

DRAFT SCOPING REPORT FOR THE ELAND MINE PV SOLAR PROJECT



JEMS

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Report Prepared by

JEMS Pty Ltd

26 In-Full Flight Mooikloof, 0059

Tel: 083 776 7898 / 082 892 4282

Email: stephan@jems.co.za / jannie@jems.co.za

Author: Stephan Barkhuizen
Report Reviewer: Jannie Cronje

Scoping Report in support of the application for an environmental authorisation (“**EA Application**”) for the proposed Eland Mine PV Solar Energy Project (“**EM PV Solar Project**”) in terms of the National Environmental Management Act, No 107 of 1998 (as amended).

NAME OF APPLICANT: Eland Platinum (Pty) Ltd (“EP”), a subsidiary of Northam Platinum Limited (“Northam”).

TEL NO: +27 12 381 4099

FAX NO: +27 11 325 4795

POSTAL ADDRESS: PO Box 3436, Brits, 0250, South Africa

PHYSICAL ADDRESS: Farm Elandsfontein 440 JQ, District of Brits

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OBJECTIVE OF THE SCOPING PROCESS

- 1) The objective of the scoping process is to, through a consultative process –
 - (a) Identify the relevant policies and legislation relevant to the activity;
 - (b) Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
 - (c) Identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
 - (d) Identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process, inclusive of cumulative impacts, and a ranking process of all the identified alternatives, focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
 - (e) Identify the key issues to be addressed in the assessment phase;
 - (f) Agree on the level of assessment to be undertaken, including the methodology to be applied; the expertise required; the extent of further consultation to be undertaken to determine the impacts; and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
 - (g) Identify suitable measures to avoid, manage, or mitigate identified impacts and determine the extent of the residual risks that need to be managed and monitored.

EXECUTIVE SUMMARY

Eland Platinum Proprietary Limited (“**EP**”), a wholly owned subsidiary of Northam Platinum Limited (“**Northam**”), owns and operates the Eland Platinum Mine (“**EM**”) and Concentrator Plant. EM is located in the North-West Province (“**NWP**”) of the Republic of South Africa (“**RSA**”) and falls under the local jurisdiction of the Madibeng Local Municipality (“**MLM**”), situated in the larger district of the Bojanala Platinum District Municipality (“**BPDM**”). The town of Brits is located 10km east of the application site, with the Tshwane Metropolitan 60 km to the west. The northern boundary of the area on which the EM surface infrastructure is situated (“**EM Surface Area**”) is bounded by the R566 (Brits - Rosslyn) provincial road and N4 Bakwena National Highway (Pretoria-Rustenburg) to the south.

EM is an established (est. 2006) platinum group metals (“**PGMs**”) and chrome mining and processing operation and comprises of two mining rights, namely Department of Mineral Resources and Energy (“**DMRE**”) Ref. No: NW 30/5/1/2/2/341MR (“**Zilkaatsnek Mining Right**”) and DMRE Ref. No: NW 30/5/1/2/2/280MR (“**Elandsfontein Mining Right**”). Note a Section 102 Consolidation was recently approved to combine the two mining rights into the Elandsfontein Mining Right.

An Environmental Authorisation (“**EA**”) Application under the National Environmental Management Act 107 of 1998 (“**NEMA**”) was submitted to the North West Department of Economic Development, Environment, Conservation and Tourism (“**NWDEDECT**”).

The EA application is submitted for the following activities:

- a PV Plant, with a generating capability of 40 MW (“**40MW PV Plant**”), situated within a 98 Ha project area (“**40MW PV Project Area**”);
- a PV Plant linked to a hydrogen fuel cell (see below), with a generating capability of 5 MW (“**5MW PV Plant**”), to be established on 10Ha within an 18 Ha investigation area (“**5MW PVHFC Project Area**”);
- a hydrogen fuel cell incorporating an electrolyser, hydrogen pressurised storage tank (120 m³ storage capacity) and battery system, to be established at the existing EM laboratory (“**HFC**”);
- Inverters and transformers;
- 11 kilovolt (“**kV**”) and 33 kV transmission lines and transmission towers;
- Cabling between project components;
- New Access and internal roads;
- On-site facility substations for both facilities;
- Telecommunications mast;

- Operations and maintenance buildings;
- Security, perimeter fencing and access control;
- Temporary offices and construction yard; and
- Water and sewage pipelines;
- Temporary laydown area.

(To be known as the "**EM PV Solar Project**").

The NWDEDECT will be the competent authority ("**CA**") for the EA Application. The Draft Scoping Report ("**DSR**") will be submitted in conjunction with the inception of the public participation process ("**PPP**").

JEMS Pty Ltd ("**JEMS**") was appointed by EP as the independent EAP for the EA Application. JEMS prepared the DSR in line with the requirements contained in Appendix 2 of the 2014 EIA Regulations, promulgated under the NEMA.

The DSR will be available for review and comments for thirty (30) days from 4 February to 7 March 2022 at the following locations:

- EM Security Office;
- MM entrance;
- Madibeng Local Library in Brits;
- Moumong Store in Mmakau
- The Community Library (at the Community Hall) Damonsville;
- Community Hall in Oukasie;
- The Community Hall in Mothotlung;
- De Wildt Helpmekaar Offices; and
- Mmakau Police Station next to the Bakgatla-Ba-Mmakau Tribal Council offices.

The information provided in the DSR acts as the baseline resource for the relevant authorities and interested and affected parties ("**I&APs**"), and its aim is to ensure that all I&APs and stakeholders have a clear understanding of the EM PV Solar Project and the biophysical and socio-economic environment where it will be undertaken. The interaction and symbiotic relationship between all involved, by means of inputs and guidance received, will contribute to the rationale of the Final Scoping Report ("**FSR**") and the subsequent environmental impact assessment ("**EIA**") phase.

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LIST OF ABBREVIATIONS

Term/Abbreviation	Definition
2013 WML Regulations	The Regulations published under NEMWA in Government Notice (“GN”) 921 of Government Gazette (“GG”) 37083 on 29 November 2013
2014 EIA Regulations	Environmental Impact Assessment Regulations promulgated in terms of NEMA in GN 982 of GG 38282 on 4 December 2014 (as amended in 2017).
2006 EIA Regulations	Environmental Impact Assessment Regulations promulgated in terms of NEMA in GN 385 of GG 28753 on 21 April 2006
BIC	Bushveld Igneous Complex
BID	Background Information Document
BSP	Biodiversity Sector Plan
BPDM	Bojanala Platinum District Municipality
CA	Competent Authority
CARA	Conservation of Agricultural Resources Act (Act No. 43. of 1983)
DALRRD	Department of Agriculture, Land Reform and Rural Development
CBA	Critical Biodiversity Area
DEIAR	Draft EIA Report
DFFE	Department of Forestry, Fisheries and Environment
DMR	The former Department of Mineral Resources
DMRE	Department of Mineral Resources and Energy
DSR	Draft Scoping Report
DWA	Then former Department of Water Affairs,
DWAF	Then former Department of Water Affairs and Forestry
DWS	Then former Department of Human Settlements, Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EM	Eland Platinum Mine
EMP	Environmental Management Programme
EMPR	Environmental Management Programme Report
EP	Eland Platinum (Pty) Ltd, a subsidiary of Northam
FEIAR	Final EIA Report
FSR	Final Scoping Report
GDP	Gross Domestic Product
GG	Government Gazette

GHG	Greenhouse Gas
GN	Government Notice
GN 509	General Authorisation in terms of section 39 of the NWA for water uses as defined in section 2(c) or section 2(i) GG 40229, 26 August 2016
GN 983	Environmental Impact Assessment Regulations promulgated in terms of NEMA in GN 983 of GG 38282 on 4 December 2014 (as amended in 2017).
GN 984	Environmental Impact Assessment Regulations promulgated in terms of NEMA in GN 984 of GG 38282 on 4 December 2014 (as amended in 2017).
GN 984	Environmental Impact Assessment Regulations promulgated in terms of NEMA in GN 985 of GG 38282 on 4 December 2014 (as amended in 2017).
HA	Hectares (measure of area, 10 000 square metres)
HFC	Hydrogen Fuel Cell
HIA	Heritage Impact Assessment
HSEC	Health Safety Environment Community
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IEA	Integrated Environmental Authorisation
IWULA	Integrated water use licence application
km	Kilometres
LOM	Life of Mine
m ²	Square Metres
MAP	mean annual precipitation
MAR	mean annual runoff
MLM	Madibeng Local Municipality
mm	Millimetres
MM	Maroelabult Mine
MPRDA	Mineral and Petroleum Resources Development Act (Act No. 28 of 2002), as amended
NEMA	National Environmental Management Act (Act No. 107 of 1998), as amended
NEMAQA	National Environmental Management: Air Quality Act (Act No. 39 of 2004), as amended
NEM:BA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004), as amended
NEMPAA	National Environmental Management: Protected Area Act (Act No. 57 of 2003), as amended
NEMWA	National Environmental Management: Waste Act (Act No. 59 of 2008), as amended
2013 WML Regulations	Published in GNR 921 under the NEMWA in <i>Government Gazette</i> 37083 on 29 November 2013, as amended in GNR 633 of 24 July 2015
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
NWA	National Water Act (Act No. 36 of 1998), as amended
NWBSP	North West Biodiversity Sector Plan
NWDACE	The former North-West Department of Agriculture, Conservation and the Environment
NWDEDECT	North West Department of Economic Development, Environment, Conservation and Tourism
Northam	Northam Platinum Limited
NWP	North-West Province
PGM	Platinum Group Metals
POS	Plan of Study
PPP	Public Participation Process
PV	Photovoltaic
Pr. Sci. Nat	Professional Natural Scientists
ROM	Run-of-mine

RWD	Return Water Dam
RSA	Republic of South Africa
SACNASP	South African Council of Natural Scientific Professions
SAHRA	South African National Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SAWS	South African Weather Service;
SHE	Safety Health Environment
SDF	Spatial Development Framework

DRAFT SCOPING REPORT

1. INTRODUCTION

EP is planning to construct a Photovoltaic (“**PV**”) Solar Energy Project within the mining right area of the EM, to be known as the “**EM PV Solar Project**”.

JEMS was appointed by EP as the independent EAP for the EA Application for the EM PV Solar Project.

EP owns and operates the EM and Concentrator Plant at EM. EM is located in the NWP of the RSA and falls under the local jurisdiction of the MLM, situated in the larger district of the BPDM. The town of Brits is located 10km east of EM, with the Tshwane Metropolitan 60 km to the west. The northern boundary of the EM Surface Area is bounded by the R566 (Brits - Rosslyn) provincial road and N4 Bakwena National Highway (Pretoria-Rustenburg) to the south.

Established in 2006, EM is a PGMs and chrome mining and processing operation and is operated under two mining rights, namely DMRE Reference. No: NW 30/5/1/2/2/341MR (“**Zilkaatsnek Mining Right**”) and DMRE Ref. No: NW 30/5/1/2/2/280MR (“**Elandsfontein Mining Right**”), granted in terms of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (“**MPRDA**”) by the DMRE, which include opencast and underground mining sections. Note a Section 102 Consolidation was recently approved to combine the two mining rights into the Elandsfontein Mining Right.

EP’s core business is to extract ore and process PGMs, and chromite concentrate at the EM and Concentrator Plant. The EM Surface Area is approximately 1624 Ha.

The existing combined mining, processing and auxiliary infrastructure on the EM Surface Area comprise of the following:

- Workshops and Stores;
- Overburden and Topsoil Stockpiles;
- Opencast Mining Pits;
- Concentrator Plant;
- On-site Laboratory;
- Mine clinic and training centre;
- Water Management Infrastructure (i.e., dams, channels and pipelines);
- Wastewater Treatment Plant and Water Treatment Plant (“**WTP**”);
- Decline Shafts (Maroelabult, Kukama and Nyala) and supporting infrastructure;

- Tailings Storage Facility (“**TSF**”), comprising of four Paddocks;
- Waste Rock Dumps (“**WRDs**”);
- Offices and auxiliaries;
- Recreational Area (Game Farm);
- Agricultural fields; and
- Haul and internal Roads.

The purpose of the proposed EM PV Solar Project is to generate electricity for use at the EM’s offices, workshops, concentrator plant, laboratory, other auxiliaries, etc. Any excess power produced will be distributed to the national grid. The EM PV Solar Project will be constructed within the EM Surface Area. The EA application is submitted for two projects:

- a PV Plant, with a generating capability of 40 MW (“**40MW PV Plant**”), situated within a 98 Ha project area (“**40MW PV Project Area**”);
- a PV Plant, with a generating capability of 5MW (“**5MW PV Plant**”), to be established on 10Ha within an 18 Ha project area (“**5MW PVHFC Project Area**”), which will be coupled with a hydrogen fuel cell (“**HFC**”) installation.

1.1 40MW PV Plant

The activities associated with the 40MW PV Plant will comprise the following:

- Inverters and transformers;
- 11 kilovolt (“**kV**”) and 33 kV transmission lines and transmission towers;
- Cabling between project components;
- Access and internal roads;
- On-site facility substation;
- Telecommunications mast;
- Operations and maintenance buildings;
- Security, perimeter fencing and access control;
- Temporary offices and construction yard;
- Water and sewage pipelines; and
- Temporary laydown area.

1.2 5MW PV Plant

The activities associated with the 5MW PV Plant coupled with a hydrogen fuel cell installation (collectively the “**5MW PVHFC**”), will comprise the following:

- a 5MW PV Plant,
- Inverters and transformers;
- 11 kV and 33 kV transmission lines and transmission towers;
- Cabling between project components;
- Internal roads;
- On-site facility substation;
- Telecommunications mast;
- Operations and maintenance buildings;
- Security, perimeter fencing and access control;
- Temporary offices and construction yard;
- Water and sewage pipelines; and
- Temporary laydown area

The HFC installation, with a generating capability of 5 MW, will be located at the existing EM Laboratory. The HFC installation will comprise:

- a HFC;
- an electrolyser (which will be contained in a container);
- a 120m³ hydrogen pressurised storage tank;
- battery system (which will be housed in a container); and
- temporary office and Temporary laydown area.

The DSR has been compiled in line with the Appendix 2 of the 2014 EIA Regulations, as amended.

2. CONTACT PERSON AND CORRESPONDENCE ADDRESS:

2.1 Details of the applicant:

Details of the applicant and the contact details of the responsible person are captured in **Table 1** below.

Table 1: Details of the applicant and contact person

Project applicant:	Eland Platinum Proprietary Limited, a wholly owned subsidiary of Northam Platinum Limited	
Registration no:	2016/427918/07	
Trading name:	Eland Platinum	
Responsible person:	Jacques Pretorius (General Manager)	
Physical address:	Farm Elandsfontein 440 JQ, District of Brits, South Africa	
Postal address:	PO Box 3436, Brits, 0250, South Africa	
Telephone no:	087 158 8000	
Fax no:	086 411 8000	
Email:	Jacques.Pretorius@norplats.co.za	
For the purpose of the application process the following people may be contacted at Eland Platinum:		
Mr. S Phalatsi SHEQ Manager Tel No: 087 158 8000 Email: Samuel.Phalatsi@norplats.co.za	Mrs. Keneilwe Sanyane Environmental Officer Tel: 087 158 8000 Email: Keneilwe.sanyane@norplats.co.za	

2.2 The EAP who prepared the report:

JEMS has been appointed as the independent EAP by EP to undertake the EA Application in terms of the National Environmental Act 107 of 1998 (“**NEMA**”), the 2014 EIA Regulations and the required water use authorisations in terms of the National Water Act 36 of 1998 (“**NWA**”).

