

# FINAL BASIC ASSESSMENT REPORT

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State



## APPENDIX G

### Environmental Management Programme (132 kV Overhead Power Line)

- EMPr for the Proposed Development of a 132 kV Overhead Power Line and Associated EGI to the Planned Artemis Main Transmission Station.



## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

# CONTENTS

<b>1</b>	<b>INTRODUCTION</b>	<b>3</b>
1.1	AUTHORS OF THE EMPr	4
1.2	PROJECT DESCRIPTION	5
1.3	ENVIRONMENTAL SENSITIVITIES	12
1.4	IMPACTS IDENTIFIED DURING THE BA PROCESS	14
<b>2</b>	<b>ABOUT THIS EMPR</b>	<b>18</b>
2.1	COMPLIANCE WITH RELEVANT LEGISLATION	18
2.2	STRUCTURE AND CONTENTS OF THE EMPr	20
2.3	HOW TO USE THIS EMPr	20
<b>3</b>	<b>ROLES AND RESPONSIBILITIES</b>	<b>22</b>
<b>4</b>	<b>SITE SPECIFIC INFORMATION</b>	<b>23</b>
4.1	CONTACT DETAILS AND DESCRIPTION OF THE PROJECT	23
<b>5</b>	<b>LAYOUT AND DEVELOPMENT FOOTPRINT SITE MAP</b>	<b>25</b>
<b>6</b>	<b>APPLICANT DECLARATION</b>	<b>25</b>
<b>7</b>	<b>PROJECT SPECIFIC EMPR</b>	<b>26</b>
7.1	SOILS AND AGRICULTURE	26
7.2	VISUAL IMPACTS	26
7.3	HERITAGE IMPACTS (ARCHAEOLOGY, PALAEOLOGY, AND CULTURAL LANDSCAPE)	29
7.4	TERRESTRIAL BIODIVERSITY	34
7.5	AQUATIC BIODIVERSITY	38
7.6	AVIFAUNA IMPACTS	45
7.7	GENERIC MANAGEMENT ACTIONS TO SUPPLEMENT APPENDIX E OF THIS EMPR	49
<b>8</b>	<b>APPENDIX A – CV OF THE EAP &amp; CO-AUTHOR</b>	<b>52</b>
<b>9</b>	<b>APPENDIX B – ROLES AND RESPONSIBILITIES</b>	<b>63</b>
<b>10</b>	<b>APPENDIX C – SITE LAYOUT</b>	<b>67</b>
<b>11</b>	<b>APPENDIX D – COMBINED LAYOUT AND SENSITIVITY MAP</b>	<b>68</b>
<b>12</b>	<b>APPENDIX E – PRE-APPROVED GAZETTED EMPR FOR POWER LINE DEVELOPMENT (GN 435)</b>	<b>69</b>
<b>13</b>	<b>APPENDIX F – CHANCE FOSSIL FINDS PROTOCOL</b>	<b>95</b>
<b>14</b>	<b>APPENDIX G – ALIEN INVASIVE SPECIES CONTROL AND MONITORING PLAN &amp; ALIEN INVASIVE VEGETATION MANAGEMENT PLAN</b>	<b>97</b>

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

# TABLES

Table 1.1: Details of the BA Project Team	5
Table 1.2: BA Reporting Structure and Components	7
Table 1.3: Description of the project components for the proposed 132 kV overhead power line and supporting infrastructure.	9
Table 1.4: Impacts identified in the BA Process	14
Table 4.1: Affected Farm Portions for the Proposed 132 kV Overhead Power Lines	24
Table 4.2: Powerline vertices for the Proposed 132 kV Overhead Power Lines	24

# FIGURES

Figure 1.1: Locality map showing the proposed 132 kV overhead and underground power line routing options alternatives and the two substation complexes for the Volta EGI .	8
Figure 1.2: Photographs of a typical monopole pylon (A) and steel lattice pylon (B) for a 132 kV power line (Source: Eskom, 2017)	11
Appendix C, Map 1: Locality map showing the proposed 132 kV overhead and underground power line routing (Theis EMPr covers the overhead powerline).	67
Appendix D, Map 1: Combined Sensitivity Map for the proposed project	68

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

---

# 1 INTRODUCTION

---

The Project Developer, VOLTA PV (PTY) Ltd (hereinafter referred to as VOLTA PV), is proposing to design, construct and operate a Solar Photovoltaic (PV) power generation facility and associated infrastructure, approximately 4km west of the town of Dealesville, in the Free State Province. The proposed projects are located within the Tokologo Local Municipality and Lejweleputswa District Municipality. The proposed Solar PV facility will make use of PV solar technology to generate electricity from energy derived from the sun; and will connect to the national grid at the planned Artemis Main Transmission Substation.

The PV facility will have a capacity of up to 290 MW. The associated infrastructure includes various structures, buildings and electrical grid infrastructure (EGI) such as, but not limited to, two 132 kV power lines, two on-site substations, and two Battery Energy Storage Systems (BESS).

The proposed VOLTA EGI comprises a 132 kV overhead and underground power line from the proposed Volta PV collector substations to Artemis MTS near Dealesville in the Free State Province. The line is assessed within a 135 m wide corridor. There are two project substations, A, the westerly one and B, the easterly one, each with a footprint of approximately 4.1 hectares. An overhead power line is the preferred option from substation A to Artemis MTS and an underground power line is the preferred option from substation B to Artemis MTS.

Assessed in the BA process is a 132 kV overhead and underground transmission power lines which extends approximately 4 km and 2 km respectively.

The proposed projects fall within the REDZ 5 (i.e. Kimberley REDZ) which was promulgated in GN 114 in February 2018. The REDZs represent areas where wind and solar PV development is being incentivised from resource, socio-economic and environmental perspectives. To date, the DFFE has gazetted 11 REDZs as well as procedures for submitting environmental impact assessment applications and reduced environmental authorisation timeframes within these REDZs, which have reduced the review timeframes by half and significantly simplified the authorisation process. The REDZs were identified in two phases, with the first 8 being identified through an SEA process which concluded in March 2015 and gazetted in February 2018 and the 3 additional REDZs concluded in March 2019 and gazetted in February 2021. A BA Process is undertaken instead of a full Scoping and EIA Process, and is subjected to a reduced decision-making timeframe.

In addition, five EGI Power Corridors were gazetted for implementation on 16 February 2018 in Government Gazette 41445, GN 113 and an additional two expanded corridors were gazetted 29 April 2021. The Gazette documented notice, given by the Minister of Environmental Affairs, of alternative procedures to be followed when applying for EA for large scale electricity transmission and distribution development activities, identified in terms of section 24(2)(a) of the NEMA in the identified Strategic Transmission Corridors (i.e. areas declared as geographical areas of strategic importance). Developers proposing to submit applications for EA for large scale electricity transmission infrastructure within any of the five gazetted Strategic Transmission Corridors, that trigger Listed Activity 9 of Listing Notice 2 of the 2014 NEMA EIA Regulations (as amended), or any other listed and specified activities that are necessary for the realisation of such infrastructure and facilities, would need to follow a BA Process, as opposed to a full Scoping and EIA Process. The proposed project also falls within the Central EGI Corridor. The fact that the proposed project falls within the Central EGI Corridor is important as it

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

---

indicates that the proposed project aligns with the strategic objectives of the country in terms of infrastructure placement.

The Draft EMPr was released with the Draft BA Report to all Interested and Affected Parties (I&APs), Organs of State and stakeholders for a 30-day review and commenting period, which extended from 31 March 2023 to 3 May 2023, excluding public holidays. All comments received during the 30-day comment period have been incorporated into this Final BA Report in the Comments and Responses Report (Appendix D Part 2 of the Final BA Report).

### 1.1 AUTHORS OF THE EMPr

---

This EMPr has been compiled by the Environmental Assessment Practitioner, Paul Lochner (EAP 2019/745), Project Manager, Abulele Adams, and the Project Officers, Helen Antonopoulos and Sonto Mkize, with inputs provided by the various specialists on the team (as indicated in Table 3). The Curriculum Vitae of Paul Lochner and Abulele Adams are also included in Appendix A of this EMPr.

#### **Paul Lochner (EAP, Technical Advisor and Quality Assurance)**

Paul Lochner is an environmental assessment practitioner (EAP) at the CSIR in Stellenbosch, with more than 28 years of experience in a wide range of environmental assessment and management studies. Paul commenced work at CSIR in 1992, after completing a B.Sc. degree in Civil Engineering and a Masters in Environmental Science, both at the University of Cape Town. His initial work at focused on wetlands and estuarine management; environmental engineering in the coastal zone; and coastal zone management plans. Since 2008, Paul has been the leader and manager of the Environmental Management Services (EMS) group within CSIR that has been at the forefront of advancing environmental assessment in South Africa. This group currently consists of approximately 10 to 20 environmental scientists, planners, and engineers, with offices in Stellenbosch, Cape Town and Durban. Paul's particular experience is in environmental planning and assessment for renewable energy, electricity grid infrastructure, desalination, oil & gas, wetlands & coastal zone management, and industrial & port development. He has been closely involvement in the research and application of Strategic Environmental Assessment (SEA) in South Africa, and he has wide experience in Environmental & Social Impact Assessment, Environmental Management Programmes (EMPRs) and Environmental Screening Studies. He has been the project leader for over 40 SEAs and EIAs over the past 28 years. He also served as project leader for a suite of SEAs commissioned by the DFFE from 2014 to 2020.

Paul is a Registered EAP (2019/745) with the Environmental Assessment Practitioners Association of South Africa (EAPASA).

#### **Abulele Adams (Project Manager & GIS mapping)**

Abulele Adams, serves as the Project Manager, in the EMS group of the CSIR. She has 9 years of experience in the Environmental Management field and has been involved in various transport SEAs. She is a registered Professional Natural Scientist (400168/17) with the South African Council for Natural Scientific Professions (SACNASP).

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

**Table 1.1: Details of the BA Project Team**

Name	Organisation	Role/ Specialist Study
<b>CSIR Project Team</b>		
Paul Lochner ( <i>Registered EAP (2019/745)</i> )	CSIR	EAP and Project Leader
Abulele Adams ( <i>Pr.Sci.Nat.</i> )	CSIR	Project Manager
Helen Antonopoulos	CSIR	Project Officer
Luanita Snyman-van der Walt ( <i>Pr.Sci.Nat.</i> )	CSIR	Project Mapping
Sonto Mkize	CSIR	Project Officer
<b>Specialists</b>		
Johann Lanz ( <i>Pr.Sci.Nat.</i> )	Private	Agricultural Compliance Statement
Lourens du Plessis ( <i>GPr G/Sc</i> )	LOGIS	Visual Impact Assessment
Bryony Walmsley ( <i>EAPASA</i> )		
Jaco van der Walt	Beyond Heritage	Heritage Impact Assessment (Archaeology Cultural Landscape)
Prof Marion Bamford	Private	Palaeontology
Corné Niemandt ( <i>Pr.Sci.Nat.</i> )	Enviro-Insight	Terrestrial Biodiversity, Terrestrial Plant Species, and Terrestrial Animal Species
Russel Tate ( <i>Pr.Sci.Nat.</i> )	HCV Africa (Enviro-Insight)	Aquatic Biodiversity and Species Impact Assessment
Luke Verburgt ( <i>Pr.Sci.Nat.</i> )	Enviro-Insight	Avifauna Impact Assessment
Tony Barbour	Private	Socio-Economic Impact Assessment
Debbie Mitchell	Ishecon	BESS Risk Assessment (PV only)
Merchandt Le Maitre ( <i>Pr Tech Eng</i> )	Skerp Consulting Engineers	Traffic Impact Assessment
Hardy Luttig and Shane Teek	GEOSS South Africa (PTY) Ltd	Geohydrology Assessment
Hardy Luttig and Shane Teek		Desktop Geotechnical Assessment
Sonto Mkize, Abulele Adams ( <i>Pr.Sci.Nat.</i> ) Helen Antonopoulos	CSIR	Civil Aviation Site Sensitivity Verification
Sonto Mkize, Abulele Adams ( <i>Pr.Sci.Nat.</i> ) Helen Antonopoulos	CSIR	Defence Site Sensitivity Verification
<b>Technical Input</b>		

## 1.2 PROJECT DESCRIPTION

As noted in Section 1, the Project Applicant is proposing the construction of a 132 kV overhead and underground transmission power line and associated EGI to feed the electricity generated by the proposed VOLTA PV facility to onsite substations. The proposed VOLTA EGI comprises a 132 kV overhead and underground power line from the proposed Volta PV collector substations to Artemis MTS near Dealesville in the Free State Province. The line is assessed within a 135m to 700 m wide corridor. There are two project substations, A, the westerly one and B, the easterly one, each with a footprint of approximately 4.1 hectares. An overhead power line is the preferred option from substation A to Artemis MTS and an underground power line is the preferred option from substation B to Artemis MTS.

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

---

The BA considered both overhead and underground options for powerlines. The focus of this EMPr is the overhead powerlines. The underground powerline option is dealt with in a separate EMPr (Appendix K).

Based on email discussions with the DFFE in February 2023, the option to apply for combining the Applications for EA in terms of Regulation 11 (4) of the 2014 NEMA EIA Regulations (as amended), and the issuing of multiple EAs in terms of Regulation 25 (1) and (2) of the 2014 NEMA EIA Regulations (as amended) was discussed. It was confirmed that a letter must be submitted to the DFFE to motivate for the combination and issuing of multiple EAs. The combination request was submitted to the DFFE via email on 28 February 2023 and it was made specifically in terms of the following regulations of the 2014 NEMA EIA Regulations (as amended):

- Regulation 11 (4): *“If one or more proponents intend undertaking interrelated activities at the same or different locations within the area of jurisdiction of a competent authority, the competent authority may, in writing, agree that the proponent or proponents submit a single application in respect of all of those activities and to conduct a consolidated assessment process but the potential environmental impacts of each activity, including its cumulative impacts, must be considered in terms of the location where the activity is to be undertaken”.*
- Regulation 25 (1) and (2): *“(1) If the competent authority decides to grant authorisation, the competent authority must issue an environmental authorisation or environmental authorisations complying with regulation 26 to, and in the name of, the applicant or applicants. (2) If the competent authority decides to grant authorisation in respect of an application, the competent authority may issue a single environmental authorisation or multiple environmental authorisations in the name of the same or different applicants covering all aspects for which authorisation is granted”.*

It was motivated to the DFFE to submit a combined Application for Environmental Authorisation (EA) in terms of Regulation 11 (4) of the 2014 NEMA EIA Regulations (as amended), and for the issuing of multiple EAs (should they be granted) in terms of Regulation 25 (1) and (2) of the 2014 NEMA EIA Regulations (as amended). The combined reporting process reduces the administrative aspects on the case officer and reduces the number of reports that need to be reviewed by Interested and Affected Parties (I&APs), while still maintaining high levels of environmental rigour and clear reporting. The combination and multiple EA request was approved by the DFFE on 10 March 2023 2020. A copy of this approval is included in Appendix L of this BA Report.

Therefore, one BA Report has been compiled and this report includes the PV facility and the Powerline environmental assessment. As requested in the approval letter, the BA Report is submitted with distinct and clear sections dedicated to the PV facility and EGI. A submission of a standalone appendix with the relevant information that needs to be included in the EA (should it be granted) will also be submitted. Table A.2 below indicates the two proposed projects, the two separate EAs that are requested (should they be granted).

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

**Table 1.2: BA Reporting Structure and Components**

No.	Project	Applicant	No. of Applications for EA	No. of BA Reports	No. of Specialist Reports	No. of EAs
1	PROJECT 1: Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS), and associated infrastructure near Dealesville, Free State.	VOLTA PV (Pty) LTD	1 Combined Application for EA	1 Combined BA Report	1 Specialist Report per theme to address all the Solar PV facility and BESS.	1 EA
2	PROJECT 2: Basic Assessment for the proposed development of a 132 kV Power line and associated EGI (i.e., Volta EGI) from the Volta PV Facility to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State				1 Specialist Report per theme to address the Powerline.	1 EA
<b>Total</b>			<b>1 Application for EA</b>	<b>1 BA</b>		<b>2 EAs</b>

The BA process assessed two power line routing alternatives for the transfer of the electricity. Please refer to Figure A-2 for the power line routing alternatives which are assessed as part of this BA process. The figure also includes the substation complexes at the proposed VOLTA PV facility site.

The specialists assessed the following power line routing alternatives:

**Proposed powerline options:**

- *Preferred options*

There are two project substations, A, the westerly one and B the easterly one.

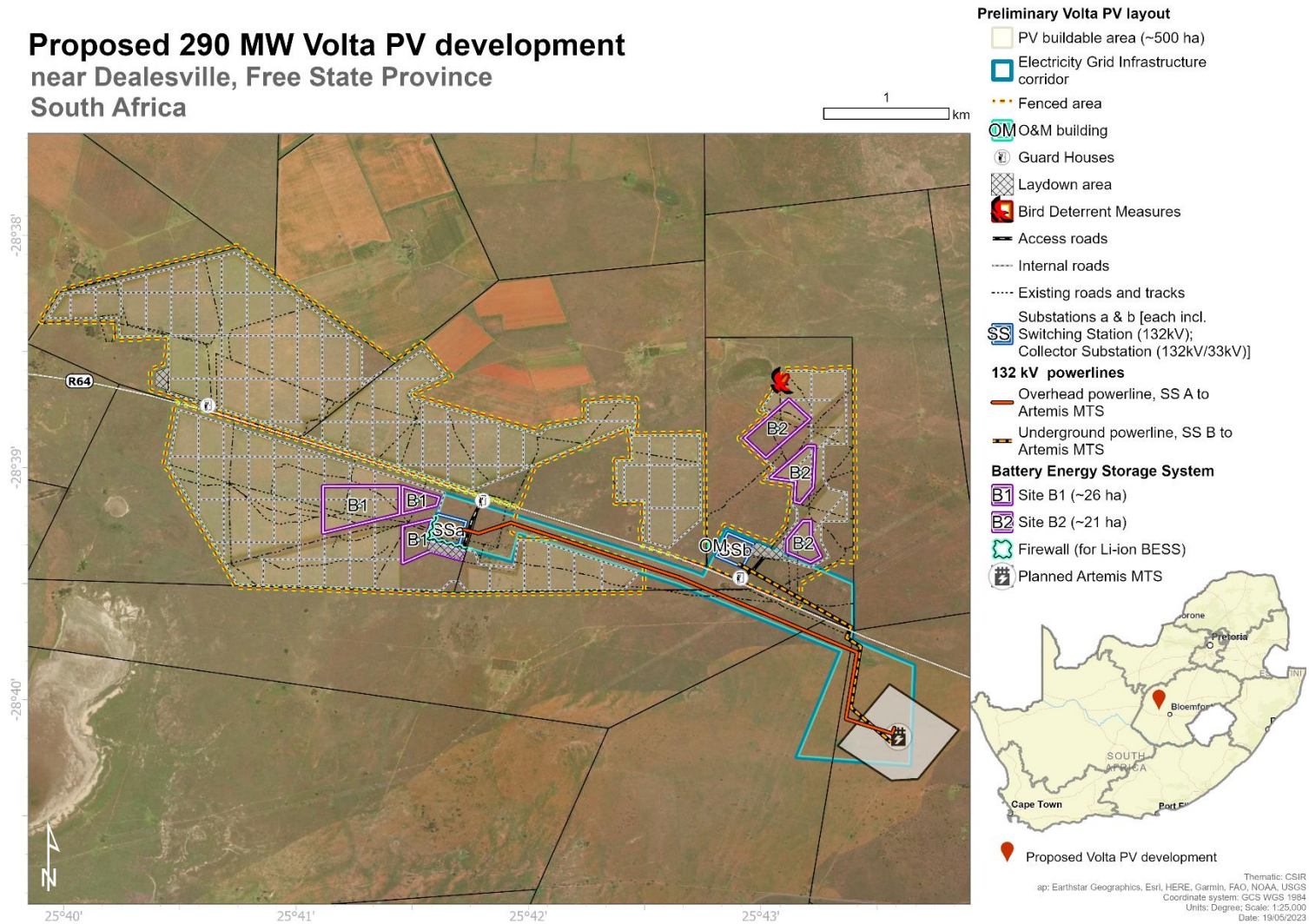
- An overhead power line from substation A to Artemis MTS and an
- An underground power line from substation B to Artemis MTS.



## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### Proposed 290 MW Volta PV development near Dealesville, Free State Province South Africa



**Figure 1.1:** Locality map showing the proposed 132 kV overhead and underground power line routing and the two substation complexes for the Volta EGI .

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

A description of the key components of the proposed power line and EGI project is provided in Table 1.3, below, and is also discussed within the forthcoming sub-sections. It is important to note at the outset that the exact specifications of the proposed project components will be determined during the pre-construction detailed engineering design phase (subsequent to the issuing of EA, should such authorisation be granted for the proposed power line and EGI project) but that the information provided below is seen as the worst-case scenario for the proposed power line project.

**Table 1.3: Description of the project components for the Proposed 132 kV Overhead Power Line and supporting infrastructure.**

Project Description for VOLTA EGI		
Component	Dimensions / Specifications	
On-site substation hub (including collector and/or switching yard)	Number of substation alternatives:	No alternatives as the Artemis MTS position has been set by ESKOM as well as collector substation SSa as they were set for REIPP Rounds 5 and 6 projects.  The same Substations (SSa and SSb) and powerlines to Artemis MTS that are to be used for connecting the Solar PV to the grid will be used for the battery power (BESS Site 1 and BESS Site 2) evacuation, at night when solar generation is inactive.
	Footprint (ha):	For each substation SSa and SSb a 0,7 ha platform for substation, surrounded by 4ha, fence. The remainder of 4ha is open ground for overhead lines to turn and connect into the substation
	Capacity:	Each approx. 500MVA on substations SSa and SSb
	Height (m):	Max 30 m (lightening conductors) 132kV OHL pylons need 16m clearance from ground (including earth and structure 20m maximum height) All other plant including transformers, CTs, VTs Breakers, SCADA and control room, fencing etc will be below 10m
Internal transmission and/or distribution lines	Under or aboveground:	Underground
	Capacity (kV):	800V from inverters to containerised mini-subs. 33kV from mini-subs to substations SSa and SSb
	If above: height (m) If below: maximum depth (m)	Max depth 1M
	If above - width of service road below powerline(s) (m):	As per ESKOM spec- see attached ESKOM restrictions document
	Length (m):	Estimate
Overhead transmission powerlines for connection of PV facility, via SSa to existing national grid and for connecting BESS Site 1 to national grid via SSa, at night when solar	Capacity (kV):	132 kV
	Pylon type:	Monopole Twin circuit – various designs available
	Tower type:	Monopole
	Height (m):	Max 20m
	Foundation:	Concrete with anchors

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

generation is inactive.	Width of registered servitude (m):	See attached ESKOM restrictions document 18 meters
	Width of service road below powerline (m):	5m
	Width of powerline corridor for specialist assessment (m):	30m
	Length of powerline (km):	Less than 4km from VOLTA PV collector substation SSa to Artemis MTS of 132kV overhead line
Underground transmission powerlines for connection of PV facility, via SSb to existing national grid and for connecting BESS Site 2 to national grid via SSb, at night when solar generation is inactive.	Capacity (kV)	132 kV
	Trench width (m)	3.6m
	Trench Depth (m)	1.2m
	Width of registered servitude (m):	15m
	Width of service road next to powerline (m):	5m
	Width of powerline corridor for specialist assessment (m):	30m
	Length of powerline (km):	Less than 2.1km from VOLTA PV collector substation SSb to Artemis MTS of 132kV OHL
Any additional infrastructure – please describe?	Danger tape will be placed 30cm above the cable and 70cm below ground (at least one tape for each circuit) At joins a widening of the trench will be needed (approx. double the width)	

### 1.2.1 Substations

The on-site substations form part of the VOLTA EGI assessment. The substation infrastructure was assessed as part of the combined BA process for the VOLTA PV and BESS and EGI projects.

