

**Appendix D: Environmental Management
Programme (PV Plants and Ancillary
Infrastructure excluding Overhead
Transmission Infrastructure)**

REPORT

Environmental Management Programme for Eight
200MW Photovoltaic (PV) plants on the Remaining
Extent of Farm Bokpoort 390, Groblershoop, Northern
Cape

Ref 14/12/16/3/3/1/2142 (Venda)
Ref 14/12/16/3/3/1/2143 (Tsonga)
Ref 14/12/16/3/3/1/2144 (Tswana)
Ref 14/12/16/3/3/1/2145 (Sotho)
Ref 14/12/16/3/3/1/2146 (Swati)
Ref 14/12/16/3/3/1/2147 (Afrikaans)
Ref 14/12/16/3/3/1/2150 (Pedi)
Ref 14/12/16/3/3/1/2151 (Zulu)

ENVIRONMENTAL MANAGEMENT PROGRAMME

Client: ACWA Power Energy Africa (Pty) Ltd
Reference: MD4195-RHD-ZZ-XX-RP-YE-0001
Status: P01.01/S0
Date: 18 May 2020

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Classification

Project related



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Acronyms

CA	Competent Authority
CBA	Critical Biodiversity Area
DWS	Department of Water and Sanitation
dEO	Designated Environmental Officer
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EMPr	Environmental Management Programme
ERP	Emergency Response Plan
ESA	Ecological Support Area
GIS	Geographic Information Systems
GNR	Government Notice Regulation
IAP	Invasive Alien Plant
I&AP	Interested and Affected Party
IEM	Integrated Environmental Management
MMP	Maintenance Management Plan
MSDS	Material Safety Data Sheet
NEM:AQA	National Environmental Management: Air Quality Act (Act No. 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NEM:PAA	National Environmental Management: Protected Areas Act (Act No. 57 of 2003)
NEM:WA	National Environmental Management: Waste Act (Act No. 36 of 1998) (as amended)
NEMA	National Environmental Management Act (Act No. 107 of 1998) (as amended)
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
NWA	National Water Act (Act No. 36 of 1998)
PM	Project Manager
RoW	Right-of-Way
SANBI	South African National Biodiversity Institute
SDC	Safe Disposal Certificate
SEF	Site Environmental File
SEMA	Suite of Environmental Management Acts
WUL(A)	Water Use Licence (Application)

Glossary

Accident	A road vehicle accident.
Activity (Development)	An action either planned or existing that may result in environmental impacts through pollution or resource use. For the purpose of this report, the terms 'activity' and 'development' are freely interchanged.
Alien Species	(a) A species that is not an indigenous species; or (b) an indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention as set out in the National Environmental Management: Biodiversity Act (Act No. 10 of 2004).
Applicant	The project proponent or Developer responsible for submitting an environmental application to the relevant environmental authority for environmental authorisation.
Buffer	A buffer is seen as an area that protects adjacent communities from unfavourable conditions. A buffer zone is usually an artificially imposed zone included in a management plan.
Building and Demolition Waste	Building and demolition waste means waste, excluding hazardous waste, produced during the construction, alteration, repair or demolition of any structure, and includes rubble, earth, rock and wood displaced during that construction, alteration, repair or demolition.
Client's Project Manager	The person appointed by the client who is responsible for the construction site as a whole.
Contractor	Companies appointed on behalf of the Developer to undertake activities, as well as their sub-contractors and suppliers.
Construction Project Management Team	The team consists of a Project Manager as well as a Designated Environmental Officer.
Culvert	A pipe or box intended to convey water under a highway, railroad, canal, or similar facility.
Degradation	The lowering of the quality of the environment through human activities e.g. river degradation, soil degradation.
Domestic Waste	Domestic waste means waste, excluding hazardous waste, that emanates from premises that are used wholly or mainly for residential, educational, health care, sport or recreation purposes.
Emergency	An undesired event that results in a significant environmental impact and requires the notification of the relevant statutory body such as a local or provincial authority.
Environment	In terms of the National Environmental Management Act (NEMA) (Act No. 107 of 1998)(as amended), "Environment" means the surroundings within which humans exist and that are made up of: <ul style="list-style-type: none"> (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plants and animal life; (iii) any part or combination of (i) of (ii) and the interrelationships among and between them; and (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

Environmental Aspect	An environmental aspect is any component of a Contractor's construction activity that is likely to interact with the environment.
Environmental Control Officer	An individual nominated through the Developer to be present on-site to act on behalf of the Developer in matters concerning the implementation and day to day monitoring of the EMPr and conditions stipulated by the authorities.
Environmental Impact	A change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services.
Environmental Management Programme	A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive impacts, and, limiting or preventing negative environmental impacts are implemented during the life-cycle of a project. It is an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction and operation, long-term maintenance, and, decommissioning of a project are prevented and that positive benefits of the projects are enhanced.
General Waste	General waste means waste that does not pose an immediate hazard or threat to health or to the environment, and includes - <ul style="list-style-type: none"> (i) domestic waste; (ii) building and demolition waste; (iii) business waste; and (iv) inert waste.
General Waste Landfill Site	A waste disposal site that is designed, managed and permitted to allow for the disposal of general waste.
Hazardous Waste Landfill Site	A waste disposal site that is designed, managed and permitted to allow for the disposal of hazardous waste.
Impact	A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.
Mitigation	Measures designed to avoid, reduce or remedy adverse impacts.
Principal Agent	The principal agent is appointed by the Developer to oversee the overall project management and the management of the professional project team.
Re-use	To utilise articles from the waste stream again for a similar or a different purpose without changing the form of properties of the articles.
Recycle	A process where waste is reclaimed for further use, this involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or raw material.
Rehabilitation	Rehabilitation is defined as the return of a disturbed area to a state which approximates the state (where possible) which it was before disruption. Rehabilitation for the purposes of this specification is aimed at post-reinstatement re-vegetation of a disturbed area and the insurance of a stable land surface. Re-vegetation must aim to accelerate the natural succession processes so that the plant community develops in the desired way, i.e. promote rapid vegetation establishment.
Road Reserve	A corridor of land, defined by co-ordinates and proclamation, within which the road, including access intersections or interchanges, is situated. A road reserve may, or may not, be bounded by a fence.
Road Width	For the purposes of this document, the road width is defined as the area within the road reserve i.e. fence line to fence line, but also includes all areas beyond the road reserve that are affected by the continuous presence of the road, e.g. a reach of a watercourse.

**Safety, Health and
Environmental (SHE)
Officer**

The SHE Officer is a Contractor representative, responsible for the safety, health and environmental aspects during construction. The SHE Officer will be responsible for the day-to-day monitoring of the EMPr and Health and Safety Plan (if identified as the dEO).

Waste

Waste means any substance, whether or not that substance can be reduced, re-used, recycled and recovered -

- (i) that is surplus, unwanted, rejected, discarded, abandoned or disposed of;
- (ii) which the generator has no further use of for the purposes of production;
- (iii) that must be treated or disposed of; or
- (iv) that is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but—
 - o a by-product is not considered waste; and
 - o any portion of waste, once re-used, recycled and recovered, ceases to be waste.

Waste Disposal Facility

Waste disposal facility means any site or premise used for the accumulation of waste with the purpose of disposing of that waste at that site or on that premises.

Workforce

The entire project team including people employed by the Principal Agent or the Contractor, persons involved in activities related to the project, or person present at or visiting the construction area, including permanent contactors and casual labour.

1 INTRODUCTION

ACWA Power Energy Africa (Pty) Ltd (hereafter referred to as ACWA Power) is proposing to construct a solar energy facility consisting of ten (10) photovoltaic (PV) plants on the north-eastern portion of the Remaining Extent (RE) of the Farm Bokpoort 390, located 20 km north-west of the town of Groblershoop within the !Kheis Local Municipality in the ZF Mgqawu District Municipality, Northern Cape Province.

On 21 October 2016, a 150 MW Concentrating Solar Power (CSP) plant in 900 ha was authorised by the Department of Environmental Affairs (DEA) – Ref 14/12/16/3/3/2/879. Due to the changes in the Integrated Resource Plan (IRP) published in October 2019, ACWA Power intend replacing the authorised CSP site with eight (8) new PV plants. The updated layout has been revised to incorporate the 8 new PV plants of 200 MW each, covering a total of 1200 ha (i.e. 150 ha for each plant).

Individual applications for Environmental Authorisation will be lodged per plant (8 applications in total), however, this Basic Assessment (BA) study is applicable to the entire development footprint for the 8 individual plants.

Two (2) 75 MW PV plants including ancillary infrastructure (Ref 14/12/16/3/3/2/880 and 14/12/16/3/3/2/881), were also authorised by the DEA on 24 October 2016. The intention to replace the CSP plant with 8 PV plants will result in development footprint changes of the overall project. As such PV 1 (Ndebele) and PV 2 (Xhosa) PV plants will undergo an amendment to better cater for the overall project development and ancillary infrastructure. A separate BA study is currently being undertaken for the two approved PV plants to include battery energy storage systems as well as the increase in the electricity output from 75 MW to 200 MW.

ACWA Power has indicated that the development will be funded from local and international sources and hence the EIA for the proposed development would need to comply with the International Finance Corporation Performance Standards (IFC) 2012 and the Equator Principles.

As stated above this project is viewed as an update to the original environmental processes and as such this Environmental Management Programme (EMPr) is predominantly based on the following documents provided in the previously authorised EMPrs compiled by Golder Associates:

- Proposed 150 MW CSP Tower Development on the Remaining Extent of the Farm Bokpoort 390, Northern Cape undertaken by Golder Associates Africa, 2016¹.
- Proposed 75 MW Photovoltaic (PV 1) Solar Development on the Remaining Extent of the Farm Bokpoort 390, Northern Cape undertaken by Golder Associates Africa, 2016².
- Proposed 75 MW Photovoltaic (PV 2) Solar Development on the Remaining Extent of the Farm Bokpoort 390, Northern Cape undertaken by Golder Associates Africa, 2016³.

The locality map including the layout of the new PVs plant and ancillary infrastructure is provided in **Figure 1**.

¹ Schlechter, M., & Baxter, B. 2016. Final EIA Report: Proposed 150MW CSP Tower Development on the Remaining Extent of Farm Bokpoort 390, Northern Cape. Golder Associates. Ref 14/12/16/3/3/2/879.

² Schlechter, M., & Baxter, B. 2016. Final EIA Report: Proposed 75MW Photovoltaic (PV1) Solar Development on the Remaining Extent of the Farm Bokpoort 390, Northern Cape. Golder Associates. Ref 14/12/16/3/3/2/881.

³ Schlechter, M., & Baxter, B. 2016. Final EIA Report: Proposed 75MW Photovoltaic (PV2) Solar Development on the Remaining Extent of the Farm Bokpoort 390, Northern Cape. Golder Associates. Ref 14/12/16/3/3/2/880

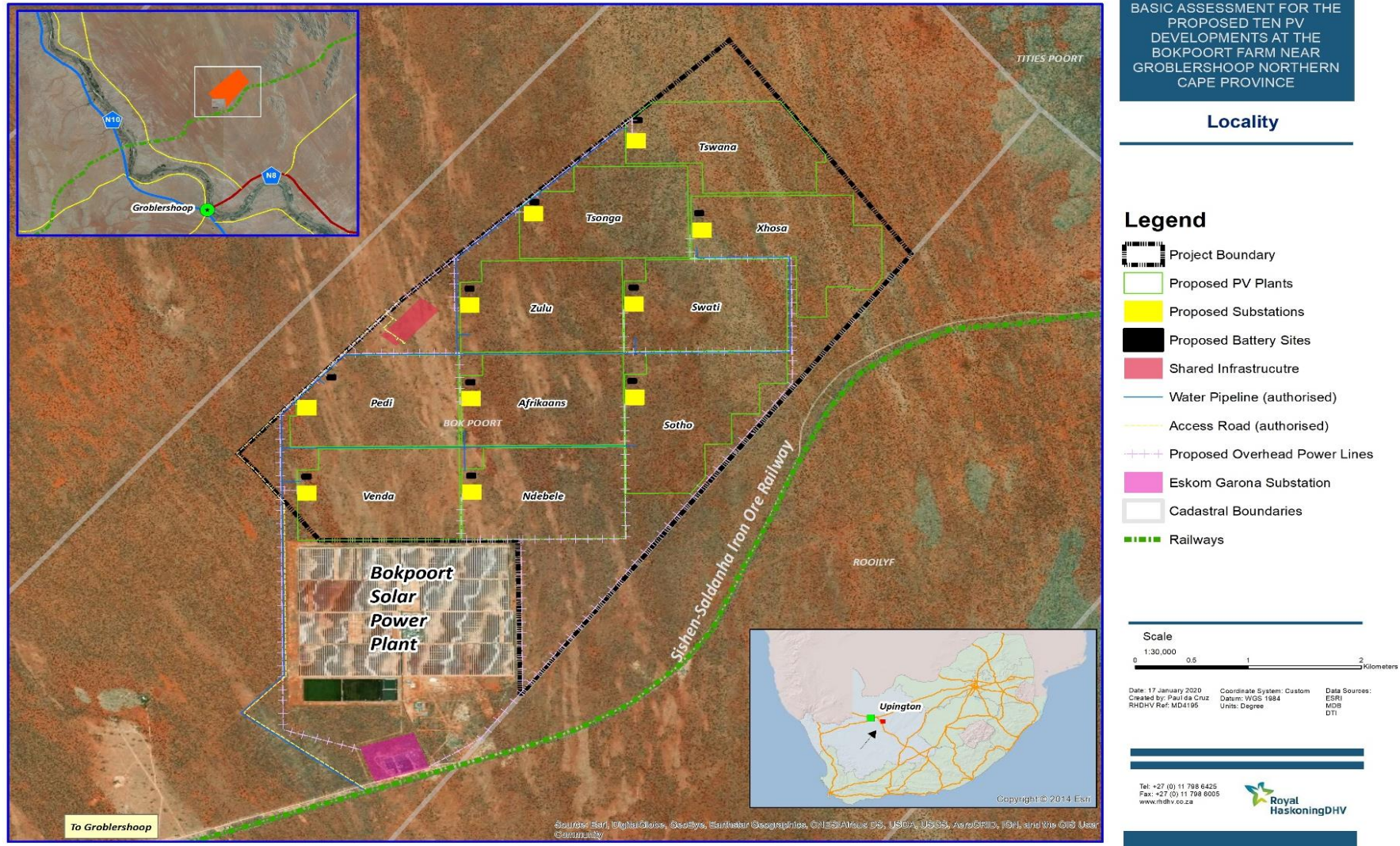


Figure 1: Locality map

This EMPr has been prepared as part of the BA study to provide specific environmental guidance to the relevant parties for the planning, construction, rehabilitation of the proposed infrastructure with regards to their responsibilities in terms of the environmental specification.

The Competent Authority, being the Department of Environmental Affairs, Forestry and Fisheries (DEFF) requires that an EMPr be submitted in accordance with Section 19 of the EIA Regulations 2014 (as amended in 2017). Section 19 should be read in conjunction with Section 24N of the NEMA (Act No. 107 of 1998) (as amended).

In the context of this project and in most cases, the EMPr is primarily based on the principles of NEMA, which therefore bestows a 'Duty of Care' on those who cause, have caused or may in future cause pollution or degradation of the environment, as per Section 28(1) of the NEMA.

1.1 Purpose of the Environmental Management Programme (EMPr)

The purpose of the EMPr is to prescribe mitigation and management measures to ensure social and environmental impacts, risks and liabilities identified during the BA study are effectively managed during the construction phase and to further ensure the enhancement of the positive environmental benefits of the development are achieved.

Therefore, the EMPr specifies the mitigation and management measures to which ACWA Power is committed, should the EA be granted, and details how ACWA Power and/ or other responsible parties will mobilise organisational capacity and resources to implement these measures.

The EMPr is developed in terms of the Suite of Environmental Management Acts (SEMAs) and enforces that construction activities meet the requirements of existing environmental legislation and good environmental practice in terms of national and international norms and standards.

Core to the purpose of the EMPr is to implement the 'mitigation hierarchy' (DEA et al., 2013), which is illustrated in **Figure 2**.

AVOID or PREVENT Refers to considering options in project location, siting, scale, layout, technology and phasing to avoid impacts on biodiversity, associated ecosystem services, and people. This is the best option, but is not always possible. Where environmental and social factors give rise to unacceptable negative impacts the development should not take place. In such cases it is unlikely to be possible or appropriate to rely on the latter steps in the mitigation.

MINIMISE Refers to considering alternatives in the project location, siting, scale, layout, technology and phasing that would minimise impacts on biodiversity and ecosystem services. In cases where there are environmental and social constraints every effort should be made to minimise impacts.

REHABILITATE Refers to rehabilitation of areas where impacts are unavoidable and measures are provided to return impacted areas to near-natural state or an agreed land use after construction activities. Although rehabilitation may fall short of replicating the diversity and complexity of a natural system.

OFFSET Refers to measures over and above rehabilitation to compensate for the residual negative effects on biodiversity, after every effort has been made to minimise and then rehabilitate impacts. Biodiversity offsets can provide a mechanism to compensate for significant residual impacts on biodiversity.

Figure 2: Mitigation hierarchy

1.2 Objectives of the EMPr

The EMPr has the following objectives:

- To outline mitigation measures and environmental specifications which are required to be implemented for all phases of the project in order to minimise the extent of environmental impacts, and to manage environmental impacts associated with the proposed project.
- To identify measures that could optimise beneficial impacts.
- To establish a method of monitoring and auditing environmental management practices during all phases of development.
- Specify time periods within which the measures contemplated in the EMPr must be implemented.
- To provide an environmental awareness plan.

It must be noted that the EMPr is a dynamic document that will be periodically reviewed and updated. The approach adopted for this EMPr is derived from the Deming Cycle (**Figure 3**), a cycle of continuous improvement that entails the reiterative actions of plan, do, check, act, and critically to then return to the planning phase. When applicable, changes to the EMPr are to be approved in accordance with legislative requirements.

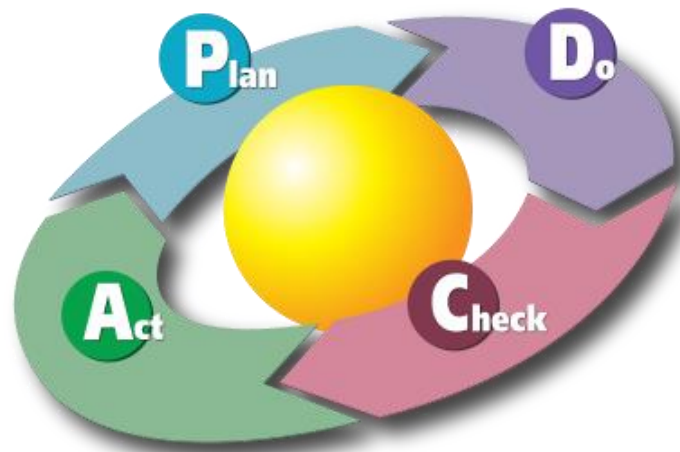


Figure 3: Deming cycle of continuous improvement

1.3 Scope of the EMPr

In accordance with the requirements of the NEMA, this EMPr is to be implemented by the Developer as well as any employee, contractor, agent, or sub-contractor appointed to act on behalf of the Developer in the execution of the project, in order to ensure environmental compliance on site.

The specifications outlined in this EMPr are thus applicable to all activities undertaken by the Developer as well as their appointed contractors and all persons involved in the execution of the works, including sub-contractors, the workforce, suppliers, and volunteers, for the duration of construction, operation and future maintenance.

1.4 Structure of the EMPr

The EMPr provides proposed mitigation and management measures for the following phases of the project (Table 1).

Table 1: Different Phases of the project construction

Phase	Description
Pre-Construction (Planning & Design)	This section will provide guidelines on pre-construction activities including site establishment and clearance; environmental induction and training and awareness; site access and health and safety.
Construction	This section will provide guidelines on construction methods and considerations.
Operations	This section will provide guidelines on the operational phase.
Post-Construction / Rehabilitation	This section of the EMPr provides management principles for the rehabilitation, maintenance and operational phases of the project. This will include best practice, procedures and responsibilities as required for various associated activities.

The content of this EMPr is consistent with the requirements as set out in Section 19 (Appendix 4) of the EIA Regulations 2014 (as amended in 2017) and is cross-referenced as follows (Table 2).

Table 2: Compliance with Appendix 4 of the EIA Regulations (2014 as amended in 2017)

EMPr Requirements according to Appendix 4 of GN R. 982 (326)	Section in the EMPr & Appendix
(1) An EMPr must comply with section 24N of the Act and include -	
a) Details of –	
(i) the EAP who prepared the report; and	Section 1.6.2
(ii) the expertise of that EAP to prepare an EMPr, including a CV.	
b) A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.	Section 2
c) 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.	Figure 4
d) A description of the impact management outcomes, 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 -	
(i) planning and design;	Section 8; 9; 10
(ii) pre-construction activities;	
(iii) construction activities;	
(iv) rehabilitation of the environment after construction and where applicable post closure; and	
(v) where relevant, operation activities.	

EMPr Requirements according to Appendix 4 of GN R. 982 (326)	Section in the EMPr & Appendix
e) A description and identification of impact management outcomes required for the aspects contemplated in paragraph (d).	Section 8; 9; 10
f) A description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to - <ul style="list-style-type: none"> (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; and (iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable. 	Section 8; 9; 10
g) The method of monitoring the implementation of the impact management actions contemplated in paragraph (f).	Section 8; 9; 10
h) The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f).	Section 8; 9; 10
i) An indication of the persons who will be responsible for the implementation of the impact management actions.	Section 8; 9; 10
j) The time periods within which the impact management actions contemplated in paragraph (f) must be implemented.	Section 8; 9; 10
k) The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f).	Section 8; 9; 10
l) A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations.	Section 5
m) An environmental awareness plan describing the manner in which - <ul style="list-style-type: none"> (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. 	Section 6
n) Any specific information that may be required by the competent authority.	A separate Generic EMPr for the Development of Overhead electricity Transmission Infrastructure
(2) Where a government notice gazetted by the Minister provides for a generic EMPr, such generic EMPr as indicated in such notice will apply.	NA

1.5 Applicable Documentation

The following environmental documentation is applicable for the project, and must be read in conjunction with this EMPr:


- Environmental Authorisation/ s – once issued;
- Final Consultation Basic Assessment for the Proposed Development of a 200MW Photovoltaic (PV) Plants at the Bokpoort Farm near Groblershoop, Northern Cape including all annexures and specialist studies; and
- Any other permit and/ or licence issued in respect to this project.

1.6 Project Team Details

1.6.1 Project Developer

The Developer is the ACWA Power and the details of the responsible person are listed in **Table 3**.

Table 3: Details of the developer

Applicant	ACWA Power Energy Africa (Pty) Ltd	
Representative	Prabashen Govender	
Physical Address	7th Floor 90 Grayston Drive Sandton 2196	
Telephone	(011) 722 4100	
E-mail	pgovender@acwapower.com	

1.6.2 Details of the Environmental Assessment Practitioner

The team responsible for the preparation of the EMPr is presented in **Table 4** below.

Table 4: Details of the Environmental Team

Consultant	Royal HaskoningDHV	Royal HaskoningDHV
Contact Persons	Prashika Reddy	Seshni Govender
Postal Address	PO Box 867, Gallo Manor, 2191	
Telephone	087 352 1577	087 352 1592
E-mail	prashika.reddy@rhdhv.com	Seshni.govender@rhdhv.com
Qualification	BSc (Hons) Geography BSc (Hons) Botany	BSc (Hons) Environmental Science
Expertise	Prashika Reddy is a Senior Environmental Scientist with 17 years' experience in various environmental fields including: EIAs, EMPrs, PPP and environmental monitoring and audits. She is/ has been part of numerous multi-faceted large-scale projects, including the establishment of linear developments	Seshni Govender is an Environmental Consultant working on strategic environmental planning and water-related projects. Seshni has been involved in numerous Water Use Licence projects, including complex integrated licencing that requires understanding cumulative environmental impacts. As an

Consultant	Royal HaskoningDHV	Royal HaskoningDHV
	(roads and powerlines), industrial plants, electricity generation plants, mixed-use developments and mining projects. She is a Professional Natural Scientist (400133/10) with the South African Council for Natural Scientific Professions as well as a Registered EAP with EAPASA (2019/917).	Environmental Scientist Seshni contributes to projects through; report writing, data management and analysis, environmental impact analysis, policy review and public engagement/consultation.

CVs of the Environmental Team are provided in **Annexure A**.

