20)** sensitivity areas: The vegetation and habitats in these areas have had some disturbance and may include some potential habitat for red data species and/or the presence of some protected/red listed species. Development in these areas, would be subject to strict guidelines and the mitigation measures.
- **High (21-25)** sensitivity areas included either confirmed occurrence of numerous protected/red listed species and ideal red data species habitat, important ecosystem processes or the presence of CBAs. Any development in these areas would have a significant environmental impact. No development should take place in these areas, but it is recognised that in certain exceptional cases, development may need to take place. Under these conditions very strict development guidelines would be required, and only under guarantee that similar areas within the site would be conserved thus reducing the risk of development.

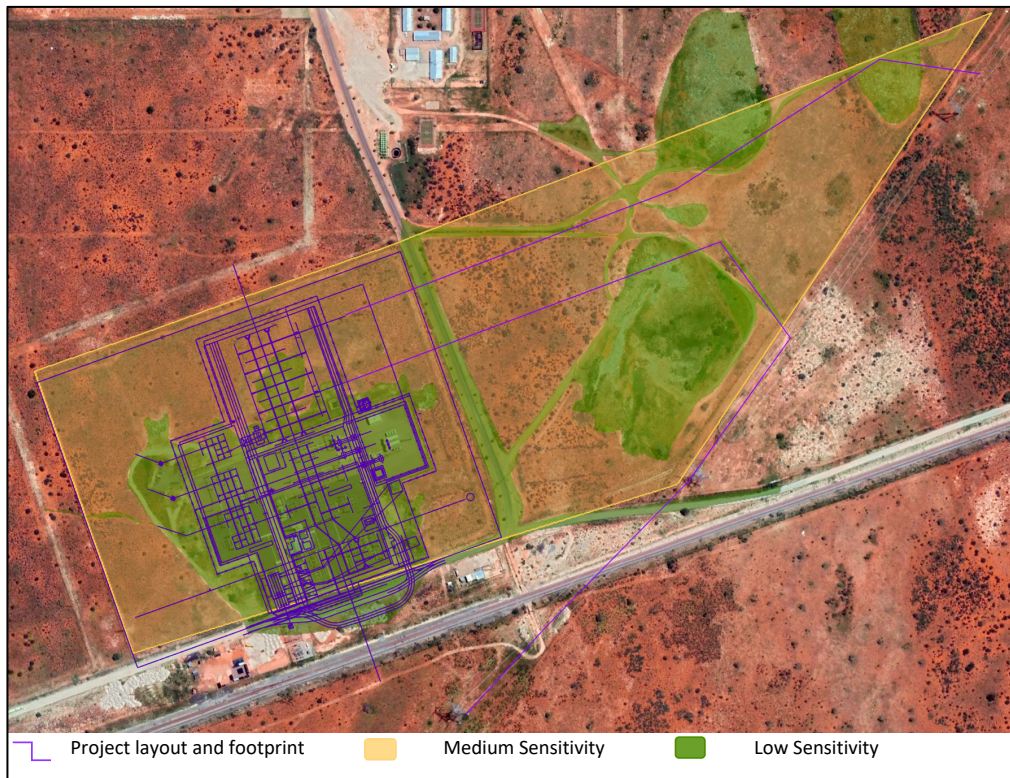


Figure 6 Map of area sensitivity overlaid with the proposed project developmental footprint

6 Impacts associated with the expansion of the substation

The expansion of the Garona substation and the construction of the 400 kV Line will require the clearing of natural vegetation. This expansion project has the potential to impact on the biodiversity ecosystems in the following ways;

6.1 Additional loss of Natural vegetation, Alien invasion and further habitat fragmentation

Typically a development is divided into the construction phase and the operational phase. The construction phase usually results in the most significant impacts. It is during this phase that most of the destruction of habitat and microhabitat takes place. Vegetation clearing will occur as a result of the construction of the substation expansion and the 400kV line. This will cause additional fragmentation and habitat disturbance in the landscape. This disturbance destroys primary vegetation. Clearing of additional surface areas has the effect of creating unnatural open spaces through the vegetation and the matrix of the landscape. For the smaller species, it limits movement and restricts access to foraging sites. This results in reduced population density of prey species (invertebrates and / or smaller birds and / or smaller mammals and / or herpetofauna) which then reduces the food availability for predators (invertebrates and / or larger birds and / or larger mammals and / or herpetofauna). The changes in the vegetation structure also alter the availability of suitable cover for many faunal species. Additional

clearance of primary vegetation allows secondary pioneer species or invasive plants to enter and re-colonise disturbed areas, thus increasing the possibility of Alien species invading. Invasive species affect our natural biodiversity in a number of ways. They may compete directly with natural species for food or space, may compete indirectly by changing the food web or physical environment, or hybridize with indigenous species. Rare species with limited ranges and restricted habitat requirements are often particularly vulnerable to the influence of these alien invaders. Much of the area associated with the proposed development has already had some form of disturbance in it, such as roads, fences and infrastructure, and is already highly fragmented.