JEMS is a multi-skilled Environmental and Water Management Consultancy, providing independent and professional services to the industrial, mining, and commercial sectors. It is a proudly South African, level 2 Broad-Based Black Economic Empowerment (“**B-BBEE**”) company.

GS Barkhuizen will be the lead EAP for the project. Mr. Thembani Mashamba the EAP Reviewer of the EA Application with the support of JG Cronje (Project Sponsor).

Mr Barkhuizen has 12 years’ experience in the environmental field. His experience is in the management of EIA, EMPR and Integrated Water Use Licence Applications (“**IWULA**”) processes; coordination and execution of PPP; and management of multi-disciplinary project teams, mainly for mining related projects. He is also involved in conducting environmental

audits and site assessments. Mr. Barkhuizen is a Certified Natural Scientist in the Environmental Sciences Field (Registration number: 115982) with the South African Council for Natural Scientific Professions (“**SACNASP**”) and his EAP registration is pending with Environmental Assessment Practitioners Association of South Africa (“**EAPASA**”).

Mr. Thembani Mashamba is the EAP reviewer for the application and has 25 years’ experience in the Environmental Management and Impact Assessment Sector. Mr. Mashamba experience include amongst others, implementation and administration of the NWA, implementation of the MPRDA and NEMA (EIA Regulations) requirements and waste management.

Mr. Jannie Cronje will be the project sponsor and reviewer of the Environmental Scoping and EIAR. He is a director of JEMS, with 30 years’ experience in the environmental and geohydrology consultancy industry. Mr. Cronje is appropriately qualified and registered with the relevant professional bodies. He is registered as a Pr. Sci. Nat (Pr.Sci. Nat. 400063/93) with the SACNASP.

Refer to Appendix 1 for copies of the EAP’s qualifications as listed above for this project. Curriculum Vitae (“**CVs**”) of the project team members listed above, with their past experience, can be found in **Appendix 2**.

Table 2: Details of the EAP

EAP:	Gerhardus Stephanus Barkhuizen			
EAP Reviewer	Thembani Mashamba			
Company:	JEMS (Pty) Ltd			
Address:	26 In Full Flight, Mooikloof, 0059			
P.O. Box	92269 P O Box, Mooikloof, Pretoria, 0059			
Tel:	082 892 4282	083 776 7898	082 908 2881	
Fax:	086 658 3132			
Email:	stephan@jems.co.za	jannie@jems.co.za	Thembani@jems.co.za	
JEMS Team Details				
Designation	Name	Qualification	Registration	Experience
Project Manager/reviewer and Sponsor	JG Cronje	Hons. BSc Geohydrology Post Grad Dipl. Terrain Evaluation	Professional Natural Scientists (Pr.Sci. Nat. 400063/93) with the SACNASP	30 Years
Lead EAP	GS Barkhuizen	BTech Landscape Technology Hons. BSc Environmental Monitoring and Modelling	Certified Natural Scientist in the Environmental Sciences Field (Registration number: 115982), with SACNASP	12 Years

			EAP registration pending with EAPASA	
EAP Reviewer	T Mashamba	BSC Degree and Higher Education Diploma; Management Development Program (MDP); Master of Business Leadership (MBL)		24 Years

3. DESCRIPTION OF THE PROPERTY

The town of Brits is located 10km east of EM, with the Tshwane Metropolitan Municipality 60 km to the west. The northern boundary of the EM Surface Area is bounded by the R566 (Brits - Rosslyn) provincial road and N4 Bakwena National Highway (Pretoria-Rustenburg) to the south.

The surrounding communities and their proximity to EM include:

- Brits (10km west);
- Damonsville (1 km north);
- Mothotlung (2 km north);
- Moumong (1.2 km north-east);
- Mmakau (3 km north); and
- De Wildt (3.7 km east).

Land surrounding EM is mainly used for livestock grazing, agriculture, mining (EM is adjacent to the Maroelabult Mine (“MM”) (which EP has purchased and obtained consent under section 102 of the MPRDA to incorporate the relevant mining rights for MM into the Elandsfontein Mining Right), Herculite Ferrochrome's Smelter and Mine, and granite mining further north); renewable power (De Wildt Solar Power Station); future filling station; and several community residential area and related activities. The Zilkaatsnek Eco-estate (mixed land-use development), small holdings and other businesses are located directly to the south (across the N4 highway), with several conservancy and protected areas further to the south (i.e., Magaliesberg Biosphere Area, Peglerae Conservancy and De Wildt Cheetah Research Area, etc.). (Refer to **Figure 1** and **Figure 2**).

The EM PV Solar Project will be located within the surface area of the EM on the following properties as listed in **Table 3**, below and **Table 4** for the Owner Details for the applicable properties:

Table 3: Locality and Property description of the Eland Mine PV Solar Project

EA Application Property Description incl. 21-digit Surveyor General Code for each farm portion:	The EM PV Solar Project will be located on the following properties: <u>Elandsfontein 440JQ:</u> <ul style="list-style-type: none"> ■ Portion 37 (a portion of Portion 16) - T0JQ00000000044000037 <u>Zilkaatsnek 439JQ:</u> <ul style="list-style-type: none"> ■ Portion 83 (a portion of Portion 58) - T0JQ00000000043900083 <u>Schietfontein 437 JQ</u> <ul style="list-style-type: none"> ■ Portion 13 (a portion of Portion 2) - T0JQ00000000043700013 ■ Portion 14 (a portion of Portion 2) - T0JQ00000000043700014
Application area (Ha):	The entire EM Surface Area is approximately 1624 Ha in extent. The EM PV Solar Project will take place on an area of +/- 116 Ha within the EM Surface Area.
Province:	North-West Province
District Authority	Bojanala Platinum District Municipality
Local Authority	Madibeng Local Municipality
Magisterial district:	Brits
Municipal Wards	Ward 21
Distance and direction from nearest town:	EM is located near the town of Brits (10 km west). Surrounding communities include Damonsville, Mothotlung, Mmakau, De Wildt and private landowners and farmers.
Catchment	Situated in the Quaternary Sub-Catchment A21J, that drains to the Crocodile River Catchment and forms part of the Limpopo Water Management Area (WMA)
Servitudes	Several servitudes, including Eskom power lines, are located within the area on which the EM PV Solar Project will be situated (“ Project Area ”). Servitudes to north and south of the EM Surface Area boundary include a railway and national road route (N4 – Bakwena)
Major roads and routes	The R566 forms the northern boundary of the EM Surface Area, linking Brits and Rosslyn. The N4 Bakwena national highway is located directly south of EM, linking Pretoria with Rustenburg, Brits and Mafikeng.

Table 4: Landowner details of the Eland Mine PV Solar Project

Property Description	Landowner Details
The Farm Zilkaatsnek 439JQ	
Portion 83 (a portion of Portion 58)	Eland Platinum Proprietary Limited
The Farm Elandsfontein 440 JQ	
Portion 37 (a portion of Portion 16)	Eland Platinum Proprietary Limited
The Farm Schietfontein 437 JQ	
Portion 13 (a portion of Portion 2)	Eland Platinum Proprietary Limited
Portion 14 (a portion of Portion 2)	Eland Platinum Proprietary Limited

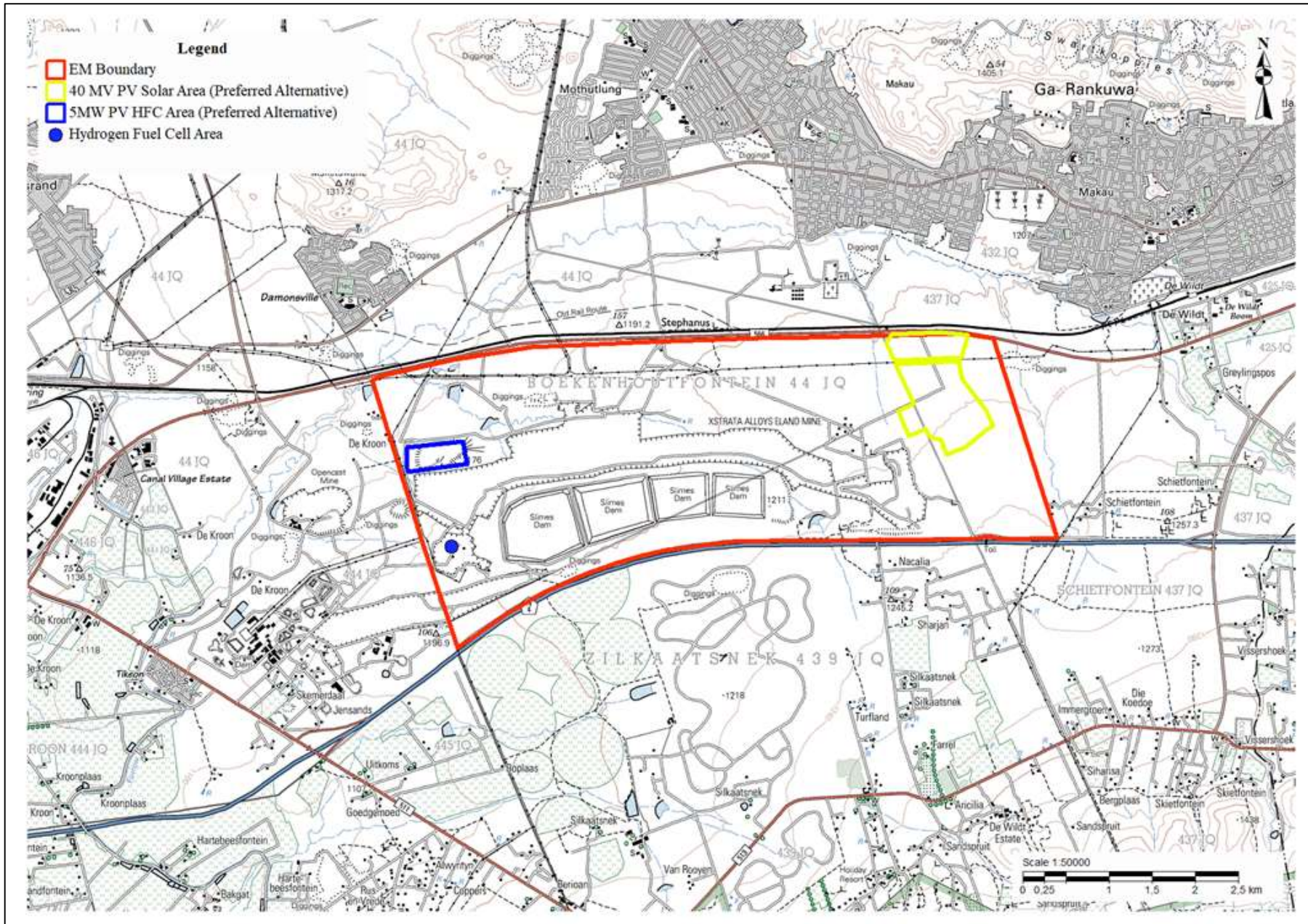


Figure 1: 1:50 000 Topographical Map for the EM PV Solar Project.

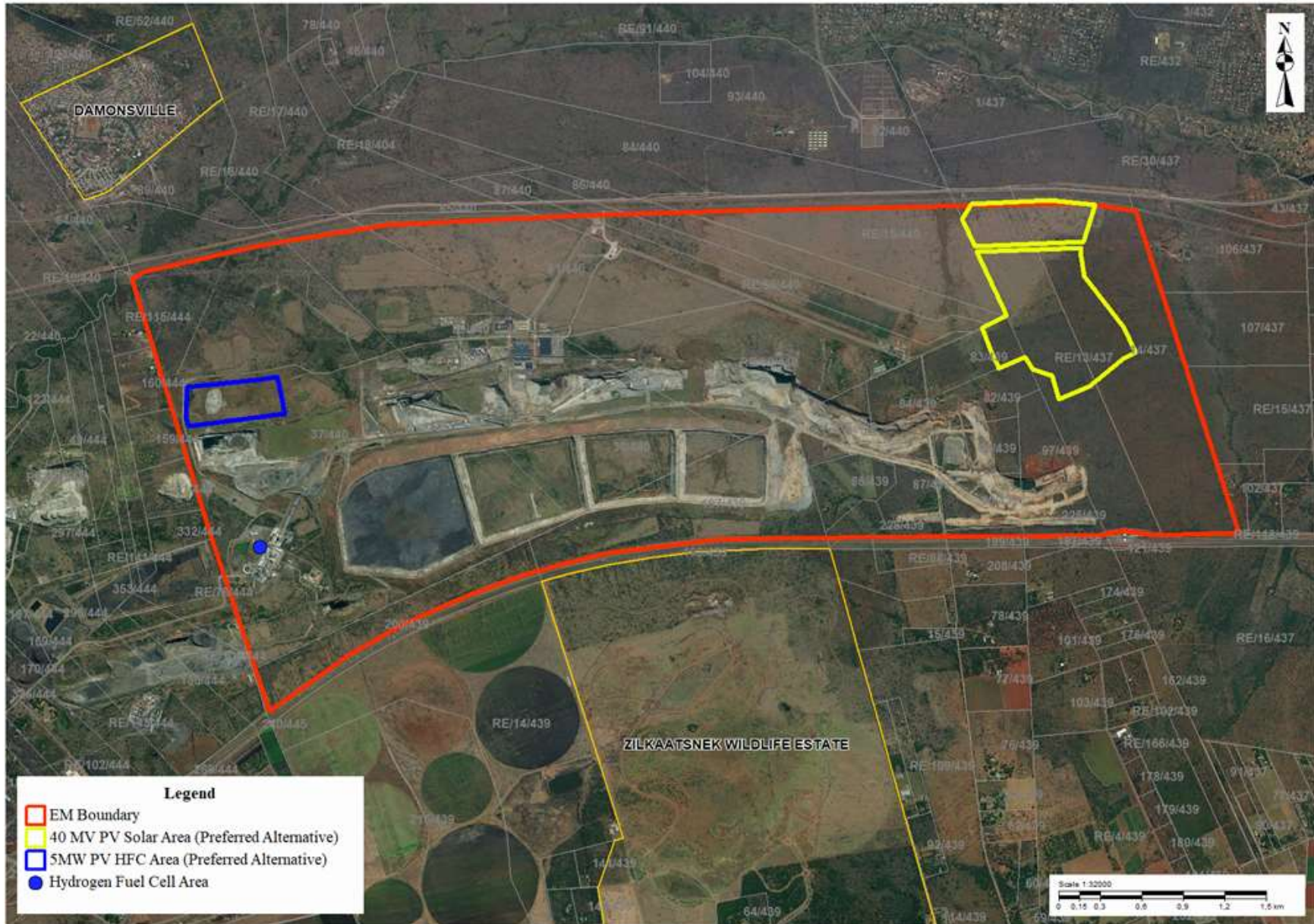


Figure 2: Aerial Map for the EM PV Solar Project.