2 PROJECT DESCRIPTION

2.1 Property Description

The project area is located on the north eastern portion of the Farm Bokpoort 390 RE which is 20 km north-west of the town of Groblershoop within Ward 3 of the !Kheis Local Municipality in the ZF Mgcawu District Municipality, Northern Cape Province. The total Bokpoort II project area designated for the development is approximately 1500 ha. The project site is situated approximately 77 km south-east of Upington. The Orange River is located approximately 12 km south-west of the site.

The landowner details as well as 21-digit surveyor general codes are provided in **Table 5**. Consent has been received from ACWA Power SolAfrica Bokpoort CSP.

Table 5: Property details

Property	Owner	21 Digit Surveyor-General Code
Farm Bokpoort 390 RE	ACWA Power SolAfrica Bokpoort CSP Power Plant (Pty) Ltd (RF)	C0280000000038900000

2.2 Project Location and Co-ordinates

The corner point co-ordinates of each PV plant are provided in **Table 6**.

Table 6: Project co-ordinates

PV Plant Identifier	Co-ordinates – PV Plant	BESS	Powerline
PV 3 – Venda	NW: 28°42'41.94"S; 21°59'18.97"E NE: 28°42'41.64"S; 21°59'59.23"E SE: 28°43'10.62"S; 21°59'59.50"E SW: 28°43'10.95"S; 21°59'13.07"E	NW: 28°42'50.28"S; 21°59'14.61"E NE: 28°42'50.25"S; 21°59'16.56"E SE: 28°42'51.17"S; 21°59'16.67"E SW: 28°42'51.27"S; 21°59'14.63"E	1: 28°44'17.24"S; 21°59'31.02"E 2: 28°44'14.91"S; 21°59'22.10"E 3: 28°44'12.32"S; 21°59'13.30"E 4: 28°44'6.86"S; 21°59'8.72"E 5: 28°43'58.60"S; 21°59'8.85"E 6: 28°43'50.44"S; 21°59'8.61"E 7: 28°43'42.34"S; 21°59'8.67"E 8: 28°43'34.19"S; 21°59'8.55"E 9: 28°43'26.09"S; 21°59'8.43"E 10: 28°43'17.92"S; 21°59'8.42"E 11: 28°43'9.78"S; 21°59'8.43"E 12: 28°43'1.79"S; 21°59'8.32"E 13: 28°42'55.17"S; 21°59'12.85"E
PV 4 – Pedi	NW: 28°42'12.24"S; 21°59'26.32"E NE: 28°42'12.04"S; 21°59'58.93"E SE: 28°42'40.99"S; 21°59'59.22"E SW: 28°42'41.34"S; 21°59'10.94"E	NW: 28°42'18.82"S; 21°59'21.84"E NE: 28°42'18.91"S; 21°59'23.67"E SE: 28°42'19.79"S; 21°59'23.81"E SW: 28°42'19.71"S; 21°59'21.85"E	1: 28°42'51.15"S; 21°59'8.21"E 2: 28°42'42.91"S; 21°59'7.99"E 3: 28°42'34.83"S; 21°59'7.93"E 4: 28°42'27.91"S; 21°59'10.95"E
PV 5 – Afrikaans	NW: 28°42'11.95"S; 22° 0'5.85"E NE: 28°42'11.64"S; 22° 0'46.12"E SE: 28°42'40.63"S; 22° 0'46.39"E SW: 28°42'40.96"S; 21°59'59.96"E	NW: 28°42'20.27"S; 22° 0'1.62"E NE: 28°42'20.29"S; 22° 0'3.62"E SE: 28°42'21.26"S; 22° 0'3.54"E SW: 28°42'21.41"S; 22° 0'1.67"E	1: 28°42'21.84"S; 21°59'16.86"E 2: 28°42'15.61"S; 21°59'22.65"E 3: 28°42'11.77"S; 21°59'32.00"E 4: 28°42'11.61"S; 21°59'41.11"E 5: 28°42'11.53"S; 21°59'50.28"E 6: 28°42'11.60"S; 21°59'59.36"E 7: 28°42'19.91"S; 21°59'59.49"E 8: 28°42'27.78"S; 22° 0'0.13"E
PV 6 – Sotho	NW: 28°42'11.57"S; 22° 0'52.77"E NE: 28°42'11.29"S; 22° 1'33.02"E	NW: 28°42'20.16"S; 22° 0'47.87"E NE: 28°42'20.02"S; 22° 0'49.86"E	1: 28°44'22.74"S; 21°59'50.77"E 2: 28°44'18.56"S; 21°59'57.64"E

PV Plant Identifier	Co-ordinates – PV Plant	BESS	Powerline
	SE: 28°42'55.97"S; 22° 1'5.53"E SW: 28°42'56.01"S; 22° 0'47.02"E	SE: 28°42'20.94"S; 22° 0'49.83"E SW: 28°42'20.72"S; 22° 0'47.83"E	3: 28°44'13.94"S; 22° 0'5.32"E 4: 28°44'4.47"S; 22° 0'13.00"E 5: 28°43'51.54"S; 22° 0'17.42"E 6: 28°43'43.50"S; 22° 0'17.25"E 7: 28°43'35.30"S; 22° 0'17.12"E 8: 28°43'27.23"S; 22° 0'17.26"E 9: 28°43'19.14"S; 22° 0'17.02"E 10: 28°43'10.68"S; 22° 0'16.87"E 11: 28°43'10.64"S; 22° 0'26.13"E 12: 28°43'10.58"S; 22° 0'35.34"E 13: 28°43'10.51"S; 22° 0'46.96"E 14: 28°43'2.42"S; 22° 0'46.87"E 15: 28°42'54.17"S; 22° 0'46.71"E 16: 28°42'46.15"S; 22° 0'46.67"E 17: 28°42'37.97"S; 22° 0'46.74"E 18: 28°42'27.66"S; 22° 0'47.14"E
PV 7 – Swati	NW: 28°41'41.92"S; 22° 0'52.53"E NE: 28°41'41.62"S; 22° 1'32.99"E SE: 28°42'10.65"S; 22° 1'33.07"E SW: 28°42'10.97"S; 22° 0'46.65"E	NW: 28°41'50.49"S; 22° 0'48.24"E NE: 28°41'50.46"S; 22° 0'50.06"E SE: 28°41'51.23"S; 22° 0'50.16"E SW: 28°41'51.32"S; 22° 0'48.22"E	1: 28°43'57.55"S; 22° 0'18.35"E 2: 28°43'44.35"S; 22° 0'28.87"E 3: 28°43'31.06"S; 22° 0'39.29"E 4: 28°43'17.82"S; 22° 0'49.70"E 5: 28°43'4.40"S; 22° 1'0.30"E 6: 28°42'51.02"S; 22° 1'10.98"E 7: 28°42'37.80"S; 22° 1'21.48"E 8: 28°42'24.34"S; 22° 1'32.05"E 9: 28°42'10.93"S; 22° 1'31.90"E 10: 28°42'11.11"S; 22° 1'13.46"E 11: 28°42'11.26"S; 22° 0'55.01"E 12: 28°42'2.37"S; 22° 0'46.33"E 13: 28°41'58.10"S; 22° 0'46.29"E
PV 8 – Zulu	NW: 28°41'42.32"S; 22° 0'5.58"E NE: 28°41'42.03"S; 22° 0'45.81"E SE: 28°42'11.04"S; 22° 0'46.09"E SW: 28°42'11.35"S; 21°59'59.67"E	NW: 28°41'50.71"S; 22° 0'1.26"E NE: 28°41'50.77"S; 22° 0'3.18"E SE: 28°41'51.64"S; 22° 0'3.25"E SW: 28°41'51.70"S; 22° 0'1.28"E	1: 28°42'9.27"S; 21°59'28.75"E 2: 28°42'3.04"S; 21°59'34.72"E 3: 28°41'56.96"S; 21°59'40.56"E 4: 28°41'50.88"S; 21°59'47.02"E 5: 28°41'45.23"S; 21°59'53.51"E 6: 28°41'44.46"S; 21°59'57.81"E 7: 28°41'52.77"S; 21°59'57.98"E 8: 28°41'57.98"S; 22° 0'0.03"E
PV 9 – Tsonga	NW: 28°41'12.46"S; 22° 0'32.05"E NE: 28°41'12.24"S; 22° 1'4.55"E SE: 28°41'41.21"S; 22° 1'4.84"E SW: 28°41'41.59"S; 22° 0'16.56"E	NW: 28°41'23.10"S; 22° 0'19.91"E NE: 28°41'23.07"S; 22° 0'21.82"E SE: 28°41'24.07"S; 22° 0'21.88"E SW: 28°41'24.10"S; 22° 0'19.95"E	1: 28°41'38.11"S; 22° 0'1.83"E 2: 28°41'32.24"S; 22° 0'8.25"E 3: 28°41'26.66"S; 22° 0'14.70"E
PV 10 - Tswana	NW: 28°40'52.02"S; 22° 0'54.44"E NE: 28°40'51.77"S; 22° 1'30.95"E SE: 28°41'20.93"S; 22° 1'41.29"E SW: 28°41'11.54"S; 22° 0'46.87"E	NW: 28°40'57.07"S; 22° 0'49.39"E NE: 28°40'57.08"S; 22° 0'51.33"E SE: 28°40'58.08"S; 22° 0'51.36"E SW: 28°40'58.08"S; 22° 0'49.42"E	1: 28°41'21.00"S; 22° 0'21.29"E 2: 28°41'15.23"S; 22° 0'27.84"E 3: 28°41'9.58"S; 22° 0'34.28"E 4: 28°41'3.77"S; 22° 0'40.88"E 5: 28°40'58.01"S; 22° 0'47.46"E 6: 28°41'1.65"S; 22° 0'48.76"E

2.3 Technical Description

The PV plant converts the sun's energy directly into electrical energy. The PV plant will consist of 200 MW photovoltaic solar arrays. The general position of the PV plant is shown in **Figure 1**.

Each of the PV plants will consist of the following infrastructure:

- Solar PV panel that will be able to deliver up to 200 MW to the Eskom National Grid;

- Inverters that convert direct current (DC) generated by the PV modules into alternating current (AC) to be exported to the electrical grid;
- A transformer that raises the system AC low voltage to medium voltage. The transformer converts the voltage of the electricity generated by the PV panels to the correct voltage for delivery to Eskom;
- Transformer substation; and
- Instrumentation and Control consisting of hardware and software for remote plant monitoring and operation of the facility.

Associated infrastructure includes:

- Mounting structures for the solar panels;
- Cabling between the structures, to be laid underground where practical;
- A new 132 kV overhead powerline (servitude spanning 15.5 m on both sides with towers that will be 35 m high) which will connect the facility to the National Grid via Eskom's existing Garona Substation;
- Battery Energy Storage System (BESS);
- Internal access roads (4 – 6 m wide roads will be constructed but existing roads will be used as far as possible) and fencing (approximately 3 m in height); and
- Shared infrastructure consisting of buildings, including a workshop area for maintenance, storage (i.e. fuel tanks, etc.), laydown area, parking, warehouse, and offices (previously approved).

Table 7 summarises the main technical details for the proposed PV plant and associated infrastructure.

Table 7: Technical details of the proposed PV plant/ s

Facility Component	Description/ Dimensions
Height of PV panels	4.5 m
Area of PV Array	150 ha
Area occupied by inverter/ transformer stations/ substations	150 m x 150 m
Capacity of on-site substation	11 kV/132 kV on site substation
Area occupied by both permanent and construction laydown areas	5 ha
Area occupied by buildings	Approximately 5 ha (temporary facilities used during the construction and operational phase will be less than as PV does not require a lot of operational staff)
Length of internal roads	To be finalised during detailed design of facility
Width of internal roads	4 m
Proximity to grid connection	Approximately 5 km
Height of fencing	3 m
Type of fencing	Security Fencing
Overhead powerline length	Varies in length
Overhead powerline servitude	15.5 m on each side

Facility Component	Description/ Dimensions
Overhead powerline tower height	35 m
BESS (either lead-acid or lithium-ion)	Battery power at point of connection: 150 MW Area required: 400 m x 400 m Quantity of hazardous substance: 4500 m ³
Construction/ labour camp	Construction camp to be constructed for up to 200 people

2.4 Sensitivity Map

The overall sensitivity map is included in **Figure 4** and **Annexure B**.

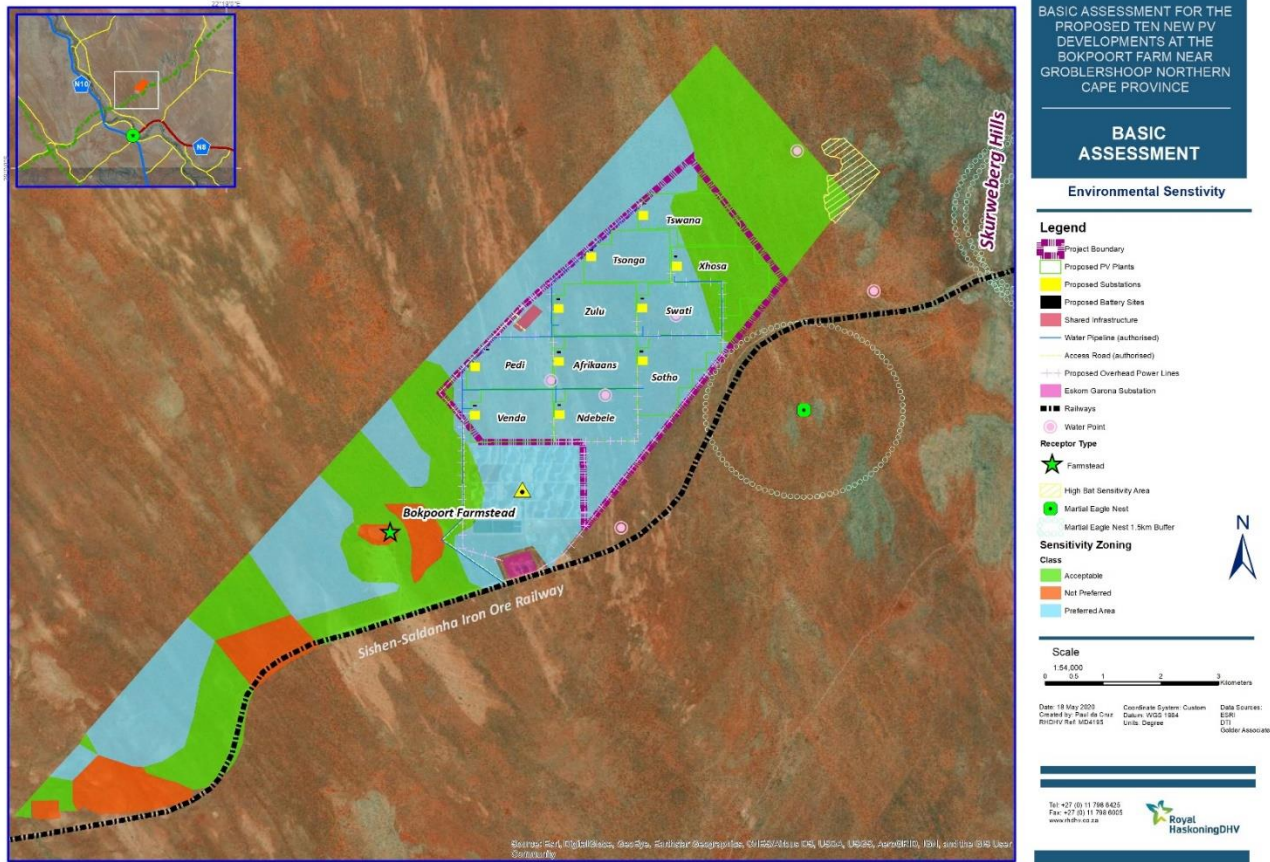


Figure 4: Sensitivity map

3 LEGAL FRAMEWORK

In order to protect the environment and ensure that the development is undertaken in an environmentally responsible manner, there are a number of significant environmental legislation (**Table 8**) that need to be considered during this study.

This section outlines the legislation that is applicable to the proposed project and has been considered in the preparation of this report.

Table 8: Key legislation considered

Acts	Objectives, important aspects, associated notices and regulations
<p>National Environmental Management Act, 1998 (Act No. 107 of 1998)(as amended)</p>	<p>Objectives: To provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state.</p> <p>Relevant Notices and Regulations:</p> <ul style="list-style-type: none"> ▪ Environmental Impact Assessment Regulations, 2014 (GNR 326 in GG 40772 as amended on 04 April 2017) ▪ Listing Notice 1 (GNR 327) as amended in 2017 ▪ Listing Notice 2 (GNR 325) as amended in 2017 ▪ Listing Notice 3 (GNR 324) as amended in 2017 <p>Relevance to the proposed project:</p> <ul style="list-style-type: none"> ▪ Development must be socially, environmentally and economically sustainable. ▪ Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated; the social, economic and environmental impacts of activities including disadvantages and benefits, must be considered, assessed and evaluated and decisions must be appropriate in the light of such consideration. ▪ ‘Polluter Pays’ principle. ▪ Any activity that is proposed and which is listed in the NEMA EIA Regulations, requires environmental authorisation.
<p>National Water Act (Act No. 36 of 1998) (as amended)</p>	<p>Objectives: The National Water Act (NWA) is a legal framework for the effective and sustainable management of water resources in South Africa. Central to the NWA is recognition that water is a scarce resource in the country which belongs to all the people of South Africa and needs to be managed in a sustainable manner to benefit all members of society. The NWA places a strong emphasis on the protection of water resources in South Africa, especially against its exploitation, and the insurance that there is water for social and economic development in the country for present and future generations.</p> <p>Relevance to the proposed project:</p> <ul style="list-style-type: none"> ▪ Sustainable protection, use, development and conservation of water resources – including aquatic ecosystems. ▪ Defines 11 water uses and provides licencing procedures.

Acts	Objectives, important aspects, associated notices and regulations
	<p>Notices and Regulations:</p> <ul style="list-style-type: none"> ▪ General Authorisation in terms of Section 39 of the National Water Act (Act No. 36 of 1998, Water Uses Section 21 (a) and (b) (GN in GG 40243 of 02 September 2016). ▪ General Authorisation in terms of Section 39 of the National Water Act (Act No. 36 of 1998, Water Uses Section 21 (c) and (i) (GN in GG 40229 of 26 August 2016).

3.1 Other Relevant Acts, Guidelines, Department Policies and Environmental Management Instruments

Table 9: Other relevant Acts, Guidelines, Department Policies and Instruments

Acts/Guideline/Policies/Environmental Management Instruments	Considerations
The Constitution (No. 108 of 1996)	Chapter 2 – Bill of Right Section 24 – Environmental Rights
<p>National Environmental Management Biodiversity Act (Act No. 10 of 2004) and Regulations:</p> <ul style="list-style-type: none"> ▪ Threatened or protected species (GN 388) ▪ Lists of species that are threatened or protected (GN 389) ▪ Alien and invasive species regulations (GNR 506) ▪ Publication of exempted alien species (GNR 509) ▪ Publication of National list of invasive species (GNR 507) ▪ Publication of prohibited alien species (GNR 508) 	Provide for the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources.
World Heritage Convention Act (Act No. 49 of 1999)	South Africa is home to eight of the world's official heritage sites, as determined by UNESCO's World Heritage Committee. The Cape Floral Region has been recognised as one of the most special places for plants in the world in terms of diversity, density and number of endemic species.
National Environmental Management: Waste Act (Act No. 59 of 2008) as amended	<p>Section 17 - Every attempt must be made to reduce, recycle or re-use all waste before it is disposed.</p> <p>Section 25 - All waste (general and hazardous) generated during construction may only be disposed of at appropriately licenced waste disposal sites.</p> <p>All waste management activities (e.g. recycling, treatment) meeting the relevant thresholds should be authorised under the National Environmental Management: Waste Act (Act No. 59 of 2008) [NEM:WA] (as amended) and Government Notice (GN) 921 of 29 November 2013 (as amended in 2015 and 2017). No person may commence, undertake or conduct a waste management activity listed GN 921 (as amended) unless a licence is issued in respect of that activity.</p>

Acts/Guideline/Policies/Environmental Management Instruments	Considerations
National Environmental Management: Air Quality Act (Act No 39 of 2004)	Section 32 - Control of dust. Section 34 - Control of noise. Section 35 - Control of offensive odours.
National Heritage Resources Act (Act No. 25 of 1999)	Section 34 - No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority. Section 35 - No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site. Section 36 - No person may, without a permit issued by the South African Heritage Resource Agency (SAHRA) or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. "Grave" is widely defined in the Act to include the contents, headstone or other marker of such a place, and any other structure on or associated with such place. Section 38 - The construction of a bridge or similar structure exceeding 50 m in length.
Electricity Regulation Act No. 4 of 2006 as amended by the Electricity Regulation Amendment Act No. 28 of 2007	These regulations regulate the use and generation of electricity.
Occupational Health and Safety Act (Act No. 85 of 1993)	Section 8 - General duties of employers to their employees. Section 9 - General duties of employers and self-employed persons to persons other than their employees.
Construction Regulations (2014)	Contractors must comply with the Construction Regulations which lay out the framework for construction related activities.
<p>Other: Hazardous Substance Act (Act No. 15 of 1973) and Regulations Conservation of Agricultural Resources Act (Act No. 43 of 1983) Civil Aviation Act (Act No. 13 of 2009) and Civil Aviation Regulations (CAR) of 1997 Electricity Act (Act No. 41 of 1987) Civil Aviation Authority Act (Act No. 40 of 1998) White Paper on Renewable Energy (2003) Integrated Resource Plan for South Africa (2019) Environmental Impact Assessment Guidelines for Renewable Energy Projects, GNR 989 of 2015 in terms of NEMA (Act No. 107 of 1998) Land Use Planning Ordinance (Ordinance 15 of 1985) National Road Traffic Act (Act No. 93 of 1996) Procedure to be followed in Applying for Environmental Authorisation for Large Scale Wind and Solar Photovoltaic Energy Development Activities in terms of Section 24(2)a of NEMA, 1998 when occurring in Geographical Areas of Strategic Importance (GG No. 114, 16 February 2018)</p>	

Acts/Guideline/Policies/Environmental Management Instruments	Considerations
ZF Mgcawu District Municipality Integrated Development Plan 2017-2022 Northern Cape PSDF (2012) Energy Policy !Kheis Local Municipality By-laws	

3.2 International Conventions and Agreements

Relevant environmental and social international conventions and agreements to which South Africa is a party that is applicable to this project are presented in **Table 10**.

Table 10: Relevant international conventions to which South Africa is a party^{4 5}

Convention/ Agreements
Convention on Biological Diversity (29 December 1993)
United Nations Framework Convention on Climate Change - Kyoto Protocol (23 February 2005)
Montreal Protocol on Substances That Deplete the Ozone Layer (1 January 1989)
United Nations Convention to Combat Desertification (26 December 1996)
United Nations Framework Convention on Climate Change (21 March 1994)
Stockholm Convention on Persistent Organic Pollutants (POPs) (17 May 2004)
The Fourth ACP-EEC Convention 15 December 1989 (Lome)
Convention concerning the Protection of the World Cultural and Natural Heritage 1972 (Paris)
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (24 February 2004)
Paris Agreement adopted on 12 December 2015 at the 21st session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC CoP21)

3.3 International Standards

3.3.1 International Finance Corporation Performance Standards

ACWA Power is committed to complying with the IFC Performance Standards (PS) on social and environmental sustainability. These were developed by the IFC and were last updated on 1st January 2012.

The PS comprise of eight performance standards as described in **Table 11**.

⁴ Sources: United States Central Intelligence Agency World Fact book (www.cia.gov/library/publications/the-world-factbook/index.html)

⁵ Schlechter, M., & Baxter, B. 2016. Final EIA Report: Proposed 75MW Photovoltaic (PV2) Solar Development on the Remaining Extent of the Farm Bokpoort 390, Northern Cape. Golder Associates. Ref 14/12/16/3/3/2/880.