Each on-site substation complex has an approximately 4 ha fenced area within which there will be 75 m x 75 m substation equipment. The larger fenced area is to allow space for cables to be routed in and out.

Note that the VOLTA EGI is intended to be shared with the ibVogt projects. The Substation A will also serve as a collector substation for ibVogt transmission. In this case each IPP is responsible for their incoming 33kV or 132kV cables and for their Switching and Collector Substation 132kV/33kV and powerlines from the substation A to Artemis MTS.

A joint EMPr should be agreed on with a clear assignment of roles and responsibilities.

The co-ordinates for the centre-point of the substations are noted in Table 4.2, below.

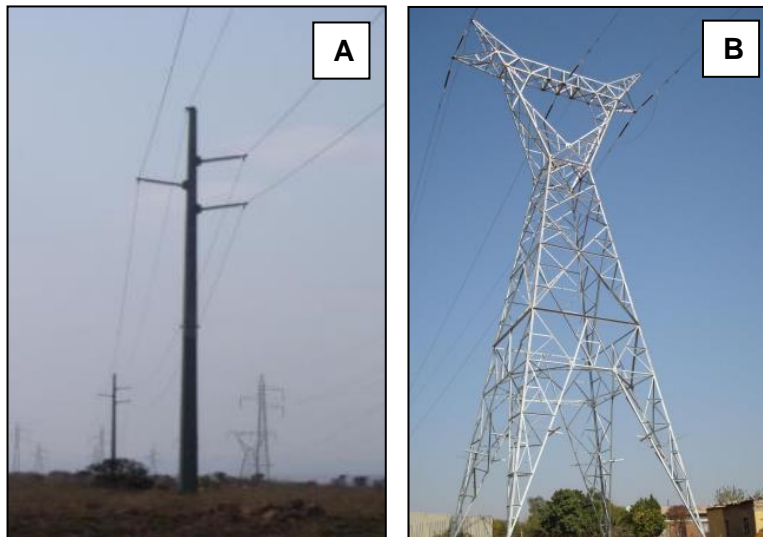
### 1.2.2 Proposed Overhead Power line

As explained above, a 132 kV overhead power line of approximately 4 km is proposed to feed electricity from the on-site substation (SSA) to the planned Artemis MTS. There is a single proposed routing in the EGI corridor.

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

An overhead power line consists of one or more conductors that are strung (using insulators) on in-line (intermediate) structures and bend (strain) structures. The structures proposed for this 132 kV power line are monopole pylons or steel lattice pylons, or a combination of both where required.



**Figure 1.2: Photographs of a typical monopole pylon (A) and steel lattice pylon (B) for a 132 kV power line (Source: Eskom, 2017)**

The choice of pylon type depends on the topography and the alignment of the power line corridor such as whether the pylons will be placed within a straight section within the power line corridor (intermediate structures) or at bends (strain structures), as well as how sharp the bend is. The span lengths are estimated to range between 200 m and 350 m depending on the topography and sensitivities of the area. Generally, monopole-type pylons are used for shorter spans, whereas steel lattice-type pylons are used where long spans (>500m) across valleys and rivers are required.

Each structure varies in height from approximately 12 m to 40 m. The size of the footprint depends on the type of structure used, i.e. whether it is an intermediate or strain structure. This will typically range from approximately 0.5 m<sup>2</sup> to 8 m<sup>2</sup> for monopole pylons, and 36 m<sup>2</sup> to 64 m<sup>2</sup> for steel lattice pylons. The size and type of foundation to be installed will depend on underlying geotechnical conditions, i.e. the soil bearing capacity (actual sub-soil conditions). The working area required around a pylon position during the construction phase can range up to 30 m x 30 m.

As noted above, the power line will be constructed within the assessed 135 m to 700 m wide EGI corridor. The servitude width required for a 132 kV power line is 32 m (i.e. 16 m on either side of the centreline).

The exact specifications of the proposed pylon component will be determined during the detailed engineering design phase and the information provided here is seen as the worst-case scenario.

### 1.2.3 Service Roads and External Access Roads

The development is located in close proximity to an existing road network. Several existing access points are located along Road P59-2 (R64). There are internal access roads to be constructed between

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

---

different development portions and the maximum width of these is 4 m with an approximate length of 20km of internal roads.

Exact specifications of the widening, length and upgrading of the farm gravel roads will be confirmed during the detailed design phase.

### 1.3 ENVIRONMENTAL SENSITIVITIES

---

As noted above, specialists were required to assess an approximately 135 m to 700 m wide corridor for the proposed overhead power line development and two substations. The specialists have assessed the powerline route within the corridor. However, the registered servitude will be up to 32 m wide, or where multiple adjacent power lines occur, in line with the guideline and requirements for 132 kV power lines stipulated in the 2011 Eskom Distribution Guide Part 19.

Based on the findings of the specialist studies, environmental sensitivity maps were produced. These maps show the sensitivities on site (e.g. terrestrial, aquatic, avifaunal, visual, paleontological and heritage features) within the larger assessed area that was identified. Appendix D of this EMP includes the environmental sensitivity maps which indicate the environmental sensitive areas and features identified within the power line corridor and routing during the BA process (as described above). Based on the specialist studies, the key environmental sensitivities and features that must be avoided in terms of the layout of the power line and substations are listed below (refer to Appendix D for visual representation).

#### ▪ **Agriculture**

- The agricultural protocol requires confirmation that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities. However, the agricultural uniformity and low agricultural potential of the environment, means that the exact positions of all infrastructure will make no material difference to agricultural impacts and there are no sensitivities related to this theme to be mapped.

#### ▪ **Visual**

- There are currently no areas within the PV and EGI layouts that require avoidance.
- Overall, the significance of the visual impacts is expected to range from moderate to low as a result of the numerous existing power lines within close proximity to the proposed site and its location within the Kimberley REDZ. There are a fair number of potential sensitive visual receptors within a 3 km radius of the proposed structures, although the possibility does exist for visitors to the region to venture into closer proximity to the facility structures. These observers may consider visual exposure to this type of infrastructure to be intrusive. It should be noted that of these receptors located within a 3km radius of the proposed sites, a number of the homesteads are located on farms that already have authorization to construct renewable energy developments.

#### ▪ **Heritage (Archaeology and Cultural Landscape)**

- There are currently the following areas rated as moderate -high sensitivity:
  - VT002, Med;
  - VT012 High;
  - VT101 High; and

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

- J Orton 881 High
- These have been avoided in the layout of the PV and The EGI for the Volta project.
- Based on the current lay out the low-density background Stone Age scatters at VT014, VT015 and VT016 will be directly affected by the EGI development. These isolated Stone Age scatters are out of context and scattered too sparsely to be of significance apart from mentioning them in this report. Furthermore, based on the work done by Sampson (1986) the impacts by powerlines on Stone Age artefacts is limited and the impact on these occurrences is therefore low.
- **Palaeontology**
  - There are no no-go palaeontological sensitivity areas designated by the specialists. The entire site is designated as low sensitivity.
- **Terrestrial Biodiversity and Species**
  - The development area for the Volta PV and EGI intersects with important grassland area. The specialist assessment has concluded that development should be focussed in already disturbed areas. The PV solar arrays and associated infrastructure should be focused in areas identified as medium sensitivity and lower, should the appropriate mitigation measures be implemented as development activities will have medium impacts overall which are acceptable and which should be followed by appropriate restoration activities. **Only the Watercourse habitat must be avoided by the development, and an effort must be made to avoid the Grassland, where possible.** Appropriate mitigation measures and rehabilitation can reduce the impact to the Grassland to moderate.
  - The underground powerline route should ideally avoid the Grassland habitat as far as possible; where this is not possible an effective rehabilitation plan must be drafted.
- **Aquatic Biodiversity and Species**
  - The Ecological Importance and Sensitivity (EIS) of the delineated wetlands were derived to be high. Buffer zone calculations of the project indicated a requirement of 20m for all wetland types. All wetlands have been avoided in the site layout.
- **Avifauna**

The following no-go areas have been avoided by the proposed layout of the PV Facilities:

  - Very High sensitivity (no-go): Surface water: This includes all wetlands and pans in the area
  - There are no major negative impacts to avifauna SCC expected from the proposed Volta EGI development, provided that the proposed mitigation measures are applied appropriately and that continued adaptive management take place throughout the lifespan of the facility. Without long-term data to present the flight paths of large-bodied SCC prone to collision, it is not possible to develop strict no-go areas for OHPLs based on likely collisions (other than significantly buffering major attractions like large freshwater pans).
- **Socio-Economic**
  - Sensitivity maps in terms of areas to avoid are not applicable for the Socio-Economic Assessment.
- **Geohydrology**

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

- Sensitivity maps in terms of areas to avoid are not applicable for the Geohydrology Assessment.
- **Traffic**
  - Sensitivity maps in terms of areas to avoid are not applicable for the Traffic Impact Statement.
- **Civil Aviation**
  - No civil aviation related sensitivities were identified.
- **Defence**
  - No defence related sensitivities were identified.

Based on the boundaries of the assessed area and the constraints of the environmental sensitivities, a preliminary site layout has also been determined for this project (Appendix C of this EMP). Based on these specialist findings, the final alignment of the power line route within the assessed and approved corridor must avoid the sensitive features that were identified by the specialists (see Appendix D, Map 3).

### 1.4 IMPACTS IDENTIFIED DURING THE BA PROCESS

Informed by the specialist studies (as shown in Table 1.1), the following main direct potential impacts, as indicated in Table 1.4, were identified and appropriate management and mitigation measures included within the EMP (where required) to ensure the potential impacts are suitably addressed and managed during all phases of the project life cycle (i.e. construction, operational, and decommissioning).

**Table 1.4: Impacts identified in the BA Process**

IMPACT THEME	IMPACTS IDENTIFIED
AGRICULTURE	<p><b><u>Construction and Decommissioning Phase</u></b></p> <ul style="list-style-type: none"> <li>▪ Occupation of land - Agricultural land directly occupied by the development infrastructure will become restricted for agricultural use, with consequent potential loss of agricultural productivity for the duration of the project lifetime.</li> <li>▪ Soil erosion and degradation – Erosion can occur as a result of the alteration of the land surface run-off characteristics, predominantly through the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Soil erosion and loss of topsoil are completely preventable. The stormwater management that will be an inherent part of the engineering on site and standard, best-practice erosion control and topsoil management measures recommended and included in the Environmental Management Programme (EMP), are likely to be effective in preventing soil erosion and loss of topsoil.</li> </ul> <p>Indirect:</p> <ul style="list-style-type: none"> <li>▪ Increased financial security for farming operations – Reliable and predictable income will be generated by the farming enterprises through the lease of the land to the energy facilities. This is likely to increase their cash flow and financial security and could improve farming operations and productivity through increased</li> </ul>

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

IMPACT THEME	IMPACTS IDENTIFIED
	<p>investment into farming.</p> <ul style="list-style-type: none"> <li>▪ Improved security against stock theft and other crime due to the presence of security infrastructure and security personnel at the energy facility.</li> </ul>
VISUAL	<p><b><u>Construction Phase:</u></b></p> <ul style="list-style-type: none"> <li>▪ Impact 1: Potential visual impact of construction activities on sensitive visual receptors in close proximity to the proposed infrastructure</li> </ul> <p><b><u>Operational Phase:</u></b></p> <ul style="list-style-type: none"> <li>▪ Potential visual impact on sensitive visual receptors located within a 0.5 km radius of the grid connection infrastructure.</li> <li>▪ Potential visual impact on sensitive visual receptors within a 0.5 – 1.5 km radius</li> <li>▪ Potential visual impact on sensitive visual receptors within a 1.5 – 3 km radius</li> </ul> <p><b><u>Decommissioning Phase:</u></b></p> <ul style="list-style-type: none"> <li>▪ Impact 1: increase in heavy vehicles utilising the roads to the site that may cause, at the very least, a visual nuisance to other road users and landowners in closer proximity (&lt; 0.5 km) to the decommissioning activities.</li> </ul> <p><b><u>Cumulative Impacts:</u></b></p> <ul style="list-style-type: none"> <li>▪ Impact 1: The potential impact on the sense of place of the region.</li> </ul>
HERITAGE AND CULTURAL LANDSCAPE	<p><b><u>Construction Phase</u></b></p> <ul style="list-style-type: none"> <li>▪ Impact assessment of the Project on isolated Stone Age scatters (VT01 and VT12).</li> </ul> <p><b><u>Operational Phase</u></b></p> <ul style="list-style-type: none"> <li>▪ Potential visual impacts to the cultural landscape and sense of place – see Visual Impact Assessment</li> </ul> <p><b><u>Decommissioning Phase</u></b></p> <ul style="list-style-type: none"> <li>▪ Potential impacts to the cultural landscape</li> </ul> <p><b><u>Cumulative impacts</u></b></p> <ul style="list-style-type: none"> <li>▪ Potential impacts to heritage resources</li> </ul>
PALAEOLOGY	<p><b><u>Construction Phase</u></b></p> <ul style="list-style-type: none"> <li>• Disturbance, damage or destruction of fossils within the development footprint due to excavations and surface clearance..</li> </ul>
TERRESTRIAL BIODIVERSITY	<p><b><u>Construction Phase:</u></b></p> <ul style="list-style-type: none"> <li>▪ Loss of habitat and sensitive features;</li> </ul>



## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

IMPACT THEME	IMPACTS IDENTIFIED
AND SPECIES	<ul style="list-style-type: none"> <li>▪ Loss of protected species;</li> <li>▪ Introduction and spread of alien invasive species</li> <li>▪ Increased erosion and soil compaction;</li> <li>▪ Littering and General Pollution;</li> </ul> <p><b><u>Operational Phase:</u></b></p> <ul style="list-style-type: none"> <li>▪ Increase in alien invasive species;</li> <li>▪ Loss of species composition and diversity;</li> <li>▪ Littering and General Pollution;</li> </ul> <p><b><u>Decommissioning Phase:</u></b></p> <p>Such alterations and changes will be dependent upon the expectant post-decommissioning land use and operation cease of the PV Facilities and associated infrastructure. However, abandonment of the site would probably result in:</p> <ul style="list-style-type: none"> <li>▪ Alien invasive species management;</li> <li>▪ Loss of habitat;</li> </ul> <p><b><u>Cumulative Impacts:</u></b></p> <p>The cumulative impact assessment considers other proposed, approved and existing power lines within the 30 km radius.</p> <p>Given the above, cumulative impacts arising from the implementation of this project and other land use changes in the region are likely to exhibit the following:</p> <ul style="list-style-type: none"> <li>○ Habitat loss and fragmentation</li> </ul>
AQUATIC BIODIVERSITY	<p><b><u>Construction Phase:</u></b></p> <ul style="list-style-type: none"> <li>• Operation of equipment and machinery</li> <li>• Clearing vegetation for 75 m2 for substations and pylon footings</li> <li>• Stockpiling of and placement construction materials</li> <li>• Excavating/shaping landscape for the underground cable</li> <li>• Final landscaping, backfilling and postconstruction rehabilitation</li> </ul> <p><b><u>Operational Phase:</u></b></p> <ul style="list-style-type: none"> <li>• Alteration of drainage</li> <li>• Alteration of surface water flow dynamics</li> <li>• Establishment of alien plants on disturbed areas</li> </ul> <p><b><u>Decommissioning Phase:</u></b></p> <p>Such alterations and changes will be dependent upon the expectant post-decommissioning land use and operation cease of the PV Facilities and associated infrastructure. However, abandonment of the site would probably result in:</p> <ul style="list-style-type: none"> <li>• Operation of equipment and machinery.</li> <li>• Clearing vegetation for laydown areas</li> <li>• Stockpiling of and placement construction materials</li> </ul>

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

IMPACT THEME	IMPACTS IDENTIFIED
	<ul style="list-style-type: none"> <li>• Excavating/shaping landscape</li> <li>• Final landscaping, backfilling and postconstruction rehabilitation</li> </ul> <p><b><u>Cumulative Impacts:</u></b></p> <p>The cumulative impact assessment considers other proposed, approved and existing power lines within the 30 km radius.</p> <p>Given the above, cumulative impacts arising from the implementation of this project and other land use changes in the region are likely to exhibit the following:</p> <p><b><u>Construction Phase:</u></b></p> <ul style="list-style-type: none"> <li>• Operation of equipment and machinery</li> <li>• Clearing vegetation for laydown yards and buildings</li> <li>• Stockpiling of and placement construction materials</li> <li>• Excavating/shaping landscape</li> <li>• Final landscaping, backfilling and postconstruction rehabilitation</li> </ul> <p><b><u>Operational Phase:</u></b></p> <ul style="list-style-type: none"> <li>• Alteration of drainage</li> <li>• Alteration of surface water flow dynamics</li> <li>• Establishment of alien plants on disturbed areas</li> </ul> <p><b><u>Decommissioning Phase:</u></b></p> <ul style="list-style-type: none"> <li>• Operation of equipment and machinery.</li> <li>• Clearing vegetation</li> <li>• Stockpiling of and placement construction materials</li> <li>• Excavating/shaping landscape</li> <li>• Final landscaping, backfilling and postconstruction rehabilitation</li> </ul>

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

IMPACT THEME	IMPACTS IDENTIFIED
AVIFAUNA	<p><b><u>Construction Phase:</u></b></p> <ul style="list-style-type: none"> <li>▪ Disturbance of foraging and breeding behaviours of birds due to noise, dust and lighting;</li> <li>▪ Loss of habitat due to clearing, trenching for the underground cable, alteration and exclusion from previously accessible habitats.</li> </ul> <p><b><u>Operational Phase:</u></b></p> <ul style="list-style-type: none"> <li>▪ Continued disturbance due to operational activities (use of vehicles, lights etc.);</li> <li>▪ Loss of habitat due to altered and excluded habitats;</li> <li>▪ Direct mortality from electrocution or collision with infrastructure (specifically power lines);</li> <li>▪ Attraction to the facility exacerbating potential impacts described above.</li> </ul> <p><b><u>Decommissioning Phase:</u></b></p> <ul style="list-style-type: none"> <li>▪ Continued disturbance due to operational activities (use of vehicles, lights etc.);</li> <li>▪ Habitat loss reclamation from rehabilitation activities.</li> </ul> <p><b><u>Cumulative Impacts:</u></b></p> <ul style="list-style-type: none"> <li>▪ Please see Appendix C.13 for a detailed description of cumulative impacts</li> </ul>

---

## 2 ABOUT THIS EMPr

---

### 2.1 COMPLIANCE WITH RELEVANT LEGISLATION

---

Section 19 of NEMA requires that an EMPr be submitted where a BA process is being undertaken for an EA application. The content of an EMPr must either contain the information set out in Appendix 4 of the 2014 NEMA EIA Regulations (as amended) promulgated in Government Gazette 40772 and GN R326 on 7 April 2017, or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. As part of the 2016 EGI Strategic Environmental Assessment, a generic EMPr was also compiled for the development and expansion of (a) overhead electricity transmission and distribution infrastructure; and (b) substation infrastructure for the transmission and distribution of electricity. On 2 March 2018, these two Generic EMPrs were gazetted in Government Gazette 41473, GN 162 and GN 163, for public comment for a period of 45 days. **On 22 March 2019, these two Generic EMPrs were gazetted for implementation in Government Gazette 42323, GN 435.** It is therefore understood that these gazetted EMPrs must be applied by all parties involved in the EA Process. This EMPr therefore subscribes to the requirements of the gazetted EMPrs (Gazette 42323, GN 435).

Since the Generic EMPr for power lines has been gazetted and is applicable to the proposed project, the following has been undertaken:

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

---

- Section 1 of Part B of the gazetted Generic EMPr contains a pre-approved template with aspects that are common to the development of power line infrastructure. This section will be completed by the contractor, with each completed page signed and dated by the holder of the EA prior to commencement of the activity. To allow I&APs access to the pre-approved EMPr template for consideration through the decision-making process, the template was released with the Draft BA Report during the 30-day comment period, which extended from 31 March to 03 May 2023, excluding public holidays. It is included in Appendix E of this EMPr.
- Section 2 of Part B of the gazetted Generic EMPr has been completed to include site specific information, a preliminary infrastructure layout and development footprint site map, and a declaration that the Applicant will comply with the pre-approved template provided in Part B: Section 1 of the gazetted EMPr. This is submitted to the DFFE in the BA Process for review and decision-making and has been included in Section 4 (site specific information), Section 5 (preliminary infrastructure layout) and Section 6 (declaration of the Applicant) of this EMPr.
- Part C of the gazetted Generic EMPr has been compiled and included in Section 7 of this EMPr. It includes site specific impact management outcomes and impact management actions that are not included in the pre-approved generic EMPr. This section has been prepared by the EAP, with input from relevant specialists. This section of the EMPr is a supplement to the gazetted EMPr and provides site specific mitigation measures identified in the specialist studies contained in Appendix C of the Draft BA Report. **It was confirmed with the DFFE Interpretation Query Unit in February 2020 that if Part C the gazetted Generic EMPr is required, the impact management outcomes and impact management actions must be provided; whilst the columns under the headings, “Implementation” and “Monitoring” can only be completed by the relevant parties after the EA is issued (as per Part B – Section 1).**

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

---

### 2.2 STRUCTURE AND CONTENTS OF THE EMPr

---

This Site Specific EMPr includes the following:

- Section 4: Site specific information;
- Section 5: Preliminary infrastructure layout and development footprint site map;
- Section 6: Declaration that the Applicant will comply with the pre-approved template provided in Part B: Section 1 of the gazetted EMPr (which is included in Appendix E of this EMPr);
- Section 7: Site-Specific EMPr as required by Part C of the gazetted EMPr.

The Site-Specific EMPr follows the same template as that of Part B – Section 1 of the gazetted EMPr, as recommended. Where applicable, each section of the Site-Specific EMPr is divided into the following four phases of the project cycle:

- Planning and Design Phase;
- Construction Phase;
- Operational Phase; and
- Decommissioning Phase.

The overall goal for environmental management for the proposed project is to plan, design, construct and operate the project in a manner that:

- Minimises the ecological footprint of the project on the local environment;
- Minimises impacts on fauna, flora and freshwater ecosystems;
- Facilitates harmonious co-existence between the project and other land uses in the area;
- Enhances the socio-economic benefits in the local area; and
- Contributes to the environmental baseline and understanding of environmental impacts of EGI in a South African context.

In this EMPr, the following spatial parameters apply to the management actions, unless where specified differently:

- The study site demarcated as the proposed VOLTA powerline corridor and routing was assessed (i.e. approximately 157 ha).