4. LEGAL FRAMEWORK

EM is an operational mine and is governed by the requirements of the MPRDA and Regulations thereunder. NEMA and the 2014 EIA Regulations also apply to EM. In this regard, apart from the Mining Rights held by EP, it also operates with the following environmental approvals, licenses and permits for the area held under the EM Surface Area. (This list does not cover occupational health and safety legislation requirements), refer to **Table 5** below:

Table 5: Authorisations received for EM and MM

SITE	TYPE OF AUTHORISATION	DESCRIPTION	REFERENCE NUMBER	DATE
EM	EMPR	<u><i>Elandsfontein Mining Right: 2006 EMPR</i></u> The Elandsfontein 2006 EMPR was for the construction and operation of Opencast Mining Activities and Pits; Underground Mining Activities and Infrastructure; Concentrator Plant; Temporary Topsoil Stockpiles; Ore Stockpiles; WRD; Access Roads; Haul Roads; TSF; Sewage Treatment Plant (“ STP ”); WTP; Water and Power Supply Reticulation; Fuel, Lubricant and Chemical Storage Infrastructure; and Offices, Change houses and Workshops	(NW)30/5/1/2/3/2/1/280EM)	21 December 2006
	Environmental Authorisation (EA)	<u><i>Eland Mine 2007 NWDACE EA</i></u> The EA was for the construction and operation of the Concentrator Plant and associated infrastructure; WRD; Establishment of access control; Powerlines; TSF; STP; WTP; Fuel, lubricant and chemical storage facilities; and Offices, Change houses and Workshops.	EIA 518/2005NW	13 March 2007
	EMPR	<u><i>Zilkaatsnek Mining Right 2008 EMPR</i></u>	(NW) 30/5/1/2/3/2/1/341EM	January 2008

SITE	TYPE OF AUTHORISATION	DESCRIPTION	REFERENCE NUMBER	DATE
		The Zilkaatsnek 2008 EMPR was for the construction and operation of the Opencast Mining operations; Internal haul roads; Water pipelines (pit dewatering); and temporary topsoil and waste stockpiles.		
	Section 102 EMPR amendment	<p><u>2010 Zilkaatsnek 84/97 EMPR Amendment</u></p> <p>This EMPR Amendment was approved to include the mining on Portion 84 and 97 of the Farm Zilkaatsnek for the following infrastructure: Opencast Mining operations; Internal haul roads; Water pipelines (pit dewatering); and temporary topsoil and waste stockpiles.</p>	(NW) 30/5/1/2/3/2/1/341EM	19 November 2010
	EA	<p><u>2012 Proposed Concentrator Plant EA</u></p> <p>The EA was issued for listed activities to construct and operate the following: an additional concentrator plant; Dense media separator ("DMS") plant; DMS WRD; DMS run-off dam; new access route; supportive infrastructures, including administration, training and induction building; stores, change house and ablution, clinic, laboratory facilities; explosive magazine upgrade; communication towers; and helipad and greenhouse.</p>	NWP/EIA/441/2007	8 August 2012
	Water Use Licence (" WUL ")	<p><u>EM WUL</u></p> <p>A WUL from the then Department of Water Affairs ("DWA"), under section 21 of the NWA, for water uses associated with the EM Surface Area, including the proposed Concentrator Plant expansion project. The WUL licenses the following water uses:</p> <ul style="list-style-type: none"> ■ Section 21 (a): Taking of water from a water resource ■ Section 21 (c): Impeding or diverting the flow of water in a watercourse ■ Section 21 (g): Disposing of waste in a manner which may detrimentally impact on a water resource ■ Section 21 (i): Altering the bed, banks course or characteristics of a watercourse 	License No: 03/A21J/ABCGIJ/1547)	23 October 2012

SITE	TYPE OF AUTHORISATION	DESCRIPTION	REFERENCE NUMBER	DATE
		<ul style="list-style-type: none"> Section 21 (j): Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people. 		
	Section 102 EMPR amendment	<p><u>2010 Zilkaatsnek Schietfontein EMP Amendment</u></p> <p>This EMPR Amendment was approved by the then DMR to include mining on Portions 13 and 14 of the Farm Schietfontein for opencast mining operations; underground mining operations; internal haul roads; water pipelines (pit dewatering); and temporary topsoil and waste stockpiles.</p>	(NW) 30/5/1/2/3/2/1/341EM	13 March 2013
	EA	<p><u>Zilkaatsnek Prospecting Right EA</u></p> <p>The EA was granted for prospecting activities on Portions 83, 86 and 197 (a portion of Portion 113) of the Farm Zilkaatsnek 439JQ.</p>	NW 30/5/1/1/3/2/1/12469EM	23 January 2019
	EA	<p><u>Schietfontein and Krelingspost Prospecting Right EA</u></p> <p>The EA was granted for the prospecting activities on the Remaining Extents of Portions 5, 32, 99 and Portions 24 (a portion of Portion 2), 33 (a portion of Portion 32), 34 (a portion of Portion 2), and Portions 100 and 101 (portions of Portion 99) of the Farm Schietfontein 437 JQ and Portions 2, 3, 76, 79 and 80; and Portions 70, 71, 72, 73, 74 and 75 (portions of Portion 67) of the Farm Krelingspost 425 JQ.</p>	NW 30/5/1/1/3/2/1/12604EM	12 February 2020

An application by EP has been approved by the DMRE in January 2022 to consolidate the EMPr(s) and MR for the EM and MM Areas

5. DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY:

5.1 Overview of Current Operation

5.1.1 Mine Overview

EM is an established mine, with a Concentrator Plant that produces PGM and chromite concentrate. A description of the operational mining and processing activities is provided below (Refer to *Figure 3*).

5.1.2 The Mining Processes

Two different mining methods are undertaken at EM at two sections, namely underground mining at Elandsfontein and opencast mining at Zilkaatsnek. The different mining sections and methods are described below.

5.1.2.1 *Elandsfontein*

Opencast mining operations commenced in 2006 prior to the commissioning of the Concentrator Plant, to build up an ore stockpile. The opencast workings were accessed via two boxcuts, located along the length of the UG2 outcrop. Mining took place on both sides of each of the boxcuts (SLR, 2012). Excess waste rock was used for the construction of the TSF Paddocks and roads.

The opencast reserves on the Farm Elandsfontein have been mined out (SLR, 2012). The underground mining operation is divided into two mining blocks. These areas are accessed through two decline portals in the high wall of the initial opencast boxcuts (SLR, 2012). These are referred to as the Nyala (eastern portal) and Kukama (western portal) Shafts. Each portal contains two declines, providing access to the underground workings.

5.1.2.2 *Zilkaatsnek*

The mining method for the Zilkaatsnek opencast operation comprise of a series of boxcuts, which, once the ore has been removed; and the next cut of overburden will be removed. EP has obtained authorisation from the DMRE to backfill these voids.

5.1.3 The processing processes

The current mineral processing operations comprise of one Concentrator Plant, with the option of adding an additional concentrator plant in future. The expansion has been authorised as detailed in the **Table 5**.

The existing Concentrator Plant comprises of ROM ore stockpiling, ore storage (silo), crushing and screening, milling and flotation circuits, concentrate handling, a chromite recovery circuit and a TSF. The Concentrator Plant has a capacity to process 250 000 tonnes per month and is designed to produce PGM and chromite concentrate.

5.1.3.1 *ROM Processing*

Underground mining is undertaken at the EM's Kukama Shaft and Nyala Shafts. The ROM is transported to the Concentrator Plant, where it is crushed and milled. PGM is extracted from the milled ore by floatation. The tailings from the floatation is then fed to a Chrome Extraction Plant, where chrome concentrate is extracted by using gravity separation. The final tailings are deposited on the existing TSF Paddocks. The PGM concentrate is transported off-mine to a Smelter (Zondereinde) for further processing and the chromite concentrate sold to the market.

5.1.3.2 *Tailings Re-mining*

The hydro-mining and reprocessing of the tailings in the existing TSF Paddock 1 has been authorised by the DMRE. PGM is extracted from the re-mined tailings by floatation. The tailings from the floatation is fed to a Chrome Extraction Plant, where chrome concentrate is extracted by using gravity separation. The final tailings are deposited on the existing TSF Paddocks. The PGM concentrate is transported off mine to a Smelter for smelting and the chromite concentrate sold to the market.

5.1.3.3 *Ore from outside source*

Ore sourced from outside sources is transported and stockpiled on the existing ROM stockpile area. The stockpiled ore is hydro-mined and pumped to the Concentrator Plant, where it is milled. PGM is extracted from the milled ore by floatation. The tailings from the floatation is fed to a Chrome Extraction Plant, where chrome concentrate is extracted using gravity separation. The final tailings are deposited on the existing TSF Paddocks. The PGM concentrate is transported off mine to a Smelter for smelting and the chrome concentrate sold to the market.

5.1.3.4 Grout plant/backfill plant

Limited quantities of the tailings stored in the TSF is processed in a backfill plant to produce cementitious backfill, which is pumped underground for ground support.

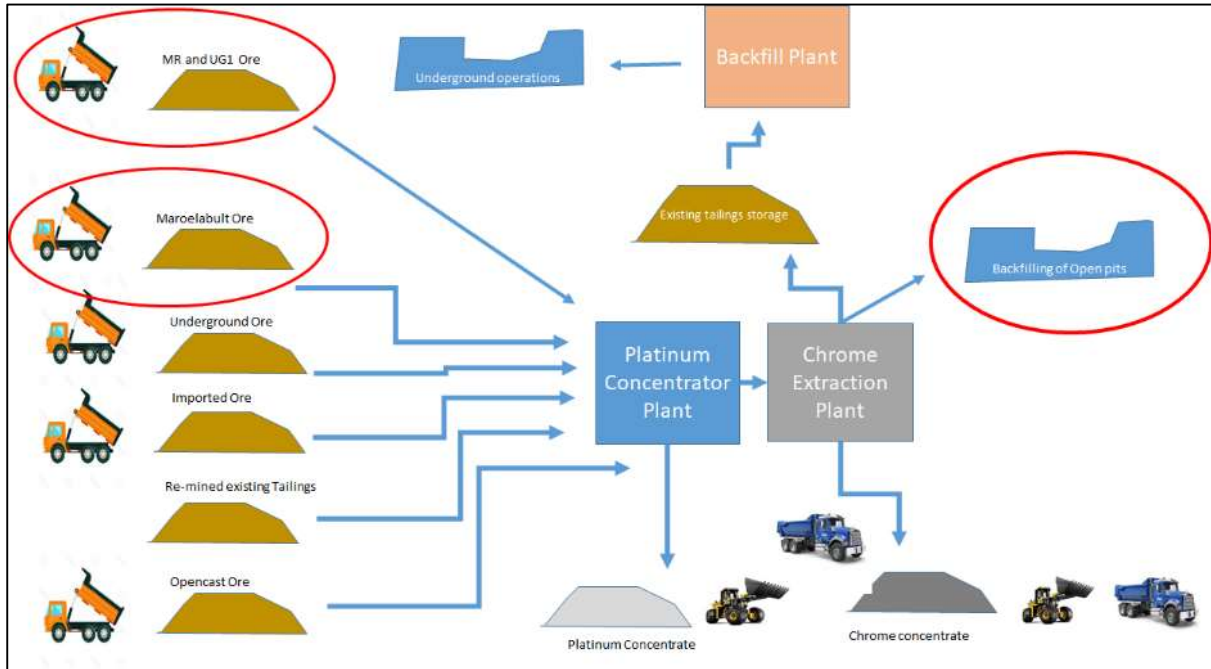


Figure 3: EM Operation Process Flow Diagram.

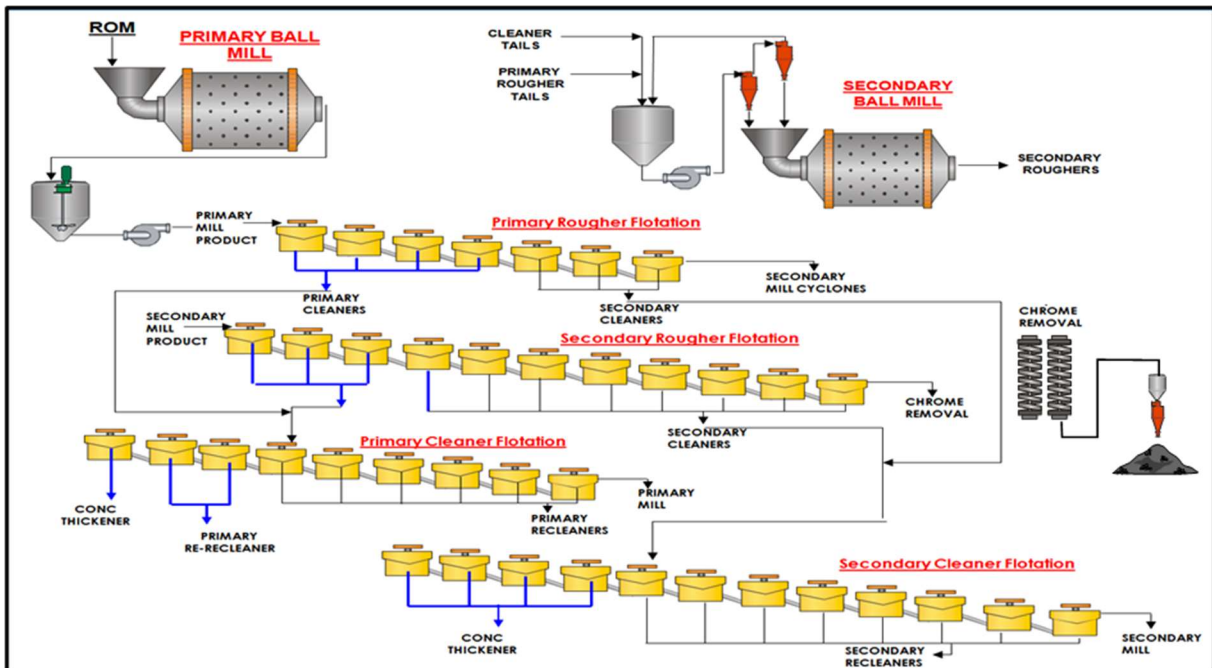


Figure 4: Processing Plant Flow Diagram

5.2 Proposed Activities

The purpose of the proposed EM PV Solar Project is to generate electricity for use at the EM's offices, workshops, concentrator plant, laboratory, other auxiliaries, etc. Any excess power produced will be distributed to the national grid. The EM PV Solar Project will be constructed within the EM Surface Area and comprise of the following:

- 40MW PV Plant, with a generating capability of 40 MW, situated within a 98 Ha project area;
- a 5MW PV Plant, with a generating capability of 5MW, to be established on 10Ha within an 18 Ha project area which will be coupled with a HFC installation.