Table 11: IFC Performance Standards

Objective	Applicability
<p>PS 1: Assessment and Management of Environmental and Social Risks and Impacts Guidance note on the categorisation of projects during project screening, requirements for institutional capacity and requirements for public consultation and disclosure.</p>	<p>This Basic Assessment Study supported by comprehensive specialist assessments (Appendix B1 – B13) has identified environmental and social risks and impact of the project and provided mitigation measures to enhance positive impacts and minimise negative impacts.</p> <p>The impact assessment is consistent with Good International Industry Practices (GIIP) and takes into account the nature, extent, duration, intensity, probability and significance of the identified impacts both before and after mitigation measures (Chapter 7). Cumulative impacts that result from the incremental impacts on areas or resources directly impacted by the project have also been identified and noted in the study (Chapter 7).</p> <p>The EMPr (Appendix D) provides the actions for the management of identified environmental impacts and a detailed outline of the implementation programme. The EMPr provides strategies to be used to address the roles and responsibilities of environmental management personnel on site, and a framework for environmental compliance and monitoring.</p> <p>Extensive engagement has taken place with project affected people for the previously authorised 2 PV plants and CSP plant and will continue for the development of the PV plants (Chapter 6).</p>
<p>PS 2: Labour and Working Conditions Recognises that the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers, including health and safety. Failure to establish and foster a sound worker-management relationship can undermine worker commitment and retention and can jeopardise a project.</p>	<p>The project will provide employment opportunities for 100 – 250 people during the construction phase and 20 – 40 people during the operations phase.</p> <p>Prior to development, human resource policies and procedures, working conditions and terms of employment, equal opportunity, retrenchment policy and a formal grievance mechanism must be established to promote the fair treatment, non-discrimination and equal opportunity of workers in line with national employment and labour laws.</p> <p>Further to this, the Developer also has an obligation to provide a safe and healthy work environment for its employees in terms of the Occupational Health and Safety Act (Act No. 85 of 1993).</p>
<p>PS 3: Resource Efficiency and Pollution Prevention Recognises that increased economic activity and urbanisation often generate increased levels of pollution to air, water, and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels. More efficient and effective resource use and pollution prevention and greenhouse gas emission</p>	<p>South Africa's reliance on fossil fuels as a primary energy source is well known and coal combustion is the main contributor to carbon dioxide emissions, a greenhouse gas that has been linked to climate change. The proposed renewable energy project utilising PV technology offers a sustainable alternative to fossil fuels and in line with the South Africa's IRP (2019) which ensures that a more diversified energy mix is sought that reduces reliance on a single or a few primary energy sources.</p>

Objective	Applicability
<p>avoidance and mitigation technologies enhance the efficiency and sustainability of the project.</p>	<p>The change from CSP technology to PV technology further decreases the demand for water consumption from 0.3 million cubic metres per annum (Mm³/ a) to 0.22 Mm³/ a.</p> <p>Pollution prevention measures contained in this report and EMPr (Appendix D) are in line with GIIP and contain comprehensive management outcomes and impact management actions for waste generation during the different project phases as well as the storage and use of hazardous substances that may have a potential to have a detrimental impact on the environment.</p>
<p>PS 4: Community Health, Safety and Security Recognises that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. This Performance Standard addresses the Promotor' responsibility to avoid or minimise the risks and impacts to community health, safety, and security.</p>	<p>The proposed project will be designed, constructed, operated and decommissioned in accordance with GIIP. Mitigation measures and controls are provided in the EMPr (Appendix D) for spills, incidents and pollution control as well as for containment losses of hazardous substances particularly the BESS. An Emergency Preparedness and Response Plan must be compiled by the Developer for the project prior to implementation.</p> <p>Traffic and dust impacts have been assessed as being moderate prior to the implementation of mitigation measures and have to be carefully managed as these impacts have been documented during the stakeholder engagement process as being major safety and nuisance factors.</p> <p>An adequate resolution needs to be obtained regarding the upgrading (re-gravelling, surfacing etc.) of existing roads and intersections in the study area separate to this environmental assessment process.</p>
<p>PS 5: Land Acquisition and Involuntary Resettlement Recognises that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land. Involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood) as a result of project-related land acquisition and/or restrictions on land use, while temporary or permanent.</p>	<p>No physical or economic displacement and resettlement of people will take place. In terms of land acquisition, the study area is owned by ACWA Power SolAfrica Bokpoort CSP Power Plant (Pty) Ltd (RF).</p>
<p>PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources Recognises that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development.</p>	<p>The project will not impact any proclaimed protected biodiversity area.</p> <p>As assessment of the critical habitats (Appendix B5) have shown that apart from the rocky outcrop to the north of the study area associated with the Koranna-Langeberg Mountain Bushveld Vegetation type which is classified as a Natural Habitat, the calcareous low shrub plains, open shrub plains, open shrub duneveld and transformed areas are classified as</p>

Objective	Applicability
	<p>Modified Habitats. A 250 m buffer has been applied to the rocky outcrop and no development is allowed to encroach this area.</p> <p>The Biodiversity Assessment (Appendix B5) was compiled with impacts managed in line with the mitigation hierarchy. No impacts were identified that could not be mitigated to an acceptable level. Mitigation measures associated with the protection of fauna and flora and management of alien invasive species have been included in the EMPr (Appendix D).</p>
<p>PS 7: Indigenous Peoples Recognises that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalised and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development.</p>	<p>The Socio-economic study ^{6 7 8} confirmed that there is no evidence of the presence of any indigenous people residing or utilising the project area and immediate surrounds.</p>
<p>PS 8: Cultural Heritage Recognises the importance of cultural heritage for current and future generations. Consistent with the Convention Concerning the Protection of the World Cultural and Natural Heritage, this Performance Standard aims to ensure that protect cultural heritage in the course of their project activities.</p>	<p>A comprehensive Heritage Impact Assessment (Appendix B9) and Desktop Palaeontology Impact Assessment (PIA) together with Chance Find Protocol (Appendix B10) were conducted for the project.</p> <p>No sites, features or objects of cultural significance are known to exist in the development area, there would be no impact as a result of the proposed development. Should archaeological sites or graves be exposed in other areas during construction work, measures and controls have been stipulated in this report and EMPr (Appendix D) for the management of the site/ graves.</p> <p>No significant fossil heritage resources have been recorded within the study area. The area is inferred to be of low sensitivity in terms of palaeontological heritage and no sensitive or No-Go/ Access restricted areas have been identified within it during the desktop PIA. In the case of any significant chance fossil finds during construction (e.g. vertebrate teeth, bones, burrows, petrified wood, shells), these must be safeguarded - preferably in situ -and reported as soon as possible to the South African Heritage Resources Agency (SAHRA).</p>

⁶ Smith, T; de Waal, D. 2016. Socio-economic Impact Assessment for the proposed 75 MW Photovoltaic (PV1) Solar Facility (Bokpoort II Solar Development). Report No 1400951-302448-18.

⁷ Smith, T; de Waal, D. 2016. Socio-economic Impact Assessment for the proposed 75 MW Photovoltaic (PV2) Solar Facility (Bokpoort II Solar Development). Report No 1400951-303533-1.

⁸ Smith, T; de Waal, D. 2016. Socio-economic Impact Assessment for the proposed 150 MW CSP Tower Facility (Bokpoort II Solar Development) on the Remaining Extent of the Farm Bokpoort 390, Northern Cape. Report No 1400951-299899-7.

4 ENVIRONMENTAL CODE OF CONDUCT

One of the objectives of the EMPr is to ensure that all the workforce, Contractors, sub-contractors and construction staff, service providers and suppliers have an understanding of environmental issues and potential impacts on site activities. This environmental code of conduct provides the basic rules that must be strictly adhered to. It is the responsibility of the Contractor to enforce that each contractor, sub-contractor service providers and suppliers understand and adhere to the Code of Conduct.

ENVIRONMENTAL CODE OF CONDUCT

ALL PERSONS ARE OBLIGED TO KEEP TO THE RULES OF THIS CODE OF CONDUCT

Ignorance, negligence, recklessness or a general lack of commitment resulting in environmental degradation or pollution must not be tolerated!

ENVIRONMENTAL RULES

- Only use authorised accesses;
- Dispose waste to the correct waste containers provided – do not litter;
- Use the toilet facilities provided;
- Do not dispose contaminated wastewater to the stormwater or the environment;
- Immediately report any spillage from containers, plant or vehicles;
- Do not burn or bury any waste;
- Do not trespass onto private properties;
- Do not trespass into 'No-Go'/ Access restricted Areas;
- Never tease, catch or set devices to trap or kill any animal;
- Never damage or remove any trees, shrubs or branches unless it forms part of working instructions and authorisation has been received;
- Do not deface, draw or cut lettering or any other markings on trees, rocks or buildings in the area; and
- Know the environmental incident procedures.

5 MANAGEMENT AND MONITORING PROCEDURES

5.1 Organisational Structure and Responsibilities

ACWA Power is the Primary Developer for the project. Each of the team roles are elaborated on in terms of their specific duties in **Table 12**.

Table 12: Roles and responsibilities

Role	Responsibility
<p align="center">Developer (ACWA Power or End User)</p>	<p>Role: The Developer is ultimately responsible for ensuring compliance with the environmental specification and all relevant legislation and is accountable for any non-compliances with this EMPr and any other conditions of approval or non-compliances with legislation.</p> <p>Responsibilities:</p> <ul style="list-style-type: none"> ▪ Appoint a Project Manager (PM) to assume ultimate project responsibility; ▪ Appoint an Environmental Control Officer (ECO) to monitor environmental compliance according to the EA, Final Approved EMPr and all other relevant licences and permits; ▪ Be fully conversant with the conditions of the EA, EMPr and all other licences and permits; ▪ Ensure the EA, Final Approved EMPr and all other relevant licences and permits are in the tender documentation issued to prospective Contractors; ▪ Request for, review and approve the method statements prepared by the Contractor; ▪ Review and comment on environmental assessments and/ or reports produced by the Contractor and ECO; ▪ Discuss with the ECO the application of penalties for the infringement of the Environmental Specifications, another possible enforcement measures necessary; ▪ Issue penalties as and when necessary based on the recommendation of the ECO; ▪ Arrange information meetings for or consult with the public about the impending construction activities; ▪ May on the recommendation of the PM and/ or ECO order the Contractor to suspend any or all works on-site if the Contractor or his sub-contractor/ supplier fails to comply with the said environmental specifications for the project; and ▪ Ensure the EMPr is implemented as well as revised and updated as and when required.
<p align="center">Project Manager (Developer's Engineering Representative on Site)</p>	<p>Role: The PM reports directly to the Developer, oversees site works and liaises with the Contractor(s) and the ECO.</p> <p>Responsibilities:</p> <ul style="list-style-type: none"> ▪ Implement the environmental specification on site;

Role	Responsibility
	<ul style="list-style-type: none"> ▪ Be fully conversant with the conditions of the EA, EMPr and all other licences and permits; ▪ Ensure the EA, Final Approved EMPr and all other relevant licences and permits are in the tender documentation issued to prospective Contractors; ▪ Request for, review and approve the method statements prepared by the Contractor; ▪ Review and comment on environmental assessments and/ or reports produced by the Contractor and ECO; ▪ Undertake regular site visits and ensure environmental specifications are implemented; ▪ Monitor compliance with the requirements of the specification; ▪ Assess the Contractor's environmental performance in consultation with the ECO from which a brief monthly statement of environmental performance is drawn up for record purposes and to be reported on within project meetings; and ▪ A Pre-construction survey of the site must be undertaken of the entire works area and all support infrastructure (such as site construction camps) etc. This must include a complete photographic record and may also include video recordings.
Principal Contractor including Sub-Contractors, Service Providers, Suppliers and Maintenance Contractor	<p>The Contractor must:</p> <ul style="list-style-type: none"> ▪ Be fully conversant and comply with the EA, Final Approved EMPr and all other relevant licences and permits; ▪ Implement the EMPr for the duration of the contract; ▪ Manage and maintain the Site Environmental File for the duration of the contract; ▪ Appoint a suitably qualified Site Environmental Officer whose responsibility includes on-going monitoring and control of all construction activities concerning minimisation of environmental impact and adherence to all relevant environmental documentation for the duration of the project; ▪ Supply method statements timeously for all activities requiring special attention as specified and/ or requested by the Developer, ECO and/ or PM during the duration of the Contract; ▪ Ensure any sub-contractors/ suppliers who are utilised within the context of the contract comply with the environmental requirements of the project, in terms of the specifications. The Contractor will be held responsible for non-compliance on their behalf; ▪ Provide trained and qualified resources - budgets, equipment, personnel and training - for the effective control and management of the environmental risks associated with the construction of the development; ▪ Bear the cost of any delays, with no extension of time granted, should his or her sub-contractors/ suppliers contravene the said specifications such that the Engineer orders a suspension of work. The suspension will be enforced until such time as the offending party(ies), procedure, or equipment is corrected; ▪ Bear the costs of any damages/ compensation resulting from non-adherence to the said specifications or written site instructions; ▪ Read and act on ECO reports and take cognisance of the information/ recommendations contained therein; ▪ Comply with all applicable legislation; ▪ Ensure that he/ she informs the PM timeously of any foreseeable activities which will require input from the ECO; ▪ Notify the ECO and PM, verbally and in writing at least ten (10) working days in advance of any activity he/ she has reason to believe may have significant

Role	Responsibility
	<p>adverse environmental impacts, so that mitigatory measures may be implemented timeously;</p> <ul style="list-style-type: none"> ▪ Ensure environmental awareness among his/ her employees, sub-contractors and workforce so that they are fully aware of, and understand the Environmental Specifications and the need for them; ▪ Maintain a register of environmental training for site staff and sub-contractor's staff for the duration of the contract; ▪ Communicate and liaise frequently and promptly with the ECO and the PM to ensure effective, proactive environmental management with the overall objective of preventing or reducing negative environmental impacts while enhancing positive environmental impacts; ▪ The Contractor will conduct all activities in a manner that minimises disturbance to the natural environment as well as directly affected residents and the public in general; and ▪ The Principal Contractor assumes responsibility and accountability of all appointed sub-contractors and must ensure their compliance with this EMPr.
<p>Designated Environmental Officer (dEO) (Contractor's Representative)</p>	<p>Role: Each Contractor must have a dedicated Environmental Officer (dEO) to ensure the day to day implementation of the environmental specification on site and to report to the PM and ECO.</p> <p>Responsibilities: The dEO must:</p> <ul style="list-style-type: none"> ▪ Be fully conversant and assist the Contractor in complying with the EA, Final Approved EMPr and all other relevant licences and permits; ▪ Be fully conversant with all relevant environmental legislation applicable to the project, and ensure compliance with them; ▪ Compile environmental method statements on behalf of the Contractor that will specify how potential environmental impacts will be managed in line with the requirements of the EA, Final Approved EMPr and other relevant licences and permits and where relevant environmental best practice, and how they will practically ensure that the objectives of the EMPr are achieved; ▪ Convey the contents of the EA, Final Approved EMPr and other relevant licences and permits to the Principal Contractor, sub-contractors and suppliers. Ensure all relevant information is relayed to construction site-staff in a manner that is easily understandable; ▪ Undertake daily and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EA, Final Approved EMPr and other relevant licences and permits; ▪ Take appropriate action if the specifications contained in the EA, Final Approved EMPr and other relevant licences and permits are not followed. This must include reporting transgressions to the Project Manager, Engineer and Principal Contractor, and may include the recommendation for penalties to be imposed on the Principal Contractor; ▪ Monitor and verify that environmental impacts are kept to a minimum, as far as possible;

Role	Responsibility
	<ul style="list-style-type: none"> ▪ Order the removal from the construction site of any person(s) and/ or equipment in contravention of the specifications of the EMPr; ▪ Submitting a report at each site meeting which will document all incidents that have occurred during the period before the site meeting; ▪ Ensuring that the Written Warning Notification and Incidents Register is available on request; and ▪ Maintain an environmental register which keeps a record of all incidents which occur on the site during construction. <p>Required Qualifications:</p> <ul style="list-style-type: none"> ▪ Environmental Management Diploma or Degree. ▪ Any traceable and verifiable experience working as an environmental resource on a previous project.
Environmental Control Officer (ECO)	<p>Role: The ECO must be employed by the Developer for the duration of the contract. The ECO must report to the relevant authorities as required by the conditions of approval. The ECO must monitor compliance against the environmental specification and report on such.</p> <p>Responsibilities: The ECO must:</p> <ul style="list-style-type: none"> ▪ Be fully conversant with the conditions attached to the EA, EMPr and all other relevant licences and permits; ▪ Be familiar with the recommendations and mitigation measures of the associated EMPr for the project; ▪ Monitor the implementation of the EA, EMPr and all other relevant licences and permits during the pre-construction, maintenance and rehabilitation phases; ▪ Monitor that the Developer and Principal Contractor are in compliance with the EA, EMPr and all other relevant licences and permits at all times during the pre-construction, maintenance and rehabilitation phases of the project; ▪ Monitor all site activities monthly for compliance; ▪ Conduct bi-monthly audits of the site (one contract at a time) according to the EA, EMPr and all other relevant licences and permits, and report findings to the project team; ▪ Attend monthly site meetings and provide feedback on compliance, updates on outstanding reviews or approvals and highlight areas of potential environmental risk based on current and upcoming construction activities; ▪ Recommend corrective action for any environmental non-compliance at the site; ▪ Compile a monthly ECO report in line with the requirements of Appendix 7 of the EIA Regulations (2014 as amended in 2017); and ▪ Conduct once-off training (induction) with the Contractor on the requirements of the EA, EMPr, and other relevant licences and permits; and may include general environmental awareness based on best practice. <p>Required Qualifications</p> <ul style="list-style-type: none"> ▪ Environmental Management Diploma or Degree. ▪ 5 years+ experience in environmental field. ▪ Traceable and verifiable ECO experience specifically in renewable energy developments.

Role	Responsibility
	<p><i>It must be noted that the responsibility of the ECO is to monitor compliance and give advice on the implementation of the EMPr and not to enforce compliance. Ensuring compliance is the responsibility of the Developer, Project Manager, Contractor and the Site Environmental Officer.</i></p>
Environmental Manager (EM)	<ul style="list-style-type: none"> ▪ Be fully conversant and assist the Operations Manager in complying with the EAs, Operational EMPr and all other relevant licences and permits applicable to the plant. ▪ Be fully conversant with all relevant environmental legislation applicable to the plant and ensure compliance with them. ▪ Assist in the compilation of environmental specifications, operating instructions and company standards that will specify how potential environmental impacts will be managed in line with the requirements of the EAs, Operational EMPr and other relevant licences and permits and where relevant environmental best practice, and how they will practically ensure that the objectives of the Operational EMPr are achieved; ▪ Convey the contents of the EAs, Operational EMPr and other relevant licences and permits to new contractors and service providers, if required; ▪ Conduct annual internal audits and internal reporting of the plant and surrounding areas in compliance with the Operational EMPr and other relevant licences and permits. ▪ Take appropriate action if the specifications contained in the EAs, Operational EMPr and other relevant licences and permits are not followed. ▪ Monitor and verify that environmental impacts are kept to a minimum, as far as possible. ▪ Order the removal from the plant, any person(s) and/ or equipment in contravention of the specifications of the Operational EMPr. ▪ Appoint an independent Environmental Auditor to annually monitor environmental compliance according to the EAs, Operational EMPr and all other relevant licences and permits.

5.2 Monitoring

A monitoring programme will be in place not only to ensure compliance with the EMPr through the contract/work instruction specifications, but also to monitor any environmental issues and impacts which have not been accounted for in the EMPr that are or could result in significant environmental impacts for which corrective action is required.

A monitoring programme will be implemented for the duration of the construction phase of the project. This programme will include:

- Monthly audits will be conducted by the ECO for the duration of the construction activities including rehabilitation – the ECO shall undertake this environmental monitoring with the audits considering compliance with the EMPr.
- On-going monitoring is to be undertaken by the Contractor's dEO – this will include notification to the ECO in the event an incident takes place.
- External auditing may take place at unspecified times by the authorities and/ or other relevant authorities.
- The Contractor's dEO must undertake daily site inspections to ensure all legislative requirements are adhered to.

5.3 Reporting Procedures

5.3.1 Documentation

The following documentation must be kept on site in order to record compliance with the EMPr:

- An Environmental File which includes:
 - Copy of the EMPr and all appendices;
 - Copy of the EA;
 - Copy of all other licences/ permits;
 - Copy of relevant legislation;
 - Environmental Policy of the Main Contractor;
 - Environmental Method Statements compiled by the Contractor;
 - Written Warning Notifications;
 - Environmental Register, which must include:
 - Complaints Register - including records of Complaints, and, minutes and attendance registers of all environmental meetings;
 - Incident Register - including copies of notification of Emergencies and Incidents, this must be accompanied by a photographic record;
 - Waste Documentation such as, but not necessarily limited to:
 - Waste Manifest Documents;
 - Weighbridge Receipts (for general waste);
 - Safe Disposal Certificates (SDCs) (for hazardous waste);
 - Waste Management Contractors Permits (to operate); and
 - Waste Management Licences (for recycling and disposal facilities) - if applicable.
 - Material Safety Data Sheets (MSDSs) for all hazardous substances;
 - Dust suppression register;
 - Notification of Emergencies and Incidents in terms of Section 30 of NEMA (Act No. 107 of 1998) and Section 20 of the National Water Act (Act No. 36 of 1998).

5.3.2 Environmental Register

The Contractor must establish an Environmental Register that includes:

- ECO Audit Reports and findings.
- Complaints Register.
- Incidents Register.

The Contractor must enforce that the following information is recorded for all complaints / incidents:

- Nature of complaint/ incident.
- Causes of complaint/ incident.
- Party(ies) responsible for causing complaint/ incident.
- Immediate actions undertaken to stop/ reduce/ contain the causes of the complaint/ incident.
- Additional corrective or remedial action taken and/ or to be taken to address and to prevent reoccurrence of the complaint/ incident.
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions.
- Procedures to be undertaken and/ or penalties to be applied if corrective or remedial actions are not implemented.
- Copies of all correspondence received regarding complaints/ incidents.

The above records will form an integral part of the Contractors' records. These records must be kept in the Site Environmental File on site, and must be made available for scrutiny; if so requested by the Developer, ECO or relevant authorities.

5.3.3 *Method Statements*

To allow the mitigation measures in this document to be implemented, task-specific method statements must be developed for each set of tasks. A Method Statement details how and when a process must be carried out, detailing possible dangers/ risks, and the methods of control required. Method statements can include:

- Type of construction activity;
- Timing and location of the activity;
- Construction procedures;
- Materials and equipment to be used;
- Transportation of the equipment to/ from site;
- How equipment/ material must be moved while on site;
- Location and extent of construction site office and storage areas;
- Identification of impacts that might result from the construction activity;
- Methodology and/ or specifications for impact prevention/ containment;
- Methodology for environmental monitoring;
- Emergency/ disaster incident and reaction procedures (required to be demonstrated); and
- Rehabilitation procedures and continued maintenance of the impacted environment.

The Contractor must be accountable for all actions taken in non-compliance of the approved Method Statements. The Contractor must keep all the Method Statements and subsequent revisions on file, copies of which must be distributed to all relevant personnel for implementation.

As a minimum, the following Method Statements must be generated:

- Site establishment;
- Formalisation of any access or emergency vehicular routes;
- Cement mixing/ concrete batching;
- Contaminated water;
- Dust;
- Environmental awareness course(s);
- Environmental monitoring;
- Erosion control;
- Fire, hazardous and/ or poisonous substances;
- Fuels and fuel spills (must form part of the item above);
- Storage, handling and decanting of diesel (must form part of the item above);
- Personnel, public and animal safety;
- Rehabilitation of modified environment(s);
- Solid and liquid waste management;
- Sources of materials (including MSDSs);
- Soil management (including topsoil and stockpiles);
- Stormwater Management; and
- Wash areas.

Method Statement topics may be grouped together in certain instances reducing the need to produce stand-alone statements covering each topic.

5.3.4 Environmental Emergency Response

According to NEMA (Act No. 107 of 1998) - "incident" means an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed.

According to Section 20 of the National Water Act (Act No. 36 of 1998), "incident" includes any incident or accident in which a substance - (a) pollutes or has the potential to pollute a water resource; or (b) has, or is likely to have, a detrimental effect on a water resource.

The Contractor's environmental emergency procedures must enforce responses to unexpected/ accidental actions/ incidents that could cause environmental impacts. Such incidents must include:

- Accidental discharges to water (i.e. into the watercourse) and land;
- Accidental spillage of hazardous substances (typically: oil, petrol, and diesel);
- Accidental damage to existing utilities e.g. sewer and water pipelines;
- Accidental toxic emissions into the air; and
- Specific environmental and ecosystem effects from accidental releases or incidents.

An *Environmental Emergency Response Action Plan* is separate to the Health and Safety Plan as it is aimed at responding specifically to environmental incidents and must enforce and include the following:

- Construction employees shall be trained in terms of incidents and emergency situations;
- Details of the organisation (i.e. manpower) and responsibilities, accountability and liability of personnel;
- A list of key personnel and contact numbers;
- Details of emergency services (e.g. the fire department/ on-site fire detail, spill clean-up services) shall be listed;
- Internal and external communication plans, including prescribed reporting procedures;
- Actions to be taken in the event of different types of emergencies;
- Incident recording, progress reporting and remediation measures to be implemented; and
- Information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.