### 2.3 HOW TO USE THIS EMPr

---

This EMPr is intended to serve as a guideline to be used by the EA holder and any person/s acting on behalf of the holder, during the planning and design, construction, operational and decommissioning phases of the development. This EMPr provides clear direction on the selection and implementation of appropriate environmental management and control techniques during the life cycle of the development. The mitigation, management, and monitoring measures prescribed in this EMPr must be seen as binding to the EA holder and any person acting on its behalf, including but not limited to agents, employees, associates, guests or any person rendering a service to the development site.

It is essential that this EMPr be carefully studied, understood, implemented and adhered to as far as reasonably possible, throughout all phases of the proposed development. A copy of the EMPr must be

## **APPENDICES**

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

retained by the EA holder, and an additional copy must be kept on site at all times during the above-mentioned phases of the development.

This EMPr must be included in all tender documentation and contracts compiled for potential bidders and subsequent contractors and subcontractors employed by the EA Holder, as this EMPr identifies and specifies the procedures to be followed by engineers and other contractors to ensure that the adverse impacts of construction and maintenance activities are either avoided or reduced. Appointed contractors must make adequate financial provision to implement the environmental management measures specified in this document.

This EMPr must be seen as a working document, which may be amended as and when needed, to accommodate changing circumstances on site or in the surrounding environment, or in order to accommodate requests/ conditions issued by the competent authority, the DFFE. Amendments to this EMPr must first be approved by the competent authority, in writing, before being implemented.

A joint EMPr should be agreed on with a clear assignment of roles and responsibilities for the sharing of the EGI between different IPPs.

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 3 ROLES AND RESPONSIBILITIES

Since the Generic EMPr is applicable for the proposed power line, it is best to adopt the definitions of the roles and responsibilities as captured in the gazetted EMPrs of GN 435. This will allow consistency of the management of the project from an environmental perspective and will avoid any contradiction in terms of the roles and responsibilities.

The generic roles and responsibilities required for key role players are those of the:

- Project Developer / Developer’s Project Manager (DPM);
- Developer Site Supervisor (DSS)
- Environmental Control Officer (ECO);
- Developer’s Environmental Officer (DEO);
- Contractor; and
- Contractor’s Environmental Officer (CEO).

The definitions of the roles and responsibilities are included in Appendix B of this EMPr.

The Project Developer/Applicant has considered the guideline to the roles and responsibilities included in the Generic EMPr for substations (GN 435) for the implementation thereof. However, the Project Developer/Applicant has identified corresponding terminology for each of these project-specific roles as highlighted in the table below:

Roles and responsibilities in the Government Gazetted EMPrs of GN 435 for the construction phase	Terminology used for the corresponding roles and responsibilities in the Vhuvhili project for the construction phase
Project Developer / Developer’s Project Manager (DPM)	Project Owner
Developer Site Supervisor (DSS)	Project Owner’s Site Supervisor
Environmental Control Officer (ECO)	ECO
Developer’s Environmental Officer (DEO)	Project Owner’s Environmental Officer
Contractor	Engineering, Procurement and Construction (EPC) Contractor
Contractor’s Environmental Officer (CEO)	CEO
Roles and responsibilities for the operational phase for the VOLTA PV facility	
<ul style="list-style-type: none"> <li>• Operations and Maintenance (OM) Contractor</li> <li>• Facilities Manager (Owner)</li> </ul>	

The definitions of the roles and responsibilities are included in **Appendix B** of this EMPr, showing how the roles described above for the VOLTA PV project correspond with generic roles used in EMPrs.

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

# 4 SITE SPECIFIC INFORMATION

## 4.1 CONTACT DETAILS AND DESCRIPTION OF THE PROJECT

### 4.1.1 Details of the Applicant

<b>Name of Applicant</b>	VOLTA PV (Pty) Ltd
<b>Name of Applicant Representative</b>	Mark Bleloch
<b>Telephone Number:</b>	+27 81 529 0312
<b>Physical Address:</b>	5th Floor Mariendahl House, Newlands on Main, 11 Main Road Tel: 021 888 2400 Fax: 021 888 2693 Newlands, Cape Town, 7700

### 4.1.2 Details and Expertise of the EAP and Co-author

<b>Company of the EAP</b>	Council for Scientific and Industrial Research (CSIR)
<b>Name of EAP</b>	Paul Lochner (EAPASA Reg.No. 2019/745)
<b>Telephone Number:</b>	+27 21 888 2400
<b>Email Address:</b>	PLochner@csir.co.za
<b>Expertise of the EAP (Curriculum Vitae included):</b>	<p><b>Qualifications:</b></p> <ul style="list-style-type: none"> <li>▪ MPhil Environmental Science</li> <li>▪ BSc Civil Engineering awarded with Honours</li> </ul> <p><b>Experience:</b></p> <ul style="list-style-type: none"> <li>▪ Paul has more than 28 years of experience in environmental assessment and management.</li> </ul> <p><b>Professional Registration and Affiliations:</b></p> <ul style="list-style-type: none"> <li>▪ Registered EAP (2019/745) with the Environmental Assessment Practitioners Association of South Africa (EAPASA)</li> <li>▪ International Association for Impact Assessment, South African Affiliate.</li> </ul> <p><b>Curriculum Vitae of Paul Lochner is included in Appendix A of this EMP.</b></p>

<b>Company of the co-author</b>	Council for Scientific and Industrial Research (CSIR)
<b>Name of co-author</b>	Abulele Adams
<b>Telephone Number:</b>	+27 21 888 2400
<b>Email Address:</b>	Aadams1@csir.ac.za
<b>Expertise of the co-author (Curriculum Vitae included):</b>	<p><b>Qualifications:</b></p> <ul style="list-style-type: none"> <li>▪ MSc Geography</li> <li>▪ BSc Hon GIS</li> <li>▪ BSc Environmental Science</li> </ul> <p><b>Experience:</b></p> <ul style="list-style-type: none"> <li>▪ Abulele has more than 9 years' experience in environmental assessment).</li> </ul> <p><b>Professional Registration and Affiliations:</b></p> <ul style="list-style-type: none"> <li>▪ International Association for Impact Assessment, South African Affiliate.</li> </ul>



## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

	<ul style="list-style-type: none"> <li>▪ South African Council for Natural Scientific Professionals– Registered Professional.</li> </ul> <p><b><u>Curriculum Vitae of Abulele Adams is included in Appendix A of this EMPr.</u></b></p>
--	---

### 4.1.3 Project Name

<b>Project Name</b>	Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State.
---------------------	--

### 4.1.4 Description of the Project

Refer to Section 1.2 of this EMPr for a detailed description of the proposed project.

### 4.1.5 Project Location

The power line corridors are located approximately 6 km from Dealesville. The Project Developer provided two options for power line routing alternatives which traverse the farm portions indicated in Table 4.1.

**Table 4.1: Affected Farm Portions for the Proposed 132 kV Overhead Power Lines**

Affected Farm Portion	Mooihoek (RE/1551)	Cornelia (RE/1550)	Modderpan (RE/750)	Oxford (1/1030)	Klipfontein (RE/305)	Leliehoek (RE/748)
<b>Volta EGI</b>	✓	✓	✓	✓	✓	✓
<b>SG Code</b>	<b>F004000000001 55100000</b>	<b>F00400000000 0155000000</b>	<b>F0040000000007 5000000</b>	<b>F004000000001 03000001</b>	<b>F004000000000 30500000</b>	<b>F004000000000 74800000</b>

**Table 4.2: Powerline vertices for the Proposed 132 kV Overhead Power Lines**

POWERLINE VERTICES	No	Lat_y_dms	Long_x_dms
Overhead 132 kV, SS A to ARTEMIS	1	28° 40' 07.31983323" S	25° 43' 34.48868038" E
Overhead 132 kV, SS A to ARTEMIS	2	28° 40' 08.77596538" S	25° 43' 33.95516950" E
Overhead 132 kV, SS A to ARTEMIS	3	28° 40' 04.95752081" S	25° 43' 22.00312209" E
Overhead 132 kV, SS A to ARTEMIS	4	28° 39' 47.79678058" S	25° 43' 24.88347485" E
Overhead 132 kV, SS A to ARTEMIS	5	28° 39' 28.37898798" S	25° 42' 38.82256148" E
Overhead 132 kV, SS A to ARTEMIS	6	28° 39' 14.30786212" S	25° 41' 55.47125157" E
Overhead 132 kV, SS A to ARTEMIS	7	28° 39' 17.02896773" S	25° 41' 47.15048204" E
Overhead 132 kV, SS A to ARTEMIS	8	28° 39' 16.05058411" S	25° 41' 43.37341950" E

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Overhead 132 kV, SS B to ARTEMIS	1	28° 40' 10.96526028" S	25° 43' 33.63256749" E
Overhead 132 kV, SS B to ARTEMIS	2	28° 40' 02.01736216" S	25° 43' 23.27324536" E
Overhead 132 kV, SS B to ARTEMIS	3	28° 39' 46.29094963" S	25° 43' 25.78651447" E
Overhead 132 kV, SS B to ARTEMIS	4	28° 39' 44.00992834" S	25° 43' 22.14713219" E
Overhead 132 kV, SS B to ARTEMIS	5	28° 39' 41.26757690" S	25° 43' 23.34530910" E
Overhead 132 kV, SS B to ARTEMIS	6	28° 39' 24.87439682" S	25° 42' 54.20919388" E

### 4.1.6 Preliminary Technical Specification of the Overhead Power lines

Refer to Section 1.2 of this EMPr for the preliminary technical specifications of the overhead power line and supporting infrastructure.

## 5 LAYOUT AND DEVELOPMENT FOOTPRINT SITE MAP

This section includes maps of sensitivities, as well as the preliminary infrastructure layout. As noted above, the feature and sensitivity map were prepared based on specialist findings and existing databases. Individual feature and sensitivity maps are included in the specialist studies (Appendix C of the BA Report). Individual feature maps for each specialist theme, where relevant, are also included in Section B and Section D of the BA Report. Relevant to this EMPr, the combined sensitivity and layout maps for the proposed development are included in Appendix C of this EMPr.

## 6 APPLICANT DECLARATION

The proponent/applicant or holder of the EA affirms that he/she will abide and comply with the prescribed impact management outcomes and impact management actions as stipulated in part B: section 1 of the generic EMPr and have the understanding that the impact management outcomes and impact management actions are legally binding. The proponent/applicant or holder of the EA affirms that he/she will provide written notice to the CA 14 day prior to the date on which the activity will commence of commencement of construction to facilitate compliance inspections.

Name: Mark Bleloch

Position: consultant with VOLTA PV (Pty) LTD directors proxy

Signature Proponent/applicant/ holder of EA

Date:



9/06/2023

With proxy from directors

Mark Bleloch Pr.Eng 920 460

**APPENDICES**

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

## 7 PROJECT SPECIFIC EMPR

The project specific EMPr is presented below per specialist theme.

### 7.1 SOILS AND AGRICULTURE

**Important Note:** The Agricultural Compliance Statement has concluded that there are no additional mitigation measures required, over and above what has already been included in the Generic EMPr for overhead electricity transmission and distribution infrastructure as per Government Notice 435, which was published in Government Gazette 42323 on 22 March 2019. Please refer to Appendix C.1 of the Final BA Report for the Agricultural Compliance Statement.

### 7.2 VISUAL IMPACTS

Impact Management Outcomes: Reduce visual intrusion of construction, operational and decommissioning activities and infrastructure on the surrounding landscape and receptors.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<b>PLANNING AND DESIGN PHASE</b>						
<ul style="list-style-type: none"> <li>▪ Plan the placement of laydown areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e. in already disturbed areas) wherever possible.</li> <li>▪ Retain and maintain natural vegetation (if present) immediately adjacent to the development footprint.</li> <li>▪ Make use of existing roads wherever possible and plan the layout and construction of roads and infrastructure with due cognisance of the topography to limit cut and fill requirements.</li> <li>▪ Plan all roads, ancillary buildings and ancillary infrastructure in such a way that clearing of vegetation is minimised.</li> <li>▪ Consolidate infrastructure and make use of already disturbed sites rather than undisturbed areas.</li> <li>▪ Consult a lighting engineer in the design and planning of lighting to ensure the correct specification and placement of lighting and light fixtures for the Facility and the ancillary infrastructure. The following is recommended:</li> </ul>	To be completed post EA by relevant parties					

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Reduce visual intrusion of construction, operational and decommissioning activities and infrastructure on the surrounding landscape and receptors.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> <li>▪ Shield the sources of light by physical barriers (walls, vegetation, or the structure itself).</li> <li>▪ Limit mounting heights of fixtures, or use foot-lights or bollard lights.</li> <li>▪ Make use of minimum lumen or wattage in fixtures.</li> <li>▪ Making use of down-lighters or shielded fixtures.</li> <li>▪ Make use of Low Pressure Sodium lighting or other low impact lighting.</li> <li>▪ Make use of motion detectors on security lighting, so allowing the site to remain in darkness until lighting is required for security or maintenance purposes.</li> </ul>						
<b>CONSTRUCTION PHASE</b>						
<ul style="list-style-type: none"> <li>▪ Ensure that vegetation cover adjacent to the development footprint (if present) is not unnecessarily removed during the construction phase, where possible.</li> <li>▪ Reduce the construction phase through careful logistical planning and productive implementation of resources wherever possible.</li> <li>▪ Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.</li> <li>▪ Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.</li> <li>▪ Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent).</li> <li>▪ Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting, where possible.</li> <li>▪ Rehabilitate all disturbed areas (if present/if required) immediately after the completion of construction works.</li> </ul>			To be completed post EA by relevant parties			
<b>OPERATIONAL PHASE</b>						
<ul style="list-style-type: none"> <li>▪ Maintain roads and servitudes to forego erosion and to suppress dust.</li> <li>▪ Monitor rehabilitated areas, and implement remedial action as and when required.</li> <li>▪ Investigate and implement (should it be required) the potential to screen visual impacts at affected receptor sites.</li> </ul>			To be completed post EA by relevant parties			
<b>DECOMMISSIONING PHASE</b>						
<ul style="list-style-type: none"> <li>▪ Remove infrastructure not required for the post-decommissioning use of the site.</li> </ul>			To be completed post EA by relevant parties			

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Reduce visual intrusion of construction, operational and decommissioning activities and infrastructure on the surrounding landscape and receptors.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> <li>▪ Rehabilitate access roads and servitudes not required for the post-decommissioning use of the site. If necessary, an ecologist should be consulted to give input into rehabilitation specifications.</li> <li>▪ Monitor rehabilitated areas quarterly for at least a year following decommissioning, and implement remedial action as and when required.</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 7.3 HERITAGE IMPACTS (ARCHAEOLOGY, PALAEOLOGY, AND CULTURAL LANDSCAPE)

Impact Management Outcomes: Avoid impacts (preferred) or locate and sample or rescue sites/burials before disturbance. Rescue information, artefacts or burials before extensive damage occurs. Minimise landscape scarring						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<b>PLANNING AND DESIGN PHASE</b>						
<ul style="list-style-type: none"> <li>▪ Once construction commences all aspects of the Project should be carried out within the approved footprint so as to avoid impacts to heritage resources;</li> <li>▪ Recorded heritage features should be indicated on development plans and construction crews should be made aware that these sites should be avoided with the applicable buffer zones.</li> <li>▪ It is recommended that the EGI is micro-sited to avoid the Tree lined avenue (Feature 871 as recorded by Orton 2016).</li> <li>▪ The final pylon positions and underground powerline route should be subjected to a heritage walk down prior to development.</li> <li>▪ The heritage walk down report must be submitted to SAHRA for comments prior to the commencement of the development.</li> <li>▪ Minimum of 5 m away from all graves. The power line and associated service track must be located at least 50 m from the graves.</li> <li>▪ Minimise duration of construction period.</li> <li>▪ Make use of existing tracks where possible for final alignment.</li> <li>▪ Ensure effective rehabilitation of areas not needed during operation.</li> <li>▪ 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 (Sityhilelo Ngcatsha/Natasha Higgitt 021 202 8660) must be alerted as per section 35(3) 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.</li> <li>▪ If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Ngqabutho Madida 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.</li> </ul>	<p>To be completed post EA by relevant parties</p>					

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Avoid impacts (preferred) or locate and sample or rescue sites/burials before disturbance. Rescue information, artefacts or burials before extensive damage occurs. Minimise landscape scarring						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> <li>▪ 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</li> </ul>						
<b>CONSTRUCTION PHASE</b>						
<p><u>Archaeological and cultural impact mitigation</u></p> <ul style="list-style-type: none"> <li>▪ Regular monitoring of the development footprint by the ECO to implement the Chance Find Procedure for heritage and palaeontology resources (outlined in Section 10.2) in case heritage resources are uncovered during the course of construction.</li> <li>▪ Once construction commences all aspects of the Project should be carried out within the approved footprint so as to avoid impacts to heritage resources;</li> <li>▪ Recorded heritage features should be indicated on development plans and construction crews should be made aware that these sites should be avoided with the applicable buffer zones.</li> <li>▪ It is recommended that the EGI is micro-sited to avoid the Tree lined avenue (Feature 871 as recorded by Orton 2016).</li> <li>▪ The final pylon positions and underground powerline route should be subjected to a heritage walk down prior to development.</li> <li>▪ The heritage walk down report must be submitted to SAHRA for comments prior to the commencement of the development.</li> </ul> <p>Mminimum of 5 m away from all graves. The power line and associated service track must be located at least 50 m from the graves.</p> <ul style="list-style-type: none"> <li>▪ Minimise duration of construction period.</li> <li>▪ Make use of existing tracks where possible for final alignment.</li> <li>▪ Ensure effective rehabilitation of areas not needed during operation.</li> <li>▪ 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 (Sityhilelo Ngcatsha/Natasha</li> </ul>	<p>To be completed post EA by relevant parties</p>					

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Avoid impacts (preferred) or locate and sample or rescue sites/burials before disturbance. Rescue information, artefacts or burials before extensive damage occurs. Minimise landscape scarring						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<p>Higgitt 021 202 8660) must be alerted as per section 35(3) 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.</p> <ul style="list-style-type: none"> <li>▪ If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Ngqabutho Madida 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.</li> <li>▪ 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.</li> </ul> <p><u>Palaeontological impact mitigation</u></p> <ul style="list-style-type: none"> <li>▪ The ESO, DEO and ECO should be made aware of the possibility that fossil remains (e.g. plants and bones, etc.) may be unearthed during excavations in the north-eastern portion of the corridor as delineated in Appendix F of the EMPr.</li> <li>▪ Photographs of similar fossils must be provided to the construction contractor (as included in the Appendix E of the EMPr) and must be incorporated into the training, environmental awareness, and induction programme for construction personnel.</li> <li>▪ During excavations the rocks and discard must be given a cursory inspection by the ESO or designated person. Only if fossils are found in the delineated potential fossiliferous rock, then the Chance Fossil Finds Protocol (see Appendix E of this EMPr) must be implemented.</li> <li>▪ The standard Chance Fossil Finds Protocol must be implemented by the ECO, ESO, DEO, CEO and, where necessary, a palaeontological specialist (refer to Appendix E of this EMPr).</li> <li>▪ Construction staff sighting potential objects of palaeontological significance are to cease construction at sighted location and report to the field supervisor or Environmental Site Officer (ESO) who, in turn, must report to the ECO.</li> <li>▪ If paleontological resources are uncovered during the course of the development, a professional palaeontologist must be contracted as soon as possible to inspect the</li> </ul>						



## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Avoid impacts (preferred) or locate and sample or rescue sites/burials before disturbance. Rescue information, artefacts or burials before extensive damage occurs. Minimise landscape scarring						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<p>paleontological resource.</p> <ul style="list-style-type: none"> <li>▪ Photographs must be sent to the contracted palaeontologist for a preliminary assessment and if deemed necessary the palaeontologist should visit the site.</li> <li>▪ Significant fossil finds should be safeguarded and reported at the earliest opportunity to the SAHRA's Archaeology, Palaeontology and Meteorites (APM) Unit (Natasha Higgitt/Phillip Hine 021 462 5402) as per section 35(3) of the NHRA. Non-compliance with section 35(3) of the NHRA is an offence in terms of section 51(1)e of the NHRA and item 5 of the Schedule.</li> <li>▪ If the newly discovered resources prove to be of palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;</li> <li>▪ The contracted palaeontologist will liaise with SAHRA on the nature of the find and consequent actions (permitting and collection of find).</li> <li>▪ Any fossils found by the palaeontologist should be removed. Only a professional Palaeontologist may excavate uncovered fossils with an appropriate permit obtained from SAHRA and all fossil material collected must be properly curated in an approved repository.</li> <li>▪ Monitoring for fossil remains on an on-going basis by ESO/ DEO / CEO during the construction phase.</li> </ul>						
<b>OPERATIONAL PHASE</b>						
<ul style="list-style-type: none"> <li>▪ Ensure that the relevant construction mitigation and management measures are adhered to during the operation phase.</li> <li>▪ Ensure disturbance is kept to a minimum and does not exceed project requirements</li> <li>▪ Ensure that all maintenance vehicles and activities stay within designated areas.</li> </ul>	To be completed post EA by relevant parties					
<b>DECOMMISSIONING PHASE</b>						
<ul style="list-style-type: none"> <li>▪ Ensure that the construction mitigation and management measures are adhered to during the decommissioning phase.</li> <li>▪ Ensure disturbance is kept to a minimum and does not exceed project requirements.</li> <li>▪ Minimise duration of decommissioning period.</li> <li>▪ Monitor for the presence of fossils. Construction staff sighting potential objects of palaeontological significance are to cease construction at sighted location and report to the field supervisor who, in turn, must report to the ECO.</li> </ul>	To be completed post EA by relevant parties					

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Avoid impacts (preferred) or locate and sample or rescue sites/burials before disturbance. Rescue information, artefacts or burials before extensive damage occurs. Minimise landscape scarring						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> <li>▪ If paleontological resources are uncovered during the course of the development, a professional palaeontologist must be contracted as soon as possible to inspect the paleontological resource.</li> <li>▪ Significant fossil finds should be safeguarded and reported at the earliest opportunity to the SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit (Natasha Higgitt/Phillip Hine 021 462 5402) as per section 35(3) of the NHRA. Non-compliance with section 35(3) of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule.</li> <li>▪ 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 (Sityhilelo Ngcatsha/Natasha Higgitt 021 202 8660) must be alerted as per section 35(3) 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.</li> <li>▪ If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Ngqabutho Madida 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.</li> <li>▪ 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.</li> <li>▪ If the newly discovered resources prove to be of palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;</li> <li>▪ The contracted palaeontologist will liaise with SAHRA on the nature of the find and consequent actions (permitting and collection of find).</li> <li>▪ Any fossils found by the palaeontologist should be removed. Only a professional Palaeontologist may excavate uncovered fossils with an appropriate permit obtained from SAHRA and all fossil material collected must be properly curated in an approved repository.</li> <li>▪ Ensure effective rehabilitation of all areas after completion.</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 7.4 TERRESTRIAL BIODIVERSITY