5.2.1 40MW PV Plant

The activities associated with the 40MW PV Plant will comprise the following:

- a 40MW PV Plant,
- Inverters and transformers;
- 11 kV and 33 kV transmission lines and transmission towers;
- Cabling between project components;
- Access and internal roads;
- On-site facility substation;
- Telecommunications mast;
- Operations and maintenance buildings;
- Security, perimeter fencing and access control;
- Temporary offices and construction yard;
- Water and sewage pipelines; and
- Temporary laydown area.

5.2.2 5MW PV Plant

The activities associated with the 5MW PV Plant, linked to a HFC installation (collectively the “**5MW PVHFC**”), will comprise the following:

- a 5MW PV Plant,
- Inverters and transformers;
- 11 kV and 33 kV transmission lines and transmission towers;
- Cabling between project components;
- Internal roads;

- On-site facility substation;
- Telecommunications mast;
- Operations and maintenance buildings;
- Security, perimeter fencing and access control;
- Temporary offices and construction yard; and
- Water and sewage pipelines;
- Temporary laydown area

The HFC installation, with a generating capability of 5 MW, will be located at the existing EM Laboratory. The HFC installation will comprise:

- a hydrogen fuel cell
- an electrolyser (which will be contained in a container);
- a 120m³ hydrogen pressurised storage tank
- battery system (which will be housed in a container); and
- temporary office and Temporary laydown area.

The 40 MW PV Project Area and 5MW PVHFC Project Area are collectively referred to as the “EM PV Solar Project Area”.

The proposed listed activities in NEMA will be triggered as part of the EM PV Solar Project:

Table 6: General list of proposed activities

NAME OF ACTIVITY	AERIAL EXTENT OF ACTIVITY ²	LISTED ACTIVITY	APPLICABLE LISTING NOTICE
1. Establishment of temporary construction camp and laydown area (5Ha for 40MW PV Plant and 2Ha for the 5MW PVHFC Plant)	+/- 7 Ha	X	GNR 983
2. Upgrading and expansion of haul roads for the transportation of material and general equipment movement	+/- 1 Ha	X	GNR 983 GNR 985
3. Construction of a new access road from the R566 (Brits-Rosslyn Road) to the 40MW PV Plant Area	+/- 0.5 Ha	X	GNR 983 GNR 985
4. Expansion of existing and development of new water and sewage pipelines	+/-1 Ha	X	GNR 983 GNR 985
5. Vegetation clearance and soil disturbance of 116 Ha for the 40 MW PV Project Area and 5MW PVHFC Project Area, including the associated infrastructure, roads, power lines and pipelines at EM	+/- 116 Ha	X	GNR 984 GNR 985
6. Construction and operation of the proposed 40 MW PV and 5MW PV Plant linked to a HFC, including the associated infrastructure, transmission lines, roads and pipelines at EM	+/- 116 Ha	X	GNR 983 GNR 984 GNR 985
7. Construction and operating of an 120m ³ hydrogen gas storage tank, as part of the 5 MW PVHFC	200 m ²	X	GNR 983 GNR 985

NAME OF ACTIVITY	AERIAL EXTENT OF ACTIVITY ²	LISTED ACTIVITY	APPLICABLE LISTING NOTICE
8. Construction and operation of an onsite substation complex (2Ha for 40MW PV Plant and 1Ha for the 5MW PVHFC)	+/- 4 Ha	X	GNR 983 GNR 985
9. Building rubble and construction waste will be generated during the construction Phase.	+/- 500 m ²	N/A	Not listed
10. Decommissioning of the temporary construction camp	+/- 1000 m ²	N/A	Not listed
11. Rehabilitate and revegetate the areas affected by construction and land clearance.	Unknown	N/A	Not listed
12. Continued ground and surface water monitoring	Unknown	N/A	Not listed
13. Dust suppression and monitoring	Unknown	N/A	Not Listed
14. Maintaining and training of emergency preparedness and response plan	Unknown	N/A	Not listed

5.3 Description of the activities to be undertaken

5.3.1 Overview of Solar PV Technology

Solar energy facilities, such as those which utilise PV technology, use the energy from the sun to generate electricity through a process known as the Photovoltaic Effect. Generating electricity using the Photovoltaic Effect is achieved by using the following components:

5.3.1.1 *Photovoltaic Modules*

PV cells are made of crystalline silicon, the commercially predominant PV technology, that includes materials such as polycrystalline and monocrystalline silicon or thin film modules manufactured from a chemical ink compound. They are arranged in multiples / arrays and placed behind a protective glass sheet to form a PV module (Solar Panel). Each PV cell is positively charged on one side and negatively charged on the opposite side, with electrical conductors attached to either side to form a circuit. This circuit captures the released electrons in the form of an electric current (i.e., Direct Current (DC)).

When sunlight hits the PV panels free electrons are released and flow through the panels to produce DC. DC then needs to be converted to Alternating Current (AC), using an inverter, before it can be directly fed into the electrical grid.

5.3.1.2 *Inverters*

Inverters are used to convert electricity produced by the PV panels from DC into AC, to enable the facility to be connected to the mine electrical distribution system. Numerous inverters will be arranged in several arrays, to collect and convert power produced by the facility.



Figure 5: Example of a PV Solar Panel.

5.3.1.3 Support Structures

PV panels will be fixed to a support structure. They can either utilise fixed / static support structures, or alternatively single or double axis tracking support structures. PV panels which utilise fixed / static support structures are set at an angle (fixed tilt PV system), to optimise the amount of solar irradiation. With fixed / static support structures, the angle of the PV panel is dependent on the latitude of the proposed development and may be adjusted to optimise for summer and winter solar radiation characteristics. PV panels which utilise tracking support structures track the movement of the sun throughout the day, to receive the maximum amount of solar irradiation.

5.3.1.4 PV array areas (40 MW and 5 MW Generating Capacity)

Fixed-tilt, single-axis tracking, and/or double-axis tracking PV technology will be used for the project. Monofacial or bifacial panels are both also considered. The EM PV Solar Project will comprise solar panels which, once installed, will stand approximately 5m above ground level. The solar panels will include centralised inverter stations, or string inverters mounted above ground. If centralised inverter stations are used, megavolt distribution transformers are located internally, whereas string inverters are containerised with switchgear. The main transformer capacity varies according to detailed design and project-specific requirements.

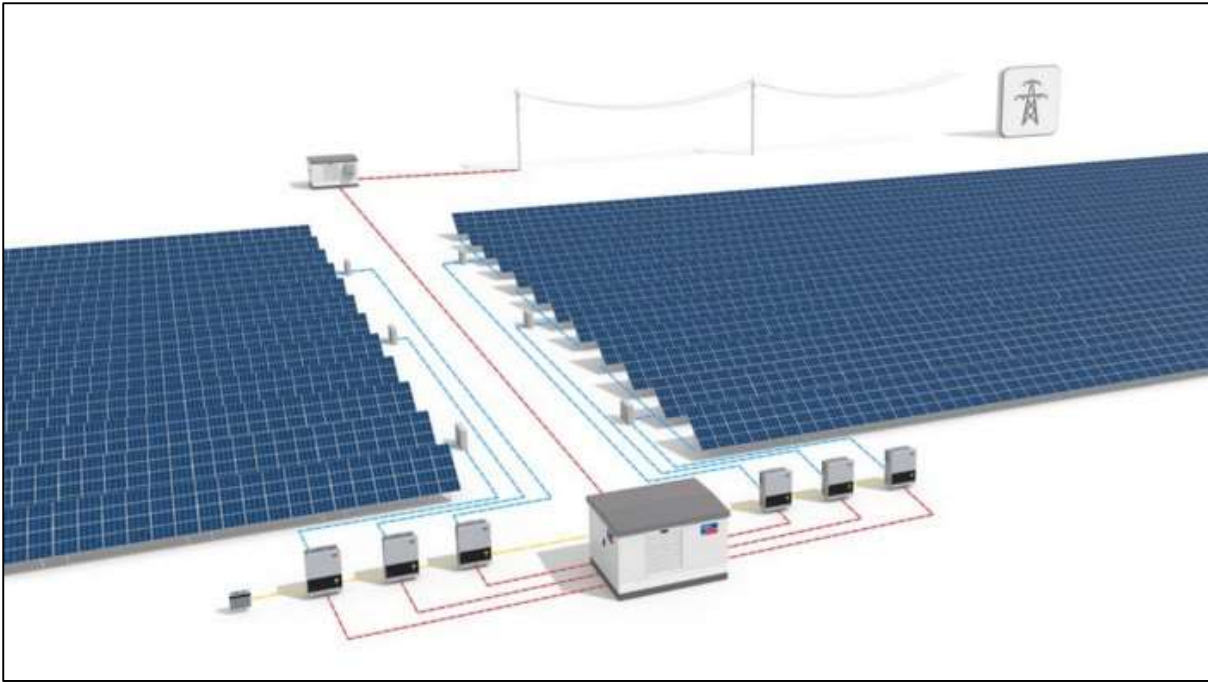


Figure 6: PV Solar Plant principle diagram (source: Solardao) ¹

5.3.1.5 PV Hydrogen fuel cell (PVHFC) technology

The 5MW PVHFC will consist of the:

- 5MW PV array, linked to a HFC; and
- HFC with a hydrogen pressurised storage tank of 120m³, incorporating an electrolyser and a battery storage system located at the existing EM Laboratory.

In the hydrogen fuel cell, hydrogen and oxygen will be combined to generate electricity, heat and water using platinum as a catalyst. The hydrogen fuel will be generated in an electrolyser, where water is separated into oxygen and hydrogen. The hydrogen will be stored in pressurised vessel (storage tank), with a combined capacity of 380kg at a pressure of 35 bar (120m³). The 5 MW PV Plant will be utilised to energise the electrolyser and charge batteries for periods during which solar energy will not be available.

5.3.1.6 Substation Complexes

Two onsite substation complexes will be developed to receive, convert and step up the electricity generated by the 40 PV Plant and 5MW PVHFC to evacuate power to the existing consumer substation. The infrastructure will cover an area of approximately 2 Ha with a maximum height of 5m. The onsite substation complexes will be divided into a medium and

¹ (<https://medium.com/@solar.dao/how-pv-solar-plants-work-a-beginners-guide-79f085b8ee88>).

high voltage sides. The medium voltage side of the onsite substation complexes contain collection, transformation (i.e., 11 kV to 33 kV) and measurement equipment. The high voltage side contains mainly measurement equipment and connection to the 11 or 33 kV transmission line.

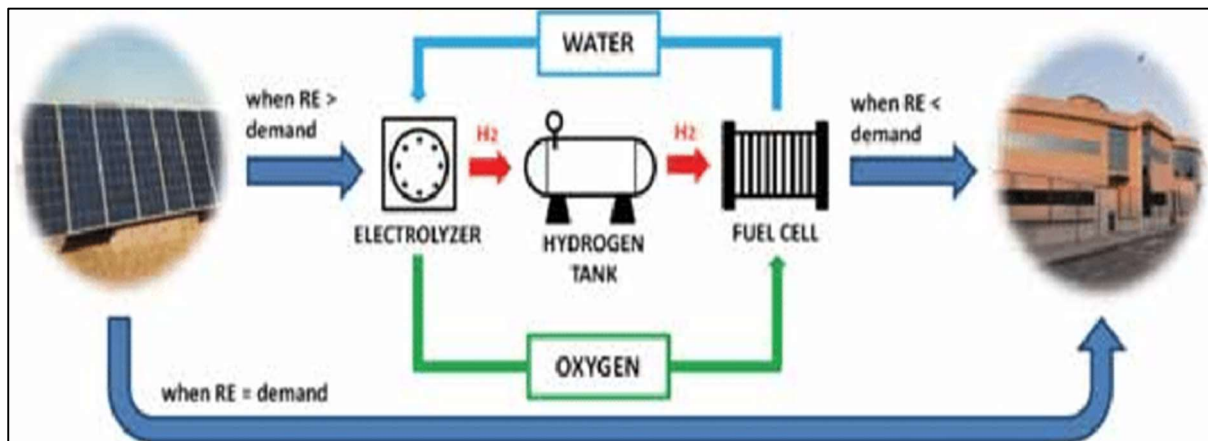


Figure 7: Process Flow Diagram of a PV Hydrogen Fuel Cell Technology.

5.3.1.7 Stormwater control

Where required, stormwater infrastructure will be constructed on the site to ensure that stormwater run-off from the site is appropriately managed.

5.3.1.8 Telecommunications

A radio telecommunication mast of a maximum height of 50 m (lattice or monopole type) will be installed within the substation complex for any data communications required for the EM PV Solar Project during the construction and operation phases of the development.

5.3.1.9 Temporary structures

Temporary structures will be installed within the EM PV Solar Project Area, with a combined maximum size of 7 Ha, including:

- temporary offices,
- construction yard, and
- a laydown area.

The construction yard will be used to perform small tasks during the construction phase, including equipment preparation, cleaning activities and will include one or few container-type

offices for contractors and technical staff. The laydown area will be used for storage of material and equipment during the construction phase. This area will be rehabilitated on completion of construction activities.

5.3.1.10 Operations and maintenance buildings

Additional building infrastructure is required to support the functioning of the facility and provide services to personnel that will operate and maintain the facility. These operations and maintenance (O&M) buildings, of approximately 1 Ha in size, will be located next to the onsite substation complex and include:

- workshops;
- small storage areas for materials and spare parts for use on site for maintenance activities during the operation phase;
- single storey concrete house with offices and ablutions facilities for staff, security and visitors;
- guard hut at the entrance of the proposed site with a mobile toilet;
- septic tanks and sewer lines connected to the service ablution facilities;
- water storage tanks or covered lined ponds;
- small diameter water supply pipeline connecting existing boreholes or existing pipeline access points to storage;
- central waste collection and storage area; and
- parking area.

5.3.1.11 Services to facility

Service connections and water supply required for the construction and operational activities will be sourced from the existing mine water and sewage supply network. Alternatively, water will be supplied via trucks from the on-site sources.

During the construction phase water will be required for consumption and services; and dust suppression on the roads and within the construction area. An estimated 1 600 m³ will be required for the construction phase. Recycled/treated water will be used if and where possible.

The PV panel will require regular cleaning and maintenance activities (at least quarterly), to ensure optimal operation and generation of electricity. EP will implement environmentally friendly dry-cleaning methods, if possible and available, or use water to clean the panels. Dirty water will be re-used as far as possible. During the operational phase (minimum of 25 years) approximately 1 600m³/annum of water will be used annually for the cleaning of panels; road maintenance and general employee usage.

EP has an existing WUL, which authorises the abstraction of groundwater and receives water from the Harties Irrigation Board. Water requirements and sources will be finalised in the EIA Phase.