Mitigation measures:

The significance of the loss of habitat may be mitigated slightly if there are areas with suitable ecological corridors this may be possible by ensuring that no disturbance occurs in the areas outside the development footprint. Only the actual development must be disturbed, the surrounding edges must be regarded as no-go areas. A comprehensive Alien Invasive Plant removal programme must be drawn up and implemented.

Assessment of Impact:

Attribute	Pre-mitigation	Post- mitigation
Scale	1	1
Duration	5	5
Magnitude	2	0
Probability	3	3
Impact Significance	24 (Low)	18 (Low)

6.2 Loss of Species of Conservation Concern

As the area of the development footprint is already disturbed and the likelihood of SCC occurring within this development footprint area is very low, the impact of this development on SCC cannot be considered to be significant. There is no habitat within the proposed development footprint that is specific/ critical to any faunal SCC. However the surrounding development has already resulted in the loss of a significant number of SCC, especially the loss of a large amount of *Boscia albitrunca* trees, this cumulative impact increases the significance of the loss of these trees related to this specific development.

Mitigation:

A search and rescue operation should be performed prior to clearing, it should however be noted that this is not a feasible or practical option with regard to the protected trees.

Assessment of Impact:

Attribute	Pre-mitigation	Post- mitigation
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Scale	3	2
Duration	5	5
Magnitude	4	2
Probability	2	2
Impact Significance	24 (Low)	18 (Low)

6.3 Anthropogenic Disturbances, Intentional and/or accidental killing of fauna

Anthropogenic disturbances include aspects such as, vibrations caused by machinery & vehicles. These aspects will impact on invertebrate species more than any other faunal species. These anthropogenic disturbances impact on the way invertebrates forage. For example; some invertebrates use vibrations caused by their prey to locate and catch them. Vibrations caused by construction equipment will make this impossible. Smaller fauna will inevitably be killed during land clearing activities as these activities will destroy their habitat. Some faunal species may be killed as a result of increase vehicle traffic on the roads. Some faunal species may also be killed as a result of operational activities or presence of infrastructure, such as the overhead lines. Collisions of large terrestrial birds with the overhead power lines may occur, electrocution of birds on pylons is also a possibility. Species most likely to be affected are bustards, korhaans and other large terrestrial species. The length of the line generally affects the significance of this impact, thus as the proposed line is relatively short the significance of this impact is reduced. The proposed development area is disturbed and fragmented by surrounding infrastructure which decreases the suitability of the area as a foraging area, thereby decreasing the probability of occurrence. In addition to unintentional killing of fauna, some faunal species, particularly herpetofaunal species, are often intentionally killed as they are thought to be dangerous.

Mitigation measures

There is unfortunately no mitigation for the vibrations caused by machinery/vehicles, except perhaps ensuring that activities are kept to a minimum. The intentional killing of fauna can be mitigated through education and training and the enforcement of a strict policy against the killing of fauna. The type of pylons used in terms of clearances on a pole structure can influence electrocutions rates, the use of bird flight diverters on the lines can reduce collision incidences.

Assessment of Impact:

Attribute	Pre-mitigation	Post- mitigation
Scale	1	1
Duration	5	5
Magnitude	6	4
Probability	2	2
Impact Significance	24 (Low)	20 (Low)

7 Discussion & Conclusion

A review of the biodiversity on site and the anticipated impacts associated with this type of development on the biodiversity indicates that none of the anticipated impacts can be highlighted or construed to represent an unacceptable or severe threat to sensitive biodiversity within the development footprint. This development does however form part of a larger development and the cumulative impacts associated with every phase of this development does have a significant impact to the biodiversity in the greater area.