<ul style="list-style-type: none"> <li>▪ <b>Impact Management Outcomes: Maintain all activities to the designated footprint and existing roadways or built structures. Avoidance of unnecessary disturbance to site and surrounds and established buffers where required. Ensure appropriate management of alien vegetation on site. Minimize the alteration of plant communities and species.</b></li> </ul>						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<b>PLANNING AND DESIGN PHASE</b>						
<ul style="list-style-type: none"> <li>▪ Project Developer and Appointed Ecological Specialist to ensure that the placing of infrastructure takes the sensitivity mapping of the ecological assessment into account to avoid and reduce impacts on sensitive habitats and protected species.</li> <li>▪ Ensure the necessary permits or licenses are identified and applied for as applicable. Await response and provision of permit. Undertake plant rescue if and where required by permits.</li> <li>▪ Ensure compliance with relevant Environmental Specifications for the control and removal of alien invasive plant species. Appoint a specialist or contact relevant authorities to seek guidance on the removal of the alien vegetation on site (see Appendix G). Compile and finalise invasive alien plant management programme (see Appendix G).</li> </ul>	To be completed post EA by relevant parties					
<b>CONSTRUCTION PHASE</b>						
<u>General</u> <ul style="list-style-type: none"> <li>▪ Limited development should take place within High sensitivity areas or buffer zones. Accordingly, the Watercourse habitats should be avoided for the placement of pylons and underground cabling. The Grassland should be avoided where possible, but with appropriate mitigation and rehabilitation impacts can be reduced.</li> <li>▪ No construction related activities, such as the site camp, storage of materials, temporary roads or ablution facilities may be located in the high sensitivity areas.</li> <li>▪ The topsoil and vegetation disturbed for the underground trenches must be replaced and rehabilitated where necessary.</li> <li>▪ Only the planned placement of powerlines must be disturbed. Vegetation and topsoil removal outside of these areas must be avoided.</li> <li>▪ Utilise existing access routes as far as possible.</li> <li>▪ Confine the movement of vehicles to the access routes to and from the site and to</li> </ul>	To be completed post EA by relevant parties					

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

<ul style="list-style-type: none"> <li>▪ <b>Impact Management Outcomes: Maintain all activities to the designated footprint and existing roadways or built structures. Avoidance of unnecessary disturbance to site and surrounds and established buffers where required. Ensure appropriate management of alien vegetation on site. Minimize the alteration of plant communities and species.</b></li> </ul>						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<p>the construction and operation areas.</p> <ul style="list-style-type: none"> <li>▪ Do not drive in the natural veld.</li> <li>▪ Rehabilitate new vehicle tracks and areas where the soil has been compacted as soon as possible.</li> <li>▪ Monitor the entire site for signs of erosion throughout the construction, operational and decommissioning phases of the project.</li> <li>▪ Refer to Aquatic Report mitigation measures relevant to watercourse crossings and development close to watercourses..</li> <li>▪ The site camp must not be located in high sensitivity areas and their buffer zones.</li> <li>▪ Dangerous goods may not be stored within 100 m of a watercourse – refer to the BESS assessment for more details.</li> <li>▪ Hydrocarbon fuels must be stored in a secure, bunded area.</li> <li>▪ Sufficient waste disposal bins must be available on site and clearly marked. Skip bins may be required during the construction phase which must be emptied on a regular basis.</li> <li>▪ Ablution facilities must be located outside sensitive areas and their buffer zones.</li> <li>▪ Portable abluion facilities must be regularly cleaned and maintained in good working condition.</li> <li>▪ Any spillage from abluion facilities must be cleaned up immediately and disposed of in an appropriate manner.</li> <li>▪ Vehicles must be in good working condition, with no oil, water or fuel leaks. Vehicles must be regularly inspected and any problems corrected.</li> <li>▪ Refuelling may only take place in an appropriate, bunded area. Refuelling may not take place in sensitive areas.</li> <li>▪ Hydrocarbon spills must be contained and cleaned up immediately. Spill kits must be available on site in case of accidental spillage</li> </ul> <p><u>Vegetation clearance</u></p> <ul style="list-style-type: none"> <li>▪ Avoidance is the best measure. All suitable habitats should be excluded from the proposed development, where relevant.</li> <li>▪ Where the approved layout designs impact on individuals, permit applications are required for either the relocation or destruction of provincially protected species (Free State Nature Conservation Ordinance 8 of 1969)</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

<ul style="list-style-type: none"> <li>Impact Management Outcomes: Maintain all activities to the designated footprint and existing roadways or built structures. Avoidance of unnecessary disturbance to site and surrounds and established buffers where required. Ensure appropriate management of alien vegetation on site. Minimize the alteration of plant communities and species.</li> </ul>						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> <li>Compile an alien and invasive species control and monitoring plan in terms of NEMBA</li> </ul> <p><u>Alien Invasive Plant Species Control</u></p> <ul style="list-style-type: none"> <li>Compile an alien and invasive species control and monitoring plan in terms of NEMBA.</li> <li>The removal of alien vegetation through mechanical mechanisms or application of a herbicide is likely to be required in order to curtail proliferation. The appointed ECO of the project is to be consulted prior to application of the herbicide. Appoint a specialist or contractor to undertake a sweep and survey of the final development footprint site, with an alien invasive plant management team to remove exotic vegetation prior to the commencement of construction (see Appendix G).</li> <li>Herbicides for the control of alien species should be applied according to the relevant instructions, material safety data sheets (MSDS), and by appropriately trained personnel.</li> <li>No alien species should be used in rehabilitation or landscaping.</li> <li>Cleared areas may need to be fenced-off during rehabilitation to exclude livestock and wildlife.</li> <li>Implement a monitoring program for the early detection of alien invasive plant species. Employ a control program to combat declared alien invasive plant species</li> <li>Material brought onto site e.g. building sand should be regularly checked for the germination of alien species.</li> </ul>						
OPERATIONAL PHASE						
<ul style="list-style-type: none"> <li>The loss of species composition and diversity cannot be mitigated due to a permanent structure which will change microclimatic conditions for the life of the facility operation.</li> <li>A rehabilitation plan is required to restore each habitat to a natural state that is representative of the respective vegetation type after decommissioning.</li> <li>Compile an alien and invasive species control and monitoring plan in terms of NEMBA.</li> <li>Vehicles must be in good working condition, with no oil, water or fuel leaks.</li> <li>Vehicles must be regularly inspected and any problems corrected.</li> <li>Refuelling may only take place in an appropriate, designated bunded area.</li> </ul>	To be completed post EA by relevant parties					

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

<ul style="list-style-type: none"> <li>▪ <b>Impact Management Outcomes: Maintain all activities to the designated footprint and existing roadways or built structures. Avoidance of unnecessary disturbance to site and surrounds and established buffers where required. Ensure appropriate management of alien vegetation on site. Minimize the alteration of plant communities and species.</b></li> </ul>						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> <li>▪ Any spillages must be reported immediately and dealt with appropriately.</li> <li>▪ Spill kits must be available on site in case of accidental spillage.</li> <li>▪ Sufficient waste disposal bins must be available on site and clearly marke</li> </ul>						
DECOMMISSIONING PHASE						
<ul style="list-style-type: none"> <li>▪ The loss of vegetation is unavoidable within the approved layout development footprint, but sensitive areas must be avoided.</li> <li>▪ Compile an alien and invasive species control and monitoring plan in terms of NEMBA</li> <li>▪ A rehabilitation plan is required to restore each habitat to a natural state after decommissioning.</li> <li>▪ Ensure that there is appropriate disposal of materials and waste during decommissioning activities.</li> <li>▪ Unnecessary clearance of natural vegetation should be avoided.</li> <li>▪ Excessive dust can be reduced by spraying water onto the roads or other disturbed areas during construction activities.</li> <li>▪ Areas where infrastructure are removed, must be revegetated with indigenous plant species.</li> <li>▪ No alien species should be used for rehabilitation/revegetation or any other purpose.</li> <li>▪ Implement a monitoring program for the early detection of alien invasive plant species and employ a control program to combat declared alien invasive plant species.</li> <li>▪ The use of structures which may inhibit movement of fauna, e.g. mesh or electric fencing should be avoided, where feasible.</li> </ul>	To be completed post EA by relevant parties					

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 7.5 AQUATIC BIODIVERSITY

Impact Management Outcomes: Limit the disturbance of aquatic habitat; minimise potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<b>PLANNING AND DESIGN PHASE</b>						
<ul style="list-style-type: none"> <li>▪ The proposed layout should be reviewed during the detailed design phase (post-EA, but prior to construction), by an environmental professional (e.g. EAP, ECO or ecological specialist) to confirm that the pylon structures have been placed outside of the delineated wetland and wetland buffer zones (as shown in mapped in Figure D.6).</li> <li>▪ In terms of Government Notice 509 of 2016, where the final detailed design locates power line infrastructure (e.g. pylons, etc.) within the 500 m regulated area of a watercourse, a General Authorisation must be obtained by the EA holder for the relevant section 21 water use activity as provided in the National Water Act (Act 36 of 1998), as amended,</li> <li>▪ Utilisation should be made of existing disturbed areas where possible.</li> <li>▪ Ensure that the Department of Water and Sanitation are consulted to confirm the need and requirements of a Water Use Licence. The relevant requirements of the National Water Act (Act 36 of 1998, as amended) regarding water use and pollution management must be always adhered to.</li> <li>▪ Develop an Alien Plant Control Plan which specifies actions and measurable targets (preliminary guide available in Appendix G).</li> </ul>	To be completed post EA by relevant parties					
<b>CONSTRUCTION PHASE</b>						
<ul style="list-style-type: none"> <li>▪ All contractors and staff are to be familiarised with the method statement and have undergone an induction / training on the location of sensitive No-go areas and basic environmental awareness using the mitigation provided in this report.</li> <li>▪ Access routes adjacent to the wetlands must make use of existing road ways and crossings where possible;</li> <li>▪ Areas where construction is to take place must be clearly demarcated. Any areas not demarcated must be avoided;</li> <li>▪ Storm-water generated from roadways must be captured and buffered, where flow velocities are to be significantly reduced before discharge into the environment.</li> <li>▪ Storm-water verges as well as other denuded areas must be grassed (re-vegetated) with local indigenous grasses to protect against erosion;</li> <li>▪ Any materials excavated must not be deposited in the wetlands or areas where it is</li> </ul>	To be completed post EA by relevant parties					

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Limit the disturbance of aquatic habitat; minimise potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<p>prone to being washed downstream or impeding natural flow;</p> <ul style="list-style-type: none"> <li>▪ The installation of sedimentation/erosion protection measures must be implemented before the start of construction, e.g., several rows of silt traps and fences (this is particularly important in the access roads leading or adjacent to the watercourses);</li> <li>▪ Stockpiling or storage of materials and/or waste must be placed beyond the defined buffers in this report for each respective activity;</li> <li>▪ No vehicles shall enter watercourse buffer zones outside of construction footprints;</li> <li>▪ No vehicles shall be serviced on site; a suitable workshop with appropriate pollution control facilities should be utilised offsite;</li> <li>▪ Hydrocarbons for refuelling purposes must be stored in a suitable storage device on an impermeable surface outside of the delineated wetland buffer zone;</li> <li>▪ Disturbed areas must be re-vegetated after completion of the phase;               <ul style="list-style-type: none"> <li>- A three-month timeframe for the initiation of this action;</li> <li>- Ripping of the soils should occur in two directions; and</li> <li>- Removed vegetation and topsoil can be harvested and applied here.</li> </ul> </li> <li>▪ Drainage channels constructed for the access roads must be constructed so as not to result in erosion;</li> <li>▪ An inspection of the drainage channels must be completed within 3 months following the end of activities and within a month after the first rainfall event which exceeds 50mm. Should excessive sediment be transported down the channels it is recommended that sediment screens are implemented;</li> <li>▪ Sediment screens must be inspected, maintained and cleared every month or after significant rainfall (&gt;150mm/24hrs);</li> <li>▪ An alien vegetation removal and management plan must be implemented along the verges of the roads and crossing points;</li> <li>▪ General storm-water management practices should be included in the design phase and implemented during the construction phase of this project; and</li> <li>▪ Following the completion of the phase, all construction materials and debris should be removed and disposed of in a suitable off-site area. An inspection should be completed within a week after the phase is completed.</li> <li>▪ Where trenches are required for the underground powerline, it is recommended that the removed soils are stockpiled in a sequential fashion where topsoil's are not mixed with the subsoils. Once trenching is complete and backfilling is required,</li> </ul>						



## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Limit the disturbance of aquatic habitat; minimise potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<p>these soils must be put back in the logical order with sub-soils placed in the trench and covered by topsoil's.</p> <ul style="list-style-type: none"> <li>▪ The underground powerlines must be protected from lateral sub-surface flows by using a suitable casing of the engineers choice.</li> <li>▪ Where sub-surface flows during trench construction are encountered it is recommended that trenching does not concentrate or divert these. Where there is significant sub-surface flows encountered a hydrogeology study may be required.</li> </ul>						
OPERATIONAL PHASE						
<ul style="list-style-type: none"> <li>▪ The implementation of a suitable storm-water management plan for the disturbance footprint must be in place and implemented by this phase;</li> <li>▪ The access road and silt traps (if installed) must be inspected monthly for signs of erosion. When erosion is observed, the area should be rehabilitated within 3 months. In addition, inspections following a &gt;200mm/24 hr rainfall event must occur within 3 months of the event;</li> <li>▪ An annual audit of the roads for signs of environmental disturbance outside of the footprint area must be conducted; and</li> <li>▪ Alien invasive management programmes should continue throughout the duration of the activity.</li> <li>▪ Watercourse monitoring should take place annually as part of the environmental management plan.</li> </ul> <p><u>Management of spills, stormwater and pollution</u></p> <ul style="list-style-type: none"> <li>▪ Develop norms and practices for the treatment of hydrocarbon or chemical spills such as oil or hydraulic fluid. Ensure that the required equipment is available on hand to contain any spills.</li> <li>▪ Control waste discharges and do not allow wastewater from operational activities to enter the watercourse.</li> <li>▪ Effective culverts should be incorporated into the design of access roads.</li> <li>▪ Maintenance of construction vehicles/equipment should not take place within the watercourse or watercourse buffer.</li> <li>▪ Monitoring should be done to ensure that sediment pollution is timeously dressed.</li> <li>▪ Treatment of pollution identified should be prioritized according to best practice guidelines.</li> </ul>	To be completed post EA by relevant parties					

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Limit the disturbance of aquatic habitat; minimise potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> <li>▪ Ongoing monitoring of the structures, in particular before the rainfall period, should be undertaken to ensure that the integrity of the structures is intact and that they are not blocked with debris. Ongoing monitoring post large rainfall events should also be undertaken to identify and address any erosion occurring within the watercourses.</li> <li>▪ Regular independent water quality monitoring should form part of operational procedures in order to identify pollution.</li> <li>▪ Where development activities are located upslope from wetlands, effective stormwater management should be a priority during both construction and operational phase. This should be monitored as part of the EMP.</li> </ul> <p><u>Alien Invasive Plant Species Control and Rehabilitation</u></p> <ul style="list-style-type: none"> <li>▪ Implement the Alien Plant Control Plan which was developed in the planning and design phase.</li> <li>▪ Invasive alien plant material that has been cleared should be removed from the site;</li> <li>▪ Long-term monitoring for the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish, as specified in the Alien Vegetation Management Plan.</li> <li>▪ Operational activities should not impact on rehabilitated or naturally vegetated areas.</li> <li>▪ Monitor rehabilitation and the occurrence of erosion twice during the rainy season for at least two years and take immediate corrective action where needed.</li> </ul>						
DECOMMISSIONING PHASE						
<ul style="list-style-type: none"> <li>▪ A suitable rehabilitation and closure plan must be developed for the project.</li> <li>▪ It is recommended that all infrastructure installed is effectively decommissioned and removed from the site.</li> <li>▪ All contractors and staff are to be familiarised with the method statement and have undergone an induction / training on the location of sensitive No-go areas and basic environmental awareness using the mitigation provided in this report.</li> <li>▪ Access routes into or adjacent to the wetlands must make use of existing road ways and crossings where possible;</li> <li>▪ Areas where construction is to take place must be clearly demarcated. Any areas not demarcated must be avoided;</li> <li>▪ Storm-water generated from roadways must be captured and buffered, where flow</li> </ul>						To be completed post EA by relevant parties

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Limit the disturbance of aquatic habitat; minimise potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<p>velocities are to be significantly reduced before discharge into the environment.</p> <ul style="list-style-type: none"> <li>▪ Storm-water verges as well as other denuded areas must be grassed (re-vegetated) with local indigenous grasses to protect against erosion;</li> <li>▪ Any materials excavated must not be deposited in the wetlands or areas where it is prone to being washed downstream or impeding natural flow;</li> <li>▪ The installation of sedimentation/erosion protection measures must be implemented before the start of construction, e.g., several rows of silt traps and fences (this is particularly important in the access roads leading or adjacent to the watercourses);</li> <li>▪ Stockpiling or storage of materials and/or waste must be placed beyond the defined buffers in this report for each respective activity;</li> <li>▪ No vehicles shall enter watercourse buffer zones outside of construction footprints;</li> <li>▪ No vehicles shall be serviced on site; a suitable workshop with appropriate pollution control facilities should be utilised offsite;</li> <li>▪ Hydrocarbons for refuelling purposes must be stored in a suitable storage device on an impermeable surface outside of the delineated wetland buffer zone;</li> <li>▪ Disturbed areas must be re-vegetated after completion of the phase;               <ul style="list-style-type: none"> <li>- A three-month timeframe for the initiation of this action;</li> <li>- Ripping of the soils should occur in two directions; and</li> <li>- Removed vegetation and topsoil can be harvested and applied here.</li> </ul> </li> <li>▪ Drainage channels constructed for the access roads must be constructed so as not to result in erosion;</li> <li>▪ An inspection of the drainage channels must be completed within 3 months following the end of activities and within a month after the first rainfall event which exceeds 50mm. Should excessive sediment be transported down the channels it is recommended that sediment screens are implemented;</li> <li>▪ Sediment screens must be inspected, maintained and cleared every month or after significant rainfall (&gt;150mm/24hrs);</li> <li>▪ An alien vegetation removal and management plan must be implemented along the verges of the roads and crossing points;</li> <li>▪ General storm-water management practices should be included in the design phase and implemented during the construction phase of this project; and</li> <li>▪ Following the completion of the phase, all construction materials and debris should be removed and disposed of in a suitable off-site area. An inspection should be completed</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Limit the disturbance of aquatic habitat; minimise potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<p>within a week after the phase is completed.</p> <p><u>Demarcation of Working Area</u></p> <ul style="list-style-type: none"> <li>▪ For all project-related components within the site, the aquatic features of high sensitivity should be demarcated by the appointed ECO before the commencement of the decommissioning activities and treated as no-go areas during the decommissioning phase.</li> <li>▪ Ensure that no decommissioning activities impact on the watercourse or buffer area. This includes edge effects.</li> </ul> <p><u>Waste Management and Housekeeping</u></p> <ul style="list-style-type: none"> <li>▪ Appoint a reliable contractor for the removal of refuse during the decommissioning phase.</li> <li>▪ Ensure that there is appropriate disposal of materials and waste.</li> <li>▪ Provision of adequate ablution facilities for personnel; these ablution facilities should not be placed within 100m of any of any aquatic features or its associated buffer zone delineated within the site.</li> </ul> <p><u>Management of spills, stormwater and pollution</u></p> <ul style="list-style-type: none"> <li>▪ Control of waste discharges and do not allow dirty water from decommissioning activities to enter the watercourse.</li> <li>▪ Culverts must remain in place and must not removed if the given road is not removed during the decommissioning phase.</li> <li>▪ Develop norms and practices for the treatment of hydrocarbon or chemical spills such as oil or hydraulic fluid. Ensure that the required equipment is available on hand to contain any spills.</li> <li>▪ Maintenance of construction vehicles/equipment should not take place within the watercourse or watercourse buffer.</li> <li>▪ Vehicle movement should be restricted to the minimum that is required for decommissioning. Unnecessary movement of vehicles will increase the degradation of paths and dirt roads leading to increased hardened surfaces (compaction) and consequent erosion risk.</li> <li>▪ Monitoring should be done to ensure that sediment pollution is timeously dressed.</li> <li>▪ Treatment of pollution identified should be prioritized according to best practice guidelines.</li> <li>▪ Regular independent water quality monitoring should form part of decommissioning</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Limit the disturbance of aquatic habitat; minimise potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<p>procedures in order to identify pollution.</p> <p><u>Alien Invasive Plant Species Control and Rehabilitation</u></p> <ul style="list-style-type: none"> <li>▪ Implement the Alien Plant Control Plan which was developed in the planning and design phase.</li> <li>▪ Monitor the establishment of alien invasive species within the areas affected by the decommissioning and take immediate corrective action where invasive species are observed to establish.</li> <li>▪ Invasive alien plant material that has been cleared should be removed from the site;</li> <li>▪ Long-term monitoring for the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish, as specified in the Alien Vegetation Management Plan.</li> <li>▪ Progressive rehabilitation must occur. Rehabilitation has to be take place as soon as decommissioning commences to prevent soil erosion.</li> <li>▪ Rehabilitation of any disturbed areas within the aquatic features and the recommended buffer areas should be undertaken immediately following completion of the disturbance activity according to rehabilitation measures as included in a method statement for that specific activity.</li> <li>▪ A mixture of indigenous vegetation seed must be used during rehabilitation. The mix must include: Annual and perennial species, pioneer species. These species must be indigenous to the area to ensure there is no ecological imbalance in the area.</li> <li>▪ Monitor rehabilitation and the occurrence of erosion twice during the rainy season for at least two years and take immediate corrective action where needed.</li> <li>▪ Decommissioning activities should not impact on rehabilitated or naturally vegetated areas.</li> </ul>						

**APPENDICES**

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

**7.6 AVIFAUNA IMPACTS**

Impact Management Outcomes: Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the Construction Environmental Management Programme (CEMP <sub>r</sub> ) Prevent bird collisions with the 132 kV power lines						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<b>CONSTRUCTION PHASE</b>						
<ul style="list-style-type: none"> <li>▪ Adopt temporal avoidance strategies to prevent executing the most intensive activities generating noise and dust during the most sensitive period between December to March when it is the most likely time that waterbirds will be attracted the PAOI due to the presence of water. Therefore, intensive activities (<u>e.g. trenching for the underground cable</u>) should be scheduled as far as practically possible between April-November. Note that light activities such as normal vehicle use of the roads are not affected by this mitigation measure and these may proceed year-round.</li> <li>▪ Minimise light pollution and fit external lighting with downward facing hoods.</li> <li>▪ Enforce a speed limit of 40 km/h on site.</li> <li>▪ If necessary apply dust-suppression measures (road wetting) to limit dust.</li> <li>▪ Limit the areas cleared for construction purposes (e.g. laydown areas).</li> <li>▪ Do not implement a bare earth policy for construction of road servitudes</li> <li>▪ Rehabilitate all areas disturbed immediately after construction.</li> <li>▪ Prioritise existing roads for access routes.</li> <li>▪ Develop and implement an Alien and Invasive Plant Control Plan.</li> <li>▪ All staff must undergo a strict induction process to inform them of the importance of preventing fires.</li> <li>▪ A site-specific CEMP<sub>r</sub> must be implemented, which gives appropriate and detailed description of how construction activities must be conducted. All contractors are to adhere to the CEMP<sub>r</sub> and should apply good environmental practice during construction. The CEMP<sub>r</sub> must specifically include the following:</li> <li>▪ Activity should be restricted to a working corridor as close as possible to the footprint of the infrastructure.</li> <li>▪ Vegetation clearance should be limited to what is absolutely necessary.</li> <li>▪ Driving restricted to authorised roads;</li> <li>▪ Measures to control noise and dust should be applied according to current best practice in the industry.</li> </ul>	To be completed post EA by relevant parties					