Portable sanitation facilities (i.e., chemical toilets) will be used at the security guard hut at the entrance of the site and any sewage generated will be collected and treated/disposed-off at the WM WWTP. It is estimated that up to 10 kl of sewage (wastewater) will be produced during the construction phase. During the operational phase, limited activities would occur on the site thus the production of sewage (wastewater) will be minimal and the existing waste water infrastructure will be used.

It is likely that new internal roads will have to be constructed to allow for the movement of construction vehicles. The new roads will likely be wider than 8m. A new access road will possibly be constructed near the 40MW PV Plant area.

Waste management will be a priority and all waste will be handled according to the EM Waste Management Plan. The preliminary types of waste that will be generated include:

- Building rubble (mainly in the form of construction material, excavated substrate and domestic solid waste);
- General Waste (i.e., Cardboard waste (panel packaging), waste (rubber caps on panel edges, wooden pallets, plastic wrapping etc.); and
- Hazardous Waste (i.e., waste oil and paint, etc.).

The EA Application is therefore submitted for the abovementioned activities. The EM PV Project Area will consist of a total footprint of **+/- 116 Ha**. The EM PV Solar Project will be constructed and operated within the EM Surface Area. Refer to the **Figure 8 - 10** below for an indication of the location of the EM PV Solar Project. Technical specifications and engineering drawings will be included as part of the EIA Report (“**EIAR**”).

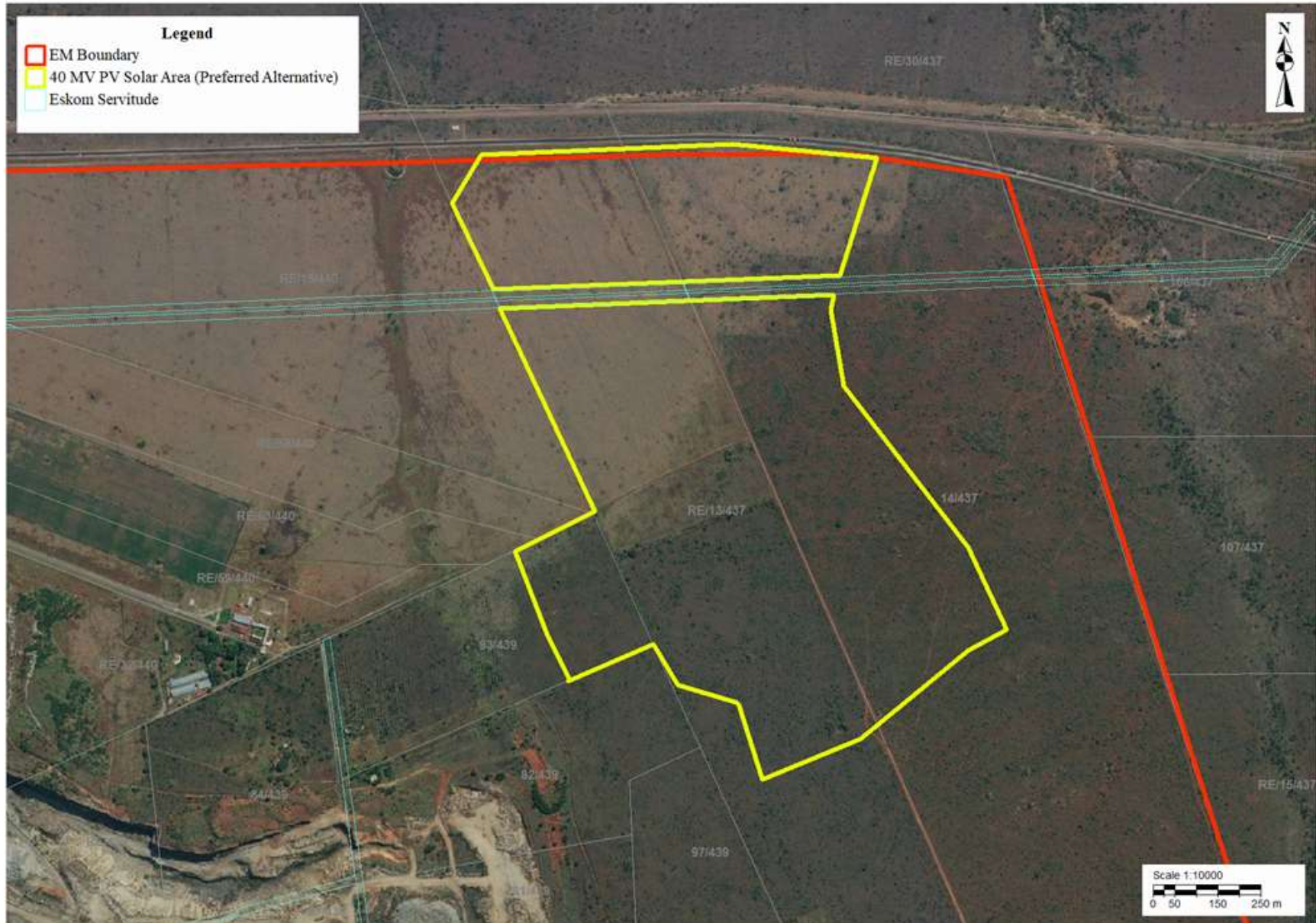


Figure 8: Location of the 40MW PV Solar Area.



Figure 9: Location of the 5 MW PV Hydrogen Fuel Cell Area.

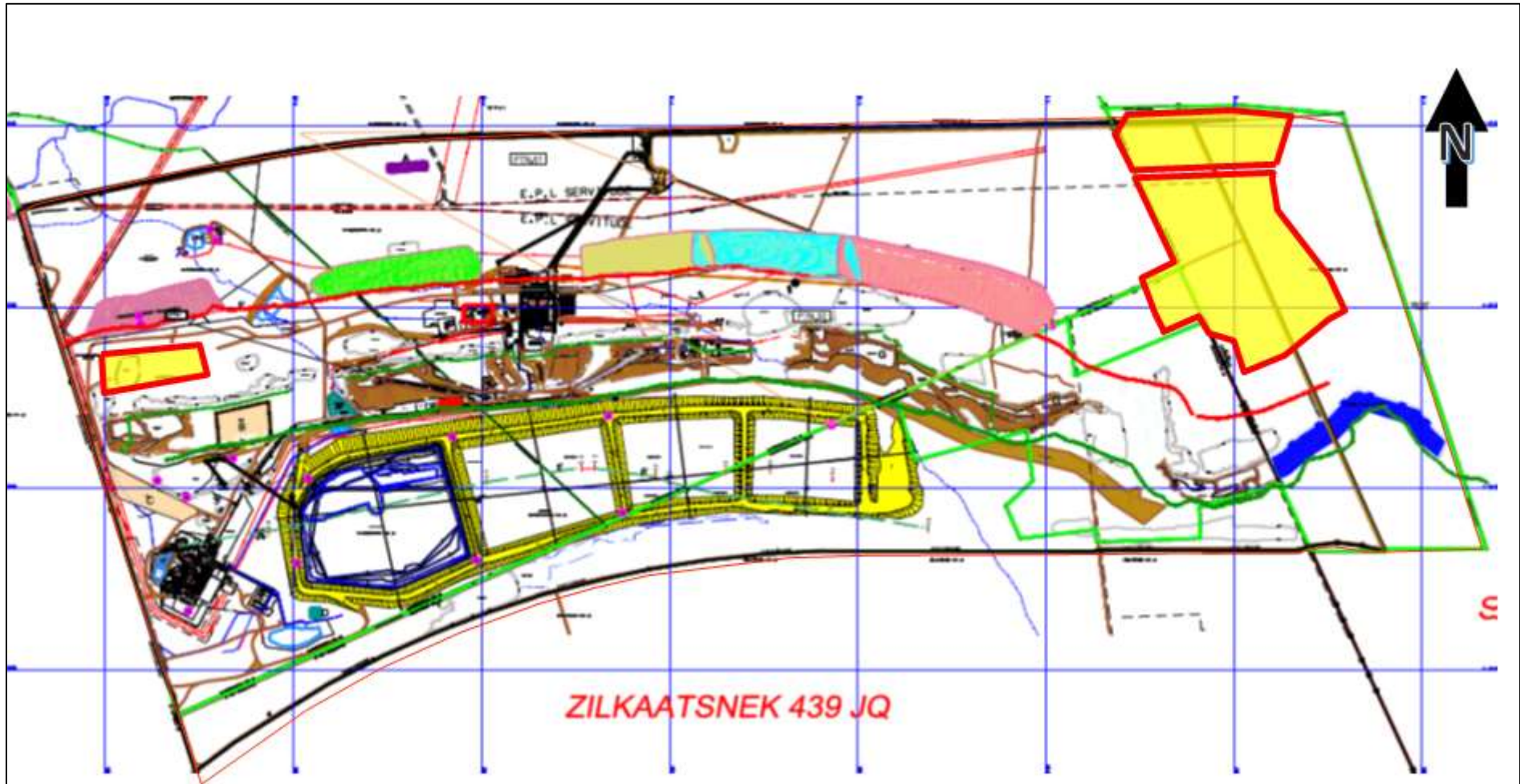


Figure 10: Locality of the EM PV Solar Project in relation to the Mining and Surface Infrastructure.

6. POLICY AND LEGISLATIVE CONTEXT

Table 7: Policy and legislative context of the EA Application

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
<p>1. <u>Constitution of the Republic of South Africa (Act No. 108 of 1996) ("Constitution")</u></p> <p>Environmental legislation is shaped by the Bill of Rights set out in the Constitution. Section 24 of the Constitution, known as the 'Environmental Right', guarantees every person the right to an environment that is not harmful to their health or well-being; provides for environmental protection of the against pollution and degradation and centres sustainable development as the cornerstone of South Africa's environmental law regime. This right is binding on the State and people, both natural and juristic.</p> <p>In fulfilment of its constitutional mandate to take reasonable legislative measures to give effect to section 24 of the Constitution, the government has promulgated several environmental laws. These laws provide a legal framework that embodies internationally recognised legal principles.</p> <p>The principal act governing activities that affect the environment is National Environmental Management Act, 1998.</p> <p>In accordance with the constitutional mandate to protect the environment, on 1 November 2012 the National Council of Provinces ratified the Paris Agreement, adopted under the United Nations Framework Convention on Climate Change, which has been said to represent a turning point in global climate governance.</p> <p>In September 2021, South Africa updated its Nationally Determined Contribution ("NDC"). South Africa's National Climate Change Adaptation Strategy, 2020 ("NCCAS") supports the country's ability to meeting its obligations under of the Paris Agreement.</p>	<p>The Constitution itself has no permitting requirements. However, the manner in which the Environmental Right is applied implies that environmental impacts associated with developments should be considered separately and cumulatively.</p> <p>Furthermore, section 24 includes the notion that justifiable economic and social development should be promoted, through using natural resources and ecologically sustainable development.</p> <p>The EM PV Solar Project is a renewable energy project which promotes South Africa's obligations in terms of the Paris Agreement and NDC and, due to greenhouse gas ("GHG") emission reduction, promotes an environment that is not harmful to persons' health or wellbeing and sustainable development.</p> <p>The Scoping/EIA and EMPr will be compiled considering the Constitution, Paris Agreement and South Africa's National Climate Change Adaptation Strategy, 2020.</p>
<p>2. <u>National Environmental Management Act (Act No. 107 of 1998) ("NEMA")</u></p> <p>In terms of sections 24(2) and 24D of NEMA the Minister of Forestry and Fisheries and Environmental Affairs promulgated certain activities that may not commence</p>	<p>The EM PV Solar Project includes activities listed in terms of GN R983, GN R984 and G.N. R985 which require an EA from the CA, in terms of</p>

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
<p>without an EA. Activities promulgated in terms of GN983 and GN9835 require a basic assessment process, while activities promulgated in terms of GN984 require that a full Scoping and EIA process be conducted. GN 983, 984 and 985 are promulgated under NEMA in GG 38282 of 4 December 2014 (as amended). The requirements for an EIA and EMP are specified in Appendixes 3 and 4 of GN 982 promulgated under NEMA in GG 38282 of 4 December 2014 (as amended) ("2014 EIA Regulations").</p> <p>Section 28 of NEMA also places a duty of care on all persons to prevent, limit or remediate any pollution or degradation of the environment.</p>	<p>2014 EIA Regulations. This EA must be obtained prior to the commencement of the activities.</p> <p>The application for the EA will be made to the NWDEDECT as the Competent Authority ("CA") for the EM PV Solar Project.</p> <p>DFFE confirmed to Northam as part of another solar project in April 2021 that the provincial environmental departments should be the CA. The DMRE is the CA under the 2014 EIA Regulations where the listed activities are directly related to mining activities. As with the previous solar project, the EM PV Solar Project will generate electricity for use at the EM's offices, workshops, concentrator plant, laboratory, other auxiliaries, etc. Any excess power produced will be distributed to the national grid. The EM PV Solar Project is therefore not directly related to mining activities and the provincial environmental department is the CA.</p> <p>EP is committed to always during construction, operation and decommissioning of the EM PV Solar Project comply with the duty of care as set out in Section 28. The duty of care applies to all activities taking place at the EM PV Solar Project Area and also the EM and is not solely focused on the listed activities being applied for. While no permitting or licensing requirements arise through section 28 of NEMA, this section is applicable through the consideration of potential cumulative, direct, and indirect impacts and the implementation of the required mitigation measures.</p>
<p>3. EIA Regulations (2014 EIA Regulations)</p> <p>Chapter 6 of the 2014 EIA Regulations provides for the requirements for PPP, which must be carried out as part of the EA application process. In terms of Regulations 21 and 23, the outcome of the PPP must be reported in the FSR and EIAR submitted to the CA. The PPP, "<i>must give all potential or registered interested and affected parties, including the competent authority a period of at least 30 days to submit comments on each of the EMPR, scoping report and environmental impact assessment report, and where applicable the closure plan, as well as the report contemplated in regulation 32, if such reports or plans are submitted at different times</i>" (Regulation 40 (1)).</p>	<p>A PPP will be undertaken to make provision for the consultation process during the EM PV Solar Project.</p> <p>The properties where the EM PV Solar Project will be undertaken are owned by EP.</p> <p>Surrounding landowners will be notified as part of PPP process.</p>

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
<p>The PPP must also:</p> <ul style="list-style-type: none"> ■ provide access to all information that reasonably has or may have the potential to influence any decision regarding an application; ■ involve consultation with the CA, every state department that administers a law relating to the environment relevant to the application, all relevant organs of state, and all I&APs; and ■ provide opportunity for I&APs to comment on reports and plans prior to submission of an application but must be provided with an opportunity to comment on such reports once an application has been submitted to the CA. <p>The process must include:</p> <ul style="list-style-type: none"> ■ notification of the application to all I&APs, as stipulated in Regulation 41; ■ registration of all I&APs, as required in Regulations 42 and 43; and ■ a record of comments and responses and records of meetings of and with I&APs, as outlined in Regulation 44. <p>Regulation 39 of the 2014 EIA Regulations requires that:</p> <p><i>"(1) If the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land.</i></p> <p><i>(2) Sub regulation (1) does not apply in respect of—</i></p> <p><i>(a) linear activities; and</i></p> <p><i>(c) strategic integrated projects as contemplated in the Infrastructure Development Act, 2014."</i></p>	
<p>4. <u>DFFE Web-Based Screening Tool</u></p> <p>In terms of Regulation 16(1)(b)(v), read with regulation 21 of the 2014 EIA Regulations, it is compulsory for an EA application to include a report generated</p>	<p>The requirement for the submission of a screening report for the EM PV Solar Project is applicable, as it triggers Regulation 21 of the EIA Regulations, 2014. The screening report has been compiled and is attached to this Scoping Report under Appendix 7.</p>