The Contractor and their sub-contractor(s), service providers and suppliers must comply with the environmental emergency preparedness and incident and accident-reporting requirements as per the relevant legal requirements.

5.3.5 Written Warning Notification(s)

A Written Warning Notification must be issued to the Contractor as a final step towards rectifying a failure in complying with a requirement of the EMPr. This must be issued by the ECO to the Contractor in writing. Preceding the issuing of a Written Warning Notification, the Contractor must be given an opportunity to rectify the issue within an agreed timeframe. Failure to rectify the non-compliance within one (1) working week of the issue of the warning or a repeat non-compliance will result in a penalty.

The ECO must verify that the agreed actions have taken place by the agreed completion date, when completed satisfactorily; the ECO and Contractor must close out the non-compliance.

5.3.6 Public Communication and Liaison with I&APs

The Developer must ensure that the adjacent landowners are informed and updated throughout the construction phase.

Sufficient signage must be erected around the site (including at the entrance), informing the public of the construction activities taking place. The signboards must include the following information:

- The name of the Contractor; and
- The name and contact details of the site representative to be contacted in the event of emergencies or complaint registration.

6 TRAINING AND ENVIRONMENTAL AWARENESS

The Developer is committed to promoting and implementing sustainability throughout their operations. As It is important to ensure that the Contractor has the level of environmental awareness and competence to enforce continued environmental due diligence and on-going minimisation of environmental harm. Training needs must be identified based on the available and existing capacity of site personnel (including the Contractors, sub-contractors, service providers and suppliers) to undertake the required EMPr management actions and monitoring activities. It is vital that all personnel are trained to perform their designated tasks to an acceptable standard.

The environmental training is aimed at:

- Promoting environmental awareness;
- Informing the Contractor of all environmental procedures, policies and programmes applicable;
- Providing generic training on the implementation of environmental management specifications;
- Providing job-specific environmental training in order to understand the key environmental features of the construction site and the surrounding environment. Job-specific training include: Spill response training; Snake handling, Training by an avian specialist to identify potential Red Data species as well as the signs that indicate possible breeding by these species.
- The effectiveness of the environmental training will be reflected by the degree of conformance to EMPr requirements, the result of internal audits and the general environmental performance achieved by the project;
- Incidents and non-compliances will be assessed through the Internal Incident Investigation and Reporting System, to determine the root cause, including the possible lack of awareness/ training;
- Should it be evident that re-training is required, the SHE Manager will inform the Developer/ End user of the need and take the appropriate actions;
- General awareness training of all personnel shall be repeated annually; and
- The re-induction shall take into consideration changes made in the EMPr, changes in legislation, current levels of environmental performance and areas of improvement.

Environmental awareness to the employees of the project must be provided by the Principal Contractor in the following forms:

- Toolbox Talks (Weekly) – These are mandatory. The topics discussed during training sessions must be recorded, with all employees present signing an attendance register. These records must be maintained in the Site Environmental File.
- EMPr Awareness (as and when required).

As potential environmental impacts differ in each execution/ implementation, the environmental topics selected for discussion can either be:

- General topics that are applicable to the entire activity;
- Area specific topics as identified in the impacts on the receiving environment or based on findings from the most recent ECO report;
- Topics that can be “taken home” and implemented off-site.

The above-mentioned awareness activities must be used to share information and to ensure that all personnel are aware of the environment in which they operate and what environmental aspects require attention during their daily operations/ activities/ tasks. Additionally, personnel awareness training will be undertaken if and when required to strengthen the personnel’s understanding of environmental issues.

6.1 Activity Specific Topics

Some activities may have environmental impacts that are unique to each area as determined by the outcomes of the risk assessment and findings of the ECO reports. These must be addressed in the Weekly Tool Box Talks.

Area-specific topics include (and some of these topics may be a repeat of those covered under general topics):

- Stormwater and erosion management;
- Potential for water pollution and related impacts;
- Identification and management of erosion;
- Vehicle emissions and related impacts;
- Practical training regarding the clean-up of major and minor hydrocarbon spills;
- The importance of the waste management system and implementing good housekeeping;
- Dust generation and why and how to reduce dust; and
- Biodiversity interaction awareness.

6.2 Take-home Topics

Environmental awareness must not stop at the work place. Many of the concepts learned at work can be applied to employees' life style at home. Topics that can be covered under "take home topics" include, but are not limited to:

- Water consumption and conservation and;
- Domestic waste minimisation and recycling - "Reduce, Reuse and Recycle".

7 ENVIRONMENTAL MANAGEMENT PROGRAMME – PRE-CONSTRUCTION

7.1 Authorisation, Licences and Permits

Management Objective: The development must have the relevant authorisation, licences and permits in place prior to construction according to applicable legislation					
Management Outcome: All construction work must comply with the conditions of the relevant authorisations, licences and permits.					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> All required authorisations, permits and licences must be obtained by the Developer prior to the commencement of construction. All applications for licences in respect of protected trees must be obtained from the relevant Provincial DEFF/ NCDENC office. Permits for the removal of protected plant species must be obtained from NCDENC. Material for construction must be sourced from licenced borrow pits or commercial sources. 	Developer	Obtaining authorisations, permit and licences prior to construction	ECO	Once-off	All authorisations, licences and permits must be filed in the Site Environmental File

7.2 Appointment of Contractor

Management Objective: Appointment of Contractor who will undertake construction works in compliance with approved environmental authorisation, licences and permits					
Management Outcome: The appointed Contractor (including all sub-contractors and suppliers) complies with the relevant provisions of the environmental authorisation, approved EMPr and all other relevant licences and permits, as well as applicable environmental legislation and associated regulations					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> The Developer must ensure that this EMPr forms part of any contractual agreements with a Contractor(s) and sub-contractors for the execution of the proposed project. The Contractor must make adequate financial provision in their budgets for the implementation of the 	Developer Contractor	Environmental Authorisation, EMPr, licences and permits	ECO	Once-off	Contractor Agreements and Appointment

Management Objective: Appointment of Contractor who will undertake construction works in compliance with approved environmental authorisation, licences and permits					
Management Outcome: The appointed Contractor (including all sub-contractors and suppliers) complies with the relevant provisions of the environmental authorisation, approved EMPr and all other relevant licences and permits, as well as applicable environmental legislation and associated regulations					
environmental authorisation, approved EMPr and all other relevant licences and permits.		must be included in the tender documents and the Contractor needs to price appropriately			
3. The Contractor (including all sub-contractors and suppliers) must comply with the relevant provisions of the environmental authorisation, EMPr, applicable environmental legislation and associated regulations promulgated in terms of these laws.					

7.3 Environmental Awareness Training

Management Objective: Environmental impacts during construction are minimised due to general awareness of environmental requirements					
Management Outcome: Environmental impacts are minimised through effective awareness and training for all construction staff including sub-contractors, service providers and suppliers					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
1. The ECO must undertake the initial environmental induction with the project management team prior to the commencement of construction.					
2. The Contractor’s Environmental Induction presentation must be provided to the ECO for review (comment and approval) prior to the commencement of construction.					
3. All contractors, sub-contractors, service providers and suppliers must acknowledge their understanding of the EMPr and environmental responsibilities by signing an induction attendance record.	ECO	On-site environmental induction	-	Once-off	Record of attendance to the induction must be filed in the Site Environmental File

Management Objective: Environmental impacts during construction are minimised due to general awareness of environmental requirements					
Management Outcome: Environmental impacts are minimised through effective awareness and training for all construction staff including sub-contractors, service providers and suppliers					
<ol style="list-style-type: none"> All construction staff including sub-contractors, service providers and suppliers must receive environmental awareness training. Training must be done via Toolbox Talks and records of the training (attendance registers and content notes) must be kept within the Site Environmental File. Information posters must be erected and maintained at key location site. The Contractor's environmental awareness training must be site specific and address all findings raised by the ECO. 	Contractor	Weekly toolbox talks and awareness training	ECO	Monthly	Record of attendance to the toolbox talks must be filed in the Site Environmental File

7.4 Preparation of Area for Construction

Management Objective: Impacts on fauna and vegetation in and adjacent to the construction area are avoided					
Management Outcome: Construction activities are restricted to the demarcated construction area					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> A pre-construction photographic record of the entire construction servitude must be undertaken prior to commencement. Under no circumstances must any natural area on neighbouring properties (outside the approved development footprint) be impacted, degraded, cleared, or affected in any manner. The construction of a semi-permanent fence (which will prevent vehicle and personnel access to adjacent areas) must be constructed. The demarcation and fencing must be signed off by the ECO before any work commences. Prior to the stripping and clearing of the terrestrial habitat within the development footprint/ corridor, a search and rescue of indigenous vegetation must be undertaken and relocated to suitable habitat out of the development footprint/ corridor. Prior to site clearance, a detailed 'walkthrough' must be conducted to ascertain the number, abundance and physical conditions of all protected tree species (<i>Acacia erioloba</i> (Camel Thorn), <i>Acacia</i> 	Contractor Ecologist Avian Specialist	Demarcation of construction servitude prior to site clearing Walkthrough by Ecologist and Avian Specialists DEFF & NCDENC permits	ECO	Once-off	All DEFF and NCDENC permits must be filed in the Site Environmental File Walkthrough reports by Ecologist & Avian Specialists

Management Objective: Impacts on fauna and vegetation in and adjacent to the construction area are avoided					
Management Outcome: Construction activities are restricted to the demarcated construction area					
<p><i>haematoxylon (Grey Camel Thorn) and Boscia albitrunca (Shepherd's Tree) were observed in the project area) to assist with permit application (DEFF).</i></p> <p>6. Prior to site clearance, conduct a detailed 'walkthrough' of the proposed site to ascertain the number, abundance and physical conditions of all protected plant species to assist with permit application (NCDENC).</p> <p>7. Prior to site clearance, conduct targeted searches for less mobile animal species of conservation concern with high probability of occurring within the Project footprint (i.e. small mammals, medium mammals that may have dens/resting places/ roosts, burrows, etc. within the footprint) to allow relocation to take place where necessary, and avoid mortalities of these species.</p> <p>8. Prior to construction, an avian specialist must conduct a site walkthrough, covering the final road and pipeline route as well as the shared infrastructure area, to identify any nests/ breeding/ roosting activity of sensitive species, as well as any additional sensitive habitats. The results of which may inform the final construction schedule in close proximity to that specific area, including abbreviating construction time, scheduling activities around avian breeding and/ or movement schedules, and lowering levels of associated noise.</p>					<p>Pre-construction photographic records</p> <p>Clearly marked construction servitude</p>

8 ENVIRONMENTAL MANAGEMENT PROGRAMME – CONSTRUCTION

8.1 Site Establishment

Management Objective: Incorporation of environmental issues and constraints in the planning and establishment of the site					
Management Outcome: Impacts relating to site establishment are minimised					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> 1. Stockpile areas, hazardous materials storage areas (including fuels), equipment cleaning areas, cooking and ablution facilities, workshops, parking must be restricted to the Shared Infrastructure area as indicated in the layout plan (Annexure A). 2. The location of any additional temporary lay-down, stockpile, waste or spoil areas must be approved by the Environmental Control Officer (ECO) prior to implementation. 3. Signage must be placed in the area where construction will take place informing the public of the activities taking place. 4. The construction areas must be kept in an orderly state at all times. 	Contractor and dEO	Layout Plan	ECO	Once-off	Approved Layout Plan

8.2 No-Go Areas/ Access Restricted Areas

Management Objective: Construction-related activities in No-Go/ Access restricted areas is prevented					
Management Outcome: Impact on No-Go/ Access restricted areas are avoided through effective demarcation and management of these areas					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> 1. The extent of disturbance must be limited to the extent of the construction footprint. No areas outside the construction footprint must be cleared unless authorised. 2. Any contractors found working inside the No-Go/ Access restricted areas (areas outside the working servitude) must be issued a penalty as per the penalty system setup for the project. 3. Unauthorised stockpiling, dumping or storage of equipment, material or waste must be strictly prohibited in identified No-Go/ Access restricted areas. 	Contractor and dEO	Demarcation of sensitive areas and staying within approved areas for construction	dEO ECO	Daily Monthly	Site inspection of sensitive No-Go/ Access restricted areas

Management Objective: Construction-related activities in No-Go/ Access restricted areas is prevented					
Management Outcome: Impact on No-Go/ Access restricted areas are avoided through effective demarcation and management of these areas					
4. Areas outside of the construction footprint that are disturbed during the construction phase must be rehabilitated immediately to the satisfaction of the ECO as per the relevant re-vegetation/ re-planting plan.					
5. Existing roads or authorised access roads must be used to gain access to site.					
6. No surface disturbance or vegetation clearance should occur in the rocky outcrop that consists of Natural Habitat as defined by IFC. This habitat, plus a 250 m buffer, must be demarcated and no construction activity must occur within the demarcated zone.					
7. No construction activities or staff are permitted within 1.5 km of the identified Martial Eagle nest buffer.					

8.3 Soil Management

Management Objective: Additional construction-related activities impact on soils are prevented					
Management Outcome: Impact on soils are minimised or avoided through implementation of mitigation measures					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
1. A <i>Soil Management Method Statement</i> must be compiled by the Contractor and approved by the ECO.	Contractor and dEO	Method Statement to be compiled for soil stockpile management	dEO ECO	Daily Monthly	Site inspection and compliance with Method Statement
2. Erosion/ sediment control measures such as use of silt curtains, erosion berms, sand bags etc. must be placed around the stockpiles to limit sediment runoff from stockpiles.					
3. Subsoil and topsoil must be stockpiled separately. Stockpiled soil must be replaced in the reverse order to which it was removed (subsoil first followed by topsoil).					
4. Stockpiles of construction materials must be clearly separated from soil stockpiles in order to limit any contamination of soils.					
5. The maximum depth of topsoil stripping should be 30 cm or as agreed with the ECO.					

Management Objective: Additional construction-related activities impact on soils are prevented					
Management Outcome: Impact on soils are minimised or avoided through implementation of mitigation measures					
<p>6. If additional unconsolidated material exists below 30 cm and needs to be removed for construction purposes, it must be stripped and stockpiled separately from the upper 30 cm topsoil.</p> <p>7. The stockpiles must only be placed within demarcated stockpile areas.</p> <p>8. Stockpiled soils must be kept free of weeds and must not be compacted.</p> <p>9. Limiting the stockpile height to 3 metres and the slope to 1 in 5 and rounding the top edges.</p>					
<p>1. A <i>Soil Erosion and Sedimentation Control Method Statement</i> must be compiled by the Contractor and approved by the ECO prior to construction.</p> <p>2. Vegetation/ soil clearing, and stripping activities must only be undertaken during agreed working times and permitted weather conditions.</p> <p>3. Construction activities must be scheduled to minimise the duration of exposure to bare soils on site.</p> <p>4. All erosion control measures must be maintained and monitored weekly and sediment accumulating behind the structures must be removed and redistributed to ensure that structures do not fail.</p> <p>5. Conduct inspections after each rainfall event to identify areas of erosion.</p> <p>6. Implement an effective system of stormwater runoff control at all points of disturbance where water accumulation might occur. The system must effectively collect and safely disseminate any runoff water from all hardened surfaces, and it must prevent any potential down slope erosion. Any occurrences of erosion must be attended to immediately and the integrity of the erosion control system at that point must be amended to prevent further erosion from occurring there.</p>	Contractor and dEO	Method Statement to be compiled for erosion control and sedimentation	dEO ECO	Daily Monthly	Site inspection and compliance with Method Statement

8.4 Vegetation Clearing

Management Objective: Construction-related activities are undertaken in a manner which prevents additional impacts to vegetation					
Management Outcome: Vegetation clearance and associated impacts are minimised through adherence of EMPr vegetation clearance requirements					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> 1. Areas proposed for vegetation clearance must be clearly marked and no heavy vehicles should travel beyond the marked area. 2. The retention of a vegetated buffer zone between the edge of the proposed infrastructure footprint and the outer boundary of the facility, within which the existing vegetation is retained. 3. Cleared vegetation and debris that has not been utilised must be collected and disposed of at a suitable licenced waste disposal facility. Under no circumstances may it be burned on site. 4. All bare surfaces across construction site must be checked for Invasive Alien Plants (IAPs) monthly and IAPs removed by hand pulling/ uprooting and adequately disposed. 5. Herbicides must be utilised where hand pulling/ uprooting is not possible. 6. No painting or marking of rocks or vegetation to identify locality or other information must be allowed, as it will disfigure the natural setting. Marking must be done by steel stakes with tags, if required. All temporary markings must be removed upon completion of the construction. 7. Collection of branches, wood (dead or alive), shrubs or any vegetation for fire making purposes is strictly prohibited. 8. An Alien and Invasive Management Programme must be developed and implemented. This programme must include (<i>inter alia</i>) the identification, control and eradication of invasive and exotic animals and plants from the site and immediate surrounds. The programme must be developed by a qualified ecologist and implemented by the dEO. Ongoing monitoring must be conducted by the ECO and periodic monitoring (annual) by a qualified ecologist to ascertain the efficacy of the programme. 9. The methods employed to control and eradicate a listed invasive species must also be directed at the offspring, propagating material 	<p>Contractor & dEO</p> <p>Ecologist</p>	<p>Working within demarcated areas</p> <p>Alien and Invasive Management Programme</p>	<p>dEO</p> <p>ECO</p>	<p>Weekly (dEO)</p> <p>Monthly (ECO)</p> <p>Annually (Ecologist)</p>	<p>Site inspections</p>

Management Objective: Construction-related activities are undertaken in a manner which prevents additional impacts to vegetation					
Management Outcome: Vegetation clearance and associated impacts are minimised through adherence of EMPr vegetation clearance requirements					
and re-growth of such invasive species in order to prevent such species from producing offspring, forming seed, regenerating or re-establishing itself in any manner.					

8.5 Protection of Fauna

Management Objective: Construction-related activities are undertaken in a manner which prevents additional impacts to fauna and wildlife					
Management Outcome: Impacts on fauna are minimised through adherence of EMPr requirements					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<p>General</p> <ol style="list-style-type: none"> Workers/ employees on-site must be educated to not harm wildlife. This must include as a minimum, basic environmental training based on the requirements of the EMPr, including training on avoiding and conserving local wildlife. As well as potentially occurring dangerous animals of the area and the correct actions to take when encountering dangerous species, notably snakes and scorpions. Establish operational procedures for eventualities in dealing with snakebites. No wild animal may under any circumstance be hunted, snared, captured, injured, killed, harmed in any way or removed from the site. This includes animals perceived to be vermin (such as snakes, rats, mice, etc.). Due to the type of development, the type and nature of fencing/demarcation must not attempt to facilitate free movement of smaller/medium-sized animals as this could lead to unwanted presence (and accidental killing) of animals within the development site. Perimeter fencing must be designed to prevent entrapment of large bodied species such as korhaans between fence rows, giving them sufficient space for take-off, i.e. if a double-layer of parallel fencing is used, the gap between the fences should be large enough to allow for large birds to take-off and leave the area. Where this would result 	Contractor	<p>Walk-through prior to vegetation clearing</p> <p>Awareness Training</p> <p>Injuring, capturing, killing of animals identified on site must be reported as an environmental incident and investigated</p>	ECO	Monthly	Training material relating to wildlife management

Management Objective: Construction-related activities are undertaken in a manner which prevents additional impacts to fauna and wildlife					
Management Outcome: Impacts on fauna are minimised through adherence of EMPr requirements					
<p>in unacceptable compromises to the security of the site, large-bodied birds should be prevented from entering the gaps between parallel fence rows. Perimeter fence design to be done in consultation with an avian specialist.</p> <p>6. No domestic pets of any kind, with specific reference to feral cats, must be allowed on the development site.</p> <p>7. Any fauna that are found within the construction zone must be moved to the closest point of natural or semi-natural habitat outside the construction corridor. The handling and relocation of any animal perceived to be dangerous/ venomous/ poisonous must be undertaken by a suitably trained individual. A permit from the relevant conservation authority may be required.</p> <p>8. All vehicles accessing the site should adhere to a low speed limit (40km/hr is recommended) to avoid collisions with susceptible species such as reptiles (snakes and lizards).</p> <p>9. <u>An annual monitoring protocol must be executed to assess the status and impacts of the development on areas of remaining natural habitat in the immediate surrounds of the development footprint. This must include reference to botanical and faunal observations and diversity patterns and will advise the project on adverse actions and effects of the project outside the approved footprint.</u></p>					
<p>Avifauna:</p> <p>1. The appointed dEO must be trained by an avian specialist to identify the potential Red Data species as well as the signs that indicate possible breeding by these species.</p> <p>2. The dEO and ECO must then, during audits/ site visits, make a concerted effort to look out for such breeding activities of Red Data species, and such efforts 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.</p>	dEO	<p>Training on Red Data avifauna species</p> <p>Implement a Bird Monitoring Programme</p>	ECO	Monthly	<p>Site inspection</p> <p>Bird Monitoring Reports</p>

Management Objective: Construction-related activities are undertaken in a manner which prevents additional impacts to fauna and wildlife					
Management Outcome: Impacts on fauna are minimised through adherence of EMPr requirements					
3. If any of the Red Data species are confirmed to be breeding (e.g. if a nest site is found), construction activities within 500 m of the breeding site must cease, and an avian specialist must be contacted immediately for further assessment of the situation and instruction on how to proceed.					
4. A construction phase bird monitoring programme must be implemented by a bird specialist, to document potential impacts on key species such as korhaans, bustards and eagles, and must include the ongoing monitoring of the active Verreaux's Eagle and Martial Eagle nest sites.					