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the Construction Environmental Management Programme (CEMP). Prevent bird collisions with the 132 kV power lines						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> <li>▪ Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical.</li> <li>▪ Access to the rest of the property must be restricted.</li> <li>▪ Strict application of all recommendations in the biodiversity specialist report pertaining to the limitation of the footprint.</li> <li>▪ Entire power line to be fitted with Eskom approved Bird Flight Diverters (BFDs).</li> </ul>						
OPERATIONAL PHASE						
<ul style="list-style-type: none"> <li>▪ Limit the areas cleared for construction purposes (e.g. laydown areas).</li> <li>▪ Do not implement a bare earth policy for construction of road servitudes</li> <li>▪ Rehabilitate all areas disturbed immediately after construction.</li> <li>▪ Prioritise existing roads for access routes.</li> <li>▪ Develop and implement an Alien and Invasive Plant Control Plan.</li> <li>▪ All staff must undergo a strict induction process to inform them of the importance of preventing fires.</li> <li>▪ dopt temporal avoidance strategies to prevent executing the most intensive activities generating noise and dust during the most sensitive period between December to March when it is the most likely time that waterbirds will be attracted the PAOI due to the presence of water. Therefore, intensive activities (<u>e.g. trenching for the underground cable</u>) should be scheduled as far as practically possible between April-November. Note that light activities such as normal vehicle use of the roads are not affected by this mitigation measure and these may proceed year-round.</li> <li>▪ Minimise light pollution and fit external lighting with downward facing hoods.</li> <li>▪ Enforce a speed limit of 40 km/h on site.</li> <li>▪ If necessary apply dust-suppression measures (road wetting) to limit dust.</li> <li>▪ wherever possible, alignment to existing electrical transmission infrastructure is undertaken.</li> <li>▪ Where the creation of new transmission lines is necessary, attempts should be made to minimise the route length to the closest existing substation and that the route be aligned with existing powerlines/roads as far as possible. Additionally, the route should avoid wetland crossings or potentially be routed underground if this is not possible.</li> </ul>	To be completed post EA by relevant parties					

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the Construction Environmental Management Programme (CEMP). Prevent bird collisions with the 132 kV power lines						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> <li>▪ Install Eskom-approved bird flight diverters (flappers or coils) on the new above-ground transmission lines and any guide-wires used to anchor infrastructure such as pylons. This can help to increase the visibility of transmission lines and other infrastructure, especially the thinner earth line with which most collisions tend to be associated.</li> <li>▪ Bird flight diverters need to be closely spaced (&lt;15 m<sup>2</sup>) on OHPLs and must glow in the dark or have a light source to make the transmission lines more visible .This is specifically important because the proposed OHPL will be placed underneath existing OHPLs at right angles and will need to take every precaution to prevent collisions by flamingos that migrate at night.</li> <li>▪ Design of overhead electrical lines must take into account potential for electrocution by large species and pre-emptively avoid the likelihood of this by increasing distances between spans to avoid faecal “streamers” or large open wings creating a short.</li> <li>▪ In all areas where service road intersect with semi natural or natural habitat, all fences must be set back at least (strictly) 75 metres from the edge of every service road in order to allow for vulnerable species such as bustards, storks, cranes and korhaans to obtain adequate height after being flushed by vehicle traffic. Alternatively, the fences must be placed completely adjacent to the roads with a maximum of 3 metres buffer and marked with fence flappers in order to reduce flush-related collisions.</li> <li>▪ wherever possible, alignment to existing electrical transmission infrastructure is undertaken.</li> <li>▪ Where the creation of new transmission lines is necessary, attempts should be made to minimise the route length to the closest existing substation and that the route be aligned with existing powerlines/roads as far as possible. Additionally, the route should avoid wetland crossings or potentially be routed underground if this is not possible.</li> <li>▪ Install Eskom-approved bird flight diverters (flappers or coils) on the new above-ground transmission lines and any guide-wires used to anchor infrastructure such as pylons. This can help to increase the visibility of transmission lines and other infrastructure, especially the thinner earth line with which most collisions tend to be associated.</li> <li>▪ Bird flight diverters need to be closely spaced (&lt;15 m<sup>5</sup>) on OHPLs and must glow in the dark or have a light source to make the transmission lines more visible .This is</li> </ul>						



## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the Construction Environmental Management Programme (CEMP.) Prevent bird collisions with the 132 kV power lines						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<p>specifically important because the proposed OHPL will be placed underneath existing OHPLs at right angles and will need to take every precaution to prevent collisions by flamingos that migrate at night.</p> <ul style="list-style-type: none"> <li>▪ Design of overhead electrical lines must take into account potential for electrocution by large species and pre-emptively avoid the likelihood of this by increasing distances between spans to avoid faecal “streamers” or large open wings creating a short.</li> <li>▪ In all areas where service road intersect with semi natural or natural habitat, all fences must be set back at least (strictly) 75 metres from the edge of every service road in order to allow for vulnerable species such as bustards, storks, cranes and korhaans to obtain adequate height after being flushed by vehicle traffic. Alternatively, the fences must be placed completely adjacent to the roads with a maximum of 3 metres buffer and marked with fence flappers in order to reduce flush-related collisions.</li> </ul>						
DECOMMISSIONING PHASE						
<ul style="list-style-type: none"> <li>▪ Adopt temporal avoidance strategies to prevent executing the most intensive activities generating noise and dust during the most sensitive period between December to March when it is the most likely time that waterbirds will be attracted the PAOI due to the presence of water. Therefore, intensive activities (e.g. trenching for the underground cable) should be scheduled as far as practically possible between April-November. Note that light activities such as normal vehicle use of the roads are not affected by this mitigation measure and these may proceed year-round.</li> <li>▪ Minimise light pollution and fit external lighting with downward facing hoods.</li> <li>▪ Enforce a speed limit of 40 km/h on site.</li> <li>▪ If necessary apply dust-suppression measures (road wetting) to limit dust.</li> <li>▪ Limit the areas cleared for construction purposes (e.g. laydown areas).</li> <li>▪ Do not implement a bare earth policy for construction of road servitudes</li> <li>▪ Rehabilitate all areas disturbed immediately after construction.</li> <li>▪ Prioritise existing roads for access routes.</li> <li>▪ Develop and implement an Alien and Invasive Plant Control Plan.</li> <li>▪ All staff must undergo a strict induction process to inform them of the importance of</li> </ul>						To be completed post EA by relevant parties

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the Construction Environmental Management Programme (CEMP.) Prevent bird collisions with the 132 kV power lines						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
preventing fires.						

### 7.7 GENERIC MANAGEMENT ACTIONS TO SUPPLEMENT APPENDIX E OF THIS EMPR

Impact Management Outcomes: Ensure overall best practice is achieved.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<b>CONSTRUCTION PHASE</b>						
<ul style="list-style-type: none"> <li>▪ Ensure that the temporary site camp and ablution facilities are established at least 32 m away from the banks of the major drainage lines. The sensitivities captured in the sensitivity map included in Appendix D of this EMPr must also be considered when placing the site camp (the buffers assigned to water courses should also be avoided, where possible in this regard).</li> <li>▪ Ensure that there is no ad-hoc and indiscriminate crossing of watercourses and channels by vehicles during the construction phase. Access routes across the site should be strictly demarcated and selected with a view to minimise impacts on drainage lines. Watercourses where no construction activities are proposed must be considered as no-go areas.</li> <li>▪ Ensure that adequate containment structures are provided for the temporary storage of liquid dangerous goods and hazardous materials on site (such as chemicals, oil, fuel, hydraulic fluids, lubricating oils etc.). Appropriate bund areas must be provided for the storage of these materials at the site camp. Leak detection monitoring systems must be implemented.</li> <li>▪ Record and report all significant fuel, oil, hydraulic fluid or electrolyte spills or leaks so that appropriate clean-up measures can be implemented. A copy of these records must be made available to authorities on request throughout the project lifecycle.</li> <li>▪ The National Department of Forestry, Fisheries and the Environment and the Free</li> </ul>	To be completed post EA by relevant parties					

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Ensure overall best practice is achieved.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<p>State Department of Small Business Development, Tourism and Environmental Affairs (DESTEA) are to be immediately duly notified of any incident in terms of Section 30 of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA). In terms of Section 30 of NEMA, an “incident” means an unexpected, sudden and uncontrolled release of a hazardous substance, including from a major emission, fire or explosion, that causes, has caused or may cause significant harm to the environment, human life or property.</p> <ul style="list-style-type: none"> <li>▪ The Department of Human Settlements, Water and Sanitation must be immediately notified of any pollution to surface water or groundwater resources due to the proposed project activities.</li> <li>▪ Portable chemical toilet/s (ablution facilities) at the construction camp, must be serviced weekly for the duration of the construction phase by an appropriately licensed service provider.</li> <li>▪ Care should be taken with the installation of conservancy tanks to prevent cracks that could lead to leaks over time. Proper and regular servicing must be scheduled to prevent possible groundwater contamination.</li> <li>▪ Ensure that regular audits (i.e. twice weekly) of water systems and all water-related infrastructure (e.g. pipes, pumps, reservoirs, toilets, taps, etc.) are conducted to identify possible water leakages. Such infrastructure must be immediately repaired.</li> <li>▪ Ensure that the contact details of the local municipality, Eskom and emergency response officials, such as the police and fire department are kept on file and clearly sign-posted on site (and, where possible, at key locations along the EGI corridor).</li> <li>▪ Ensure that an open communication strategy is created and maintained between the Project Developer, Contractor and owners (or managers) of the adjacent farms where hunting takes place in order to ensure that the Project Developer and Contractor are made aware of planned hunts.</li> <li>▪ Ensure that construction personnel are made aware of the planned hunts and are trained on the necessary protocols to be taken.</li> <li>▪ Any signs of bird collisions / fatalities are to be recorded during the construction phase</li> <li>▪ An <u>Environmental File</u> is to be created by the EA holder or the contractor and be situated within the site camp throughout the construction phase and with the EA holder thereafter. The environmental file is to include the following: <ul style="list-style-type: none"> <li>- Copies of all approvals, including: Environmental Authorization, Water Use Licence and any other license/permit/approval.</li> </ul> </li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact Management Outcomes: Ensure overall best practice is achieved.						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> <li>- A copy of the approved EMPr</li> <li>- Copies of waste disposal slips</li> <li>- Disposal slips or cleaning/servicing slips for ablution facilities (i.e. chemical toilets)</li> <li>- All EMR's (Environmental Monitoring Reports) and ECO instructions</li> <li>- Copies of Environmental Induction Registers</li> <li>- A Complaints Register</li> <li>- Updated method statements</li> <li>- Material Safety Data Sheets (MSDS) for all hazardous substances utilised on site.</li> <li>- Copies of audit reports</li> <li>- An Incident Register</li> <li>- Copies of purchase orders for rehabilitation material etc.</li> </ul>						
<b>OPERATIONAL PHASE</b>						
<ul style="list-style-type: none"> <li>▪ Ensure that the relevant construction mitigation and management measures are adhered to during the operation phase.</li> </ul>	To be completed post EA by relevant parties					
<b>DECOMMISSIONING PHASE</b>						
<ul style="list-style-type: none"> <li>▪ Ensure that the relevant construction mitigation and management measures are adhered to during the decommissioning phase.</li> </ul>	To be completed post EA by relevant parties					

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

# 8 APPENDIX A – CV OF THE EAP & CO-AUTHOR

## CV OF PAUL LOCHNER

<b>Name of firm</b>	CSIR
<b>Name of staff</b>	Paul Lochner
<b>Profession</b>	Environmental Assessment and Management
<b>Position in firm</b>	Manager: CSIR Environmental Management Services
<b>Nationality</b>	South African

### Biographical Sketch

Paul Lochner is an environmental assessment practitioner (EAP) at the CSIR in Stellenbosch, with more than 28 years of experience in a wide range of environmental assessment and management studies. Paul commenced work at CSIR in 1992, after completing a B.Sc. degree in Civil Engineering and a Masters in Environmental Science, both at the University of Cape Town. His initial work at focused on wetlands and estuarine management; environmental engineering in the coastal zone; and coastal zone management plans. Since 2008, Paul has been the leader and manager of the Environmental Management Services (EMS) group within CSIR that has been at the forefront of advancing environmental assessment in South Africa. This group currently consists of approximately 10 to 20 environmental scientists, planners and engineers, with offices in Stellenbosch, Cape Town and Durban. Paul's particular experience is in environmental planning and assessment for renewable energy, electricity grid infrastructure, desalination, oil & gas, wetlands & coastal zone management, and industrial & port development. He has been closely involvement in the research and application of Strategic Environmental Assessment (SEA) in South Africa, and also has wide experience in Environmental & Social Impact Assessment, Environmental Management Programmes (EMPRs) and Environmental Screening Studies. He has been the project leader for over 40 SEAs and EIAs over the past 28 years. He also served as project leader for a suite of SEAs commissioned by the DFFE from 2014 to 2020. Paul is a Registered EAP (2019/745) with the Environmental Assessment Practitioners Association of South Africa (EAPASA).

### Tertiary Education

Year	Degree	Institution
1992	MPhil in Environmental Science	University of Cape Town
1990	BSc in Civil Engineering awarded with Honours	University of Cape Town

### Professional Registration

- Environmental Assessment Practitioners Association of South Africa (EAPASA), Registration Number 2019/745
- Member of the International Association for Impact Assessment South Africa (IAIASa)

### Employment Record

Period	Employer	Position
1992 - current	CSIR (Stellenbosch)	Environmental scientist
2008 – current	CSIR (Stellenbosch)	Group Leader

### List of Key Project Experience

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Date	Project Description	Role	Client
2022-ongoing	<b>Review of permitting and governance</b> for the Mogalakwena Mine, Limpopo	Project leader	Anglo American Platinum
2021-ongoing	<b>Advisory services for environmental permitting</b> for Anglo American's Carbon Neutrality and Smart Power projects in South Africa, Namibia, Botswana and Zimbabwe	Project leader	Anglo American Platinum
2021-ongoing	<b>Permitting strategy for innovative pilot projects</b> for the Mogalakwena platinum mine	Project leader	Anglo American Platinum
2022	<b>Opportunities and constraints analysis for offshore wind potential for South Africa - inventory and collation of spatial data</b>	Project leader	World Bank
2021-2022	<b>Environmental assessment training and support</b> to provincial government in the independent power producer sector in the Eastern Cape province	Project leader	Dept of Economic Development, Environmental Affairs & Tourism, Eastern Cape
2021	<b>Renewable Energy Feasibility Plan</b> for the Atlantis Special Economic Zone, Cape Town	Lead co-leader	Atlantis Special Economic Zone
2021	<b>Basic Assessment</b> for 1350 MW Aardvark solar PV facilities near Copperton	Project leader	ABO Wind
2020-2021	<b>Basic Assessments</b> for 1575 MW Solar Photovoltaic Facilities and associated Electrical Grid Infrastructure near Touws River, Western Cape	Project leader	Veroniva
2019	Independent Expert review of the ecology study as part of the EIA and EMPR for diamond prospecting at Bloemhof Dam Nature Reserve, North West province	Independent reviewer	DEA Appeals Office
2018-2019	Greater Saldanha Bay Strategic Environmental Assessment (SEA): Phase 1 Monitoring and Decision Support System	Project leader	Western Cape provincial government
2018-2019	Environmental Screening Study for a proposed 100 to 150 megalitre/day desalination facility for City of Cape Town, Phase 1: Pre-feasibility study	Project co-leader	City of Cape Town and iX Engineers
2018-2019	EIA for 150 MW wind power project in Ghana	Proposal and EIA Quality Assurance	Volta River Authority and Seljen Consult Ltd
2019	Environmental Assessment for the Kenhardt solar PV facility and electrical infrastructure (100 MW x 3), Northern Cape	Project leader	Scatec Solar Africa (Pty) Ltd
2017-2019	SEA for Wind & Solar Photovoltaic Energy development in South Africa (Phase 2)	Project reviewer	DEA & national Dept of Energy (DOE)
2017-2019	SEA for the Expansion of EGI Corridors in South Africa	Project reviewer	DEA, DOE, iGas, Eskom (national electricity utility)
2017-2019	SEA for Energy Corridors and development of a gas pipeline network for South Africa	Project reviewer	DEA, DOE, iGas, Eskom (national electricity utility)
2017-2019	SEA for Aquaculture Development in South Africa (marine and freshwater)	Project leader	DEA and national Dept of Agriculture Forestry and Fisheries (DAFF)
2018	Environmental Assessments for the Vryburg Solar project (115 MW x 3) in the Vryburg Renewable Energy Development Zone (REDZ)	Co-project manager and co-author	Veroniva & Scatec
2018	EIA for West Bank Waste Water Treatment works marine outfall pipeline, East London	Independent reviewer	WSP and Buffalo City Municipality
2017-2018	Site selection and environmental screening for a proposed 120 – 150 ML/day desalination plant for the City of Cape Town	Project leader	City of Cape Town and iX Engineers
2017-2018	EIA and EMP for Icyari Coltan Mine, Rwanda	Project reviewer	Mawarid Mining

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Date	Project Description	Role	Client
			Rwanda Ltd (MMRL), UAE
2016-2017	SEA for the Square Kilometre Array radio-telescope in the Karoo, South Africa	Project leader	DEA and DST
2016-2017	SEA for Shale Gas Development in the Karoo region of South Africa	Project co-leader	DEA and other government departments
2015-2016	SEA for the development of Electrical Grid Infrastructure for South Africa	Project leader	DEA and Eskom (national electricity utility)
2017	EIA for the 75 MW x 12 solar photovoltaic energy projects near Dealesville, Free State	Project leader	Mainstream Renewable Power SA
2014-2015	EIA for Ishwati Emoyeni 140 MW wind energy project and supporting electrical infrastructure at Murraysburg, Western Cape	Project leader	Windlab South Africa
2012-2015	SEA for identification of renewable energy zones for wind and solar photovoltaic projects in South Africa	Project leader	DEA and other national government departments
2012-2013	Environmental Screening Study (ESS) for a desalination plant for the City of Cape Town	Project leader	City of Cape Town & WorleyParsons
2012-2013	EIA for the desalination plant for the Saldanha area	Project leader	West Coast District Municipality & WorleyParsons
2012-2013	EIA for the manganese export terminal at the Port of Ngqura and Coega Industrial Development Zone (IDZ)	Project leader	Transnet
2011 – 2012	EIA (x2) for 100 MW solar photovoltaic project at Blocuso and 100 MW solar PV project at Roode Kop in the Northern Cape	Project leader	Mainstream Renewable Power
2011 – 2012	EIA (x2) for 75 MW solar photovoltaic project at GlenThorne and 75 MW project at Valleydora, in the Free State	Project leader	Solaire Direct
2010-2011	More than 10 Basic Environmental Assessments (BAs) for solar photovoltaic projects in the Western Cape, Northern Cape, Eastern Cape and Free State	Project leader	Conducted for Dutch, German, French and South African companies
2010/2011	EIA for a 100 MW wind project at Zuurbron and a 50 MW wind project Broadlands in the Eastern Cape	Project leader	WindCurrent SA (German-based company)
2010-2011	EIAs (x4) for the proposed InnoWind wind energy projects near Swellendam, Heidelberg, Albertinia and Mossel Bay (totalling approx 210 MW), Western Cape, South Africa	Project leader	InnoWind South Africa (Pty) Ltd
2009-2010	EIA for the proposed Electrawinds wind energy facility of 45-75 MW capacity in the Coega IDZ, Eastern Cape	Project leader	Electrawinds N.V. (Belgium)
2009-2010	EIA for proposed 180 MW Jeffreys Bay wind energy project, Eastern Cape	Project Leader and co-author	Mainstream Renewable Power South Africa
2009-2010	EIA for the proposed 70 megalitre/day desalination plant at Mile 6 near Swakopmund, Namibia	Project leader	NamWater, Namibia
2009	ESS for a proposed Deepwater Port, Container Hub and Industrial Development Zone, Ghana	Project Manager	Project Management International Pty Ltd
2009	EMP for the Operational Phase of the Berg River Dam, Franschhoek, South Africa	Project leader and report co-author	TCTA (national water supply utility), South Africa
2006	Environmental Impact Assessment (EIA) for extension of Port of Ngqura, Eastern Cape	Project Leader and co-author	Transnet National Port Authority
2004-2005	Environmental and Social Impact Assessment (ESIA) report for the proposed alumina refinery near Sosnogorsk, Komi Republic, Russia	Project manager and co-author	Komi Aluminium Russia, IFC, European Bank for

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Date	Project Description	Role	Client
			Reconstruction & Development (EBRD)
2005	Guideline for Environmental Management Plans (EMPs) for the Western Cape province	Author	Dept of Environmental Affairs & Development Planning, Western Cape
2003	Environmental Management Plan for the Operational Phase of the wetlands and canals at Century City, Cape Town	Project leader and lead author	Century City Property Owners' Association
2002	Environmental Impact Assessment for the proposed Pechiney aluminium smelter at Coega, South Africa	Project Manager and lead author	Pechiney, France
1999-2000	Cape Action Plan for the Environment: a biodiversity Strategy and Action Plan for the Cape Floral Kingdom - legal, institutional, policy, financial and socio-economic component	Project manager and contributing writer	World Wide Fund for Nature (WWF): South Africa and Global Environment Facility (GEF)
1999	Management Plan for the coastal zone between the Eerste and Lourens River, False Bay, South Africa	Project manager and lead author	Heartland Properties and Somchem (a Division of Denel)
1998	Environmental Assessment of the Mozal Matola Terminal Development proposed for the Port of Matola, Maputo, Mozambique	Project manager and author	SNC-Lavalin-EMS
1996-1997	Strategic Environmental Assessment (SEA) for the proposed Industrial Development Zone and Harbour at Coega, Port Elizabeth, South Africa	SEA project manager and report writer	Coega IDZ Initiative Section 21 Company
1995-1996	Environmental Impact Assessment and EMP for Development Scenarios for Thesen Island, Knysna, South Africa	Project manager and report writer	Thesen and Co.
1996	Environmental Impact Assessment for the Blouville wetlands at Century City, Cape Town	Project manager and report writer	Ilco Homes Ltd (now Monex Ltd)
1995	Environmental Impact Assessment for the Saldanha Steel Project, South Africa	Report author and project manager	Saldanha Steel Project
1994	Environmental Impact Assessment for the upgrading of resort facilities on Frégate Island, Seychelles	Project management, co-author, process facilitator	Schneid Israelite and Partners
1994	Environmental Impact Assessment for exploration drilling in offshore Area 2815, Namibia	Project manager and lead author	Chevron Overseas (Namibia) Limited
1994	Management Plan for the Rietvlei Wetland Reserve, Cape Town	Project manager and lead author	Southern African Nature Foundation (now WWF-SA)

### Recent Journal Publications and Peer Reviewed Papers

A comprehensive list of publications is available on request, with a summary provided below of recent journal publications, book chapters and peer reviewed conference papers:

Fischer D, Lochner P and Annergarn H, 2019. Evaluating the effectiveness of Strategic Environmental Assessment to facilitate renewable energy planning and improved decision-making: a South African case study, *Impact Assessment and Project Appraisal* - article ID: IAPA 1619389.