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT		REFERENCE WHERE APPLIED	
by the national web based environmental screening tool (GN R960 of 5 July 2019).		<p>The screening report identified the following environmental sensitivities:</p> <ul style="list-style-type: none"> ■ Agricultural Theme – Very High Sensitivity; ■ Animal Species Theme– Medium Sensitivity; ■ Aquatic Biodiversity Theme – Low Sensitivity; ■ Archaeological and Cultural Heritage Theme – Low Sensitivity ■ Civil Aviation Theme – Medium Sensitivity; ■ Defence Theme – Low Sensitivity; ■ Palaeontology Theme – Medium Sensitivity; ■ Plan Species Theme – Medium Sensitivity; and ■ Terrestrial Biodiversity Theme – Very High Sensitivity. <p>Specialist studies have and will be commissioned to verify the sensitivity themes as provided in the Screening Tool in the EIA Phase.</p>	
<p>5. Environment Conservation Act (Act No. 73 of 1989) ("ECA")</p> <p>The Noise Control Regulations in terms of Section 25 of the ECA are still applicable for noise control in the North West Province.</p>		<p>Noise impacts are expected to be associated with the EM PV Solar Project's construction phase. The necessity for a noise permit in terms of ECA will be considered in the EIA Phase but appears unlikely, due to the nature of the Project.</p>	
<p>6. NEMA Listed Activities (GN983, 984 and 985)</p> <p>A scoping and EIA process is being followed in terms of the 2014 EIA Regulations for activities listed under GN983, GN984 and GN 985. This report constitutes the scoping report circulated to I&APs and State Organs, in the EIA process being undertaken. The listed activities applicable to the EM PV Solar Project are given in the Table below.</p>			
Number and date of relevant notice	Activity No.	Description of each listed activity as per the GN.	Description of the proposed activities in relation to the listed activities being applied for.
GN R. 983	12(ii)(c)	<p>Development of</p> <p>(ii) infrastructure or structures with a physical footprint of 100 m², or more</p> <p>(c) if no development setback exists, within 32m of a watercourse,</p>	<p>Pump stations, pipelines and associated infrastructure required for the EM PV Solar Project may be constructed in proximity to watercourses, although currently it is not envisaged that such infrastructure will be 32m of a watercourse.</p> <p>However, provision is made to include the listed activity should this be required.</p>

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT			REFERENCE WHERE APPLIED
		measured from the edge of a watercourse.	
GN 983	R. 14	Development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 m ³ or more but not exceeding 500m ³ .	Hydrogen gas will be stored in a 120m ³ pressurised hydrogen fuel tank, as part of the 5W PVHFC, where chemical energy is converted to electricity.
GN 983	R. 19	Infilling or depositing of any material of more than 10 m ³ into, or the dredging, excavation, removal or moving of soil, sand, ..., pebbles or rock of more than 10 m ³ from a watercourse.	It is unlikely that pipelines and roads required for the EM PV Solar Project will traverse watercourses. However, provision is made to include the listed activity should this be required.
GN 983	R. 24(ii)	Development of a road: (ii) with a reserve wider than 13,5 m, or where no reserve exists where the road is wider than 8 m	It is likely that new internal roads will have to be constructed to allow for the movement of construction vehicles. The new roads will likely be wider than 8m. A new access road will likely be constructed near the 40MW PV Project Area, possibly from the R566 provincial road.
GNR. 983	28 (ii)	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 1 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 Ha	The EM PV Solar Project Area will be 116 Ha; and consist of the 40 MW PV Plant and a 5MW PVHFC, which may be considered industrial activities. The 40MW PV Plant will be located on land previously utilised for crop production; larger than 1 Ha; and outside an urban area.
GN 983	R. 48(i)(a)(c)	Expansion of: (i) infrastructure or structures where the physical footprint is expanded by 100 m ² or more; where such expansion occurs— (a) within a watercourse; (c) if no development setback exists, within 32 m of a watercourse, measured from the edge of a watercourse	EP is proposing to expand additional infrastructure that might be close to watercourses, including pump stations, pipelines and associated infrastructure required for the EM Mine PV Solar Project. It is not foreseen that any expansion activities will be undertaken within 32m of a watercourse. However, provision is made to include the listed activity should this be required.
GN 984	R. 1	Development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20MW or more.	EP is planning to construct the EM PV Solar Project within the EM mining right area. The Project will consist of a 40 MW PV Plant and a 5MW PVHFC The EM PV Solar Project's purpose is to generate electricity for use at the EM's offices, workshops, concentrator plant, laboratory, other

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT			REFERENCE WHERE APPLIED
			auxiliaries, etc. Any excess power produced will be distributed to the national grid.
GN 984	R. 15	Clearance of an area of 20 Ha or more of indigenous vegetation.	The EM PV Solar Project will be constructed on a combined footprint of 116 Ha; and consist of a 40 MW PV Plant and a 5MW PVHFC. More than 20ha of indigenous vegetation will be cleared.
GN 985	R. 3(a)(b)(h)(i)(dd) & (ff)	Development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower— (a) is to be placed on a site not previously used for this purpose; and (b) will exceed 15m in height, (i) Outside urban areas: (dd) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the CA (“ CBAs ”); (ff) Areas within 5 km from protected areas identified in terms of the National Environmental Management: Protected Areas Act 57 of 2003 (“ NEMPAA ”) or a biosphere reserve (“ Protected Area ”).	A radio telecommunication mast of a maximum height of 50 m (lattice or monopole type) will be installed within the substation complex for any data communications required for the EM PV Solar Project during its construction and operation phases. The proposed communication mast will be located inside the existing EM PV Solar Project Area; likely within / near the Marikana Thornveld ecosystem; and is situated in a CBA, as per the North-West Biodiversity Sector Plan (“ NW BSP ”). The EM PV Solar Project is within 5km of the Mnandi Nature Reserve and falls within the Magaliesberg Biosphere Buffer Area.
GN 985	R. 4 (h) (iv) & (vi)	Development of a road wider than 4 m with a reserve less than 13,5 m, whereas the development takes place: iv) CBAs; vi) Areas within 5km from a Protected Area.	It is likely that new internal roads will have to be constructed to allow for the movement of construction vehicles and a new access road for construction and maintenance of the 40MW PV Plant. The new roads will likely be wider than 8m. The proposed roads will be located inside the existing EM Surface Area; within / near the Marikana Thornveld ecosystem; and is situated in a CBA, as per the NW BSP. The EM is within 5km of the Mnandi Nature Reserve and falls within the Magaliesberg Biosphere Buffer Area.
GN 985	R. 12 (h)(iv) and (vi)	Clearance of an area of 300m ² or more of indigenous vegetation (except where such clearance is required for maintenance purposes undertaken in accordance with a maintenance management plan) in the NWP on land situated within;	The EM PV Solar Project will be constructed on a combined footprint of 116 Ha; and consist of a 40MW PV Plant and a 5MW PVHFC.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT			REFERENCE WHERE APPLIED
		iv) CBA; and vi) Areas within a watercourse or wetland, or within 100 m from the edge of a watercourse or wetland.	It is likely that the impacted vegetation will include indigenous vegetation and is within / near the Marikana Thornveld ecosystem and is/or situated in a CBA as per the NW BSP.
GN 985	R. 14(ii)(a) (c)(h)(iv) & (vi)	Development of infrastructure or structures with a physical footprint of 10m ² or more; where such development occurs – (a) within a watercourse; or (c) if no development setback has been adopted, within 32m of a watercourse, measured from the edge of a watercourse in the NWP in: iv) CBAs; and vi) Areas within 5km from Protected Areas or core areas of a biosphere reserve.	Pump stations, pipelines and associated infrastructure required for the EM PV Solar Project may be constructed in proximity to watercourses, although currently it is not envisaged that such infrastructure will be within 32m of a watercourse. However, provision is made to include the listed activity should this be required. The proposed activities are within / near the Marikana Thornveld ecosystem and situated in a CBA as per the NW BSP. The EM Surface Area is within 5km of the Mmandi Nature Reserve and falls within the Magaliesberg Biosphere Buffer Area.
GN 985	R. 18(h)(ii) & (v) & (ix)	Widening of a road by more than 4m, or the lengthening of a road by more than 1km, in the NWP in: ii) Areas within 5km from Protected Areas or a biosphere reserve; v) CBAs; and (ix) Areas within a watercourse or wetland, or within 100 m from the edge of a watercourse or wetland	It is likely that existing internal roads will have to be widened to allow for the movement of construction vehicles. The roads will likely need to be widened by 4m. The internal roads are located inside the existing EM Surface Area and within / near the Marikana Thornveld ecosystem and situated in a CBA, as per the NW BSP. The EM is within 5km of the Mmandi Nature Reserve and falls within the Magaliesberg Biosphere Buffer Area.
GN 985	R. 23(ii)(a) & (c) (h), (iv) & (vi)	The expansion of: (ii) infrastructure or structures where the physical footprint is expanded by 10m ² or more, where such expansion occurs— (a) within a watercourse;	Pump stations, pipelines and associated infrastructure required for the EM PV Solar Project may be constructed in proximity to watercourses, although currently it is not envisaged that such infrastructure will be within 32m of a watercourse. However, provision is made to include the listed activity should this be required.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT		REFERENCE WHERE APPLIED
	<p>(c) if no development setback has been adopted, within 32m of a watercourse, measured from the edge of a watercourse, in the NWP in:</p> <p>iv) CBAs; and</p> <p>vi) Areas within 5 km from Protected Areas or from the core area of a biosphere reserve.</p>	<p>The proposed activities are within / near the Marikana Thornveld ecosystem and situated in a CBA as per the NW BSP. The EM is within 5km of the Mnandi Nature Reserve and falls within the Magaliesberg Biosphere Buffer Area.</p>
<p>7. National Environmental Management: Air Quality Act (Act No. 39 of 2004) (NEMAQA)</p> <p>NEMAQA was promulgated to ensure the protection and regulation of air quality and provide measures that will prevent pollution and sustainability.</p> <p>Under NEMAQA, the Minister of Forestry and Fisheries and Environmental Affairs must identify substances in ambient air which present a threat to health, well-being or the environment and establish national standards for ambient air quality, including the permissible quantity or concentration of each substance in ambient air.</p> <p>The following regulations promulgated under NEMAQA were considered for the EM PV Solar Project:</p> <ul style="list-style-type: none"> ■ <i>List of activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage, published under GN 893 in GG 37054 of 22 November 2013 (as amended) (“AEL List”)</i>, which lists activities that could result in atmospheric emissions requiring an Atmospheric Emissions Licence before being undertaken. . ■ <i>Waterberg-Bojanala National Priority Area, GN1207/2015 in GG 39489 on 9 December 2015:</i> The Waterberg-Bojanala National Priority Area was established due to the exceedance of the ambient air quality standards or alternatively that a situation exists within the area which is causing or may cause a significant negative impact on air quality in the area and the area requires specific air quality management action to rectify the situation. 		<p>Renewable energy projects, such as the EM PV Solar Project, satisfy NEMAQA’s objectives, being clean air quality.</p> <p>The EM PV Solar Project does not trigger any listed activities in the AEL List.</p> <p>The EM and the EM PV Solar Project is located within the Waterberg-Bojanala National Priority Area, as contemplated in section 18(1) of NEMAQA.</p> <p>A dust fallout monitoring network and programme is in place for EM. EP will continuously be monitoring the dust fallout impacts at EM. Dust control measures will be included in the EMPr.</p>

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
<ul style="list-style-type: none"> ■ <i>National Dust Control Regulations, published under GN827 in GG 36974 of 1 November 2013</i>, which provide that an acceptable dust fallout rate for a non-residential area is considered more than 600 mg/m²/day but less than 1200 mg/m²/day (30-day average), with maximum allowable two exceedances per year, provided these exceedances do not take place in consecutive months. Where the dust fallout rate is exceeded, a dust fall monitoring programme, as prescribed in terms of the Regulations, must include: <ul style="list-style-type: none"> ▪ the establishment of a network of dust monitoring points, using method ASTM D1739:1970 (or an equivalent standard), sufficient in number to establish the contribution to dust fallout in residential and non-residential areas near the premises; monitor identified or likely sensitive receptor locations; and establish the baseline dust fall for the district; and ▪ a schedule for submitting to the air quality officer dust fallout monitoring reports annually or at more frequent intervals, if requested by the air quality officer. ■ GHG have been declared priority pollutants under the Declaration of Greenhouse Gases as Priority Air Pollutants published GN 710 in GG 40996 of 21 July 2017, in terms of NEMAQA, with potential reporting requirements for EM. 	
<p><u>8. National Environmental Management: Biodiversity Act (Act No. 10 of 2004) ("NEM:BA")</u></p> <p>In line with the Convention on Biological Diversity, NEM:BA aims to legally provide for biodiversity conservation, sustainable use and equitable access and benefit sharing. NEM:BA creates a basic legal framework for the formation of a national biodiversity strategy and action plan and identification of biodiversity hotspots and bioregions, which may then be given legal recognition. It imposes obligations on landowners (state or private) regarding alien invasive species. NEM:BA requires that provision be made by a site developer to remove any aliens which have been introduced to the site or are present on the site.</p> <p>The NEM:BA also provides for listing of threatened or protected ecosystems in one of four categories: critically endangered, endangered, vulnerable or protected.</p>	<p>The vulnerable Marikana Thornveld Ecosystem is located over sections of the EM PV Solar Project. As part of the application, indigenous vegetation clearance and removal will likely be undertaken. A biodiversity specialist has been appointed to determine the impact of the proposed application on the biodiversity and the findings/recommendations will be included in the EIAR. Under NEM:BA, a permit would be required for any activity that is of a nature that may negatively impact on the survival of a listed protected species.</p> <p>A biodiversity impact assessment will be undertaken in the EIA to assess the biodiversity impacts of EM PV Solar Project</p>

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
<p>Threatened ecosystems are listed to reduce the rate of ecosystem and species extinction, by preventing further degradation and loss of structure, function and composition of threatened ecosystems. The purpose of listing protected ecosystems is primarily to conserve sites of exceptionally high conservation value.</p> <p>Section 53 of NEM:BA provides that:</p> <p><i>"(1) The Minister may, by notice in the Gazette, identify any process or activity in a listed ecosystem as a threatening process.</i></p> <p><i>(2) A threatening process identified in terms of subsection (1) must be regarded as a specified activity contemplated in section 24(2)(b) of the National Environmental Management Act and a listed ecosystem must be regarded as an area identified for the purpose of that section."</i></p> <p>No notices have been published yet under this section.</p> <p>Picking parts of, or cutting, chopping off, uprooting, damaging or destroying, any specimen of a listed threatened or protected species is a restricted activity under NEM:BA. A permit is required for a restricted activity involving a listed threatened or protected ("TOPS") species without a permit. Chapter 7 of the NEM:BA regulates the process for application of a permit under NEM:BA.</p> <p>The following notices have been published in terms of section 56(1) of NEM:BA:</p> <ul style="list-style-type: none"> ➤ National List of Ecosystems that are Threatened and in need of protection ("TOPS List"), published under GN1002 in GG34809 of 9 December 2012, which contains the National List of Ecosystems that are threatened and in need of protection. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems and preserving witness sites of exceptionally high conservation value. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction; ➤ Lists of Critically Endangered, Endangered, Vulnerable and Protected Species, published under GNR151 in GG 29567 of 23 February 2007 ➤ Threatened and Protected Species Regulations, published under GNR152 in GG 29657 of 23 February 2007. 	