8.6 Protection of Ground- and Surface Water Resources

Management Objective: Construction-related activities is undertaken in a manner which prevent additional impacts to ground- and surface water resources					
Management Outcome: Impacts on ground- and surface water resources are minimised					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
1. Mitigation for spillage or leakages include bunded areas to store chemical and/ or fuel.	Contractor	Prevention of any spillage into ground- and surface water resources Monitoring Plan	ECO	Monthly	Site inspection
2. Spillages must be cleaned up immediately and contaminated soil must either be remediated in situ or disposed of at an appropriately licenced landfill site.					
3. Potentially contaminating wastes (empty containers for paint, solvents, chemicals, etc.) and cement must be stored in bunded areas until removed by a reputable contractor for disposal at an appropriately licenced facility.					
4. Drip trays with plugs must be utilised at all dispensing areas.					
5. Vehicles must be service in the dedicated workshop area.					
6. <u>It is recommended that a monitoring plan is developed including the existing monitoring boreholes on site, elements to be analysed and sampling frequency.</u>					

8.7 Spills, Incident and Pollution Control

Management Objective: To avoid, manage and mitigate potential impact on the environment due to spillages					
Management Outcome: Impacts to the environment soils, surface and groundwater is avoided (where possible) or managed					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> 1. A <i>Spill Contingency Plan</i> must be compiled by the Contractor. 2. In the event that a pollution incident occurs on site, the Contractor must: <ul style="list-style-type: none"> ▪ Implement reasonable measures immediately to contain and minimise the impacts of the incident; ▪ Investigate and determine the root cause. This must be addressed in an Action Plan to prevent a recurrence; ▪ Notify all persons whose health is affected by the incident; ▪ Undertake clean up procedures immediately; ▪ Notify the dEO and ECO of the incident immediately who will advise the employee as to the measures that must be implemented; ▪ Record the incident in the <i>Environmental Incident Register</i>; and ▪ Implement measures to prevent similar incidents from occurring in the future. 3. In the event of a significant spillage that cannot be contained and which poses a serious threat to the environment, the following Departments must be informed within forty-eight (48) hours of the incident and in accordance with Section 30 of the NEMA: <ul style="list-style-type: none"> ▪ The relevant municipality; ▪ Department of Water and Sanitation; ▪ The Local Fire Department; and ▪ Any other affected Department. 4. Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly disposed of using appropriate spill kits. Any contaminated soil from the construction site must be removed and rehabilitated or disposed appropriately at the nearest landfill site. The ECO must be notified immediately when a spill occurs. 	dEO & Contractor	<p>Construction staff to be trained in spill management</p> <p>Spill Contingency Plan</p> <p>Updated Environmental Incident Register</p>	dEO ECO	Daily Monthly	<p>Site inspection Inspection of Environmental Incident Register</p> <p>Compliance with Spill Contingency Plan</p> <p>Provision of spill kits</p>

8.8 Hazardous Substances

Management Objective: To minimise the risk of impact to the environment through the safe storage, handling, use and disposal of hazardous substances					
Management Outcome: The management of hazardous substances is undertaken in accordance with the Hazardous Substances Act (Act No. 15 of 1973)					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> Hazardous storage and refuelling areas must be bunded prior to their use on site during the construction period following the appropriate SANS codes. Material Safety Data Sheets (MSDSs) for all hazardous substances must be filed in the Site Environmental File. Fire-fighting equipment must be present at all hazardous storage facilities. Fuel storage containers must be regularly inspected to prevent leaks. 220l drums must be kept on site to collect contaminated soil. These drums must be labelled and sealed to prevent the ingress of water. Contaminated soil must be disposed of at a licenced hazardous waste site. If a water pump is required, the water pump must operate within to prevent any spillage and limit the risk of soil/ water contamination. The drip tray will need to be lined with absorbent pads and checked daily while in use. Water leaks into the drip tray must be prevented and attend to immediately. 	Contractor	Bunding of hazardous storage sites	dEO ECO	Daily Monthly	Site inspection of hazardous storage areas and inspection of drip trays and impervious surfaces

8.9 Water Supply

Management Objective: Undertake responsible water usage during construction					
Management Outcome: Water for construction is compliant with the requirements of the National Water Act (Act No. 36 of 1998)					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> Only approved/ licenced sources of water must be used for construction on the construction site and in the construction camps. Water for human consumption must be available at the site offices and at other convenient locations on site where work occurs. 	Contractor	Water abstraction from	ECO	Monthly	Site inspection Proof of water

Management Objective: Undertake responsible water usage during construction					
Management Outcome: Water for construction is compliant with the requirements of the National Water Act (Act No. 36 of 1998)					
		licenced sources			use authorisation for the abstraction of water

8.10 Stormwater Management

Management Objective: Stormwater is managed across the construction area					
Management Outcome: Avoid, prevent and manage impacts related to stormwater					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> An updated <i>Stormwater Management Plan (SWMP)</i> must address stormwater management during construction and the final developed infrastructure and approved by the ECO. Runoff generated from cleared and disturbed areas/ slopes that drains into watercourses must be controlled using erosion control and sediment trapping measures like silt fences, sandbags, earthen berms and synthetic logs, particularly where slopes are exposed. These control measures must be established at regular intervals perpendicular to the slope to break surface flow energy and reduce erosion as well as trap sediment. Berms, sandbags and/ or silt fences employed must be maintained and monitored for the duration of the construction phase and repaired immediately when damaged. The berms, sandbags and silt fences must only be removed once vegetation cover has successfully re-colonised the disturbed areas post-rehabilitation. 	Project Manager	SWMP	ECO	Monthly	Approval of SWMP

8.11 Ablution/ Sanitation

Management Objective: Adequate number of clean ablution/ sanitation facilities are available to all staff to minimise impacts on the environment						
Management Outcome: No pollution or disease arises in terms of poorly maintained ablution / sanitation facilities or lack thereof						
Impact Management Actions		Implementation		Monitoring		
		Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> 1. A minimum ratio of one chemical toilet must be provided per 15 persons. Chemical toilets must be serviced a minimum of once every week. A SDC and/ or waste manifest must be obtained and kept on site. The construction of “long drop” toilets, including French drains or soakaway systems is prohibited. Under no circumstances must open areas or the surrounding bush be used as toilet facilities. 2. The chemical toilets must be strategically placed (easily accessible to workers, preferably no more than a 300m from the work-face). 3. All ablution activities must take place in these facilities, and the waste material must be removed from site on a regular (weekly) basis by a permitted Waste Contractor for safe disposal at a licenced waste disposal facility or a municipal wastewater treatment works. 4. All temporary/ portable toilets must be secured to the ground to prevent them from toppling due to wind or any other cause. 5. If toilet facilities are to be constructed, these must be linked to conservancy tanks. All wastewater within conservancy tanks must be removed on a frequent basis (weekly). 6. Conservancy tanks must not be buried underground. If these are below ground level, they must be placed within a bunded facility where leak detection can be undertaken through visual inspection. 7. Unauthorised dumping/ spilling of waste from toilets into the environment and/ or burying of waste are strictly prohibited. 		Contractor	<p>Provision of ablution facilities during construction</p> <p>Approval for the treatment and release of wastewater (if applicable)</p>	dEO ECO	Daily Monthly	<p>Proof of servicing and safe disposal</p> <p>Water use authorisation for the release of wastewater into the environment</p>

8.12 Access Routes

Management Objective: Minimise impacts to the environment through the use of existing and established access routes					
Management Outcome: Construction vehicle movement are restricted to approved routes					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> No new construction access routes must be created, and the clearing of vegetation to widen an access road (outside of the approved construction right-of-way (8m road reserve width) must be undertaken under strict conditions and under a method statement, approved by the ECO and under supervision by the dEO. As such construction access routes must be included in the environmental compliance auditing scope of the dEO and ECO. In the event that new access roads are required, the appropriate licencing process in terms of the EIA Regulations 2014 (as amended in 2017) must be undertaken. Access of all construction and material delivery vehicles must be strictly controlled and vehicles (type e.g. private, heavy, number plates, owner etc.) recorded. Security gates must be provided at the entrance of site. Strategic positioning of entry and exit points to ensure as little impact/ effect as possible on the traffic flow. The main routes to the site must be clearly defined and signposted. 	Contractor	Access routes must be mapped prior to construction	dEO ECO	Monthly	Site inspection

8.13 Fires

Management Objective: Minimise the risk of fire during construction					
Management Outcome: Fire prevention measures are carried out in accordance with the National Veld and Forest Fire Act (Act No. 101 of 1998)					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> Prevent all open fires on site. The workers must be educated on the dangers of open/ unattended fires. Fire-fighting measures such as fire extinguishers must be located on site. 	Contractor	Awareness training	ECO	Monthly	Site inspection

Management Objective: Minimise the risk of fire during construction					
Management Outcome: Fire prevention measures are carried out in accordance with the National Veld and Forest Fire Act (Act No. 101 of 1998)					
4. The workforce must be trained in fire prevention and fire-fighting measures.					
5. The burning of general waste material is prohibited.					
6. Provide demarcated fire-safe zones, facilities and suitable fire control measures					
7. Contact numbers for the local Fire Fighting Unit must be communicated in the environmental awareness training and displayed at the camps.					

8.14 Vehicle and Equipment Maintenance

Management Objective: Vehicle and equipment maintenance are carried out in designated areas preventing pollution to soil, surface water and groundwater resources					
Management Outcome: Impacts to soil, surface water and groundwater resources are avoided or minimised through the implementation of management actions					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
1. Heavy machinery and construction vehicles must be parked in a vehicle maintenance yard which must be illustrated on the shared infrastructure layout map submitted to the ECO for approval.	Contractor dEO	Dedicated maintenance area/ yard	ECO	Monthly	Site inspection
2. A dedicated maintenance area must be demarcated with an impermeable surface leading to an oil-water separator.					
3. All machinery and equipment to be used within the sensitive working areas must be checked daily for oil and diesel leaks before gaining access to these working areas.					
4. No vehicle must be repaired in any place other than in the dedicated maintenance yard – if such repairs are required the vehicle must be made safe (i.e. no leakage while being removed to the repair facility) and removed at the earliest opportunity to the repair facility.					
5. Prior to returning on site the dEO must declare the vehicle safe to return to site.					
6. Washing of vehicles on site or at the construction camp is prohibited. The only exception is if a designated bund facility with					

Management Objective: Vehicle and equipment maintenance are carried out in designated areas preventing pollution to soil, surface water and groundwater resources					
Management Outcome: Impacts to soil, surface water and groundwater resources are avoided or minimised through the implementation of management actions					
an oil-water separator is constructed at the shared infrastructure area.					
7. The positioning of such a facility must be approved prior to construction by the ECO in consultation with the Engineer.					

8.15 Waste Management

Management Objective: To avoid, manage and mitigate potential waste impacts during the construction phase					
Management Outcome: Potential impacts to the environment caused by waste (general and hazardous) are avoided or managed					
Impact Management Actions	Implementation		Monitoring		
<i>Solid Waste</i>	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> Adequate rubbish bins and waste disposal facilities (general and hazardous waste) must be provided on-site and at the shared infrastructure area. The construction site must be kept clean and tidy and free from rubbish. Recycling/ re-use of waste must be encouraged. No solid waste must be burned on site. Bins and/ or skips must be supplied at convenient intervals on site for disposal of waste within the construction camp(s). The bins must have liner bags for easy control and safe disposal of waste. Bins must be provided to all areas that generate waste e.g. worker eating and resting areas and the camp site. General refuse and construction material refuse as well as hazardous waste must not be mixed. Hazardous waste bins must be clearly marked, stored in a contained area (or have a drip tray) and covered (either stored under a roof or the top of the container must be covered with a lid). Hazardous waste must be disposed of at a licenced hazardous waste landfill site. 	Contractor	General camp house-keeping Provision of bins Waste Register Waste documents Awareness training on waste minimisation and re-use	dEO ECO	Daily Monthly	Approved Waste Register Provision of waste disposal facilities (bins & skips) Proof of waste documents (SDCs, weighbridge receipts, recycling certificates)

Management Objective: To avoid, manage and mitigate potential waste impacts during the construction phase					
Management Outcome: Potential impacts to the environment caused by waste (general and hazardous) are avoided or managed					
<p>9. Waste bins must be cleaned out weekly or when capacity has been reached to prevent any windblown waste and/ or visual disturbance.</p> <p>10. Skips must be covered by tarpaulin or sail and bins must have lids.</p> <p>11. Once loaded onto a truck, the rubble (inert waste i.e. concrete, sand, rock etc.) must be taken to a recognised local municipal landfill site as approved by the ECO. Waybills or a signed waste manifest (with all relevant signatures) or as a last resort photographic record of the waste disposal at the local municipal landfill site must be provided as proof of safe disposal. The truck must be covered with tarpaulin or a sail.</p> <p>12. Should rubble be required as a raw material for the construction, it must be taken to a designated stockpile area - which must be approved by the ECO.</p> <p>13. Spoil material must be hauled to a designated spoil site approved by the ECO. No spoil material must be discarded on site.</p> <p>14. A Waste Register must be compiled. The dEO must control and record each load that leaves the site.</p> <p>15. A full paper trail for waste disposal must be kept that includes: permits to operate (handle, transport waste); Waste Management Licences (for both storage and waste disposal facilities - where applicable) for Waste Handling Contractor/ s; Waste Registrations (for storage of waste, and recycling facilities - where applicable) for Waste Handling Contractor/ s; Waste Manifests; Weighbridge Certificates; Safe Disposal Certificates and Certificates of Recycling.</p> <p>16. The provisions of the NEM: Waste Act and Norms and Standards for the Storage of Hazardous Waste and Recycling or Recovery of Waste must to be complied with.</p>					
<p>Wastewater</p> <p>1. In the event that wastewater needs to be treated and released into the environment, an Environmental Risk Assessment must be conducted and an approval process (in terms of applicable</p>	Contractor	Collection, storage, treatment and/ or disposal of wastewater	ECO	Monthly	Site inspection Proof of SDCs

Management Objective: To avoid, manage and mitigate potential waste impacts during the construction phase					
Management Outcome: Potential impacts to the environment caused by waste (general and hazardous) are avoided or managed (in accordance with environmental legislation) must be undertaken prior to implementation.					

8.16 Batching Plants

Management Objective: To avoid, manage and mitigate potential impact on the environment due to spillages and contamination					
Management Outcome: Minimise spillages and contamination of soil, surface water and groundwater					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> 1. A Method Statement must be compiled for Batching Plants. 2. Batching plants areas must be fitted with a containment facility for the collection of cement-laden water. 3. Mixing of concrete must take place on trays, shutter boards or on impermeable surfaces. 4. Runoff from cement/ concrete batching areas must be directed to an excavation lined with DPM plastic and allowed to dry out before being broken up and re-used elsewhere or safely disposed of at a licenced disposal facility. 5. No tracking of wet concrete is allowed. 6. Wet concrete must be cleared from site daily. 7. Only dry concrete may be stockpiled directly on the ground. 8. Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site. 	Contractor	Method Statement for Batching Plants	dEO ECO	Monthly	Approved Method Statement for Batching Plants Site inspection

8.17 Noise Management

Management Objective: To avoid or prevent unnecessary noise to the environment by ensuring noisy construction activities are mitigated					
Management Outcome: Noise management is undertaken in accordance with SANS 10103 and the Occupational Health and Safety Act (Act No. 85 of 1993)					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> 1. Surrounding communities and adjacent landowners are to be notified upfront (within 48 hours) of noisy construction activities (blasting, excavations and piling activities). 					

Management Objective: To avoid or prevent unnecessary noise to the environment by ensuring noisy construction activities are mitigated					
Management Outcome: Noise management is undertaken in accordance with SANS 10103 and the Occupational Health and Safety Act (Act No. 85 of 1993)					
<ol style="list-style-type: none"> 2. All construction vehicles and equipment must be kept in good repair. 3. Construction activities, must be limited to the period 06h00 to 22h00. 4. With regard to unavoidable noisy construction activities in the vicinity of noise sensitive areas, the Developer should liaise with adjacent landowners/ occupants on how best to minimise the impact. 5. Machines in intermittent use must be shut down or throttled down to a minimum whenever practicable. 6. Noise levels must be kept within prescribed limits. All noise and sounds generated must adhere to SANS 10103 specifications for maximum allowable noise levels for rural areas. No pure tone sirens or hooters must be utilised except where required in terms of SANS standards or in emergencies or during emergency drills. 7. Construction staff working in an area where the 8-hour ambient noise levels exceed 75 dBA must have the appropriate Personal Protective Equipment (PPE) (earmuffs). 8. All operations must meet the noise standard requirements of the Occupational Health and Safety Act (Act No. 85 of 1993). 9. A <i>Complaints Register</i> must be kept at the Site Office at all times. 	Contractor	Compliance with SANS 10103 and OHS Act Use of appropriate PPE	dEO ECO	Daily Monthly	Inspection of Complaints Register Site inspection

8.18 Air Quality

Management Objective: To reduce air quality (dust, emission and odour) during construction activities					
Management Outcome: Minimal dust, emissions and odour due to adherence of management actions					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> 1. Dust must be suppressed on the construction site as well as access roads and active working areas during dry periods by the regular application of water. 2. Water used for this purpose must be used in quantities that will not result in the generation of runoff. 	Contractor	Regular dust suppression	dEO ECO	Daily Monthly	Site inspection

Management Objective: To reduce air quality (dust, emission and odour) during construction activities					
Management Outcome: Minimal dust, emissions and odour due to adherence of management actions					
3. If water is abstracted from a water resource for dust suppression, a Water Use Authorisation must be obtained from the DHWW&S prior to first abstraction.		Maintaining a dust suppression register			Dust suppression register
4. A speed limit of 40 km/hr must be set for all vehicles travelling over exposed areas or near stockpiles.		Dust fallout monitoring			Records from dust fallout monitoring
5. Dust suppression measures must be implemented, especially on road stretches located within 500 m of households/ farmsteads located close to the access route.		Plant and equipment must be in good working order			Inspection of Complaints Register relating to dust complaints
6. A <i>Dust Suppression Register</i> as well as a <i>Complaints Register</i> must be kept on site. All complaints received must be investigated with remedial action taken communicated to the affected party within 7 days.					Servicing Receipts
7. Dust fallout from the construction and batching areas must be monitored by dust collection buckets located downwind of construction area. Monitoring in accordance with SANS 2004.					

8.19 Protection of Heritage and Palaeontological Resources

Management Objective: Prevent damage and destruction to fossils, archaeological site and material of heritage significance					
Management Outcome: Impact to heritage and palaeontological resources are managed in terms of the National Heritage Act					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
1. Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, must cease immediately and the ECO must be notified as soon as possible.					
2. <u>If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA.</u>	Palaeontologist Archaeologist Contractor	Construction works to be halted until the relevant provincial heritage agency is contacted	dEO ECO	Once-off	Construction works to be halted until the relevant provincial heritage agency is contacted

Management Objective: Prevent damage and destruction to fossils, archaeological site and material of heritage significance					
Management Outcome: Impact to heritage and palaeontological resources are managed in terms of the National Heritage Act					
3.	Under no circumstances must any artefacts be removed, destroyed or interfered with by anyone on the site. Contractors and workers must be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51 (1).				
4.	Monitoring of all substantial bedrock excavations for fossil remains by ECO on an ongoing basis during construction phase, with reporting of any substantial new palaeontological finds (notably fossil vertebrate bones and teeth) to SAHRA for possible specialist mitigation.				
5.	In the case of any significant chance fossil finds during construction (e.g. vertebrate teeth, bones, burrows, petrified wood, shells), these must be safeguarded - preferably in situ - and reported by the ECO as soon as possible to the South African Heritage Resources Agency, SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Phone: +27 (0)21 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). This is so that appropriate mitigation by a professional palaeontologist can be considered. Such mitigation usually involves the judicious sampling, collection and recording of fossils as well as of relevant contextual data concerning the surrounding sedimentary matrix. The palaeontologist concerned would need to apply beforehand for a collection permit from SAHRA. A tabulated Chance Fossil Finds Procedure is provided in Annexure C .				
6.	<u>If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/ Phillip Hine 021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the</u>				

Management Objective: Prevent damage and destruction to fossils, archaeological site and material of heritage significance					
Management Outcome: Impact to heritage and palaeontological resources are managed in terms of the National Heritage Act					
<u>NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule.</u>					
7.	<u>If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/ Mimi Seetelo 012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule.</u>				

8.20 Visual

Management Objective: Reasonable measures are taken to ensure intrusive visual impacts are minimised					
Management Outcome: No complaints about visual impact					
Impact Management Actions		Implementation		Monitoring	
1. Clearing of vegetation must be undertaken in a phased manner, so as to prevent the large-scale exposure of soils and substrate that could result in a large visual contrast compared to the surrounding vegetation.	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
	Contractor	EMPr	ECO	Monthly	Site Inspection

8.21 Traffic Management

Management Objective: Reasonable measures are taken to ensure the safety of public, pedestrians and construction workers at all times during construction					
Management Outcome: All precautions are taken where possible to minimise the risk of injury, harm, death or complaints. Compliance with the Occupational Health and Safety Act (Act No. 85 of 1993) and Regulations					
Impact Management Actions		Implementation		Monitoring	
1. Adequate road warning signs and road markings must be introduced.	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance

Management Objective: Reasonable measures are taken to ensure the safety of public, pedestrians and construction workers at all times during construction					
Management Outcome: All precautions are taken where possible to minimise the risk of injury, harm, death or complaints. Compliance with the Occupational Health and Safety Act (Act No. 85 of 1993) and Regulations					
<ol style="list-style-type: none"> 2. The road signage must be carried out in accordance with the latest edition of the South African Road Traffic Signs Manual (SARTSM) and comply with the latest editions of the Southern African Development Community (SADC) Road Traffic Signs Manual. 3. The Transnet Service Road must be re-gravelled (150 mm thick over width) before construction commences of the PV plants. 4. Once re-gravelled, the road must be regraded on a monthly basis to prevent the deterioration of the road condition. 5. The intersection of the Gariep Road and Transnet Service Road can be upgraded in order to reduce the traffic congestion that is expected as well as minimize the dust generation at the intersection. 6. The delivery of materials by trucks must be phased through the day to the reduce the impact that trucks may have on traffic congestion and dust generation. 7. On-site speed restrictions to be imposed for 15 km/hr once through the security gate and 40 km/hr on the access road to the site (turn-off from the Transnet Service Road). 8. Clear and early warning of construction vehicles at intersection Gariep/ Transnet Service Roads must be provided. 9. Throughout the period of construction, the Province, District and Local Municipalities to be made aware of the name and contact details of the Engineer (PM) that they can communicate with should any matters arise in connection with any aspects of the construction that are affecting the road. 	Contractor	Traffic Management Method Statement	dEO ECO	Monthly Daily	Approval of Traffic Management Method Statement

8.22 Social Considerations

Management Objective: Negative social impacts are avoided or minimised and benefits are maximised					
Management Outcome: Social benefits and impacts associated with construction activities are enhanced (in the form of employment opportunities) or avoided/minimised (social ills associated with construction activities)					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> 1. Tender documents must include statements which include the use of local communities or local community organisation(s) in supplying services and labour for the construction activities. 2. A Community Liaison Officer (CLO) must be appointed for the project to deal with the employment of local labour and to interface between the Contractor and the local community. 3. The principles of equality, BEE, gender equality and non-discrimination must be implemented. 4. Due to the concentration of a workforce in the area over the construction period, the Contractor must implement an HIV/ AIDS Awareness Programme, annually on-site. Activities for HIV/ AIDS awareness and prevention will be broad based, targeting both individuals and groups. They may consist of: <ul style="list-style-type: none"> ▪ Information posters in public places both on and off site (eating places, bars, guest houses, etc.); ▪ Peer educators (reference people) drawn from the local labour force and trained in HIV/ AIDS issues for discussions with colleagues (estimate 1 per 30 employees); ▪ Small focus group discussions and information covering key issues must be held; ▪ Inclusion of HIV/ AIDS activities at site meetings and other discussions; and ▪ Voluntary Counselling and Testing. 5. No informal settlements must be allowed. 6. Project information must be communicated to I&APs to avoid misunderstandings and the creation of unrealistic expectations. 7. A formal grievance/ complaint mechanism must be set up. 8. All complaints must be recorded, followed up and resolved expeditiously. 	<p>Contractor</p> <p>Community Liaison Officer</p>	<p>Labour recruitment policy</p> <p>Awareness training material relating to HIV/ AIDS</p>	<p>Developer</p> <p>ECO</p>	<p>Once-off</p>	<p>Recruitment of local labour to be included in contract documentation</p> <p>HR and Labour Policy</p>

Management Objective: Negative social impacts are avoided or minimised and benefits are maximised					
Management Outcome: Social benefits and impacts associated with construction activities are enhanced (in the form of employment opportunities) or avoided/minimised (social ills associated with construction activities)					
9. Local contractors and providers of goods and services must be used where practicable.					
10. ACWA Power must work with local authorities to prevent development of ad-hoc roadside dwellings, shops and so forth on or adjacent to the project site.					
11. The Contractor, in line with the relevant socio-economic focus of the !Kheis LM and ACWA Power's personnel policies, must develop an appropriate exit strategy for temporary employees.					
12. A database of local job seekers, with skills levels and employment history, must be developed before commencing with personnel recruitment for the operational phase.					

9 ENVIRONMENTAL MANAGEMENT PROGRAMME – OPERATIONS

9.1 Alien Invasive Plant Management

Management Objective: Operational activities are undertaken in a manner which prevents additional impacts to vegetation					
Management Outcome: Alien and invasive vegetation infestation is managed as per the requirements of NEM: BA and Regulations					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> Continue with the Alien and Invasive Management Programme established during the construction phase. The EM must compile relevant action plans to deal with the presence of alien and invasive species. Alien species monitoring be conducted on an annual basis during the wet/ growing season. Monitoring must focus on identified priority sites, as well as other disturbed sites throughout the site to identify potential new sites of colonisation. 	Operational Manager	IAP eradication and control	EM	Monthly	Site inspection

9.2 Protection of Fauna

Management Objective: Operations-related activities are undertaken in a manner which prevents additional impacts to fauna and wildlife					
Management Outcome: Impacts on fauna are minimised through adherence of EMPr requirements					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<p>General</p> <ol style="list-style-type: none"> Site induction for contractors and personnel must include a familiarization with all aspects relating to environmental components of the project, as well as potentially occurring dangerous animals of the area and the correct actions to take when encountering dangerous species, notably snakes and scorpions. A competent person must be appointed to safely handle and remove any dangerous animal from the operational site. Establish operational procedures for eventualities in dealing with snakebites. 	Operational Manager Avian Specialist	Awareness Training Injuring, capturing, killing of animals identified on site	EM	Monthly	Training material relating to wildlife management Operational phase bird

Management Objective: Operations-related activities are undertaken in a manner which prevents additional impacts to fauna and wildlife					
Management Outcome: Impacts on fauna are minimised through adherence of EMPr requirements					
<p>4. Information signs regarding animals that may cross roads, notably during nocturnal periods, should be erected at selected localities.</p> <p>5. Monitoring of road conditions will inform sites where burrows are observed.</p> <p>6. <u>Ongoing monitoring of the presence of animals within the site and immediate surrounds, including roads, must be conducted by the Operational Manager for the project. Voluntary contributions from personnel, by means of observations and photographic evidence is encouraged, with reference to a cautionary approach to potentially dangerous animals.</u></p> <p>Avifauna:</p> <ul style="list-style-type: none"> ▪ The on-site operational facilities manager (or a suitably appointed Environmental Manager) must be trained by an avian specialist to identify the potential Red Data species as well as the signs that indicate possibly breeding by these species. ▪ If a priority species or Red Data species is found to be breeding (e.g. a nest site is located) on or within 2 km of the operational facility (or the grid connection servitude), the nest/ breeding site must not be disturbed and the avian specialist must be contacted for further instruction. ▪ The on-site operational facilities manager (or a suitably appointed Environmental Manager) must conduct inspections every two months of the grid connection line, and all existing transmission line pylons within 2 km of the project site boundary to locate possible nesting raptors. Any such nests must not be disturbed and must be reported to the avian specialist for further instruction. ▪ No operational activities or staff are permitted within 1.5 km of the identified Martial Eagle nest. ▪ All artificial water points (e.g. livestock water points and wind pumps) on the project site and within 500 m from the boundary of the project site, must be moved or shut down (if not already removed 		<p>must be reported as an environmental incident and investigated</p> <p>Bird and bat monitoring data</p>			<p>monitoring data report</p>

Management Objective: Operations-related activities are undertaken in a manner which prevents additional impacts to fauna and wildlife					
Management Outcome: Impacts on fauna are minimised through adherence of EMPr requirements					
<ul style="list-style-type: none"> from the project site during construction) so that birds are not attracted to the project site and immediate surrounding areas. An operational monitoring programme for birds in line with applicable solar guidelines must be developed and implemented, which must include searching for mortalities. Any mortalities should be reported to the EWT/ BirdLife. Birds must be prevented from nesting in and around substations and battery storage facilities through exclusion covers or spikes. <p>Bats</p> <ul style="list-style-type: none"> Searches for bat carcasses on the ground around and beneath the PV panels must be conducted in tandem with searches for bird carcasses. The Environmental Officer must freeze bat carcasses and keep a record of the location, date and time of when it was found. 					