Cape L., Retief F., Lochner P., Fischer T., and Bond A., 2018. Exploring pluralism: Different stakeholder views of the expected and realised value of strategic environmental assessment (SEA). *Environmental Impact Assessment Review*, Volume 69, March 2018, Pages 32-41.



## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

---

Cape L., Lochner P. and Fischer D., 2017. SEAs for major infrastructure programmes in SA. *IAIA17 Conference Proceedings - 37th Annual Conference of the International Association for Impact Assessment*, 4-7 April 2017 | Le Centre Sheraton Montreal | Montreal | Canada | [www.iaia.org](http://www.iaia.org)

Schreiner, G.O., Scholes, R.J., Snyman-Van der Walt, L., De Jager, M., S, Esterhuyse., Dlodla, A., Lochner, P.A., Wright, J., Atkinson, D., Hardcastle, P., Kotze, H. 2017. Advancing a participatory and science-based approach to policy formulation for shale gas development in South Africa. *In: Eds Whitton, J., Cotton, M., Brasier, K. 2017. Citizen and other stakeholder participation in unconventional fossil fuel land use decision-making, policy formation, regulatory practice or other governance mechanisms.* London: Routledge.

Lochner P, Mabin M & Cape L, 2015, Recent Strategic Environmental Assessment experience in South Africa and national principles, in *IAIA16 (Japan) Conference Proceedings*.

### Language Capabilities

---

	Speaking	Reading	Writing
English	Excellent	Excellent	Excellent
Afrikaans	Average	Average	Average

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

---

### CV OF ABULELE ADAMS

---

## CURRICULUM VITAE – Abulele Adams Pr.Sci.Nat



Address: PO Box 320, Stellenbosch,  
7600, South Africa  
Cell : +2772 239 8220  
Email: [abuadams@gmail.com](mailto:abuadams@gmail.com)



---

<b>Present position:</b>	Senior Environmental Scientist
<b>Full Name:</b>	Adams, Abulele
<b>Professional Registration:</b>	Pr.Sci.Nat. Environmental Science – Reg 400168/17
<b>Nationality:</b>	South African
<b>Marital Status:</b>	Single
<b>Languages:</b>	English and isiXhosa
<b>Years of professional Experience:</b>	9 years

---

### BIOSKETCH

---

Abulele has been working as an environmental assessment practitioner at the Council for Scientific and Industrial Research (CSIR) since January 2014. She holds a Master of Science in Geography from the Nelson Mandela Metropolitan University (now Nelson Mandela University) in Port Elizabeth. Her undergraduate degree was a BSc in environmental science with Honors in Geographic Information Systems. She also completed a year of courses in the Sustainability Economics and Management Masters programmes at the Carl von Ossietzky University of Oldenburg, Germany.

Abulele has worked on the South African National Strategic Infrastructure Projects including the Phase 1 and Phase 2 National Wind & Solar PV Strategic Environmental Assessment (SEA), Electricity Grid Infrastructure SEA as well as the Square Kilometre Array SEA which were commissioned by the national Department of Environment, Forestry and Fisheries. In addition, she has worked on a municipal capacity development project which aims at collaborating with local municipalities to increase capacity in strategic planning areas including municipal Integrated Development Plans and Spatial Development Frameworks. Abulele is a past president of the International Association for Impact Assessment (IAIA) South Africa as well as the International Association for Impact Assessment Students and Young Professionals Section Co-Chair Committee. She is the current chair for the IAIA Climate Change Symposium taking place in Cape Town, South Africa in September 2022. She is also the recipient of the Mail and Guardian 200 Young South Africans list that celebrates young people who are making strides in their chosen fields, and charting the way for the many other South Africans.

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### PROJECT TRACK RECORD

The following table presents a list of projects that Abulele Adams has been involved in to date:

Completion Date	Project description	Role	Client	Country
In progress	<b>Development of a Research and Guidance Document</b> for the Department of Economic Development, Environmental Affairs and Tourism for Environmental Officials in Support of Environmental Assessments for Renewable energy Projects in the Eastern Cape	Project Manager	Department of Economic Development, Environmental Affairs and Tourism	South Africa
In progress	<b>Anglo Municipal Capability &amp; Partnership Programme</b>	Municipal Coordinator	Anglo American	South Africa
In progress	<b>National Foundry Technology Network Environmental Compliance and Performance Improvement for the Foundry Industry in South Africa – Phase 2</b>	Project Manager	The National Foundry Technology Network	South Africa
In progress	<b>Anglo American Smart Power</b>	Technical - GIS	Anglo American	South Africa Namibia
October 2021	<b>Biodiversity and Land use Project</b> - Development of site specific biodiversity protocols for environmental impact assessment	Project manager	South Africa National Biodiversity Institute (SANBI)	South Africa
December 2020	<b>EIA review</b> - Proposed Inyanda-Roodeplaat wind energy facility, Farm Roodeplaat Uitenhage, Eastern Cape.	Project manager Reviewer	National Department of Environment, Forestry and Fisheries	South Africa
September 2020	<b>Environmental Screening Study (x4)</b> for the development of the proposed Secunda Impumelelo and eGoli 1 Renewable Energy Facilities (REFs) and the eGoli 2 Wind Energy Facility, and BAs (x4) for the supporting electrical infrastructure	Technical - GIS	ENERTRAG South Africa (Pty) Ltd	South Africa
September 2020	<b>A desktop fatal flaw assessment</b> of the property affected by the proposed development of Project Suikerbekkie, a Solar PV energy facility near Windmeul, Western Cape Province	Project member Technical - GIS	ABO Wind Renewable Energy (Pty) Ltd	South Africa
July 2020	<b>Environmental Compliance and Performance Improvement</b> for the Foundry Industry in South Africa	Technical-GIS	The National Foundry Technology Network	South Africa
May 2020	<b>A desktop fatal flaw assessment</b> of the properties affected by the proposed development of Project Rinkhals 1 and 2, a Solar PV energy facility near Kimberley, Northern Cape Province	Project member Technical - GIS	ABO Wind Renewable Energy (Pty) Ltd	South Africa
April 2020	<b>A desktop fatal flaw assessment</b> of the	Project member	ABO Wind Renewable Energy	South Africa

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Completion Date	Project description	Role	Client	Country
	properties affected by the proposed development of two Solar PV energy projects near Kimberley, Northern Cape and Vryburg North West Province.	Technical - GIS	(Pty) Ltd	
January 2020	<b>3 x Basic Assessments</b> for Phase 2 Scatec Solar PV 4, 5 and 6 near Kenhardt, Northern Cape	Project member Technical-GIS	Scatec Africa Solar	South Africa
December 2019	<b>MCDP High Level Scan</b> of Municipal Development Planning Capacity Implications	Project member reviewer	Anglo American	South Africa
October 2019	<b>CSIR review</b> of potential for large-scale wind farm development in the Kouga area	Technical-GIS	RedCap Energy	South Africa
July 2019	<b>Environmental &amp; Social Impact Assessment</b> for the 2 x 75 MW Wind Energy Facility in the Greater Accra Region, Ghana	Project manager Technical-GIS	Volta River Authority	Ghana
October 2019	<b>Strategic Environmental Assessment (SEA)</b> for roll out of photovoltaic solar energy in South Africa Phase 2	Project manager Technical-GIS	National Department of Environmental Affairs	South Africa
August 2018	<b>Special Needs and Skills Development Programme</b>	Technical -GIS	National Department of Environmental Affairs	South Africa
May 2017	<b>Strategic Environmental Assessment (SEA)</b> for Square kilometre Array phase 1	Project member Technical-GIS	National Department of Environmental Affairs	South Africa
March 2017	<b>Basic Assessment</b> for broiler chicken farm and abattoir in Pretoria	Project manager Technical-GIS	Edward Teffu	South Africa
March 2016	<b>Strategic Environmental Assessment (SEA)</b> for Electricity Grid Infrastructure	Project member stakeholder engagement Technical -GIS and project support	National Department of Environmental Affairs	South Africa
March 2015	<b>Environmental Screening study</b> for the Amatikulu Aquaculture phase 1 project	Project member technical GIS	Department of Agriculture Forestry and Fisheries	South Africa
August 2014	<b>National Strategy for Sustainable Development review</b>	Project member research	National Department of Environmental Affairs	South Africa
December 2014	<b>Strategic Environmental Assessment (SEA)</b> for roll out of photovoltaic solar energy in South Africa.	Project member technical GIS stakeholder engagement and project support	National Department of Environmental Affairs	South Africa

---

### EMPLOYMENT RECORD

---

- **2014** Environmental Scientist and Assessment Practitioner. Council for Scientific and Industrial Research – Implementation Unit - Stellenbosch
-

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

---

### QUALIFICATIONS

- MSc Geography
    - Thesis: Towards Measuring Corporate Sustainability in the Nelson Mandela Bay Automotive Manufacturing Sector
  - BSc Hons. Geographic Information Systems
    - Modules: Human environment Interaction, Cartography, Geographic Information Systems, remote Sensing and Environmental Impact Studies
  - BSc Environmental Science
    - Majors: Botany and Geography
- 

### SHORT-COURSES, CONFERENCES GUEST LECTURES AND WORKSHOPS

Date	Workshop and conference description	Location
September 2022	International Association for Impact Assessment Climate Change Symposium	Cape Town, South Africa
May 2022	NCPC-SA 5th biennial Industrial Efficiency Conference on 25 and 26 May 2022	Pretoria, South Africa
May 2022	International Association for Impact Assessment Annual Conference	Vancouver, Canada
October 2021	WindAc Africa	Cape Town, South Africa
September 2021	International Association for Impact Assessment South Africa National Conference	Online
October 2020	Windaba	Online
May 2020	International Association for Impact Assessment Annual Conference	Online
September 2019	Conference on Wind Energy and Wildlife Impacts	Stirling, Scotland
August 2019	International Association for Impact Assessment South Africa National Conference	Bela-Bela, South Africa
May 2019	International Association for Impact Assessment Annual Conference	Brisbane, Australia
May 2018	International Association for Impact Assessment Annual Conference	Durban, South Africa
August 2017	Guest lecture on strategic environmental assessment for the strategic infrastructure projects in support of the SA national development plan	University of Cape Town
October 2016	Project Management Principles and Practices with MS 2 accreditation through the University of Pretoria	Pretoria, South Africa
August 2016	International Association for Impact Assessment South Africa National Conference	Port Elizabeth, South Africa
September 2015	International Renewable Energy Conference on renewable energy resource data for Africa	Nairobi, Kenya
July 2015	Project Management 1 accreditation through the CSIRs Innovation Leadership and Learning Academy Project Management Course	Pretoria, South Africa
February 2015	IAIA WC Workshop for Integrating Climate Change into EIA practice	Cape Town, South Africa
January 2015	CSIR Media & Science Communication Training on January 2015 at CSIR Stellenbosch	Stellenbosch, South Africa

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Date	Workshop and conference description	Location
August 2014	International Association for Impact Assessment South Africa National Conference from August 2014	Midrand, South Africa
June 2014	Society of South African Geographers Annual Conference	East London, South Africa
November 2014	Clim-A-Net workshop - DAAD Germany-South Africa exchange programme	Port Elizabeth, South Africa
April 2014	Clim-A-Net workshop – DAAD Germany-South Africa exchange programme	Lushoto, Tanzania
June 2012	Clim-A-Net workshop - DAAD Germany-South Africa exchange programme - Summer School programme	Oldenburg, Germany

---

### LANGUAGES

	Speaking	Reading	Writing
<b>isiXhosa (Home language)</b>	Excellent	Excellent	Excellent
<b>English</b>	Excellent	Excellent	Excellent
<b>isiZulu</b>	Fair	Fair	Fair
<b>Afrikaans</b>	Basic	Basic	Basic

---

### PROFESSIONAL AFFILIATIONS

- South African Council for Natural Scientific Professions (SACNASP) Professional Natural Scientist (Membership number: 400168/17)
- International Association for Impact Assessment (IAIA) South Africa National Executive Committee member 2017 – current. Membership Number 3583

---

### Awards

- 2019** Mail and Guardian 200 Young South Africans – Environment Category
- 2018** International Association for Impact Assessment (IAIA) award to the DEA- CSIR-SANBI team for their role in the advancement of environmental assessment in southern Africa, through the program of SEAs conducted for energy planning for South Africa over the past 5 years
- 2016** International Association for Impact Assessment (IAIA) South Africa National Conference - best poster
- 2015** CSIR Implementation Unit Excellence Awards: Outstanding Contribution by a Team - National Wind and Solar PV and Electricity Grid Infrastructure Strategic Environmental Assessments
- 2012** Golden Key International Academic Honours Association

## **APPENDICES**

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

---

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

# 9 APPENDIX B – ROLES AND RESPONSIBILITIES

Responsible Person(s)	Role and Responsibilities
<p>Developer’s Project Manager (DPM) or Project Developer</p> <p>In the VOLTA PV project, this is also referred to as the Project Owner.</p> <p>During the Operational Phase, the owner is referred to as the Facilities Manager.</p>	<p><u>Role</u> The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). Where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation, and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- Be fully conversant with the conditions of the EA;</li> <li>- Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s);</li> <li>- Issuing of site instructions to the Contractor for corrective actions required;</li> <li>- Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings. Overall management of the project and EMPr implementation; and</li> <li>- Ensure that periodic environmental performance audits are undertaken on the project implementation.</li> </ul>
<p>Developer Site Supervisor (DSS)</p> <p>In the VOLTA project, this is also referred to as the Project Owner’s Site Supervisor</p>	<p><u>Role</u> The DSS reports directly to the DPM, oversees site works, liaises with the contractor(s) and the ECO. The DSS is responsible for the day to day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMPr.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- Ensure that all contractors identify a contractor’s Environmental Officer (cEO);</li> <li>- Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM and ECO;</li> <li>- Must ensure that all landowners have the relevant contact details of the site staff, ECO and cEO;</li> <li>- Issuing of site instructions to the Contractor for corrective actions required;</li> <li>- Will issue all non-compliances to contractors; and</li> <li>- Ratify the Monthly Environmental Report.</li> </ul>
<p>Environmental Control Officer (ECO)</p> <p>The independent ECO reports to the Project Owner.</p>	<p><u>Role</u> The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. The ECO provides feedback to the DSS and Project Manager</p>



## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Responsible Person(s)	Role and Responsibilities
	<p>regarding all environmental matters. The Contractor, cEO and dEO are answerable to the Environmental Control Officer for non-compliance with the Performance Specifications as set out in the EA and EMPr.</p> <p>The ECO provides feedback to the DSS and Project Manager, who in turn reports back to the Contractor and potential and Registered Interested &amp; Affected Parties' (RI&amp;AP's), as required. Issues of non-compliance raised by the ECO must be taken up by the Project Manager, and resolved with the Contractor as per the conditions of his contract. Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the Project Manager. The ECO must also, as specified by the EA, report to the relevant CA as and when required.</p> <p><u>Responsibilities</u></p> <p>The responsibilities of the ECO will include the following:</p> <ul style="list-style-type: none"> <li>- Be aware of the findings and conclusions of all EA related to the development;</li> <li>- Be familiar with the recommendations and mitigation measures of this EMPr;</li> <li>- Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them;</li> <li>- Undertake regular and comprehensive site inspections / audits of the construction site according to the generic EMPr and applicable licenses in order to monitor compliance as required;</li> <li>- Educate the construction team about the management measures contained in the EMPr and environmental licenses;</li> <li>- Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective;</li> <li>- Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements;</li> <li>- In consultation with the Developer Site Supervisor order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses;</li> <li>- Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns;</li> <li>- Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr;</li> <li>- Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO);</li> <li>- Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc.) as well as corrective and preventive actions taken;</li> <li>- Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken;</li> <li>- Assisting in the resolution of conflicts;</li> <li>- Facilitate training for all personnel on the site – this may range from carrying out the training, to reviewing the training programmes of the Contractor;</li> <li>- In case of non-compliances, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-</li> </ul>

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Responsible Person(s)	Role and Responsibilities
	<p>compliance;</p> <ul style="list-style-type: none"> <li>- Maintenance, update and review of the EMPr;</li> <li>- Communication of all modifications to the EMPr to the relevant stakeholders.</li> </ul>
<p>developer Environmental Officer (dEO)</p> <p>In the VOLTA project, this is also referred to as the Project Owner's Environmental Officer</p>	<p><u>Role</u></p> <p>The dEOs will report to the Project Manager and are responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- Be fully conversant with the EMPr;</li> <li>- Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures;</li> <li>- Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s) ;</li> <li>- Confine the development site to the demarcated area;</li> <li>- Conduct environmental internal audits with regards to EMPr and authorisation compliance (on cEO);</li> <li>- Assist the contractors in addressing environmental challenges on site;</li> <li>- Assist in incident management:</li> <li>- Reporting environmental incidents to developer and ensuring that corrective action is taken, and lessons learnt shared;</li> <li>- Assist the contractor in investigating environmental incidents and compile investigation reports;</li> <li>- Follow-up on pre-warnings, defects, non-conformance reports;</li> <li>- Measure and communicate environmental performance to the Contractor;</li> <li>- Conduct environmental awareness training on site together with ECO and cEO;</li> <li>- Ensure that the necessary legal permits and / or licenses are in place and up to date;</li> <li>- Acting as Developer's Environmental Representative on site and work together with the ECO and contractor;</li> </ul>
<p>Contractor</p> <p>In the VOLTA project, this is also referred to as the Engineering, Construction and Procurement (EPC) Contractor.</p> <p>In the Operations phase, the contractor responsible for the VOLTA facility and associated EGI is referred to as the Operations and</p>	<p><u>Role</u></p> <p>The Contractor appoints the cEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr while performing the onsite activities as per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion of substation infrastructure for the transmission and distribution of electricity activities.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- project delivery and quality control for the development services as per appointment;</li> <li>- employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site</li> </ul>

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

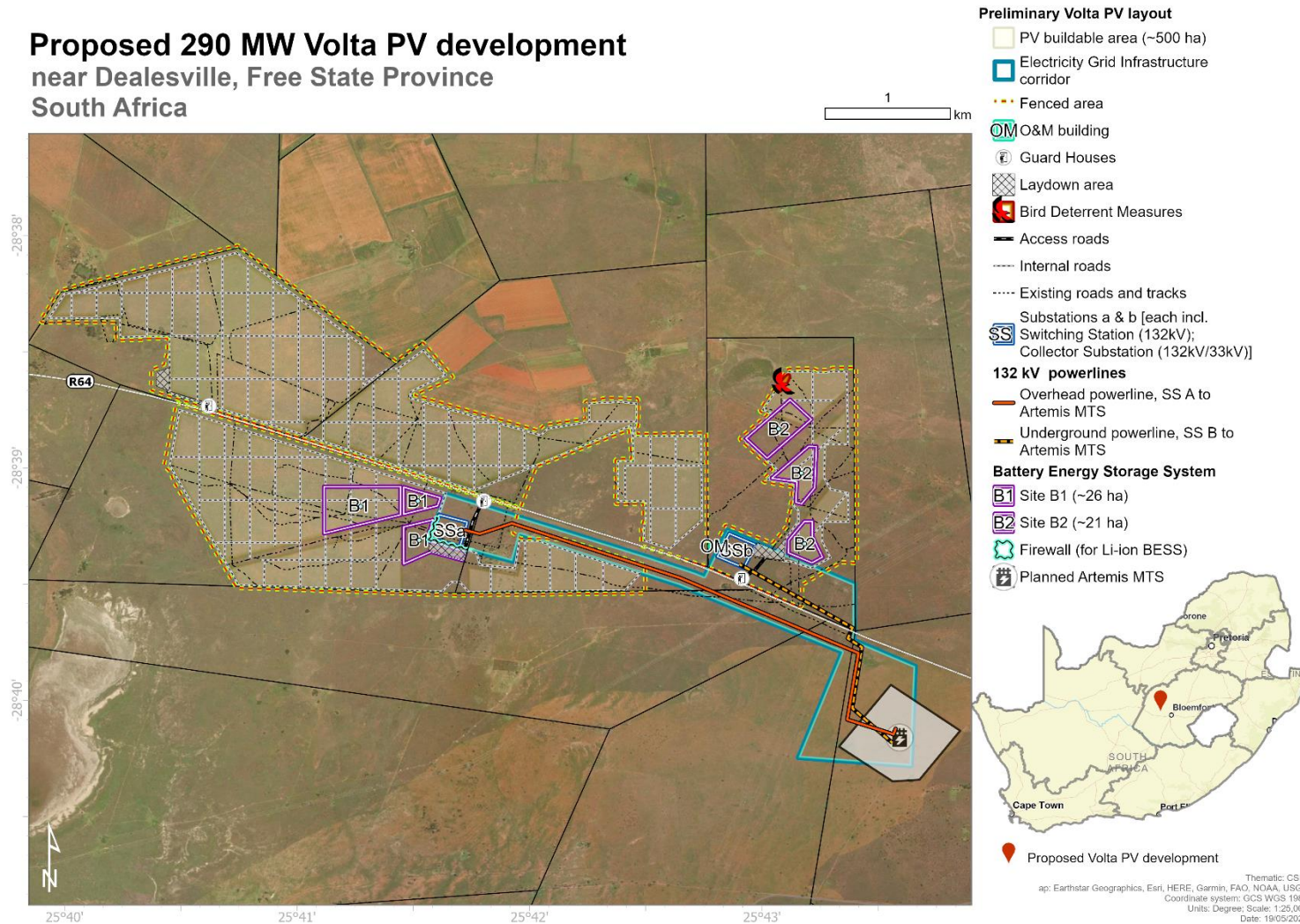
Responsible Person(s)	Role and Responsibilities
Maintenance (O&M) Contractor.	<p>during the construction period;</p> <ul style="list-style-type: none"> <li>- ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely;</li> <li>- attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones;</li> <li>- ensure that contractors' staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in EMPr, to the satisfaction of the ECO.</li> </ul>
contractor Environmental Officer (cEO)	<p><u>Role</u></p> <p>Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria:</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- Be on site throughout the duration of the project and be dedicated to the project;</li> <li>- Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site;</li> <li>- Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr and Method Statements;</li> <li>- Attend the Environmental Site Meeting;</li> <li>- Undertaking corrective actions where non-compliances are registered within the stipulated timeframes;</li> <li>- Report back formally on the completion of corrective actions;</li> <li>- Assist the ECO in maintaining all the site documentation;</li> <li>- Prepare the site inspection reports and corrective action reports for submission to the ECO;</li> <li>- Assist the ECO with the preparing of the monthly report; and</li> <li>- Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint a cEO representing that company.</li> </ul>