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
<p>Chapter 5 of NEM:BA pertains to alien and invasive species and provides that a person may not carry out a restricted activity involving a specimen of an AIP without a permit issued in terms of Chapter 7 of NEM:BA. Such permit can only be issued after a prescribed assessment of risks and potential impacts on biodiversity is carried out. Applicable, and exempted AIP are contained within the Alien and Invasive Species List 2020, GNR 1003 of GG No. 43726.</p>	
<p>9. National Environmental Management: Waste Act (Act No. 59 of 2008) ("NEMWA")</p> <p>NEMWA's purpose is to: assist in regulating waste management; ensure the protection of human health; and prevent pollution and environmental degradation through sound waste management principles and guidelines. It furthermore provides for:</p> <ul style="list-style-type: none"> ■ national norms and standards for regulating waste management by all spheres of government; ■ licensing and control of waste management activities; ■ remediation of contaminated land; ■ a national waste information system; and ■ provision for compliance and enforcement. <p>The NEMWA defines waste broadly as:</p> <p><i>"(a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or</i></p> <p><i>(b) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste—</i></p> <p><i>(i) once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered;</i></p>	<p>No waste management listed activities will be triggered by the EM PV Solar Project therefore, no WML is required to be obtained. in terms of NEMWA.</p> <p>EP has a waste management procedure that provides the measures that are implemented to manage general and hazardous waste on the EP site. EP applies the Waste Management Hierarchy of Controls when it comes to waste management.</p> <p>General and hazardous waste handling, storage and disposal will be required during construction and operation. The National Norms and Standards for the Storage of Waste (GNR 926), published under Section 7(1)(c) of NEMWA, will be considered.</p>

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
<p>(ii) where approval is not required, once a waste is, or has been re-used, recycled or recovered;</p> <p>(iii) where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or</p> <p>(iv) where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste."</p> <p>The NEMWA imposes a general duty upon waste holders to take reasonable measures to avoid waste generation and, where this is impossible, to: minimise the toxicity and quantities of waste generated; reuse, reduce, recycle and recover waste; and ensure that it is treated and disposed of in an environmentally sound way. Failure to do so is a criminal offence, with a maximum fine of R10 million or imprisonment of up to 10 years, or both.</p> <p>It is necessary to hold a WML for defined waste management activities.</p> <p>The DEA promulgated the 2013 WML Regulations, which provides that a waste management licence ("WML") is required for undertaking certain waste management activities ("Waste Listed Activities"). The Waste Listed Activities are separated into three categories, namely Category A, Category B and Category C. Category A and B Waste Listed Activities require a WML, for which either a basic assessment or an EIA process needs to be undertaken that complies with the 2014 EIA Regulations. The procedures for licensing Waste Listed Activities are stipulated in Chapter 5 of Waste Act and will have to be considered in the overall EIA process.</p> <p>Category C activities do not require a WML but must comply with <i>inter alia</i> the Norms and Standards for Storage of Waste, 2013 (published in GN 926 of GG 37088 on 29 November 2013). Such facilities need to be registered with the DEA 90 days before construction commences.</p> <p>Classification of certain waste streams is required in terms of the Waste Classification and Management Regulations, published in GN634 of GG 36784 on 23 August 2013, to ensure that the correct waste management standards and disposal methods are implemented.</p>	

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
<p>The National Norms and Standards for the Assessment of Waste for Landfill Disposal and the National Norms and Standards for the Disposal of Waste to Landfill (published under GN R635 and GN R636 respectively in GG 36784 of 23 August 2013) provide the norms and standards for disposal of waste to landfill.</p> <p>The National Waste Information Regulations (published in GN 625 of GG 35583 on 13 August 2012,) regulate the collection of data and information to fulfil the objectives of the national waste information system, as set out in section 61 of the NEMWA, and includes reporting obligations. A registered person must keep a record of the information submitted to the SAWIS or the Department.</p>	
<p>10. National Heritage Resources Act (Act No. 25 of 1999) ("NHRA")</p> <p>The protection and management of South Africa's heritage resources are controlled by the NHRA. The national enforcing authority for the NHRA is the South African Heritage Resources Agency ("SAHRA"). In terms of the NHRA, historically important features such as graves, archaeology and fossil beds are protected. Similarly, culturally significant symbols, spaces and landscapes are also afforded protection. In terms of section 38 of the NHRA, a permit is required for certain categories of development as follows:</p> <p><i>Section 38 states:</i></p> <p><i>"(1) (a): The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;</i></p> <p><i>(c): Any development or other activity which will change the character of a site -</i></p> <p><i>i. exceeding 5 000 m² in extent;</i></p> <p><i>ii. involving three or more existing erven or subdivisions thereof;</i></p> <p><i>iii. involving three or more erven or divisions thereof which have been consolidated within the past 5 years; or</i></p> <p><i>iv. the costs of which will exceed a sum in terms of regulations by SAHRA or a provincial heritage resource authority."</i></p> <p>In terms of Section 38(8) of the NHRA, section 38(1) approval from SAHRA is not required where an environmental impact assessment is undertaken under NEMA,</p>	<p>The EM PV Solar Project Area has already been fundamentally transformed by agricultural, mining and processing activities. HIAs have been conducted for the EM PV Solar Project in the past and will be updated as part of the EIAR and in accordance with the heritage authority's requirements.</p> <p>The process envisaged by section 38(8) of the NHRA will be followed and a separate permit under section 38 of the NHRA will not be required.</p> <p>There are graves located within the EM Surface Area. However, the areas are not in close proximity to the EM PV Solar Project and have been fenced-off and aren't impacted on by EP.</p>

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<p>including a HIA, and SAHRA's requirements are considered by the competent authority when granting the EA. Section 38(8) of the NHRA provides that:</p> <p><i>"The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent."</i></p> <p>Accordingly, provision is made for the assessment of heritage impacts as part of an EIA process and, if such an assessment complies with the NHRA, a separate application for consent under the NHRA is not required.</p>	
<p><u>11. National Water Act (Act No. 36 of 1998 (NWA))</u></p> <p>The NWA is the primary legislation controlling and managing the use of water resources and pollution thereof. It provides for fundamental reformation of legislation relating to water resource use. The NWA's preamble recognises that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that water resources quality protection is necessary to ensure sustainability of the nation's water resources in the interests of all water users. The NWA's purpose is stated in section 2 and enforced by the DWS. Section 2 of the NWA relates to the following:</p> <ul style="list-style-type: none"> ■ <i>Promoting the efficient, sustainable and beneficial use of water in the public interest;</i> ■ <i>Facilitating social and economic development;</i> ■ <i>Protecting aquatic and associated ecosystems and their biological diversity;</i> 	<p>The EM PV Solar Project may involve sections 21 Water Uses.</p> <p>EP holds a WUL (Refer to Section 2.3.1) which includes authorisation for abstraction from certain boreholes and it also receives water from the Harties Irrigation Board Canal. EP is considering supply of water for the EM PV Solar Project and the necessity of amending its WUL in relation to the authorised purpose for which the water may be used.</p> <p>Roads, pipelines and power lines could possibly be constructed with 100m of watercourses or 500m from wetlands. If so, a GA, in terms of GNR 509 as per the NWA, may be required to be registered for these sections 21 (c) and (i) water uses with the DWS.</p> <p>It will be further assessed in the EIA Phase if section 21(g) water uses will be undertaken for the sewage facilities when more technical information on the facilities is provided.</p>

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
<ul style="list-style-type: none"> ■ <i>Reducing and preventing pollution and degradation of water resources; and</i> ■ <i>Meeting international obligations.</i> <p>The NWA presents strategies to facilitate sound management of water resources; provides for the protection of water resources; and regulates use of water by means of Catchment Management Agencies, Water User Associations, Advisory Committees and International Water Management. As the NWA is founded on the principle of trusteeship, the government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest. Industry (including mines) can therefore only be entitled to use water if the use is permissible under the NWA.</p> <p>In terms of section 21 of the NWA, certain consumptive and non-consumptive water uses are identified and can only commence once authorised.</p> <p>Water use is broadly defined in the NWA including both consumptive and non-consumptive water uses; taking and storing water; activities which reduce stream flow; waste discharges and disposals; controlled activities; altering a watercourse; removing water found underground for certain purposes; and recreation. Consumptive water uses for the EM PV Solar Project may include taking water from a water resource (section 21(a) of NWA) and storing water (section 21(b)). Non-consumptive water uses may include impeding or diverting a watercourse's flow (section 21(c); altering a watercourse's bed, banks, course or characteristic (section 21(i); and disposal of waste in a matter that may detrimentally impact on a watercourse (section 21(g).</p> <p>Where a water use constitutes a Scheduled 1 Use (permissible use without an authorisation requirement); permissible water uses in terms of section 22 of the NWA; or is authorised in terms of a General Authorisation ("GA"), a WUL is not required. Various GAs have been published under the NWA, including for Sections 21(c),(i),(g), and (a) water uses. In respect of Sections 21(c) and (i) water uses, activities can be conducted within 100m of a watercourse and 500m of a wetland without a WUL if the impacts to the watercourse / wetland are low. Water uses that will be conducted under a GA need to be registered with the DWS.</p>	

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
<p>In terms of Section 19 of the NWA, EP must ensure that reasonable measures are taken throughout the EM PV Solar Project's lifecycle to prevent and remedy pollution to water resources from occurring, continuing, or recurring.</p>	
<p>12. GN 704</p> <p>GN 704 was promulgated under section 26(1) of the NWA and provides minimum requirements which need to be adhered to for the protection of the water resources on a mine. GN 704 regulates water use; management of dirty and clean water infrastructure; and related activities at mines. This includes minimum requirements for infrastructure that hold dirty water. A mine can apply for exemptions from these requirements and be granted approval, should sufficient management measures be put in place to ensure environmental protection.</p> <p>Regulation 4 of GN 704 places some restrictions in terms of the locality of certain infrastructure which could have an impact on water resources.</p>	<p>The EM stormwater system is designed to comply to the provisions of the GNR 704 provisions.</p>
<p>13. Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA)</p> <p>The MPRDA governs mineral resources in South Africa, regulates mining and mining authorisations and has as one of its principal objectives the equitable access and the sustainable development of the South Africa's mineral resources.</p> <p>Social and environmental sustainability is enhanced through the requirement to submit a Social and Labour Plan (SLP), which records a company's obligations to improve social development. This includes a commitment to training and social investment, with the goal of transferring skills that can be used after mine closure.</p> <p>Section 5A of the MPRDA indicates that: "<i>No person may prospect for or remove, mine, conduct technical co-operation operations, reconnaissance operations, explore for and produce any mineral or petroleum or commence with any work incidental thereto on any area without – (a) an environmental authorisation</i>".</p> <p>The MPRDA requires all mining and prospecting operations and related activities to be carried out in terms of the environmental management principles set out in section 2 of NEMA and that an EA be obtained.</p>	<p>EM is a mining operation and is operated in compliance with the MPRDA and its mining rights and SLP.</p> <p>EP is the holder of a mining right over the EM PV Project Area.</p>

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<p>14. <u>Conservation of Agricultural Resources Act, No 43 of 1998 (CARA)</u></p> <p>In terms of CARA, landowners are legally responsible for the control of weeds and alien vegetation. CARA makes provision for three categories of alien and invasive plant species:</p> <ul style="list-style-type: none"> ■ <i>Category 1a</i>: must immediately be removed and destroyed; ■ <i>Category 1b</i>: need to be immediately removed and contained; ■ <i>Category 2</i>: requires a permit to retain the species on site and it must be ensured that they do not spread. All category 2 plants in riparian zones need to be removed; and ■ <i>Category 3</i>: require a permit to retain these species. All category 3 plants in the riparian zone need to be removed. <p>CARA also regulates the conservation of soil and states that degradation of the agricultural potential is illegal. It furthermore requires the protection of land against soil erosion and the prevention of water logging and associated salinization.</p> <p>Permissions / permits are required under CARA for the ‘cultivation’ of ‘virgin soil’; cultivation and/or draining vlei(s), marshes or water sponges; and cultivation of an area within a watercourse’s flood area.</p>	<p>EP is obligated to manage alien and invasive species occurring on the entire EM Surface Area and the EM PV Solar Project Area. EP has developed an Alien and Invasive Plant Removal Procedure that will be provided in the EIAR.</p> <p>Permissions / permits required under CARA are not necessary for the EM PV Solar Project.</p>
<p>15. <u>Mine Health and Safety Act (Act No. 29 of 1996) ("MHSA")</u></p> <p>The MHSA aims to provide for protection of the health and safety of all employees and other personnel at RSA mines. Its main objectives are:</p> <ul style="list-style-type: none"> ■ Protection of the health and safety of all persons at mines; ■ Requiring employers and employees to identify hazards and eliminate them, control and minimise the risks relating to health and safety at mines; ■ Giving effect to South Africa’s public international law obligations that concern health and safety at all mines; ■ Providing for – <ul style="list-style-type: none"> ▪ employee participation in matters of health and safety through health and safety representatives and the health and safety committees at mines; ▪ effective monitoring of health and safety conditions at mines; ▪ enforcement of health and safety measures at mines; 	<p>EP already complies with the MHSA and it will be applicable to the EM PV Solar Project.</p>