9.3 Protection of Ground- and Surface Water Resources

Management Objective: Operational-related activities is undertaken in a manner which prevent additional impacts to ground- and surface water resources					
Management Outcome: Impacts on ground- and surface water are minimised during operations					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> <u>Once the construction phase has been completed it is recommended to do one monitoring routine of boreholes.</u> <u>It is recommended to monitor the Orange River water quality used on site during the operational phase.</u> All water-related infrastructure (e.g. pipes, pumps, reservoirs, toilets, taps etc.) must be regularly inspected for leaks and repaired as soon as practically possible. Settled silt must be removed from runoff control berms regularly (every 6 months) and examined for contamination with oil and/ or hydraulic fluids. Contaminated material must be subjected to remediation or appropriate disposal in accordance with prevailing 	Operational Manager	Prevention of any spillage and/ or pollution of water resources	EM	Monthly	SDCs Site inspections

Management Objective: Operational-related activities is undertaken in a manner which prevent additional impacts to ground- and surface water resources					
Management Outcome: Impacts on ground- and surface water are minimised during operations					
<p>legislation. Clean silt can be used during re-vegetation of bare areas.</p> <p>5. The BESS must be maintained according to supplier specifications to ensure optimal functionality.</p> <p>6. Potentially contaminating wastes produced during operations and maintenance activities must be stored in bunded areas until removed by a reputable contractor for disposal at an appropriately licenced disposal facility.</p> <p>7. All cleaning products used on the site must be environmentally friendly and bio-degradable.</p>					

9.4 Spills, Incidents and Pollution Control

Management Objective: To avoid, manage and mitigate potential impact on the environment due to spillages					
Management Outcome: Impacts to the environment soils, surface and groundwater is avoided (where possible) or managed					
Impact Management Actions					
	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<p>1. In the event that a pollution incident occurs on site, the Operational Manager must:</p> <ul style="list-style-type: none"> ▪ Implement reasonable measures immediately to contain and minimise the impacts of the incident; ▪ Investigate and determine the root cause. This must be addressed in an Action Plan to prevent a recurrence; ▪ Notify all persons whose health is affected by the incident; ▪ Undertake clean up procedures immediately; ▪ Notify the EO and ECO of the incident immediately who will advise the employee as to the measures that must be implemented; ▪ Record the incident in the <i>Environmental Incident Register</i>; and ▪ Implement measures to prevent similar incidents from occurring in the future. <p>2. In the event of a significant spillage that cannot be contained and which poses a serious threat to the environment, the following</p>	Operational Manager	Provision of sanitation facilities and bunding/ impervious surfaces for activities that may lead to soil and groundwater pollution	EM	Monthly	<p>Site inspection</p> <p>Inspection of Environmental Incident Register</p> <p>Compliance with Spill Contingency Plan</p> <p>Provision of spill kits</p>

Management Objective: To avoid, manage and mitigate potential impact on the environment due to spillages					
Management Outcome: Impacts to the environment soils, surface and groundwater is avoided (where possible) or managed					
<p>Departments must be informed within forty-eight (48) hours of the incident and in accordance with Section 30 of the NEMA:</p> <ul style="list-style-type: none"> ▪ The relevant municipality; ▪ Department of Water and Sanitation; ▪ The Local Fire Department; and ▪ Any other affected Department. <p>3. Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly disposed of using appropriate spill kits. Any contaminated soil from the construction site must be removed and rehabilitated or disposed appropriately at the nearest landfill site. The EO must be notified immediately when a spill occurs.</p>		Operational staff to be trained in spill management			

9.5 Hazardous Substances

Management Objective: To minimise the risk of impact to the environment through the safe storage, handling, use and disposal of hazardous substances					
Management Outcome: The management of hazardous substances is undertaken in accordance with the Hazardous Substances Act (Act No. 15 of 1973)					
Impact Management Actions					
General	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> 1. Hazardous storage and refuelling areas must be bunded prior to their use on site during the construction period following the appropriate SANS codes. 2. Material Safety Data Sheets (MSDSs) for all hazardous substances must be filed in the Site Environmental File. 3. Mixing of concrete must take place on trays, shutter boards or on impermeable surfaces. 4. Drip trays with plugs must be utilised at all dispensing areas. 5. 220l drums must be kept on site to collect contaminated soil. These drums must be labelled and sealed to prevent the ingress of water. Contaminated soil must be disposed of at a licenced hazardous waste disposal facility. 	Operational Manager	<p>Bunding of hazardous storage sites</p> <p>MSDSs</p> <p>SOP for maintenance and operation of BESS</p>	EM	Monthly	Site inspection of hazardous storage areas and inspection of drip trays and impervious surfaces

Management Objective: To minimise the risk of impact to the environment through the safe storage, handling, use and disposal of hazardous substances					
Management Outcome: The management of hazardous substances is undertaken in accordance with the Hazardous Substances Act (Act No. 15 of 1973)					
BESS					
6. Lithium ion batteries must have battery management systems (containment, automatic alarms and shut-off systems) to monitor and protect cells from overcharging or damaging conditions.		Inspections, communications, training, and drills			
7. BESS containment infrastructure must be inspected monthly.					
8. Large ESS systems must be designed with appropriate fire detection and suppression systems.					
9. A Standard Operating Procedure (SOP) for the operation and maintenance of the BESS must be compiled by the Operations Manager in line with manufacturer specifications.					
10. Inspection and maintenance procedures must be developed and documented to ensure mechanical integrity of the BESS and prevent uncontrolled releases of hazardous material from the system. These procedures must be included as part of the project SOPs.					
11. Operators must be trained on release prevention, including drills specific to hazardous materials as part of emergency preparedness response training.					

9.6 Waste Management

Management Objective: To avoid, manage and mitigate potential waste impacts during the operational phase					
Management Outcome: Potential impacts to the environment caused by waste (general and hazardous) are avoided or managed					
Impact Management Actions		Implementation		Monitoring	
1. Adequate rubbish bins and waste disposal facilities (general and hazardous waste) must be provided on-site and at the shared infrastructure area.	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
2. Recycling/ re-use of waste must be encouraged.	Operational Manager	General camp house-keeping	EM	Monthly	Approved Waste Register
3. Bins and/ or skips must be supplied at convenient intervals at the operational site for disposal of waste. The bins must have liner bags for easy control and safe disposal of waste.		Provision of bins			Provision of waste disposal

Management Objective: To avoid, manage and mitigate potential waste impacts during the operational phase					
Management Outcome: Potential impacts to the environment caused by waste (general and hazardous) are avoided or managed					
<p>4. Bins must be provided to all areas that generate waste. Waste streams must not be mixed.</p> <p>5. Hazardous waste bins must be clearly marked, stored in a contained area (or have a drip tray) and covered (either stored under a roof or the top of the container must be covered with a lid).</p> <p>6. Hazardous waste must be disposed of at a licenced hazardous waste landfill site.</p> <p>7. Waste bins must be cleaned out weekly or when capacity has been reached to prevent any windblown waste and/ or visual disturbance.</p> <p>8. Skips must be covered by tarpaulin or sail and bins must have lids.</p> <p>9. A Waste Register must be compiled. The EM must control and record each load that leaves the site.</p> <p>10. A full paper trail for waste disposal must be kept that includes: permits to operate (handle, transport waste); Waste Management Licences (for both storage and waste disposal facilities - where applicable) for Waste Handling Contractor/ s; Waste Registrations (for storage of waste, and recycling facilities - where applicable) for Waste Handling Contractor/ s; Waste Manifests; Weighbridge Certificates; Safe Disposal Certificates and Certificates of Recycling.</p> <p>11. The provisions of the NEM: Waste Act and Norms and Standards for the Storage of Hazardous Waste and Recycling or Recovery of Waste must to be complied with.</p>		<p>Waste Register</p> <p>Waste documents</p> <p>Awareness training on waste minimisation and re-use</p>			<p>facilities (bins & skips)</p> <p>Proof of waste documents (SDCs, weighbridge receipts, recycling certificates)</p>

9.7 Lighting

Management Objective: Reasonable measures are taken to ensure intrusive visual impacts are minimised					
Management Outcome: No complaints about visual impact					
Impact Management Actions	Implementation		Monitoring		
	Responsible Person/s	Method of Implementation	Responsible Person	Frequency of Monitoring	Mechanism for Monitoring Compliance
<ol style="list-style-type: none"> Where not prescribed by technical or local and international requirements, external lighting must be of an intermittent and coloured nature rather than constant white light to reduce the potential impact on the movement patterns of nocturnal species. Lighting of the site during operation must be directional and limited to only the necessary areas to prevent light spillage. Lighting of the plant at night must be limited to security lighting (where this is necessary), and emergency operational lighting must only be lit when required. 	Operational Manager	Complaints Register	EM	Monthly	Site inspection

10 ENVIRONMENTAL MANAGEMENT PROGRAMME – CLOSURE AND REHABILITATION

10.1 Closure and Rehabilitation

Management Objective: Closure and rehabilitation activities are undertaken in a manner which prevents additional impacts to the EMPr					
Management Outcome: The site is rehabilitated according to EMPr specifications					
Impact Management Actions	Implementation		Monitoring		
<ol style="list-style-type: none"> The Developer is responsible for compliance with the provisions for Duty of Care and Remediation of Damage in accordance with section 28 of National Environmental Management Act (NEMA), Act No. 107 of 1998. A Detailed Rehabilitation Plan for Terrestrial Habitats must be compiled by a suitably qualified and experienced ecologist and appended to the EMPr prior to construction commencing. All areas that have been disturbed by construction activities (including the shared infrastructure area) must be cleared of alien vegetation. The Developer must conduct bi-annual alien plant clearing for the first year post-rehabilitation. Thereafter, alien plant clearing must be undertaken annually during the wet/ growing season until such a time that further risks of alien invasion resulting from disturbance factors are considered negligible. The use of locally indigenous plant species for landscaping and rehabilitation purposes is strongly recommended. Under no circumstances must exotic and invasive plants be used for landscaping purposes. <u>Monitoring of rehabilitation success and management should be conducted after commencement of rehabilitation activities. Seasonal inspections of rehabilitation areas should be conducted by the EM, based on criteria from the Rehabilitation of Modified Environments Method Statement.</u> All remaining construction materials, building rubble and waste must be removed from the site. 	Contractor	<p>Method Statement to be compiled</p> <p>Rehabilitation of Modified Environments</p> <p>SDC</p>	EM ECO	Monthly	<p>Approved Method Statement for the Rehabilitation of Modified Environments</p> <p>SDC</p>

Management Objective: Closure and rehabilitation activities are undertaken in a manner which prevents additional impacts to the EMPr					
Management Outcome: The site is rehabilitated according to EMPr specifications					
8. All disturbed surfaces compacted by project must be ripped to a minimum depth of 30cm to allow organic contaminants to breakdown and promote vegetation establishment.					
9. If spillages do occur, they must be cleaned up immediately and any contaminated soil must be disposed of in accordance with applicable regulatory requirements.					
10. BESS should be recycled and where it cannot be recycled disposed of at a licenced hazardous waste facility. SDC must be provided.					


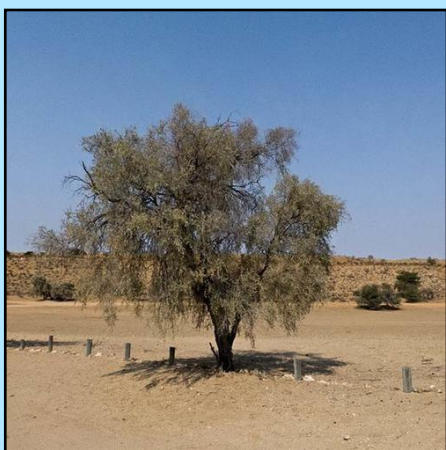
11 FAUNA AND FLORA RESCUE AND PROTECTION^{9 10 11}

In order to ensure minimal impact on listed and protected fauna and flora species and their habitat, avoidance and mitigation measures will be implemented during pre-construction, construction and operation.

11.1 Flora Rescue and Protection

The confirmed species of concern are listed in **Table 13**.



Table 13: Flora species of conservation concern recorded in the study area

Species	Conservation Status	Identification
<i>Acacia erioloba</i> (Camel Thorn)	Protected Tree (National Forest Act, 1998)	 <p>Source: Robur.q – www.wikipedia.org</p>
<i>Acacia haematoxylon</i> (Grey Camel Thorn)	Protected Tree (National Forest Act, 1998)	 <p>Source: www.seedsforafrica.co.za</p>

⁹ Schlechter, M., & Baxter, B. 2016. Final EIA Report: Proposed 150MW CSP Tower Development on the Remaining Extent of Farm Bokpoort 390, Northern Cape. Golder Associates. Ref 14/12/16/3/3/2/879.

¹⁰ Schlechter, M., & Baxter, B. 2016. Final EIA Report: Proposed 75MW Photovoltaic (PV1) Solar Development on the Remaining Extent of the Farm Bokpoort 390, Northern Cape. Golder Associates. Ref 14/12/16/3/3/2/881.

¹¹ Schlechter, M., & Baxter, B. 2016. Final EIA Report: Proposed 75MW Photovoltaic (PV2) Solar Development on the Remaining Extent of the Farm Bokpoort 390, Northern Cape. Golder Associates. Ref 14/12/16/3/3/2/880.

Species	Conservation Status	Identification
<i>Boscia albitrunca</i> (Shepherd's Tree)	Protected Tree (National Forest Act, 1998)	 <p>Source: www.kyffhauser.co.za</p>
<i>Stipagrostis amabilis</i> (Dune bushman grass (e), Duinsteekriet (a))	Kalahari endemic	 <p>Source: www.biodiversityexplorer.org</p>




11.1.1 Methodology




- Three protected tree species were recorded in the proposed project site. The ECO will, prior to construction and preferably with the onset of the growing season, conduct a walk-through of the project to identify and label all protected trees within the construction area;
- In the event that protected trees fall within the development footprint, rescue or destruction permits must be obtained from the provincial or relevant authority;
- If any species of concern are observed during the pre-construction survey, the following principles will apply:
 - Rescue operations should preferably be conducted with the onset of the growing season;
 - Identified and potentially affected plants should be translocated to a similar habitat outside the construction area. The area identified for translocation should be clearly mapped and marked for future monitoring purposes;
 - Relocated plants should be recorded with a unique identification number, photograph and GPS coordinates;
 - Rescued plants must either be planted immediately in the area designated for translocation or planted in containers to be cared for at an on-site nursery; and
 - The ECO must conduct daily inspections during site clearing to ensure that all possible species of concern are identified and handled accordingly as well as to ensure immediate response in the event of deviations from the site clearance plan.




11.2 Fauna Rescue and Protection


The fauna species of conservation concern that have been confirmed to be present or considered likely to be present in the project area. The confirmed species of concern are listed in **Table 14**.

Table 14: Fauna species of conservation concern recorded in the study area

Species name	Common Name	Conservation Status	Habitat Association in Study Area	Identification
<i>Otocyon megalotis</i>	Bat-eared Fox	NCNCA 2009 – Specially Protected	Open shrub duneveld, open shrub plains, calcareous low shrub plains throughout the PV plants footprint	 <p>Source: www.sa-venues.com</p>
<i>Atilax paludinosus</i>	Water Mongoose	NCNCA 2009 – Protected	Riparian habitat at water abstraction point	 <p>Source: www.biodiversityexplorer.org</p>
<i>Cynictis penicillata</i>	Yellow Mongoose	NCNCA 2009 - Protected	Open shrub duneveld, open shrub plains, calcareous low shrub plains throughout the PV plants footprint	 <p>Source: www.etoshanamibia.info</p>

Species name	Common Name	Conservation Status	Habitat Association in Study Area	Identification
<i>Galerella sanguinea</i>	Slender Mongoose	NCNCA 2009 - Protected	Open shrub duneveld, open shrub plains, calcareous low shrub plains throughout the PV plants footprint	 <p>Source: www.biodiversityexplorer.org</p>
<i>Lepus capensis</i>	Cape Hare	NCNCA 2009 - Protected	Open shrub duneveld, open shrub plains, calcareous low shrub plains throughout the PV plants footprint	 <p>Source: www.biodiversityexplorer.org</p>
<i>Lepus saxatilis</i>	Scrub Hare	NCNCA 2009 - Protected	Open shrub duneveld, open shrub plains, calcareous low shrub plains throughout the PV plants footprint	 <p>Source: www.pbase.com</p>

Species name	Common Name	Conservation Status	Habitat Association in Study Area	Identification
<i>Aonyx capensis</i>	Cape Clawless Otter	NCNCA 2009 – Protected, NEMBA	Riparian habitat at water abstraction point	 <p>Source: www.krugerpark.co.za</p>
<i>Ictonyx striatus</i>	Striped Polecat	NCNCA 2009 – Specially Protected; Data Deficient	Open shrub duneveld, open shrub plains, calcareous low shrub plains throughout the PV plants footprint; riparian vegetation at water abstraction point	 <p>Source: www.nambian.org</p>
<i>Mellivora capensis</i>	Honey Badger	NCNCA 2009 – Specially Protected; Near Threatened	Open shrub duneveld, open shrub plains, calcareous low shrub plains throughout the PV plants footprint; riparian vegetation at water abstraction point	 <p>Source: www.biodiversityexplorer.org</p>

Species name	Common Name	Conservation Status	Habitat Association in Study Area	Identification
<i>Orycteropus afer</i>	Aardvark	NCNCA 2009 – Specially Protected	Open shrub duneveld, open shrub plains, calcareous low shrub plains throughout the PV plants footprint	 <p>Source: www.travelsnamibia.com</p>

11.2.1 Methodology

- The Ecologist will, prior to construction conduct a walk-through of the project to identify any burrows or any other habitats that may be destroyed during site clearing to provide the animals with sufficient time to leave;
- The rocky outcrop in the northern corner of the study area constitutes prime roosting habitat for crevice roosting bats. This area should be clearly communicated as a No-Go/ Access restricted area during construction; and
- Any trenches or depressions within the cleared site must be checked on a daily basis for the presence of trapped animals. Any animals found must be removed safely and without any harm.

12 COMPLIANCE WITH THE ENVIRONMENTAL SPECIFICATION

The EMPr must form part of the Tender and Contract Documentation and is thus a legally binding document. It is also required for the Contractor to make provisions as part of their budgets for the implementation of the EMPr. In terms of *Polluter Pays Principle*. Section 28 of the NEMA, an individual responsible for environmental damage must pay the costs for both environmental and human health damage. As far as possible reasonable, feasible and implementable measures must be in place to reduce or prevent additional pollution and/ or environmental damage from occurring.

The EMPr must be considered to be an extension of the Conditions of Approval as set forth by the DEFF as well as any other regulatory authority for relevant permits and/ or licences. As such, non-compliance with the EMPr will constitute non-compliance with said Conditions.

The Contractor (as well as sub-contractors, service providers and suppliers) is deemed not to have complied with the Environmental Specification/ EMPr if:

- There is evidence of contravention of clauses within the boundaries of the site, site extensions, construction camps and/ or haul/ access roads;
- Environmental damage ensues due to negligence;
- The Contractor ignores or fails to comply with corrective or other instructions issued by the Developer, ECO or Engineer, within a specified time; or
- The Contractor (as well as sub-contractors, service providers and suppliers) fails to respond to complaints from the public.

Non-Compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance. Non-compliance with the conditions of the EMPr constitutes a breach of contract.

12.1 Penalties

Application of a penalty clause will apply for incidents of non-compliance. The Contractor (as well as sub-contractors, service providers and suppliers) must be allowed one non-compliance and a Written Warning Notification must be issued to the Contractor's Environmental Officer. Failure to rectify the non-compliance within one (1) working week of the issue of the warning or a repeat non-compliance will result in a penalty.

The penalty must be issued by a representative of the Developer. The penalty imposed must be per incident at the discretion of the Developer's Project Manager or any other duly authorised representative. The value of the penalty imposed shall be as defined in the contract and enforcement shall be at the discretion of the Developer. Such fines must be issued in addition to any remedial costs incurred as a result of non-compliance with the EMPr. The Developer will inform the Contractor of the contravention and the amount of the penalty and will deduct the amount from monies due under the Contract. The penalty monies must become the property of the Developer to be used for rehabilitation and maintenance of the site.

Unless stated otherwise in the project specification the penalties imposed per incident or violation must be:

Table 15: Penalties applicable

OFFENCE	AMOUNT
Failure to respond to complaints within specified timeframe	R10,000
Failure to close findings raised by the ECO within specified timeframes	R10,000
Failure to demarcate working areas	R10,000
Working outside of demarcated areas	R30,000
Failure to strip topsoil with intact vegetation	R50,000
Failure to stockpile topsoil correctly	R30,000
Failure to stockpile materials in designated areas	R10,000
Failure to take measures to prevent soil contamination	R10,000
Failure to take measures to control dust dispersion on-site and on access roads leading to site	R10,000
Pollution of water bodies and/ or groundwater	R20,000
Failure to implement stormwater management provisions during construction	R20,000
Failure to implement/ maintain erosion controls	R30,000
Failure to provide adequate sanitation	R10,000
Failure to provide adequate waste disposal facilities and services	R50,000
Failure to reinstate disturbed areas within the specified time-frame	R30,000
Any other contravention of the project specific specification	R10,000

12.2 Removal from Site and Suspension of Works

Failure to remediate after the issue of a financial penalty, depending on the severity and significance of the impact related to non-compliance, the ECO may undertake to report directly to the DEFF (Compliance) recommending that for:

- High impact: to issue a notice to cease construction;
- Medium impact: to issue a notice instructing the Developer to implement recommended remedial action;
or
- Low impact: ECO to notify, but up to discretion of DEFF to apply sanction.

The Developer, at the direction of the ECO, or of his own conviction, has the power to remove from site any person who is in contravention of the EMP, and if necessary, the Developer can suspend part or the whole of the works, as required.



With its headquarters in Amersfoort, The Netherlands, Royal HaskoningDHV is an independent, international project management, engineering and consultancy service provider. Ranking globally in the top 10 of independently owned, non-listed companies and top 40 overall, the Company's 6,500 staff provide services across the world from more than 100 offices in over 35 countries.

Our connections

Innovation is a collaborative process, which is why Royal HaskoningDHV works in association with Developers, project partners, universities, government agencies, NGOs and many other organisations to develop and introduce new ways of living and working to enhance society together, now and in the future.

Memberships

Royal HaskoningDHV is a member of the recognised engineering and environmental bodies in those countries where it has a permanent office base.

All Royal HaskoningDHV consultants, architects and engineers are members of their individual branch organisations in their various countries.

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Regional Office Locations

ANNEXURE A: EAP CVs



Curriculum Vitae

Prashika Reddy

Road and Rail

Senior Environmental Scientist

E: prashika.reddy@rhdhv.com

T: 0873521577

M: 0832848687

Prashika started her career in the environmental field after spending 5 years' working for the Department of Agriculture: Genetic Resources Directorate. She is a Senior Environmental Scientist in the Environmental Management and Planning Unit within the Road and Rail Advisory Group. In 2010, she obtained her professional registration as a Natural Scientist in the field of Environmental Science. She is a registered Environmental Assessment Practitioner with EAPASA.