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

# 10 APPENDIX C – SITE LAYOUT

## Proposed 290 MW Volta PV development near Dealesville, Free State Province South Africa



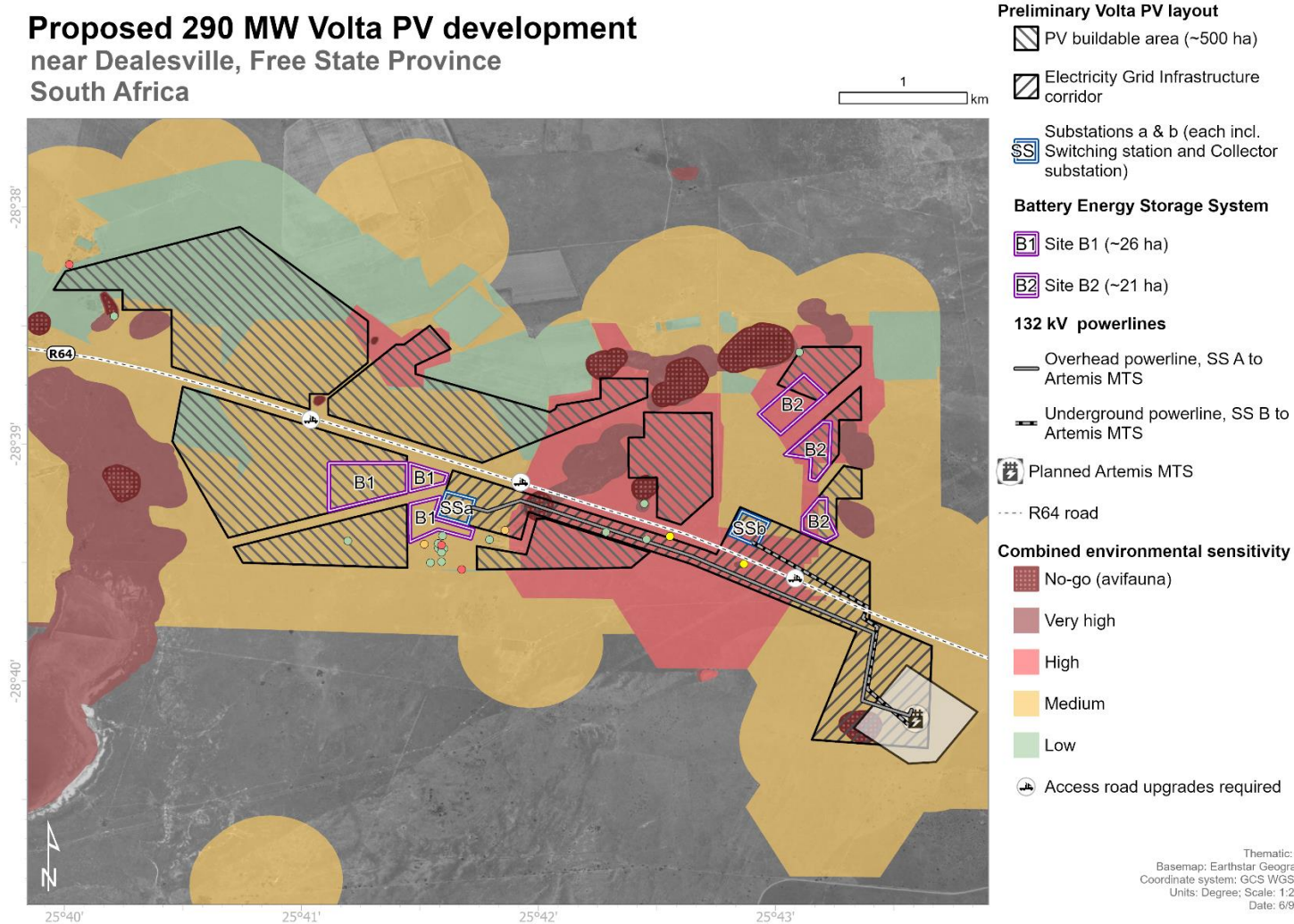
**Appendix C, Map 1: Locality map showing the proposed 132 kV overhead and underground power line routing (This EMPr covers the overhead powerline).**

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

# 11 APPENDIX D – COMBINED LAYOUT AND SENSITIVITY MAP

### Proposed 290 MW Volta PV development near Dealesville, Free State Province South Africa



**Appendix D, Map 1: Combined Sensitivity Map for the proposed project**

**APPENDICES**

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

# 12 APPENDIX E – PRE-APPROVED GAZETTED EMPR FOR POWER LINE DEVELOPMENT (GN 435)

**PRE-APPROVED GENERIC EMPR TEMPLATE FOR OVERHEAD ELECTRICITY TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE GOVERNMENT GAZETTE 42323, GOVERNMENT NOTICE 435**

**SECTION 5: IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS**

This section provides a pre-approved generic EMPr template with aspects that are common to the development of overhead electricity transmission and distribution infrastructure. There is a list of aspects identified for the development or expansion of overhead electricity transmission and distribution infrastructure, and for each aspect a set of prescribed impact management outcomes and associated impact management actions have been identified. Holders of EAs are responsible to ensure the implementation of these outcomes and actions for all projects as a minimum requirement, in order to mitigate the impact of such aspects identified for the development or expansion of overhead electricity transmission and distribution infrastructure.

The template provided below is to be completed by providing the information under each heading for each environmental impact management action.

The completed template must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must also be duly signed and dated on each page by the contractor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

*5.1 Environmental awareness training*

Impact management outcome: All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All staff must receive environmental awareness training prior to commencement of the activities;</li> <li>- The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course;</li> <li>- Refresher environmental awareness training is available as and when required;</li> <li>- All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr;</li> <li>- The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum:</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact management outcome: All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>a) Safety notifications; and</li> <li>b) No littering.</li> <li>– Environmental awareness training must include as a minimum the following:               <ul style="list-style-type: none"> <li>a) Description of significant environmental impacts, actual or potential, related to their work activities;</li> <li>b) Mitigation measures to be implemented when carrying out specific activities;</li> <li>c) Emergency preparedness and response procedures;</li> <li>d) Emergency procedures;</li> <li>e) Procedures to be followed when working near or within sensitive areas;</li> <li>f) Wastewater management procedures;</li> <li>g) Water usage and conservation;</li> <li>h) Solid waste management procedures;</li> <li>i) Sanitation procedures;</li> <li>j) Fire prevention; and</li> <li>k) Disease prevention.</li> </ul> </li> <li>– A record of all environmental awareness training courses undertaken as part of the EMPr must be available;</li> <li>– Educate workers on the dangers of open and/or unattended fires;</li> <li>– A staff attendance register of all staff to have received environmental awareness training must be available.</li> <li>– Course material must be available and presented in appropriate languages that all staff can understand.</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 5.2. Site Establishment development

Impact management outcome: Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;</li> <li>- Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through;</li> <li>- Sites must be located where possible on previously disturbed areas;</li> <li>- The camp must be fenced in accordance with <i>Section 5.5: Fencing and gate installation</i>; and</li> <li>- The use of existing accommodation for contractor staff, where possible, is encouraged.</li> </ul>						

### 5.3. Access restricted areas

Impact management outcome: Access to restricted areas prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any additional areas identified during development;</li> <li>- Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate; and</li> <li>- Unauthorised access and development related activity inside access restricted areas is prohibited.</li> </ul>						



## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 5.4. Access roads

Impact management outcome: Minimise impact to the environment through the planned and restricted movement of vehicles on site.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Access to the servitude and tower positions must be negotiated with the relevant landowner and must fall within the assessed and authorised area;</li> <li>- An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities;</li> <li>- The access roads to tower positions must be signposted after access has been negotiated and before the commencement of the activities;</li> <li>- All private roads used for access to the servitude must be maintained and upon completion of the works, be left in at least the original condition</li> <li>- All contractors must be made aware of all these access routes.</li> <li>- Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense;</li> <li>- Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads;</li> <li>- In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with <i>section 4.9: photographic record</i>; prior to use and the condition thereof agreed by the landowner, the DPM, and the contractor;</li> <li>- Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands</li> <li>- Access roads must only be developed on pre-planned and approved roads.</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 5.5. Fencing and Gate installation

Impact management outcome: Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Use existing gates provided to gain access to all parts of the area authorised for development, where possible;</li> <li>- Existing and new gates to be recorded and documented in accordance with section 4.9: <i>photographic record</i>;</li> <li>- All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner;</li> <li>- At points where the line crosses a fence in which there is no suitable gate within the extent of the line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner;</li> <li>- Care must be taken that the gates must be so erected that there is a gap of no more than 100 mm between the bottom of the gate and the ground;</li> <li>- Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate;</li> <li>- Original tension must be maintained in the fence wires;</li> <li>- All gates installed in electrified fencing must be re-electrified;</li> <li>- All demarcation fencing and barriers must be maintained in good working order for the duration of overhead transmission and distribution electricity infrastructure development activities;</li> <li>- Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where appropriate and would not cause harm to the sensitive flora;</li> <li>- Any temporary fencing to restrict the movement of live-stock must only be erected with the permission of the landowner.</li> <li>- All fencing must be developed of high quality material bearing the SABS mark;</li> <li>- The use of razor wire as fencing must be avoided;</li> <li>- Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from site. Site security will be required at all times;</li> <li>- On completion of the development phase all temporary fences are to be removed;</li> <li>- The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely.</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 5.6. Water Supply Management

Impact management outcome: Undertake responsible water usage.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All abstraction points or bore holes must be registered with the DHSWS and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis;</li> <li>- The Contractor must ensure the following:                             <ul style="list-style-type: none"> <li>a. The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river;</li> <li>b. No damage occurs to the river bed or banks and that the abstraction of water does not entail stream diversion activities; and</li> <li>c. All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented.</li> </ul> </li> <li>- Ensure water conservation is being practiced by:                             <ul style="list-style-type: none"> <li>a. Minimising water use during cleaning of equipment;</li> <li>b. Undertaking regular audits of water systems; and</li> <li>c. Including a discussion on water usage and conservation during environmental awareness training.</li> <li>d. The use of grey water is encouraged.</li> </ul> </li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 5.7. Storm- and wastewater management

Impact management outcome: Impacts to the environment caused by stormwater and wastewater discharges during construction are avoided.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the project manager;</li> <li>- All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility;</li> <li>- Natural stormwater runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO;</li> <li>- Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the Project Manager's approval and support by the ECO.</li> </ul>						

### 5.8. Solid and hazardous waste management

Impact management outcome: Waste is appropriately stored, handled and safely disposed of at a recognised waste facility.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All measures regarding waste management must be undertaken using an integrated waste management approach;</li> <li>- Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided;</li> <li>- A suitably positioned and clearly demarcated waste collection site must be identified and provided;</li> <li>- The waste collection site must be maintained in a clean and orderly manner;</li> <li>- Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal;</li> <li>- Staff must be trained in waste segregation;</li> <li>- Bins must be emptied regularly;</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact management outcome: Waste is appropriately stored, handled and safely disposed of at a recognised waste facility.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company;</li> <li>- Hazardous waste must be disposed of at a registered waste disposal site;</li> <li>- Certificates of safe disposal for general, hazardous and recycled waste must be maintained.</li> </ul>						

### 5.9. Protection of watercourses and estuaries

Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All watercourses must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities;</li> <li>- In the event of a spill, prompt action must be taken to clear the polluted or affected areas;</li> <li>- Where possible, no development equipment must traverse any seasonal or permanent wetland</li> <li>- No return flow into the estuaries must be allowed and no disturbance of the Estuarine Functional Zone should occur;</li> <li>- Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available;</li> <li>- There must not be any impact on the long term morphological dynamics of watercourses or estuaries;</li> <li>- Existing crossing points must be favored over the creation of new crossings (including temporary access)</li> <li>- When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken:             <ul style="list-style-type: none"> <li>a) Water levels during the period of construction;</li> <li>b) No altering of the bed, banks, course or characteristics of a watercourse</li> <li>c) During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained;</li> </ul> </li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p>d) Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and</p> <p>e) Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows.</p>						

### 5.10. Vegetation clearing

Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p>General:</p> <ul style="list-style-type: none"> <li>- Indigenous vegetation which does not interfere with the development must be left undisturbed;</li> <li>- Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species;</li> <li>- Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing;</li> <li>- Permits for removal must be obtained from the Department of Agriculture, Forestry and Fisheries prior to the cutting or clearing of the affected species, and they must be filed;</li> <li>- The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals;</li> <li>- Trees felled due to construction must be documented and form part of the</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p>Environmental Audit Report;</p> <ul style="list-style-type: none"> <li>– Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris;</li> <li>– Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained;</li> <li>– A daily register must be kept of all relevant details of herbicide usage;</li> <li>– No herbicides must be used in estuaries;</li> <li>– All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance to <i>Section 5.3: Access restricted areas</i>.</li> </ul> <p>Servitude:</p> <ul style="list-style-type: none"> <li>– Vegetation that does not grow high enough to cause interference with overhead transmission and distribution infrastructures, or cause a fire hazard to any plantation, must not be cut or trimmed unless it is growing in the road access area, and then only at the discretion of the Project Manager;</li> <li>– Where clearing for access purposes is essential, the maximum width to be cleared within the servitude must be in accordance to distance as agreed between the land owner and the EA holder</li> <li>– Alien invasive vegetation must be removed according to a plan (in line with relevant municipal and provincial procedures, guidelines and recommendations) and disposed of at a recognised waste disposal facility;</li> <li>– Vegetation must be trimmed where it is likely to intrude on the minimum vegetation clearance distance (MVCD) or will intrude on this distance before the next scheduled clearance. MVCD is determined from SANS 10280;</li> <li>– Debris resulting from clearing and pruning must be disposed of at a recognised waste disposal facility, unless the landowners wish to retain the cut vegetation;</li> <li>– In the case of the development of new overhead transmission and distribution infrastructures, a one metre “trace-line” must be cut through the vegetation for stringing purposes only and no vehicle access must be cleared along the “trace-line”. Alternative methods of stringing which limit impact to the environment must always be considered.</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 5.11. Protection of fauna

Impact management outcome: Minimise disturbance to fauna.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present;</li> <li>- The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme;</li> <li>- Breeding sites must be kept intact and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present;</li> <li>- Nesting sites on existing parallel lines must documented;</li> <li>- Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds;</li> <li>- Bird guards and diverters must be installed on the new line as per the recommendations of the specialist;</li> <li>- No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be marked as Access restricted areas;</li> <li>- No deliberate or intentional killing of fauna is allowed;</li> <li>- In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up, being electrocuted and causing power outages; and</li> <li>- No Threatened or Protected species (ToPs) and/or protected fauna as listed according NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/or relocated without appropriate authorisations/permits.</li> </ul>						



## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 5.12. Protection of heritage resources

Impact management outcome: Minimise impact to heritage resources.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Identify, demarcate and prevent impact to all known sensitive heritage features on site in accordance with the No-go procedure in <i>Section 5.3: Access restricted areas</i>;</li> <li>– Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance;</li> <li>– All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/ palaeontologist (or the South African Police Services), so that a systematic and professional investigation can be undertaken. Sufficient time must be allowed to remove/collect such material before development recommences.</li> </ul>						

### 5.13. Safety of the public

Impact management outcome: All precautions are taken to minimise the risk of injury, harm or complaints.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc.;</li> <li>– All unattended open excavations must be adequately fenced or demarcated;</li> <li>– Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding;</li> <li>– Ensure structures vulnerable to high winds are secured;</li> <li>– Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 5.14. Sanitation

Impact management outcome: Clean and well maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Mobile chemical toilets are installed onsite if no other ablution facilities are available;</li> <li>- The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances;</li> <li>- Where mobile chemical toilets are required, the following must be ensured:                             <ul style="list-style-type: none"> <li>a) Toilets are located no closer than 100 m to any watercourse or water body;</li> <li>b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause;</li> <li>c) No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the EMPr;</li> <li>d) Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out;</li> <li>e) Toilets are emptied before long weekends and workers holidays, and must be locked after working hours;</li> <li>f) Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards;</li> </ul> </li> <li>- A copy of the waste disposal certificates must be maintained.</li> </ul>						

### 5.15. Prevention of disease

Impact Management outcome: All necessary precautions linked to the spread of disease are taken.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Undertake environmentally-friendly pest control in the camp area;</li> <li>- Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS;</li> <li>- The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area;</li> <li>- Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable;</li> <li>- Free condoms must be made available to all staff on site at central points;</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

<ul style="list-style-type: none"> <li>- Medical support must be made available;</li> <li>- Provide access to Voluntary HIV Testing and Counselling Services.</li> </ul>						
--	--	--	--	--	--	--

### 5.16. Emergency procedures

Impact management outcome: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project;</li> <li>- The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation;</li> <li>- All staff must be made aware of emergency procedures as part of environmental awareness training;</li> <li>- The relevant local authority must be made aware of a fire as soon as it starts;</li> <li>- In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see <i>Hazardous Substances section 5.17</i>).</li> </ul>						

### 5.17. Hazardous substances

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible;</li> <li>- All hazardous substances must be stored in suitable containers as defined in the Method Statement;</li> <li>- Containers must be clearly marked to indicate contents, quantities and safety requirements;</li> <li>- All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers;</li> <li>- Bunded areas to be suitably lined with a SABS approved liner;</li> <li>- An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis;</li> <li>- All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS);</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet;</li> <li>- Employees handling hazardous substances / materials must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment must be made available;</li> <li>- The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers;</li> <li>- The tanks/ bowsers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/ bowsers (110% statutory requirement plus an allowance for rainfall);</li> <li>- The floor of the bund must be sloped, draining to an oil separator;</li> <li>- Provision must be made for refueling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained;</li> <li>- All empty externally dirty drums must be stored on a drip tray or within a bunded area;</li> <li>- No unauthorised access into the hazardous substances storage areas must be permitted;</li> <li>- No smoking must be allowed within the vicinity of the hazardous storage areas;</li> <li>- Adequate fire-fighting equipment must be made available at all hazardous storage areas;</li> <li>- Where refueling away from the dedicated refueling station is required, a mobile refueling unit must be used. Appropriate ground protection such as drip trays must be used;</li> <li>- An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substance must be available at all times;</li> <li>- The responsible operator must have the required training to make use of the spill kit in emergency situations;</li> <li>- An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken;</li> <li>- In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to <i>Section 5.7</i> for procedures concerning <i>storm- and wastewater management</i> and <i>5.8</i> for <i>solid and hazardous waste</i></li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<i>management.</i>						

### 5.18. Workshop, equipment maintenance and storage

Impact management outcome: Soil, surface water and groundwater contamination is minimised.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area;</li> <li>- During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts;</li> <li>- Leaking equipment must be repaired immediately or be removed from site to facilitate repair;</li> <li>- Workshop areas must be monitored for oil and fuel spills;</li> <li>- Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available;</li> <li>- The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil / water separator where maintenance work on vehicles and equipment can be performed;</li> <li>- Water drainage from the workshop must be contained and managed in accordance <i>Section 5.7: storm- and wastewater management.</i></li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 5.19. Batching plants

Impact management outcome: Minimise spillages and contamination of soil, surface water and groundwater.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Concrete mixing must be carried out on an impermeable surface;</li> <li>- Batching plants areas must be fitted with a containment facility for the collection of cement laden water.</li> <li>- Dirty water from the batching plant must be contained to prevent soil and groundwater contamination</li> <li>- Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains;</li> <li>- A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted;</li> <li>- Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility;</li> <li>- Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site;</li> <li>- Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to <i>Section 5.20: Dust emissions</i>)</li> <li>- Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility;</li> <li>- Temporary fencing must be erected around batching plants in accordance with <i>Section 5.5: Fencing and gate installation</i>.</li> </ul>						

### 5.20. Dust emissions

Impact management outcome: Dust prevention measures are applied to minimise the generation of dust.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO;</li> <li>- Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re- vegetated or stabilised as soon as is practically possible;</li> <li>- Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present;</li> <li>- During high wind conditions, the ECO must evaluate the situation and make</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact management outcome: Dust prevention measures are applied to minimise the generation of dust.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
recommendations as to whether dust-damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level; <ul style="list-style-type: none"> <li>– Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind;</li> <li>– Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO;</li> <li>– Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas;</li> <li>– Straw stabilisation must be applied at a rate of one bale/10 m<sup>2</sup> and harrowed into the top 100 mm of top material, for all completed earthworks;</li> <li>– For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.</li> </ul>						

### 5.21. Blasting

Impact management outcome: Impact to the environment is minimised through a safe blasting practice.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Any blasting activity must be conducted by a suitably licensed blasting contractor; and</li> <li>– Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site.</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 5.22. Noise

Impact Management outcome: Unnecessary noise is prevented by ensuring that noise from construction activities is mitigated.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only;</li> <li>- All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained;</li> <li>- Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers;</li> <li>- Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management outcome related to noise management.</li> </ul>						

### 5.23. Fire prevention

Impact management outcome: Prevention of uncontrollable fires.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Designate smoking areas where the fire hazard could be regarded as insignificant;</li> <li>- Firefighting equipment must be available on all vehicles located on site;</li> <li>- The local Fire Protection Agency (FPA) must be informed of construction activities;</li> <li>- Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site;</li> <li>- Two way swop of contact details between ECO and FPA.</li> </ul>						



## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 5.24. Stockpiling and stockpile areas

Impact management outcome: Erosion and sedimentation as a result of stockpiling are reduced.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to minimise impacts to watercourses, watercourses and water bodies;</li> <li>- All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods;</li> <li>- Topsoil stockpiles must not exceed 2 m in height;</li> <li>- During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.);</li> <li>- Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material.</li> </ul>						

### 5.25. Finalising tower positions

Impact management outcome: No environmental degradation occurs as a result of the survey and pegging operations.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- No vegetation clearing must occur during survey and pegging operations;</li> <li>- No new access roads must be developed to facilitate access for survey and pegging purposes;</li> <li>- Project manager, botanical specialist and contractor to agree on final tower positions based on survey within assessed and approved areas;</li> <li>- The surveyor is to demarcate (peg) access roads/tracks in consultation with ECO. No deviations will be allowed without the prior written consent from the ECO.</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 5.26. Excavation and Installation of foundations

Impact management outcome: No environmental degradation occurs as a result of excavation or installation of foundations.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a recognised disposal site, if not used for backfilling purposes;</li> <li>- Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes;</li> <li>- Management of equipment for excavation purposes must be undertaken in accordance with <i>Section 5.18: Workshop equipment maintenance and storage</i>; and</li> <li>- Hazardous substances spills from equipment must be managed in accordance with <i>Section 5.17: Hazardous substances</i>.</li> <li>- Batching of cement to be undertaken in accordance with <i>Section 5.19 : Batching plants</i>;</li> <li>- Residual cement must be disposed of in accordance with <i>Section 5.8: Solid and hazardous waste management</i>.</li> </ul>						