It is recommended that prior to any clearing activities an additional walk-through be conducted, to count and mark any floral SCC, specifically with respect to the protected trees. This will be necessitated for the required permits. This area should be included in the terrestrial biodiversity monitoring programme for the Bokpoort Solar Development. The recommended terrestrial biodiversity monitoring protocol should ideally comprise the following aspects:

- Alien and Invasive plant species monitoring;
- Vegetation/ ecological monitoring;
- Faunal monitoring, and
- Avian monitoring.

These aspects should ideally be executed during an optimal period of the year, considering seasonal variation in vegetation attributes, activity levels of animals and migration patterns of bird species. Ultimately, the intention is to demonstrate the stability of the surrounding environment and sensitive receptors, monitoring results should therefore ideally be repeated during the same time of year.

There will be a substantial loss of SCC as a result of the Bokpoort solar development in its entirety, most notably the number of *Boscia albitrunca* trees that will be lost. Although the expansion of the Garona substation will result in an insignificant number of SCC being lost as a direct result of the development the cumulative impact of the loss of protected trees as a result of the whole solar development should be considered. Although *B. albitrunca* is not considered to be in decline and is therefore listed as Least Concern it is listed as a protected species because it is considered a keystone species in the arid parts of South Africa, where it not only provides browse, but shade and microhabitat for other biota (i.e a close-nit relationship exists between *Boscia albitrunca* and the Brown-veined White butterfly (*Belenois aurota*)).

This proposed expansion falls with the Kalahari Karroid Shrubland vegetation type, which is a considerably small vegetation type for the arid region (828 389.89 ha) with only 0.1% under formal protection in the Augrabies Falls NR. The Bokpoort Solar developments will destroy about ~0.17% of the conservation target, this is approximately what is currently under formal protection. Even though it has a conservation target of 21%, no conservation land has been added to this vegetation unit since 2006. There is a concern that increased impacts on this vegetation unit can result in fragmented islands which can ultimately result in the hindering of ecosystem functions and processes.

A biodiversity offset has therefore been mandated for the Bokpoort Solar development, to ensure that all residual impacts associated with the development as a whole are adequately compensated, the offset area calculation has included all aspects/phases of the project including the expansion of the Garona substation.

8 References

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Appendix 1 – Impact Assessment methodology

The potential environmental impacts associated with the project will be evaluated according to its nature, extent, duration, intensity, probability and significance of the impacts, whereby:

- **Nature:** A brief written statement of the environmental aspect being impacted upon by a particular action or activity;
- **Extent:** The area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales. This is often useful during the detailed assessment phase of a project in terms of further defining the determined significance or intensity of an impact. For example, high at a local scale, but low at a regional scale;
- **Duration:** Indicates what the lifetime of the impact will be;
- **Intensity:** Describes whether an impact is destructive or benign;
- **Probability:** Describes the likelihood of an impact actually occurring; and
- **Cumulative:** In relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Occurrence		Severity	
Probability of occurrence	Duration of occurrence	Scale/extent of impact	Magnitude (severity) of impact

To assess each of these factors for each impact, the following four ranking scales are used:

Criteria for the ranking of impacts

Probability	Duration
5 - Definite/ don't know	5 - Permanent
4 - Highly probable	4 - Long-term
3 - Medium probability	3 - Medium-term (8 - 15 years)
2 - Low probability	2 - Short-term (0 - 7 years) (impact ceases after the operational life of the activity)
1 - Improbable	1 - Immediate
0 - None	0 - None
Scale	Magnitude
5 - International	10 - Very high/ don't know
4 - National	8 - High
3 - Regional	6 - Moderate
2 - Local	4 - Low
1 - Site only	2 - Minor
0 - None	0 - None

Once these factors have been ranked for each impact, the significance of the two aspects, occurrence and severity, must be assessed using the following formula:

$$SP \text{ (significance points)} = (\text{magnitude} + \text{duration} + \text{scale}) \times \text{probability}$$

The maximum value is 100 significance points (SP). The impact significance is then rated as follows:

Table : Impact significance

SP >75	Indicates high environmental significance	An impact which could influence the decision about whether or not to proceed with the project regardless of any possible mitigation.
SP 30 – 75	Indicates moderate Environmental significance	An impact or benefit which is sufficiently important to require management and which could have an influence on the decision unless it is mitigated.
SP <30	Indicates low environmental significance	Impacts with little real effect and which should not have an influence on or require modification of the project design.
+	Positive impact	An impact that constitutes an improvement over pre-project conditions