Prashika has built up an impressive résumé, having worked on diverse projects mainly in the petrochemical industry, as well as various large-scale power generation projects. She has established good working relationships with key clients and has undertaken several flagship projects on their behalf, such as Sasol and Eskom's Underground Coal Gasification project.

Years of experience

18

Years with Royal HaskoningDHV

13

Professional memberships

SA Council for Natural Scientific Professions, Pr Sci Nat, 400133/10

EAPASA, Registered EAP, 2019/917

Professional experience

Environmental Impact Assessment (EIA), Waste Management Licence and Integrated Water Use Licence for the Underground Coal Gasification (UCG) Project and associated infrastructure in support of co-firing of gas at the Majuba Power Station, Mpumalanga, South Africa, South Africa

Start Date: 2008 - 2015

Client Name: Eskom Holdings SOC Ltd

Project Value: R 5,900,000

Eskom Holdings (SOC) Ltd appointed Royal HaskoningDHV to undertake the integrated environmental authorisation process, as well as the integrated Water Use Licence, for the UCG pilot project and associated infrastructure in support of co-firing of gas at the Majuba Power Station. UCG is a process whereby coal is converted in situ into combustible gas that can be used for power generation and is one of the new clean coal technologies being developed for implementation by Eskom that intends to diversify Eskom's fuel supply.

Position: Project Manager

Assigned Tasks: Project management, client liaison, compilation of environmental reports, management of the specialist team, authority consultation and co-management of the public participation process

Integrated Environmental Authorisations for the proposed Concentrated Solar Power (CSP) Plants on the farm Sand Draai, Northern Cape Province

Start Date: 2014 - 2016

Client Name: Solafra Energy (Pty) Ltd

Project Value: R 1,500,000

Solafra appointed Royal HaskoningDHV to undertake the integrated environmental authorisation and waste licence processes for two CSP plants (central receiver and parabolic trough) with an electricity generation capacity of between 100 - 150MW to be constructed on the farm Sand Draai, Upington.

Position: Environmental Scientist

Assigned Tasks: Compilation of environmental reports

Environmental Impact Assessment for the Pumped Storage Power Generation Facility in the Steelpoort area, Mpumalanga and Limpopo Provinces

> Start Date: 2005 - 2007

> Client Name: Eskom Holdings SOC Ltd

> Project Value: R 1,300,000

As part of the increased electricity supply plan, Eskom will be constructing a Pumped Storage Scheme (PSS) in the Steelpoort area, Limpopo and Mpumalanga Provinces. It is planned that the scheme will have an installed capacity of approximately 1520MW. The proposed scheme consists of the following components: upper and lower reservoirs; underground power house complex and associated waterways that link the reservoirs; and ancillary works.

Position: Project Manager

Assigned Tasks: Completion of the EIA study and reports (EIA Report and EMP), project management, client liaison, management of the specialist team, authority consultation and co-management of the public participation process

Basic Assessment Study for Eight New PV Developments on the Farm Bokpoort, Groblershoop

Start Date: 2019

Client Name: ACWA Power Africa Holdings (Pty) Ltd

Project Value: R 966,123

Due to the changes in the Integrated Resource Plan published in October 2019, ACWA Power intend replacing the authorised CSP site with 8 new PV plants. The updated layout has been revised to incorporate the 8 new PV plants of 200MW each, covering a total of 1200ha (i.e. 150ha for each plant) on Remaining Extent of the Farm Bokpoort 390.

Position: Environmental Scientist and Project Manager

Assigned Tasks: Compilation of environmental reports and project management

Environmental Impact Assessment (EIA), Waste Management Licence and Integrated Water Use Licence for the Matimba Power Station Ash Disposal Facility, South Africa

Start Date: 2012 - 2016

Client Name: Eskom Holdings SOC Ltd

Project Value: R 5,800,000

Approximately 4.8 million tons of ash is produced annually from the Matimba Power Station. This ash is currently being disposed by means of 'dry ashing' ~3km south of the power station. The proposed ash disposal facility will ensure that the power station is able to accommodate the 'ashing' requirements for the remaining life (approximately 44 years) of the Power Station.

Position: Environmental Scientist, Project Manager

Assigned Tasks: Compilation of environmental reports (EIA Report and EMP), project management, management of the public participation process and specialist team

Charlie 1 Landfill Stormwater Management & Optimisation Project, Sasol Secunda, South Africa

Start Date: 2015 - 2016

Client Name: Sasol Chemical Industries (Pty) Ltd

Project Value: R 735,000

The Sasol Synfuels, Secunda, Charlie 1 landfill site was authorised in 1993 as a Class II Site, in terms of the Environmental Conservation Act (ECA) (Act No. 73 of 1989). Recent legislation changes such as the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) and the new Waste Classification and Management Regulations, August 2013 (GN 634) have implications for the management of waste disposal sites. The latest audits conducted at Charlie 1 landfill site highlighted that the water management is not in accordance with the permit requirements. Therefore, the Pollution Control Dam (PCD) of approximately 16000m³ will be constructed to ensure compliance with the existing permit requirements. It will be constructed to ensure effective management of leachate and stormwater.

Position: Project Manager

Assigned Tasks: Project management

Scoping Study for the Full-Scale Composting of Sludge Waste Streams, South Africa

Start Date: 2014

Client Name: Sasol Chemical Industries (Pty) Ltd

Project Value: R 850,000

The proposed project involves constructing a full-scale composting site that will be able to handle approximately 200000 - 300000t/a of sludge generated at the Sasol Secunda plant.

Position: Project Manager

Assigned Tasks: Project management, quality review of Environmental Scoping Report and public participation documentation

Waste Management Licence for the BMW Waste Facility, South Africa

Start Date: 2010

Client Name: BMW SA (Pty) Ltd

Project Value: R 168,797

Position: Project Manager

Assigned Tasks: Project management, client management, authority consultation, report compilations and internal review of work

EIA and Water Use Authorisation for the Removal, Re-Instatement and Re-Positioning of Two High-Voltage Powerlines routed through the Devon Valley Landfill, Stellenbosch

Start Date: 2019

Client Name: Stellenbosch Municipality

Project Value: R 820,000

The Stellenbosch Municipality owns and operates the Stellenbosch Landfill situated off Devon Valley Road. The landfill comprises completed cells (cell 1 and 2) as well as an operating cell (cell 3). Cell 3 is separated from cells 1 and 2 by an area on the landfill property footprint that is used for access roads, entrance area and weighbridge, green waste chipping and rubble crushing and stockpiling activities. This area is also transversed by two high voltage Eskom powerlines. The presence of these powerlines prevents the Municipality from engineering and operating the area between completed cells 1 and 2 and operating cell 3 as waste disposal cells.

Position: Project Manager and Environmental Scientist

Assigned Tasks: Project management, compilation of environmental reports, management of specialist team

Site Clearance: Planning and Design for Maintenance and/or Upgrade of the Patrol Roads and Fencing on the Borders between RSA, Swaziland and Mozambique

Start Date: 2016

Client Name: Department of Public Works

Project Value: R 2,598,000

Undertake the Basic Assessment study, mining permitting as well as Water Use Licencing application processes associated with the border patrol road and fence.

Position: Project Manager

Assigned Tasks: Project management

Basic Assessment and Water Use Licence for the rehabilitation of the existing P236 gravel road from km6.235 to km14.0 in Ubombo, KwaZulu-Natal

Start Date: 2016

Client Name: KwaZulu-Natal Department of Transport

Project Value: R 546,186

This project is a rehabilitation of a portion of the existing P236 road from km6.235 to km14.0, where the surfaced width will be increased by 2.5m and where there are climbing lanes; the surfaced width will increase by 5.6m. In areas where there will be horizontal curve widening, the width will be increased by 4.5m. Furthermore, existing culverts will be lengthened where required to accommodate the increase in the road bed width. A culvert at a stream crossing, is also planned to be replaced at km6.240 of the P236.

Position: Strategic Environmental Advisor

Assigned Tasks: Quality review of environmental reports and public participation documentation

Basic Assessment and Water Use Licence for the proposed bridge crossing over the uMfolozi River linking the Esiyembeni and Novunula areas within the Mtubatuba Local Municipality, KwaZulu-Natal

Start Date: 2016

Client Name: KwaZulu-Natal Department of Transport

Project Value: R 522,225

The KwaZulu-Natal Department of Transport (KZN DoT) is planning to construct a bridge over the uMfolozi River and associated link road that will serve to link the Esiyembeni and Novunula local communities situated on either side of the uMfolozi River which is currently impassable save for the existing N2 bridge crossing to the east near Mtubatuba.

Position: Strategic Environmental Advisor

Assigned Tasks: Quality review of environmental reports and public participation documentation

Basic Assessment for the construction of two 7km long 88kV Power Lines Grootpan / Brakfontein, South Africa

Start Date: 2015

Client Name: Eskom Holdings SOC Ltd

Project Value: R 458,021

The proposed project involves the construction of two (2) 7km 88kV power lines and dismantling of two (2) 88kV power lines from Grootpan to Brakfontein, south of Ogies in Mpumalanga.

Position: Project Principal

Assigned Tasks: Quality review and overall project management

Proposed Tinley Southbanks Beach Enhancement Project in the KwaDukuza Municipality, KwaZulu-Natal

Start Date: 2016

Client Name: Tongaat Hulett Developments (Pty) Ltd

Project Value: R 925,270

The Tinley Manor Southbanks development provides for the coastal resort, however, it does not provide for what is critical for the success of the resort and that is a safe swimming beach in close proximity to the resort. The lack of a safe swimming beach with public amenities adjacent the development was identified as a major constraint. This EIA is therefore targeted at dealing with this constraint and to enable the provision of a new beach resort that has all the requirements to be able to attract international investment, including specifically a safe, swimming beach.

Position: Strategic Environmental Advisor

Assigned Tasks: Provide strategic advice on project, review of environmental reports

Environmental Impact Assessment for the Cornubia Phase 2 Development, KwaZulu-Natal, South Africa

Start Date: 2012

Client Name: Tongaat Hulett Developments (Pty) Ltd

Project Value: R 989,660

Conduct a full Environmental Impact Assessment (EIA) for the proposed Cornubia Mixed Use Phased development - Phase 2 in Mount Edgecombe, KwaZulu-Natal.

Position: Strategic Environmental Advisor

Assigned Tasks: Provide strategic advice on project, review of environmental reports

Cornubia Retail Park - EIA, South Africa

Start Date: 2012

Client Name: Tongaat Hulett Developments (Pty) Ltd

Project Value: R 370,120

Undertaking the EIA, Public Participation Process (PPP), attending client progress meetings and providing environmental input into the planning of the proposed Phase 2 Retail Development.

Position: Strategic Environmental Advisor

Assigned Tasks: Environmental Scientist. Strategic project advice, quality review and approval of reports

Centurion Metropolitan Core Masterplan: Stormwater and Flooding, South Africa

Start Date: 2012

Client Name: City of Tshwane Metropolitan Municipality

Project Value: R 4,300,000

The City of Tshwane requires a multi-disciplinary project team to assist the Client with the Preparation of a Master Plan of the Centurion Metropolitan Core Study Area.

Position: Environmental Scientist

Assigned Tasks: Environmental Screening Investigation

Environmental Screening for the Commercial 125MW CSP, South Africa

Start Date: 2012

Client Name: Sasol Technology (Pty) Ltd

Project Value: R 185,000

Environmental Screening Investigation for the proposed 125MW commercial concentrated Solar Power Plant located in Uppington.

Position: Project Principal

Assigned Tasks: Project Management, financial management, review of Environmental Screening Report

Route Determination and Environmental Screening Investigation of 14 K-routes, South Africa

Start Date: 2016-2019

Client Name: Gauteng Department of Roads and Transport

Project Value: R 5.6 Million

Route determination and ESI for routes K

Position: Environmental Scientist

Assigned Tasks: Environmental Screening Investigation and compilation of the ESI Report

City of Tshwane: Waste Transfer Facilities, South Africa

Start Date: 2014

Client Name: City of Tshwane Metropolitan Municipality

Project Value: R 150,000

Report on environmental and sustainability considerations in Waste to Energy (WtE) Plants when they are co-fired with Municipal Solid Waste. Concept designs and environmental screening of various waste transfer stations. Situational assessment of other closed landfill facilities.

Position: Environmental Scientist

Assigned Tasks: Advise the client on Environmental authorisation requirements

Basic Assessment for the Sasol C3 Expansion Project, Sasol Industrial Complex, South Africa

Start Date: 2013

Client Name: Sasol Polymers

Project Value: R 267,614

The C3 expansion project was initiated to address an estimated 105ktpa additional propylene that will be available in 2014 as a result of various optimisation projects on the upstream Sasol Synfuels facilities. An opportunity was identified for the additional propylene to be utilised as feed for the polypropylene (PP) plants, namely PP1 and PP2. The C3 expansion project involves upgrading and implementing changes to the existing PP1 and PP2 process equipment to accommodate the increase in throughput.

Position: Project Principal

Assigned Tasks: Strategic project advice, quality review and approval of reports

BA for the Sasol Iso-Octanol Long Term Phase II Project, Sasol Industrial Complex, South Africa

Start Date: 2012

Client Name: Sasol Technology (Pty) Ltd

Project Value: R 261,184

The Iso-octanol long-term phase 2 project involves a process whereby aldehydes are converted in the existing Iso-alcohol stream (in Octene Train III) by hydrogenation to its corresponding alcohols to achieve the desired product specification for the Iso-octanol product. A new reactor and a new distillation column with its associated equipment will be installed for this purpose. The expected Iso-octanol production will range between 7 and 9kt/annum. In addition, a storage tank with a capacity of approximately 400m³ and a loading pump will be installed to enable storage and loading of the final Iso-octanol product.

Position: Project Principal

Assigned Tasks: Strategic project advice, quality review and approval of reports

Environmental Impact Assessment for the C3 Stabilisation Project situated on the Sasol Secunda Site, South Africa

Start Date: 2010

Client Name: Sasol Technology (Pty) Ltd

Project Value: R 447,172.00

Environmental Impact Assessment for the C3 Stabilisation Project situated on the Sasol Secunda Site

Position: Project Manager

Assigned Tasks: Project Management, review and compilation of EIA documentation, management of public process, liaise with client and authorities

Environmental Impact Assessment for the proposed Biogas to Power Plant Project at Sasol Synfuels, South Africa

Start Date: 2009

Client Name: Sasol Technology (Pty) Ltd

Project Value: R 167,865

Basic assessment study for the Biogas to power plant project.

Position: Project Manager

Assigned Tasks: Project management, compilation of environmental reports

Environmental Impact Assessment for the proposed Sasol Bioworks upgrade, South Africa

Start Date: 2008

Client Name: Sasol Technology (Pty) Ltd

Project Value: R306,101 Sasol One Bioworks Expansion

Position: Project Manager

Assigned Tasks: Overall Project Management and quality control

EIA or the Amendment of Mining Right for the UCG Pilot Plant, South Africa

Start Date: 2008

Client Name: Sasol Technology (Pty) Ltd

Project Value: R 404,000

Environmental Impact Assessment and Mining Authorisation for the Underground Coal Gasification Pilot Project located in Secunda Mpumalanga Province.

Position: Project Manager

Assigned Tasks: Overall Project Management and quality control

Department of Public Works: ECO Work in Pretoria, South Africa

Start Date: 2010 - 2017

Client Name: Department of Public Works

Project Value: R 2,100,000

Environmental Control Officer and Occupational Health and Safety for the demolition activities associated with the HG de Witt Building in Pretoria.

Position: Project Manager

Assigned Tasks: Project Management and Environmental Control Officer (ECO) work

AEL OEMPr Compilation

Start Date: 2019

Client Name: AEL Africa

Project Value: R 100,000

Position: Senior Environmental Scientist

Assigned Tasks: Compilation of OEMPr for the ISAP and Nitrate Plant

Environmental Status Quo for the Scottsville Local Area Plan

Start Date: 2018

Client Name: Msunduzi Municipality

Project Value: R 2.5 million

Position: Environmental Scientist

Assigned Tasks: Compilation of Environmental Status Quo chapter

White Mfolozi Bridge & Link Road, South Africa

Start Date: 2016

Client Name: Kwa-Zulu Natal Department of Transport

Project Value: R 0.8 million

Position: EAP

Assigned Tasks: Compilation of the Basic Assessment Report and EMPr in support of the necessary Environmental Authorisations and permits

Sundumbili Wastewater Treatment Works, South Africa

Start Date: 2015

Client Name: Ilembe Municipality

Project Value: R2 000 000

Position: EAP

Assigned Tasks: Environmental Screening and Environmental Impact Assessment

Rustenburg Integrated Rapid Public Transport Network (IRPTN), South Africa

Start Date: 2009

Client Name: Rustenburg Local Municipality

Project Value: R 3,000,000,000

Planning, design and implementation of the Rustenburg Rapid Transport project in Rustenburg.

The final system, which will consist of several phases, will comprise of approximately 900 busses, 600 kilometres (km), 50 bus routes, 35 km segregated bus lanes, 30 stations, 3 depots, 1 transport management centre, and zero compromise in public transport service quality. Royal HaskoningDHV are the project managers in charge of the Design and Construction, as well as the designers for the Intelligent Transportation Systems and Urban Traffic Control.

Position: Environmental Scientist

Assigned Tasks: Environmental Screening Investigation and Ad Hoc environmental advice

Previous Experience

2010 - 2012

SSI Engineers and Environmental Consultants (Pty) Ltd
Associate

2008 – 2010

SSI Engineers and Environmental Consultants (Pty) Ltd
formerly known as Bohlweki Environmental (Pty) Ltd
Senior Environmental Consultant

2006 – 2008

Bohlweki Environmental (Pty) Ltd
Junior Environmental Consultant

2001 – 2006

Department of Agriculture
Senior Plant and Quality Control Officer

Curriculum Vitae

Seshni Govender

Roads and Rail

Environmental Consultant



E: seshni.govender@rhdhv.com

Seshni is a Environmental Consultant working on strategic environmental planning and water related projects. Seshni has been involved in numerous Water Use Licence projects, including complex integrated licencing that requires understanding cumulative environmental impacts. She also has been involved in the development of the Gauteng Environment Outlook, the N11-13X Mokpane Ring Road Environmental Authorisation Processes and Open Space plans for the City of Joburg.

Seshni has drafted applications for complex integrated licences that include components of National Environmental Management Act and National Water Act on behalf of Eskom and private companies. This has exposed me to complex matters of trying to integrate environmental impacts with mitigations measures that will be in line with the sustainable development principles.

As an Environmental Scientist Seshni contributes to projects through; report writing, data management and analysis, environmental impact analysis, policy review and public engagement/consultation.

Degree

BSc Environmental Science (Hons)

Nationality

South African

Years of experience

8

Years with Royal HaskoningDHV

8

Professional experience

Basic Assessment and Environmental Management Programme for the Borrow Pit 5.5L associated with the N11 Section 13X (N11-13X), Mokopane Ring Road, Mogalakwena Local Municipality, Limpopo province

- > South African National Roads Agency Ltd
- > Limpopo Province, 2019

The South African National Roads Agency Ltd (SANRAL) has commissioned the Detail Design and the Construction Monitoring of the N11-13X Mokopane Ring Road to divert the heavy vehicle traffic that travels to and from the mines on the western side of Mokopane and to Botswana, from the already congested existing N11 section which passes through the existing villages and the Mahwelereng Township.

The N11-13X Mokopane Ring Road is a “greenfields” project where a new road will be constructed. The class of the new road will be Class 1. The new road to be constructed will typically have an overall width of 13.4 m where the initial carriageway will comprise a minimum 2.5 m outer shoulder, 2 x 3.7 m lanes, and 2.5 m inner shoulder. In general, the road reserve varies between 71 – 75 m but there are wider sections where there is a deep cutting or because of allowance for future interchanges.

A limited amount of gravel (G5 – G7 quality) will be available from cut widenings within the road reserve. The remainder of the gravel required for the proposed road construction (gravel layer works) will need to be sourced from borrow pits.

Application for Postponement of Compliance Timeframes to achieve New Plant Standards at ArcelorMittal South Africa, Vanderbijlpark Works, Emfuleni Local Municipality

- > ArcelorMittal South Africa
- > Gauteng Province, 2019

In response to Section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No.39 of 2004) (as amended in 2018), ArcelorMittal applied for a postponement of the compliance timeframes to achieve the new plant minimum emission standards, as well as alternative emission standards for certain plants at the Vanderbijlpark Works (AMSAVW), Emfuleni Local Municipality, Gauteng.

Application for an Alternative Plant Standard and Suspension Application for activities associated with the ArcelorMittal Pretoria Works, City of Tshwane, Gauteng.

- > ArcelorMittal South Africa
- > Gauteng Province, 2019

In response to Section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (as amended in 2018), ArcelorMittal intends to apply for an alternative plant standard and submit a suspension application of the compliance timeframes to achieve the new plant minimum emission standards for the Pretoria Works, City of Tshwane, Gauteng.

Water Use Licence for the Proposed Deviation of the 88kV Firham-Platrand Powerline near Standerton, Mpumalanga Province

- > Eskom Holdings SOC Limited
- > Mpumalanga Province, 2018

Eskom Holdings Limited, a State-Owned Company (SoC) proposed a deviation of a portion of the existing 88kV Firham-Platrand Powerline from pole 157 to pole 180 within a servitude of 31m and a length of approximately 2km. The purpose of the deviation is to avoid a wetland in which these poles are currently located which poses a network stability risk as it is located within a wetland area.

Firham Platrand is an interconnector between Standerton and Volksrust for network stability, the line supplies Transnet Traction Stations, should the line fail, the trains in the nearby tractions will not be able to move.

Water Use Licence Application for the Proposed Site Clearance for Planning and Design of a Border Barrier, Patrol Roads and Fencing between the Republic of South Africa (RSA), Swaziland and Mozambique, Phase 1 (KM 0.0 0 KM 54.0)

- > The National Department of Public Works (DPW) and KwaZulu-Natal Department of Transport (KZN DoT)
- > KwaZulu-Natal Province, 2018

Proposed the upgrade of existing border control infrastructure, and development of new border control infrastructure along a portion of the South Africa (KwaZulu-Natal) - Mozambique Border in the north-eastern part of the KwaZulu-Natal (KZN) Province. This application is termed the ‘Phase 1’ application and forms a component of a wider project being undertaken by the DPW for the upgrading of border control infrastructure along the South Africa - Swaziland border and the southern part of the South Africa - Mozambique border (the Phase 2 Project). The Phase 1

alignment is comprised of the section of the international border with Mozambique from the high-water mark of the Indian Ocean (KM0.0) to the eastern boundary of the Ndumo Game Reserve (KM54.0).

Environmental Screening Investigation: Route Determination for the K178 between the Gauteng Provincial Border and PWV1, Gauteng Province

- > Gauteng Department of Roads and Transport (GDRT)
- > Gauteng, 2018

The purpose of the Gauteng Strategic Road Network (GSRN) conceived by the Gauteng Department of Roads and Transport (GDRT) some 40 years ago was to plan a robust road system, with the objective of preserving transportation corridors and serving as a guideline for the rapid development and urbanisation of Gauteng.

The route for the K178 is the section between the Gauteng Provincial Border (in the east) and the future PWV1 (in the west) with an approximate length of 18.8km. The alignment generally follows the previous planned GDRT route along the alignment of the existing R54.

In the context of integrated environmental management, screening determines whether a development proposal requires environmental assessment, and if so, what level of assessment is appropriate. Screening is thus a decision-making process that is initiated during the early stages of the development of a project.

The main purpose of the ESI was to determine at this stage of the road design whether there are aspects of the development proposal that have the potential to give rise to significant or unacceptable environmental consequences i.e. fatal flaws.

Water Use Licence Application for the Proposed Site Clearance for Planning and Design of a Border Barrier, Patrol Roads and Fencing between the Republic of South Africa (RSA), Swaziland and Mozambique, Phase 2 (KM 54.0 0 KM 524.0)

- > The National Department of Public Works (DPW)
- > KwaZulu-Natal and Mpumalanga Provinces, 2018

The National Department of Public Works (DPW) as the applicant, (in conjunction with the KwaZulu-Natal Department of Transport (KZN DoT) as an implementing agent) is proposing the upgrade of existing border control infrastructure, and development of new border control infrastructure along a portion of the South Africa–

Mozambique-Swaziland Border in KwaZulu-Natal and Mpumalanga. This application was termed the 'Phase 2' application and forms a component of a wider project being undertaken by the DPW for the upgrading of border control infrastructure along the South Africa - Swaziland border and the southern part of the South Africa - Mozambique border. The Phase 1 alignment is comprised of the section of the international border with Mozambique from the high-water mark of the Indian Ocean (KM0.0) to the eastern boundary of the Ndumo Game Reserve (KM54.0), whilst this Application (Phase 2) is from KM54.0 to KM524.0.