### 5.27. Assembly and erecting towers

Impact management outcome: No environmental degradation occurs as a result of assembly and erecting of towers.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Prior to erection, assembled towers and tower sections must be stored on elevated surface (suggest wooden blocks) to minimise damage to the underlying vegetation;</li> <li>- In sensitive areas, tower assembly must take place off-site or away from sensitive positions;</li> <li>- The crane used for tower assembly must be operated in a manner which minimises impact to the environment;</li> <li>- The number of crane trips to each site must be minimised;</li> <li>- Wheeled cranes must be utilised in preference to tracked cranes;</li> <li>- Consideration must be given to erecting towers by helicopter or by hand where it is warranted to limit the extent of environmental impact;</li> <li>- Access to tower positions to be undertaken in accordance with access requirements in specified in <i>Section 8.4: Access Roads</i>;</li> <li>- Vegetation clearance to be undertaken in accordance with general vegetation</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact management outcome: No environmental degradation occurs as a result of assembly and erecting of towers.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p>clearance requirements specified in Section 8.10: Vegetation clearing;</p> <ul style="list-style-type: none"> <li>- No levelling at tower sites must be permitted unless approved by the Development Project Manager or Developer Site Supervisor;</li> <li>- Topsoil must be removed separately from subsoil material and stored for later use during rehabilitation of such tower sites;</li> <li>- Topsoil must be stored in heaps not higher than 1 m to prevent destruction of the seed bank within the topsoil;</li> <li>- Excavated slopes must be no greater than 1:3, but where this is unavoidable, appropriate measures must be undertaken to stabilise the slopes;</li> <li>- Fly rock from blasting activity must be minimised and any pieces greater than 150 mm falling beyond the Working Area, must be collected and removed;</li> <li>- Only existing disturbed areas are utilised as spoil areas;</li> <li>- Drainage is provided to control groundwater exit gradient with the spill areas such that migration of fines is kept to a minimum;</li> <li>- Surface water runoff is appropriately channeled through or around spoil areas;</li> <li>- During backfilling operations, care must be taken not to dump the topsoil at the bottom of the foundation and then put spoil on top of that;</li> <li>- The surface of the spoil is appropriately rehabilitated in accordance with the requirements specified in Section 5.29: Landscaping and rehabilitation;</li> <li>- The retained topsoil must be spread evenly over areas to be rehabilitated and suitably compacted to effect re-vegetation of such areas to prevent erosion as soon as construction activities on the site is complete. Spreading of topsoil must not be undertaken at the beginning of the dry season.</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 5.28. Stringing

Impact management outcome: No environmental degradation occurs as a result of stringing.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Where possible, previously disturbed areas must be used for the siting of winch and tensioner stations. In all other instances, the siting of the winch and tensioner must avoid Access restricted areas and other sensitive areas;</li> <li>- The winch and tensioner station must be equipped with drip trays in order to contain any fuel, hydraulic fuel or oil spills and leaks;</li> <li>- Refueling of the winch and tensioner stations must be undertaken in accordance with Section 5.17: Hazardous substances;</li> <li>- In the case of the development of overhead transmission and distribution infrastructure, a one metre "trace-line" may be cut through the vegetation for stringing purposes only and no vehicle access must be cleared along "trace-lines". Vegetation clearing must be undertaken by hand, using chainsaws and hand held implements, with vegetation being cut off at ground level. No tracked or wheeled mechanised equipment must be used;</li> <li>- Alternative methods of stringing which limit impact to the environment must always be considered e.g. by hand or by using a helicopter;</li> <li>- Where the stringing operation crosses a public or private road or railway line, the necessary scaffolding/ protection measures must be installed to facilitate access. If, for any reason, such access has to be closed for any period(s) during development, the persons affected must be given reasonable notice, in writing;</li> <li>- No services (electrical distribution lines, telephone lines, roads, railways lines, pipelines fences etc.) must be damaged because of stringing operations. Where disruption to services is unavoidable, persons affected must be given reasonable notice, in writing;</li> <li>- Where stringing operations cross cultivated land, damage to crops is restricted to the minimum required to conduct stringing operations, and reasonable notice (10 work days minimum), in writing, must be provided to the landowner;</li> <li>- Necessary scaffolding protection measures must be installed to prevent damage to the structures supporting certain high value agricultural areas such as vineyards, orchards, nurseries.</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

### 5.29. Socio-economic

Impact management outcome: Socio-economic development is enhanced.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Develop and implement communication strategies to facilitate public participation;</li> <li>- Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process;</li> <li>- Sustain continuous communication and liaison with neighboring owners and residents</li> <li>- Create work and training opportunities for local stakeholders; and</li> <li>- Where feasible, no workers, with the exception of security personnel, must be permitted to stay over-night on the site. This would reduce the risk to local farmers.</li> </ul>						

### 5.30. Temporary closure of site

Impact management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in <i>sections 5.17: management of hazardous substances</i> and <i>5.18 workshop, equipment maintenance and storage</i>;</li> <li>- Hazardous storage areas must be well ventilated;</li> <li>- Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service;</li> <li>- Emergency and contact details displayed must be displayed;</li> <li>- Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel;</li> <li>- Night hazards such as reflectors, lighting, traffic signage etc. must have been checked;</li> <li>- Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.;</li> <li>- Structures vulnerable to high winds must be secured;</li> <li>- Wind and dust mitigation must be implemented;</li> <li>- Cement and materials stores must have been secured;</li> <li>- Toilets must have been emptied and secured;</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Refuse bins must have been emptied and secured;</li> <li>- Drip trays must have been emptied and secured.</li> </ul>						

### 5.31. Landscaping and rehabilitation

Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed to a registered waste site and certificates of disposal provided;</li> <li>- All slopes must be assessed for contouring, and to contour only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983</li> <li>- All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983;</li> <li>- Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition;</li> <li>- Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners;</li> <li>- Rehabilitation of tower sites and access roads outside of farmland;</li> <li>- Indigenous species must be used for with species and/grasses to where it compliments or approximates the original condition;</li> <li>- Stockpiled topsoil must be used for rehabilitation (refer to Section 5.24: <i>Stockpiling and stockpiled areas</i>);</li> <li>- Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion;</li> <li>- Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed;</li> <li>- Subsoil must be ripped before topsoil is placed;</li> <li>- The rehabilitation must be timed so that rehabilitation can take place at the optimal</li> </ul>						

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
time for vegetation establishment; – Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; – Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly; – Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil. – Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described below. A mixture of seed can be used provided the mixture is carefully selected to ensure the following: a) Annual and perennial plants are chosen; b) Pioneer species are included; c) Species chosen must be indigenous to the area with the seeds used coming from the area; d) Root systems must have a binding effect on the soil; e) The final product must not cause an ecological imbalance in the area						

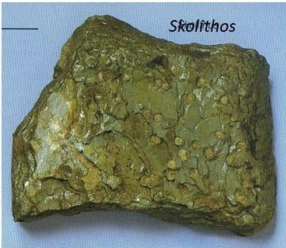
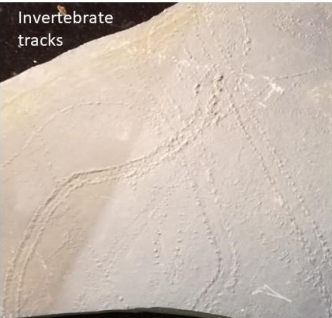


### 6. ACCESS TO THE GENERIC EMPr

Once completed and signed to allow the public access to the generic EMPr, the holder of the EA must make the EMPr available to the public in accordance with the requirements of regulation 26(h) of the EIA Regulations.

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

# 13 APPENDIX F – CHANCE FOSSIL FINDS PROTOCOL

<b>Province &amp; region:</b>	Free State Province (Tokologo Local Municipality)
<b>Responsible Heritage Resources Agency</b>	<b>South African Heritage Resources Agency (SAHRA): Archaeology, Palaeontology and Meteorites (APM) Unit</b> Contact person: Natasha Higgitt or Phillip Hine Postal address: PO Box 4637, Cape Town, 8000 Physical address: 111 Harrington Street, Cape Town, 8001. Telephone number: 021 462. Fax number: 021 462 4509. Email: <a href="mailto:nhiggitt@sahra.org.za">nhiggitt@sahra.org.za</a> or <a href="mailto:info@sahra.org.za">info@sahra.org.za</a> .
<b>Rock unit(s)</b>	Tierberg formation and Quaternary deposits.
<b>Potential fossils</b>	Plants (e.g. glossopterids, ferns and sphenophytes), insects, bone or trace fossils  <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p><i>Skolithos</i></p> </div> <div style="text-align: center;">  <p>Invertebrate tracks</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <p><i>Notophycus</i></p> </div> <div style="text-align: center;">  </div> </div>
<b>PROTOCOL: Environmental Site Officer and Environmental Control Officer</b>	The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.  When excavations begin the rocks and discard must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone or coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.  Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones (for example see Figures 7-8). This information will be built into the EMP's training and awareness plan and procedures.



## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

	<p>Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.</p> <p>If there is any possible fossil material found by the developer/environmental officer then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.</p> <p>Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.</p> <p>If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.</p> <p>If no fossils are found and the excavations have finished then no further monitoring is required.</p>
<p><b>PROTOCOL: Specialist Palaeontologist</b></p>	<p>If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.</p> <p>Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.</p> <p>If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.</p>
<p><b>General</b></p>	<p>If no fossils are found and the excavations have finished then no further monitoring is required</p>

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

---

# 14 APPENDIX G – ALIEN INVASIVE SPECIES CONTROL AND MONITORING PLAN & ALIEN INVASIVE VEGETATION MANAGEMENT PLAN

---

## Introduction

An “invasive species” is any species whose establishment and spread outside of its natural distribution range (i) threatens ecosystems, habitats or other species or has a demonstrable potential to threaten ecosystems, habitats or other species; and (ii) may result in economic or environmental harm or harm to human health. Alien invasive plant species are globally considered as one of the greatest threats to biodiversity and ecosystems integrity.

The Alien and Invasive Species (AIS) Regulations and the AIS list was published in 2020 (NEM:BA 2020a & b).

The following categories of declared weeds and invader plants are recognised in South Africa:

**Category 1a Listed Invasive Species** refers to species that must be combatted or eradicated. Landowners are obliged to take immediate steps to combat or eradicate Category 1a species.

**Category 1b Listed Invasive Species** refers to species that must be controlled. If an Invasive Species Management Programme has been developed, landowners are obliged to control the species in accordance with such programme. The following species were recorded in the area:

<i>Flaveria bidentis</i>	<i>Opuntia</i> sp.	<i>Cuscuta campestris</i>
<i>Prosopis</i> sp.	<i>Arundo donax</i>	<i>Datura ferox</i>
<i>Cereus jamacaru</i>	<i>Cirsium vulgare</i>	<i>Opuntia ficus-indica</i>
<i>Solanum elaeagnifolium</i>	<i>Verbena bonariensis</i>	<i>Verbena brasiliensis</i>
<i>Xanthium spinosum</i>		

**Category 2 Listed Invasive Species** refer to species that require a permit to carry out a restricted activity e.g. cultivation, within an area specified in the Notice or an area specified in the permit, as the case may be. Category 2 includes plant species that have economic, recreational, aesthetic or other valued properties, notwithstanding their invasiveness. It is important to note that a Category 2 species that fall outside the demarcated area specified in the permit, becomes a Category 1b invasive species. Permit-holders must take all the necessary steps to prevent the escape and spread of the species outside of the land or the area specified in the Notice or permit.

*Acacia mearnsii*

*Eucalyptus camaldulensis*






These species are exempted for existing plantations.

**Category 3 Listed Invasive Species** refer to species that are subject to exemptions and prohibitions as specified in the Notice. Category 3 species are less-transforming invasive species that are regulated by activity. The principal focus with these species is to ensure that they are not introduced, sold or transported. However, a Category 3 plant species becomes a Category 1b species within riparian areas.

## APPENDICES






Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

**Appendix G, Table 1: Identified alien plant species in the area (adapted from ARC, 2020)**

SPECIES NAME	COMMON NAME	ILLUSTRATION
<b>NEMBA Category: 1B invaders</b>		
<i>Flaveria bidentis</i>	Smelter's-Bush	
<i>Prosopis glandulosa</i> var. <i>torreyana</i>	Honey Mesquite	
<i>Prosopis velutina</i>	Velvet Mesquite	
<i>Arundo donax</i>	Giant reed	
<i>Cereus jamacaru</i>	Queen of the night cacti	






## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

SPECIES NAME	COMMON NAME	ILLUSTRATION
<b>NEMBA Category: 1B invaders</b>		
<i>Cirsium vulgare</i>	Spear thistle	
<i>Cuscuta campestris</i>	Common & lucerne dodder	
<i>Datura ferox</i>	Large thorn apple	
<i>Opuntia ficus-indica</i>	Sweet prickly pear	
<i>Solanum elaeagnifolium</i>	Silver-leaf bitter apple	

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

SPECIES NAME	COMMON NAME	ILLUSTRATION
<b>NEMBA Category: 1B invaders</b>		
<i>Verbena bonariensis</i>	Purple top, tall verbena	
<i>Verbena brasiliensis</i>	Slender wild verbena	
<i>Xanthium spinosum</i>	Spiny cocklebur	
<b>NEMBA Category: 2 invaders</b>		
<i>Acacia mearnsii</i>	Black wattle	
<i>Eucalyptus camaldulensis</i>	River red gum	

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

---

### **Prevention and control of alien invasive plant species**

The removal of alien vegetation through mechanical mechanisms or application of a herbicide is likely to be required in order to curtail proliferation. The appointed ECO of the project is to be consulted prior to application of the herbicide. A specialist or contractor should be appointed prior to construction commencement to undertake a sweep and survey of the final development footprint site, with an alien invasive plant management team to remove exotic vegetation. The following measures should be applied:

- Herbicides for the control of alien species should be applied according to the relevant instructions, material safety data sheets (MSDS), and by appropriately trained personnel.
- No alien species should be used in rehabilitation or landscaping.
- Cleared areas may need to be fenced-off during rehabilitation to exclude livestock and wildlife.
- Implement a monitoring program for the early detection of alien invasive plant species. Employ a control program to combat declared alien invasive plant species
- Material brought onto site e.g. building sand should be regularly checked for the germination of alien species.

There are a number of strategies that can be employed to prevent the introduction of new invasive plant species:

- Limiting their introductions by humans;
- Creating a buffer zone of alien-free vegetation around the site;
- Integrated catchment management with the surrounding neighbours because areas around and upstream of the site provide an unlimited source of seed which invade downstream areas; and
- Maintaining a healthy grass cover by sound veld management and judicious burning of the grass sward.

Alien invaders should be controlled by mechanical and/or chemical means. Mechanical means include ringbarking (girdling), uprooting, chopping, slashing and felling. An axe, chain saw or brush cutter can be used. Stumps or ringbarked stems should be treated immediately with a chemical weed killer. Follow-up treatment is usually needed.

Refer to Table 2 below for an Alien Invasive Vegetation Management Plan, which incorporates the mitigation measures and strategies outlined above.

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

ALIEN INVASIVE VEGETATION MANAGEMENT PLAN					
Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>A. DESIGN PHASE</b>					
Impacts due to establishment of alien invasive plants	Ensure the appropriate removal of alien invasive vegetation from the proposed project area and prevent the establishment and spread of alien invasive plants due to the project activities.	<ul style="list-style-type: none"> <li>▪ Ensure compliance with relevant Environmental Specifications for the control and removal of alien invasive plant species.</li> <li>▪ Appoint a specialist or contact relevant authorities to seek guidance on the removal of the alien vegetation on site.</li> <li>▪ Compile and finalise an alien weed eradication programme.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Appoint a suitable specialist/ Contractor or contact the relevant authorities to seek guidance on the removal of the planted alien invasive species.</li> <li>▪ Appoint a suitable specialist to compile an alien invasive vegetation eradication plan.</li> <li>▪ Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off during the design phase.</li> <li>▪ Once-off during the design phase.</li> <li>▪ Once-off during the design phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)</li> <li>▪ Project Developer (Scatec Solar)</li> <li>▪ ECO</li> </ul>
<b>B. CONSTRUCTION PHASE</b>					
Impacts due to the establishment of and increased spread of alien invasive plants	Avoid establishment and reduce the spread of alien invasive plants due to the project activities.	<ul style="list-style-type: none"> <li>▪ Appoint a specialist or contractor to undertake a sweep and survey of the final development footprint site, with an alien invasive eradication team to remove exotic vegetation prior to the commencement of construction.</li> <li>▪ Establish an ongoing monitoring programme for the construction phase to detect and quantify any alien species that may become established and identify the problem species (as per Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) and National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEM: BA)).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Appoint a suitable vegetation contractor to inspect the site and remove any exotic weeds prior to the commencement of construction. ECO to ensure that this is taken into consideration and implemented.</li> <li>▪ Prepare monitoring programme which will monitor the presence of alien invasive species on the site. If any alien invasive species are detected then the distribution of these should be mapped (GPS co-ordinates of concentrations of plants). The results should be interpreted in terms of the risk posed to sensitive habitats within and surrounding the project area.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prior to the commencement of construction</li> <li>▪ Once-off</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar), ECO and Specialist Contractor</li> <li>▪ ECO and Contractor</li> </ul>

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

ALIEN INVASIVE VEGETATION MANAGEMENT PLAN					
Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<ul style="list-style-type: none"> <li>▪ Ensure proper management of soil stockpiles. Do not import soil stockpiles from areas with alien plants to ensure proper management of stockpiles.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitor the presence of alien invasive plants during the construction phase via visual inspections and take action to remove and control these species.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO Contractor and</li> </ul>
		<ul style="list-style-type: none"> <li>▪ Undertake rehabilitation of disturbed areas as soon as possible after construction. Stockpile the shallow topsoil layer separately from the subsoil layers. Reinststate the topsoil layers (containing seed and vegetative material) when construction is complete to allow the plants to rapidly re-colonise the bare soil areas.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Rehabilitate disturbed areas and monitor the presence of alien invasive species on site.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO Contractor and</li> </ul>
		<ul style="list-style-type: none"> <li>▪ Keep clearance and disturbance of indigenous vegetation to a minimum.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitor and manage vegetation clearing by undertaking visual inspections to ensure minimal disturbance and to restrict activities to within demarcated areas.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO Contractor and</li> </ul>
		<ul style="list-style-type: none"> <li>▪ Ensure that the footprint required for the proposed project activities (such as temporary stockpiling, earthworks, storage areas, site establishment etc.) is kept at a minimum.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Verify that the proposed project area is determined and outlined prior to the commencement of the construction phase by undertaking visual inspections.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off prior to construction and as required during the construction process.</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO Contractor and</li> </ul>
		<ul style="list-style-type: none"> <li>▪ Ensure that alien invasive vegetation found on site, within the proposed project footprint, is immediately controlled and removed promptly, in a scheduled manner throughout the construction phase. The removal of alien vegetation on site during the construction phase should use registered control methods and take into consideration the Alien and Invasive Species Regulations published in terms of Section 97(1) of the NEM: BA, if applicable.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitor the presence of alien invasive plants during the construction phase via visual inspections and take action to remove and control these species. If any alien invasive species are detected then the distribution of these should be mapped (GPS co-ordinates of concentrations of plants). The results should be interpreted in terms of the risk posed to sensitive habitats within and surrounding the project area. Any alien invasive should be cleared from site.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO Contractor and</li> </ul>



## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

ALIEN INVASIVE VEGETATION MANAGEMENT PLAN					
Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<ul style="list-style-type: none"> <li>▪ The removed alien invasive vegetation should be immediately disposed at a suitable waste disposal facility and should not be kept on site for prolonged periods of time, as this will enhance the spread of these species.</li> <li>▪ All construction machinery and plant equipment delivered to site for use during the construction phase should be cleaned in order to limit the introduction of alien species.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitor the removal of the alien vegetation found on site via visual inspections.</li> <li>▪ Clean machinery and equipment prior to the construction phase.</li> <li>▪ ECO to conduct visual inspections to verify that machinery and equipment are cleaned, and report any non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ As necessary during the construction phase.</li> <li>▪ Prior to the commencement of construction.</li> <li>▪ As necessary during the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> <li>▪ ECO Contractor and</li> </ul>
<b>C. OPERATIONAL PHASE</b>					
.1. Impacts due to establishment of alien invasive plants. Exotic weed invasion may result in the ousting of natural vegetation and alteration of ecological processes on site, with incremental impacts on the adjacent veld types.	<p>Reduce the establishment and spread of alien invasive plants.</p> <p>To remove exotic weeds as and when they may arise and thereby prevent alteration of local and adjacent habitat forms.</p>	<ul style="list-style-type: none"> <li>▪ Continue with on-going monitoring programme to detect and quantify any alien species that may become established and identify the highly invasive species during the operation phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Annual audit of project area and immediate surroundings. If any alien invasive species are detected then the distribution of these should be mapped (GPS co-ordinates of concentrations of plants). The results should be interpreted in terms of the risk posed to sensitive habitats within and surrounding the project area.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Annual</li> </ul>	<ul style="list-style-type: none"> <li>▪ Operations and Maintenance Contractor</li> </ul>
		<ul style="list-style-type: none"> <li>▪ Immediately control any alien plants that become established using registered control methods. Use of herbicides and undertake manual removal of alien vegetation on site where this may arise. Regular address and redress of weeds identified on site by a suitable contractor. The clearance of exotic weed to be undertaken bi-annually at a minimum and on a needs basis at an intermittent level.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitor the use of herbicide sprays and manual removal of alien vegetation by undertaking visual inspections and reporting any non-compliance.</li> <li>▪ Maintain register of weed spraying activities and ensure that herbicide use is recorded.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Bi-annually</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar) and Environmental Manager</li> </ul>
<b>D. DECOMMISSIONING PHASE</b>					

## APPENDICES

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

ALIEN INVASIVE VEGETATION MANAGEMENT PLAN					
Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<ul style="list-style-type: none"> <li>▪ Exotic weed invasion of the decommissioned site resulting in ecological change</li> </ul>	<p>To prevent the excessive growth and propagation of exotic weeds on disturbed lands that formed a portion of the PV facility.</p>	<ul style="list-style-type: none"> <li>▪ All natural areas must be rehabilitated with species indigenous to the area. Re-seed with locally-sourced seed of indigenous grass species that were recorded on site pre-construction.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Final external audit of area to confirm that area is rehabilitated to an acceptable level.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once off</li> </ul>	<ul style="list-style-type: none"> <li>▪ Lead Contractor with advice from specialist</li> </ul>
		<ul style="list-style-type: none"> <li>▪ Exotic weed control measures to be instituted through weed control programme. Regular redress of exotic weed through the use of herbicide and manual removal.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Compile weed eradication programme for a period of 12 months after the decommissioning exercise.</li> <li>▪ Appoint contractor to undertake the weed eradication programme.</li> <li>▪ Monitor newly disturbed areas where infrastructure has been removed to detect and quantify any aliens that may become established after decommissioning and rehabilitation.</li> <li>▪ Final external audit of area to confirm that area is free of alien invasive plants after 5 years.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weed eradication exercise to be undertaken every 6 months for a period of 12 months following decommissioning.</li> <li>▪ Prior to the commencement of the decommissioning phase.</li> <li>▪ Once-off</li> <li>▪ Once-off</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)</li> <li>▪ Project Developer (Scatec Solar)</li> <li>▪ Facility Manager and Specialist/ Contractor</li> <li>▪ Facility Manager and Specialist/ Contractor</li> </ul>

## **APPENDICES**

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

---

## **APPENDICES**

Basic Assessment for the proposed development of the 290 MW Volta Solar Photovoltaic (PV) Facility (i.e., Volta PV Facility) and Battery Energy Storage System (BESS) and the proposed development of a 132 kV Power Line and associated EGI (i.e., Volta EGI) to the planned Artemis Main Transmission Substation (MTS) near Dealesville, Free State

---

## **References**

Agricultural Research Council (ARC). 2020. *Invasive alien plants in South Africa*.  
[[https://wwfafrica.awsassets.panda.org/downloads/invasive\\_alien\\_plants\\_in\\_south\\_africa.pdf](https://wwfafrica.awsassets.panda.org/downloads/invasive_alien_plants_in_south_africa.pdf)]