The project is being undertaken by the DPW in conjunction with the Department of Agriculture Forestry and Fisheries (DAFF) and the South African National Defence Force (SANDF), and Ezemvelo KZN Wildlife (EKZNW) and the iSimangaliso Wetland Park Authority (IWPA) as partner organs of state. The KZN DoT is an implementing agent for one of the infrastructure components (the border barrier structure).

The aim of the project is to stop the illegal trafficking of stolen vehicles and contraband across this section of the international border, as well as to prevent the illegal movement of people as well as livestock that could transmit disease. South Africa has approximately 4 800 km of land border and 2 800 km of coastline border which is required to be secured. South Africa is greatly affected and financial impacted by illegal imports, smuggling and other similar illegal activities which transpire over borders. In order to effectively respond to the range of security and control challenges that are being experienced by responsible organs of the State, it is important to assess the situation and to be able to incorporate a viable solution.

Basic Assessment for the Proposed Construction of a Bridge over the Rooisloot River, Various Culverts and Borrow Pits Associated With the National Route N11 Section 13x (N11-13x) (Mokopane Ring Road) in the Mokopane Area

- > South African National Roads Agency Ltd
- > Limpopo Province, 2018

The South African National Roads Agency Ltd (SANRAL) has commissioned the Detail Design and the Construction Monitoring of the N11-13X Mokopane Ring Road. An Environmental Impact Assessment (EIA) study was previously conducted for the proposed re-routing of the N11-13X road. The Environmental Authorisation and subsequent approval of the Environmental Management Plan (EMP) was obtained in 2009. The subject of this Basic Assessment Process was therefore to address the infilling activities within the watercourses which pertain to the Rooisloot Bridge and the associated culverts. There were 5 Borrow Pits associated with this project that were also subject to Basic Assessment Processes.

NW Environment Outlook, South Africa

- > North West Department of Rural, Environment and Agricultural Development
- > Mahikeng, 2018

Compilation of the water chapter as part of the publication of the North West Environment Outlook

Water Use Licence Application for the Proposed Upgrade of Dango Bridge (B1372) and Bedlane Bridge (B1336) situated along P393 (R34) Road Between Nkwalini Pass (Km0,0) and Empangeni (Km24,0)

- > KwaZulu-Natal Department of Transport
- > Empangeni, KwaZulu-Natal, 2017

The KwaZulu-Natal Department of Transport (DoT) proposed to improve the Provincial road P393 (R34) from P47-4 at Nkwalini Pass (km 0.0) to P230 at Empangeni (km 24.0) within the King Cetshwayo District Municipality in KwaZulu-Natal Province. The project starts at the intersection of P47-4 (R66) with P393 (R34) at Nkwalini Pass (km 0.0) and ends at P230 (km 24.0) towards Empangeni. The Bedlane river bridge (B1334) is situated at km 2.6 from Nkwalini Pass and the Dango river bridge (B1372) is situated at km 3.9 from Nkwalini Pass. The existing P393 road is 8.8m wide and the proposed road geometry for the rehabilitation is 10.0m wide including shoulders.

Integrated Water Use Licence Application for the Rehabilitation of the Existing P236 and Culvert from km 6.235 to km 14.0

- > KwaZulu-Natal Department of Transport
- > Ubombo,, KwaZulu-Natal, 2017

The P236 is located north of Mkhuze and starts at km 0.0 at the intersection with P2-9 and ends at km 32.0, intersecting P449. The application, however, was only for the rehabilitation of km 6.235 to km 14.0 of the P236 as well as the replacement of a culvert at Km 6.240.

Water Use Licence Application for the Proposed Culvert Rehabilitation along Provincial Road P230 from Km37.0 to Km47.0

- > KwaZulu-Natal Department of Transport
- > Umhlathuze Local Municipality, KwaZulu-Natal, 2017

This project formed part of the Empangeni Road Rehabilitation Programme and covers the rehabilitation of the provincial road P230 between km 37,0 and km 47,0 within the uMhlathuze Local Municipality which forms part of the King Cetshwayo District Municipality (DC28), KwaZulu-Natal. Provincial Road P230 from the intersection with P393 at km 37,0 to km 47,0 near Empangeni is defined as an undivided two lane road, and has been classified as a Class R1 Rural Arterial Road (in terms of the TRH26). The P230 forms part of the R34 long distance heavy haul freight route, which connects the harbour of Richards Bay and the surrounding industrial and commercial areas, with inland provinces.

Integrated Water Use Licence Application for the Canelands Extension Development, KwaZulu-Natal

> Tongaat Hulett Developments

> Kwadukuza Municipality, KwaZulu-Natal, 2017

Tongaat Hulett Development wishes to develop the site for industrial purposes. The site lies adjacent to the existing Canelands Industrial estate. Potential land uses may include general / industrial, logistics, warehousing and distribution. These land uses will complement those of the existing Canelands Industrial Estate, and will ensure that this land parcel reads as an extension to the existing development. It is proposed, due to the proximity of the floodplain and numerous other constraints located on-site, that a single platform covering an area of approximately 1.67 hectares (1.67 ha) is created. Both a servicing and traffic report has been completed, which details how this development will be accommodated by the existing bulk infrastructure within the region.

Gauteng Province Environment Outlook Report

> Gauteng Department of Agriculture and Rural Development

> Gauteng, 2017

State of the Environment Report (SoER) is a report card on the condition or quality of the environment. It provides information on how we affect the environment, how the environment affects us, and how this condition has changed over time. Environmental conditions are analysed through the use of environmental indicators which are proxies of environmental status, and which can be monitored over time and space. Reporting on the State of Environment (SoE) is therefore an important tool in identifying, assessing and setting priorities for environmental issues, as well as in determining whether environmental policies and actions are effective. Furthermore, the 'environment outlook' component attempts to describe or predict how environmental challenges will evolve in the near future, and what needs to be done to achieve a more sustainable state of living for all people in the province. The ultimate value of environmental outlook reporting lies in the degree to which that assessment can be used for adaptive environmental management to address anticipated future environmental conditions and pressures.

North West Environmental Outlook/State of the Environment Trend Analysis

> North West Department of Rural, Environment and Agricultural Development

> Mahikeng, 2017

The *Environmental Trend Analysis Report* focused on the publications of the North West Province State of Environment and Environment Outlook Reports dated 1995, 2002, 2008 and 2013, in an effort to expand this trend reporting to fully cover the period 1995 to 2013. This exercise followed on from the 2013 Environment Outlook Report which reported on environmental trends and made related recommendations to guide the province towards a more sustainable future. As such, the following objectives were achieved:

- The indicators for each chapter were tracked through the reporting period
- Data Gaps Identified
- the value of the indicator set determined

Integrated Open Space for the Greater Khayalami and Ruimsig/Honeydew Sub Regions

> City of Joburg, 2017

Development of two integrated open space plans for the Greater Khayalami and Ruimsig-Honeydew Sub-regions which aim to ensure that ecological goods and services are maintained and enhanced so as to contribute to spatial planning in the City of Johannesburg, and both economic and social development.

Environmental Impact Assessment and Integrated Water Use Licence Application for the Tinley Manor Southbanks Coastal Development, KwaZulu-Natal

> Tongaat Hulett Developments

> Kwadukuza Municipality, KwaZulu-Natal, 2017

Tongaat Hulett Developments proposes to develop the Tinley Manor Southbanks Coastal Development into a mixed-use coastal development including a large residential component. Tinley Manor Southbanks Coastal Development is an approximately 485 ha site, located between the coastal towns of Tinley Manor and Sheffield Beach within the KwaDukuza Municipality, KwaZulu-Natal.

The proposed Tinley Manor Southbanks Coastal Development is set to be the first phase of the development of Tongaat Hulett Developments' land holdings in Tinley Manor, which is situated to the south and north of the Umhlali River.

Integrated Open Space Plan – Greater Khayalami and Ruimsig-Honeydew Sub-Regions, Johannesburg, South Africa

> >Client: City of Johannesburg, 2016

Development of two integrated open space plans for the Greater Khayalami and Ruimsig-Honeydew Sub-regions which aim to ensure that ecological goods and services are maintained and enhanced so as to contribute to spatial planning in the City of Johannesburg, and both economic and social development.

Update of the Dube Tradeport State of the Environment Report

> Dube Tradeport Corporation

> KwaZulu-Natal, 2016

Compilation of the Dube Tradeport State of the Environment Report 2016/2017

Integrated Open Space Plan - Linbro Park & Greater Bassonia, Johannesburg, South Africa

> City of Johannesburg, 2016

Development of two integrated open space plans for the Linbro Park and Greater Bassonia which aim to ensure that ecological goods and services are maintained and enhanced so as to contribute to spatial planning in the City of Johannesburg, and both economic and social development.

Final Consultation Basic Assessment Report for the Dismantling of a portion of the existing double-circuit power line and the construction of two (2) 7 km long 88 kV power lines within a 2 km corridor between the Grootpan and Brakfontein Substations

> >Eskom Holdings SOC Ltd

> Ogies, Mpumalanga, 2015

Eskom Holdings (SoC) Pty Ltd (Eskom Distribution – Mpumalanga Operating Unit) proposes to construct two (2) 7 km 88 kV overhead power lines within a 2 km corridor between Grootpan and Brakfontein Substations near Ogies. The existing power lines are located on GlencoreXstrata mining property. The mine has requested that Eskom relocate the lines as they are within the operational footprint of the mine. The project also involves the dismantling of a portion of the existing 88 kV double-circuit power line approximately 5.2 km in length. The new power lines will ensure continuity of supply and access to electricity for the surrounding communities.

Conduct Pre-Feasibility (FEL-2) Waterberg Heavy Haul Line, South Africa

> Transnet SOC Ltd

> Waterberg, 2015

High-level environmental screening investigation for the proposed +/- 600km rail corridor running from Lephalale to Ermelo as part of the national Strategic Infrastructure Project (SIP) suite.

Tembisa Hub Plan, South Africa

> >Intersite Property Management Services

> Ekurhuleni Metropolitan Municipality, 2015

Preparation of a Precinct plan for the Tembisa Urban Hub in Ekurhuleni.

Review and Update of the City of Windhoek's Environmental Policy

> Consulting Services Africa (CSA)

> Windhoek, Namibia, 2014

Review the existing City of Windhoek Environmental Management Policy, 2004 and revise and improve the existing policy so that it may be approved, launched, and implemented by the Windhoek City Council.

Green existing by-laws and develop a set of new environmental by-laws or amend the existing by-laws,

> Ekurhuleni Metropolitan Municipality

> Ekurhuleni, South Africa 2014

Review the existing Ekurhuleni by-laws by introducing environmental considerations and develop a set of new environmental by-laws if required.

Route Determination and EIA for K86, K118, K181 K208, K217 and K219,

> Gauteng Department of Roads and Transport

> Gauteng Province, 2014

Route Determination and Environmental Scan of K-routes in the Gauteng Province.

Dube Tradeport State of the Environment Report

> Dube Tradeport Corporation

> KwaZulu-Natal, 2014

Compilation of the Dube Tradeport State of the Environment Report 2013/2014

State of Environment Report (SOER) for City of Johannesburg, South Africa

- > >South African Cities Network
- > City of Joburg, 2014

Compilation of the State of the Environment Report for the City of Johannesburg 2014

Position: Environmentalist

Cornubia Human Settlement - Integrated Water Use Licence Application, South Africa

- > Tongaat Hulett Developments (Pty) Ltd
- > Cornubia, KwaZulu-Natal, 2013

Water Use Licence Application for the Cornubia Industrial and Business Estate, Phase 1-Retail Park, Cornubia Phase and Cornubia Bridge

NW Environment Outlook, South Africa

- > North West Department of Economic Development, Environment, Conservation and Tourism
- > Mahikeng, 2013

Compilation and Publication of the North West Provincial

Qualifications

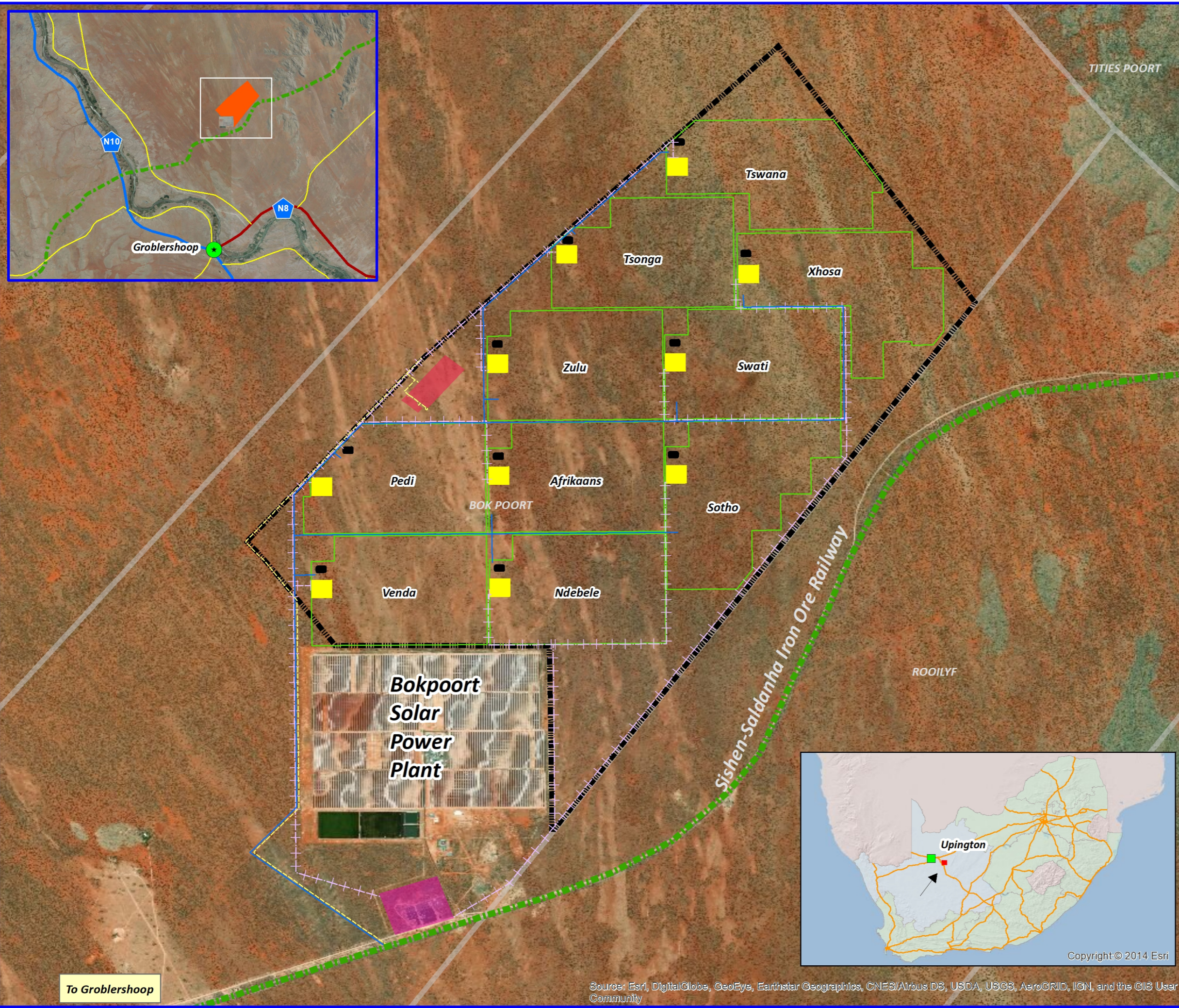
2010 BSc (Hons) Environmental Science, University of KwaZulu Natal, South Africa

2009 BSc Environmental Science, University of KwaZulu Natal, South Africa

ANNEXURE B: MAPS

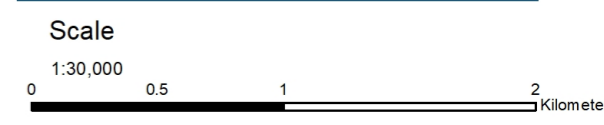
BASIC ASSESSMENT FOR THE PROPOSED TEN PV DEVELOPMENTS AT THE BOKPOORT FARM NEAR GROBLERSHOOP NORTHERN CAPE PROVINCE

Locality



Legend

- Project Boundary
- Proposed PV Plants
- Proposed Substations
- Proposed Battery Sites
- Shared Infrastructure
- Water Pipeline (authorised)
- Access Road (authorised)
- Proposed Overhead Power Lines
- Eskom Garona Substation
- Cadastral Boundaries
- Railways



Date: 17 January 2020
Created by: Paul da Cruz
RHDHV Ref: MD4195

Coordinate System: Custom
Datum: WGS 1984
Units: Degree

Data Sources:
ESRI
MDB
DTI

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To Groblershoop

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



















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BASIC ASSESSMENT FOR THE PROPOSED TEN NEW PV DEVELOPMENTS AT THE BOKPOORT FARM NEAR GROBLERSHOOP NORTHERN CAPE PROVINCE

BASIC ASSESSMENT

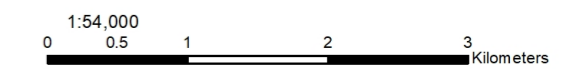
Environmental Sensitivity

Legend

-  Project Boundary
-  Proposed PV Plants
-  Proposed Substations
-  Proposed Battery Sites
-  Shared Infrastructure
-  Water Pipeline (authorised)
-  Access Road (authorised)
-  Proposed Overhead Power Lines
-  Eskom Garona Substation
-  Railways
-  Water Point
- Receptor Type**
-  Farmstead
-  High Bat Sensitivity Area
-  Martial Eagle Nest
-  Martial Eagle Nest 1.5km Buffer
- Sensitivity Zoning**
- Class**
-  Acceptable
-  Not Preferred
-  Preferred Area



Scale

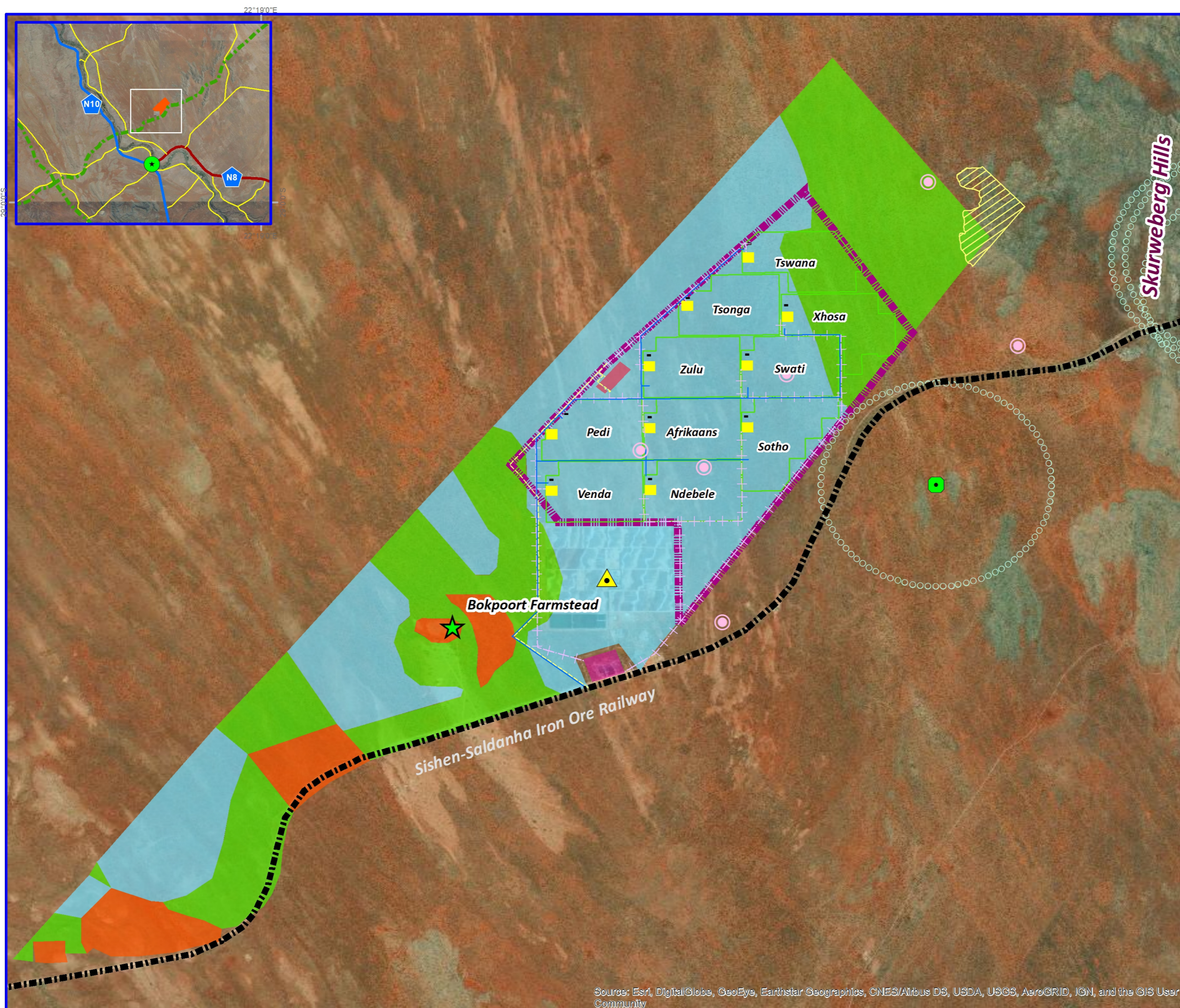


Date: 18 May 2020
 Created by: Paul da Cruz
 RHDHV Ref: MD4195
 Coordinate System: Custom
 Datum: WGS 1984
 Units: Degree
 Data Sources:
 ESRI
 DTI
 Golder Associates

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 www.rhdhv.co.za



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



ANNEXURE C: CHANCE FIND PROTOCOL

Appendix 1: CHANCE FOSSIL FINDS PROCEDURE: BOKPOORT II SOLAR POWER FACILITY ON THE REMAINING EXTENT OF FARM BOKPOORT 390 NEAR GROBLERSHOOP	
Province & region:	Northern Cape, ZF Mgcawu District Municipality.
Responsible Heritage Management Agency	SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Phone: +27 (0)21 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za
Rock unit(s)	Precambrian Namaqua-Natal basement rocks. Kalahari Group aeolian sands, calcretes, Late Cenozoic alluvium.
Potential fossils	Mammalian bones, teeth and horn cores, freshwater molluscs, trace fossils in older alluvial deposits, calcrete hardpans.
ECO protocol	1. Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately (<i>N.B.</i> safety first!), safeguard site with security tape / fence / sand bags if necessary.
	2. Record key data while fossil remains are still <i>in situ</i> : <ul style="list-style-type: none"> • Accurate geographic location – describe and mark on site map / 1: 50 000 map / satellite image / aerial photo • Context – describe position of fossils within stratigraphy (rock layering), depth below surface • Photograph fossil(s) <i>in situ</i> with scale, from different angles, including images showing context (e.g. rock layering)
	3. If feasible to leave fossils <i>in situ</i> : <ul style="list-style-type: none"> • Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation • Ensure fossil site remains safeguarded until clearance is given by the Heritage Resources Agency for work to resume
	3. If <i>not</i> feasible to leave fossils <i>in situ</i> (emergency procedure only): <ul style="list-style-type: none"> • <i>Carefully</i> remove fossils, as far as possible still enclosed within the original sedimentary matrix (e.g. entire block of fossiliferous rock) • Photograph fossils against a plain, level background, with scale • Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags • Safeguard fossils together with locality and collection data (including collector and date) in a box in a safe place for examination by a palaeontologist • Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation
	4. If required by Heritage Resources Agency, ensure that a suitably-qualified specialist palaeontologist is appointed as soon as possible by the developer.
5. Implement any further mitigation measures proposed by the palaeontologist and Heritage Resources Agency	
Specialist palaeontologist	Record, describe and judiciously sample fossil remains together with relevant contextual data (stratigraphy / sedimentology / taphonomy). Ensure that fossils are curated in an approved repository (e.g. museum / university / Council for Geoscience collection) together with full collection data. Submit Palaeontological Mitigation report to Heritage Resources Agency. Adhere to best international practice for palaeontological fieldwork and Heritage Resources Agency minimum standards.