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
<ul style="list-style-type: none"> ▪ investigations and inquiries to improve health and safety at mines; and ■ To promote: <ul style="list-style-type: none"> ▪ a culture of health and safety in the mining industry; ▪ training in health and safety in the mining industry; and ▪ cooperation and consultation on health and safety between the State, employers, employees and their representatives. 	
<p>16. <u>Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) (OHSA)</u></p> <p>The MHSAs provides that OHSA is not applicable to any matter in respect of which any provision of the MHSAs is applicable. Certain regulations under OHSA, discussed below regulate matters not provided for in MHSAs and would thus be relevant to mines.</p> <p><i>Pressure Equipment Regulations, 2009, ("PER")</i></p> <p>In terms of the PER (which replaced the repealed Vessels under Pressure Regulations, 1996) "pressure vessel" means a housing designed and manufactured to contain a fluid under a design pressure equal to or greater than 50 kPa. Hydrogen will be stored in pressurised vessels, with a combined capacity of 380kg at a pressure of 35 bar /3500kPa). Accordingly, the PER apply to the EM PV Solar Project.</p> <p>Compliance with the PER requires, <i>amongst others</i> that:</p> <ul style="list-style-type: none"> ■ Categorizing pressure equipment ("PE") and comply with SANS 347 and the relevant health and safety standard published under OHSA ("OHSA Standard"); ■ Ensuring that the PE is operated and maintained within its design and operating parameters. ■ Providing the manufacturer, repairer or modifier with comprehensive information of the operating or intended operating conditions of the PE, including the characteristics of the fluid and operating parameters of other connected pressure equipment, where reasonably practicable; ■ Ensuring PE has a certificate, issued by the manufacturer, including a verification signature by an approved inspection authority when required, 	<p>EP will take cognisance of the requirements of the OHSA in relation to storage of hydrogen that will be used for the EM PV Solar Project.</p>

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<p>which certifies that the PE has been designed and manufactured in accordance with the relevant OHSA Standard;</p> <ul style="list-style-type: none"> ■ Ensuring PE has a certificate issued by the repairer or modifier, including a verification signature by an approved inspection authority when required, which certifies that the PE has been modified or repaired in accordance with the relevant OHSA Standard; ■ Ensuring that PE has a certificate issued by an approved inspection authority before commissioning, where applicable; ■ Complying with service inspection and testing interval requirements, alternatively a risk-based inspection management system may be implemented in accordance with the relevant OHSA Standard; and ■ Keeping a record, which shall be open for inspection by an inspector, in which the certificate of manufacture, and the results, after manufacturing, of all inspections, tests, modifications and repairs is recorded. <p><u>Major Hazard Installation Regulations, 2001 (“MHI Regulations)</u></p> <p>A “major hazard installation” (“MHI”) is defined in OHSA as “(a) where more than the prescribed quantity of any substance is or may be kept, whether permanently or temporarily; or (b) where any substance is produced, processed, used, handled or stored in such a form and quantity that it has the potential to cause a major incident”. Hydrogen is highly flammable and would likely be considered to have the “potential to cause a major incident”. Accordingly, the MHI Regulations would be applicable. In terms of the MHI, every employer and user shall notify the chief inspector, provincial director, and relevant local government in writing of <i>inter alia</i> the erection of any installation which will be a MHI, prior to commencement of erection thereof. Furthermore regulation 5 of the MHI Regulations requires that a risk assessment is undertaken at intervals not exceeding 5 years and that such assessment be submitted to the CA.</p>	
<p>17. <u>Hazardous Substance Act (Act No. 15 of 1973) (HSA)</u></p> <p>The HSA provides for the:</p> <ul style="list-style-type: none"> ■ Control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly 	<p>EP will take cognisance of the requirements of the HSA in relation to hazardous substances (including hydrogen) that will be used for the EM PV Solar Project.</p>

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<p>sensitizing or flammable nature or the generation of pressure thereby in certain circumstances;</p> <ul style="list-style-type: none"> ■ Control of certain electronic products; ■ Division of such substances or products into groups in relation to the degree of danger, with licensing requirements for certain activities undertaken in respect of Groups I and III.; ■ Prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products; and ■ Matters connected therewith. <p>Hydrogen is classified as a Group II substance for which there are not licensing requirements under the HAS.</p>	
<p>18. <u>Aviation Act (Act No. 74 of 1962) – 13th amendment of the Civil Aviation Regulations (CARS) 1997</u></p> <p>Any communications structure, building or other structures, whether temporary or permanent, which has the potential to endanger aviation in navigable airspace or interfere with the operation of navigation or surveillance systems or Instruments Landing Systems, including meteorological systems for aeronautical purposes, is considered an obstacle and motivation must be submitted to the Commissioner for Civil Aviation for evaluation (Refer SA_CAR Part 139.01.33) and providing consent for the development.</p> <p>The following structures require markings:</p> <ul style="list-style-type: none"> ■ Any structure exceeding 45m above ground level or structures where the top of the structure exceeds 150m above the mean ground level, the mean ground level considered to be the lowest point in a 3km radius around such structure. ■ Structures lower than 45m, which are considered as a danger to aviation shall be marked as such when specified. ■ Overhead wires, cable etc. crossing a river, valley or major roads shall be marked, and in addition their supporting towers marked and lighted if an aeronautical study indicates it could constitute a hazard to aircraft. 	<p>EP must ensure that the correct marking of infrastructure >45 m above ground level is undertaken during the operational phase of the EM PV Solar Project, refer to CAR Part 139.01.33). The South African Civil Aviation Authority will be contacted to confirm whether any obstacle approvals would be required.</p>

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<p>19. <u>Electronic Communications Act 36 of 2005 ("ECA")</u></p> <p>Section 29 of the ECA provides that any person who constructs, equips or carries on <i>inter alia</i>, power by means of electricity must conform to the requirements of an electronic communications network service licensee for the prevention of damage to any of its electronic communications network and facilities or works by such construction. Before commencing construction such a person must give thirty days prior written notice to the licensee of his or her intention to commence the construction and provide the licensee with the required information. Such information includes a plan of the proposed works, showing the manner the manner and position of the works to be constructed and such further information as may be required.</p>	<p>EP will take cognisance of the requirements of the ECA in relation to the EM PV Solar Project if applicable.</p>
<p>20. <u>Electricity Regulation Act, 2006 ("ERA") and IRP, 2019</u></p> <p>In terms of the exemption notice dated 5 October 2021 if the EM PV Solar Project will have a capacity of more than 100MW, which it will, a Generation Licence under section 7 (Activities requiring Licensing) of the ERA will need to be applied for and obtained. If it is 100MW or below, then it will be subject to the exemption and no Generation Licence will be required, although registration in terms of section 3.1 of Schedule 2 (Exemption from obligation to apply for and hold a License) of the Electricity Regulation Act will still be required.</p> <p>The IRP, 2019 makes provision, for the period from 2019-2022, for an allocation for distributed generation to the extent of the short-term capacity and energy gap (i.e. there is not a specific, determined allocation for distributed generation). For the period from 2023 to 2030, the allocated amount for distributed generation is 500MW per year.</p> <p>Consequently, if the Project is commissioned prior to the end of 2022 then no Ministerial deviation would be required from the IRP because the Minister has deliberately left the exact allocation open ended in cognisance of the energy shortfall in the country.</p> <p>For the period from 2023 to 2030, the allocated amount for distributed generation is 500MW per year. Accordingly, to the extent that the EM PV Solar Project will only be commissioned in or after 2023 and more than 500MW of distributed generation is under development / seeking licensing or registration in South Africa,</p>	<p>As the EM PV Solar Project will have a capacity of more than 100MW, a Generation Licence would need to be applied for and obtained for purposes of the EM PV Solar Project.</p>

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<p>then a Ministerial deviation would need to be applied for and obtained for purposes of the EM PV Solar Project.</p>	
<p><u>21. Restitution of Land Rights Act 22 of 1994 ("RLRA")</u></p> <p>The RLRA governs land restitution claims. Initially, the RLRA only allowed land claims to be lodged until December 1998. This period was amended with the promulgation of the Restitution of Land Rights Amendment Act of 2014 and the process for the lodgement of claims was extended to 2019 ("Extended Period"). However, a few months thereafter, the Constitutional Court delivered a judgment, <i>Access Movement of South Africa and Others v Chairperson of the National Council of Provinces and Others</i> 2016(5) SA 635 (CC) ("LAMOSA") In terms of the LAMOSA judgments, the DRDLR is interdicted from processing those claims lodged after December 1998 until those lodged prior to December 1998 have been finalised.</p> <p>Under section 11(7) of the RLRA no person may sell, exchange, donate, lease, subdivide, rezone or develop a land in respect of which a land claim has been published in a GG without having given the Regional Land Claims Commissioner one month's written notice of the intention to do so.</p>	<p>EP will take cognisance of the requirements of the RLRA relation to the EM PV Solar Project. It will liaise with the Regional Land Claims Commission ("LCC") to obtain a confirmation about land claims over the EM PV Solar Area and provide notices in terms of section 11(7) of the RLRA where necessary.</p> <p>The LCC has confirmed that a land claim lodged was lodged in respect of Schietfontein 437 JQ in the Extended Period. The confirmation provides that section 11(7) of the RLRA does not apply unless the LCC has accepted the claim for investigation and published it in the Government Gazette. This is currently not possible in respect of claims in the Extended Period.</p>
<p><u>22. National Road Traffic Act (Act No 93 of 1996) ("NRTA")</u></p> <p>The technical recommendations for highways (TRH 11): "<i>Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads</i>" set out the conditions and rules which apply to the transportation of abnormal vehicles and loads on public roads and procedures in applying for exemption permits.</p>	<p>An abnormal load/vehicle permit may be required to transport the various components to site for the construction phase. EP takes note of the requirements of the NRTA and will comply with them where relevant.</p>
<p><u>23 National Veld and Forest Fire Act, 101 of 1998 ("NVFFA")</u></p> <p>Chapter 4 of the NVFFA (Veldfire Protection through Firebreaks) provides that owners must prepare and maintain firebreaks. This chapter sets out the procedure in this regard and the role of neighbouring landowners and the fire protection association.</p> <p>Landowners must ensure that: (i) firebreaks are wide and long enough to have a reasonable chance of preventing a veldfire from spreading to or from neighbouring</p>	<p>The NVFFA has no permitting or licensing requirements. However, EP will take cognisance of the requirements of the NVFFA relation to the EM PV Solar Project.</p>

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<p>property, (ii) that it does not cause soil erosion; and (iii) it is reasonably free of inflammable material capable of carrying a veldfire across it.</p> <p>Chapter 5 (Fire Fighting) places a duty on all owners to acquire equipment and have available personnel to fight fires.</p>	
<p>20. National Forests Act, No 84 of 1998 ("NFA")</p> <p>In terms of section 15(3) of the NFA, the Minister published a list of protected tree species (GN 536 of 7 September 201, GG 41887). The effect thereof is that no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any product derived from a protected tree, except under a licence or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated.</p>	<p>A permit would need to be obtained for any protected trees that are affected by the EM PV Solar Project. A biodiversity assessment and a walk-through survey will be conducted for the EIA to assess the need for such permits.</p>
<p>21. Disaster Management Act (Act No. 57 of 2002)</p> <p>COVID 19 Regulations as contained in the Disaster Management Act (Act No. 57 of 2002): Directions regarding measures to address, prevent and combat the spread of COVID-19 relating to national environmental management permits and licence (GN 650 of 5 June 2020 and GN 970 of 9 September 2020) were published in GGs 43412 and 43696 respectively to curtail the threat posed by the COVID-19 pandemic and alleviate, contain and minimise the effects of the national state of disaster, and in particular to provide directions to ensure fair licensing processes and PPP as required by certain laws, including NEMA ("COVID Regulations"). These regulations are applicable during the national state of disaster.</p> <p>The COVID Regulations require that for a new EA application, a written public participation plan ("PP Plan") is annexed to the application form and submitted to the CA. The PP Plan must contain proposals on how the identification of and consultation with all potential I&APs will be ensured in accordance with Regulations 41(2)(a) to (d) of the EIA Regulations, 2014 or proposed alternative reasonable measures, as provided for in Regulation 41(2)(e). A virtual meeting or pre-application discussion must be held with the CA to determine the reasonable measures to be followed to identify and register potential I&APs.</p>	<p>The proposed PPP Plan is detailed in the EA Application form and is attached under Appendix 6 – I&AP Consultation Report of the DSR, which will both be submitted to and approved by the NWDEDECT.</p> <p>NWDEDECT will be requested to approve the PPP Plan prior to PPP commencing in respect of the DSR.</p> <p>The approved PP Plan will be attached to the FSR submitted to NWDEDECT, with the required declaration signed by JEMS in respect of the PPP followed in respect of the DSR. These requirements will similarly be complied with in the EIA Phase.</p> <p>The above is subject to the national state of disaster still being in place during the EA Application.</p>

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<p>The EAP must ensure that: (i) all reasonable measures have been taken to identify potential I&APs for purposes of conducting PPP on the application; and (ii) as far as is reasonably possible and taking into account the specific aspects of the application, that information containing all relevant facts have been made available and participation by potential or registered I&APs has been facilitated in such a manner that all potential or registered I&APs have been provided with a reasonable opportunity to comment on the application.</p> <p>A signed declaration must be submitted by the EAP confirming the above and that: (i) the PP Plan, as agreed to by the CA has been adhered to; and (ii) that the reports and documents submitted for decision making purposes contain the PP Plan.</p>	
<p><u>22. Environmental Impact Assessment Guideline for Renewable Projects (GN 989 of 16 October 2015)</u></p> <p>The purpose of this document is primarily to provide guidance on the environmental management legal framework applicable to renewable energy operations and all the role players in the sector (DEA, 2015). The guideline is principally intended for use by the following stakeholder groups (DEA, 2015):</p> <ul style="list-style-type: none"> ■ Public Sector Authorities (as regulator and/or competent authority); ■ Joint public sector authorities and project funders, e.g., Eskom, IDC, etc; ■ Private Sector Entities (as project funder/developer/consultant); ■ Other I&APs (as determined by the project location and/or scope). <p>The guideline seeks to identify activities requiring authorisation prior to commencement of that activity, and provide an interface between national EIA regulations and other legislative requirements of various authorities (DEA, 2015).</p>	<p>The guideline was considered in the preparation of the DSR and will be considered for the EIAR.</p>
<p><u>23. International Instruments and Commitments</u></p> <p>International instruments considered as part of the application process include:</p> <ul style="list-style-type: none"> ■ The Paris Agreement ■ Equator Principles of Financial Institutions ■ Sustainable Development Goals 	<p>Where necessary, EP will take cognisance of these international instruments and commitments in relation to the EM PV Solar Project.</p>

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
<p>24. <u>Other Legislation and Policy</u></p> <p>Other policies, legislation and associated regulations (where applicable) considered as part of the application process include:</p> <ul style="list-style-type: none"> ■ National Climate Change Adaptation Strategy, 2020 ■ National Development Plan 2030. ■ Spatial Development Framework (“SDF”), 2016: North West Province, as amended; ■ BPDM Integrated Development Plan (“IDP”), 2012 and 2019/20 reviewed IDP. ■ MLM IDP, 2017-2018. ■ Madibeng Environmental Management Framework, 2009. ■ Water Services Act 108 of 1997 ■ Transvaal Nature Conservation Ordinance, 12 of 1983. ■ DFEE Consultation Guidelines. ■ Spatial Planning and Land Use Management Act, No 16 of 2013. ■ Subdivision of Agricultural Land Act 70 of 1970 ■ Traditional and Khoi-San Leadership Act, No. 3 of 2019 . ■ Municipal Systems Act, No 32 of 2000. ■ Regulations of Gatherings Act, No. 205 of 1993 ■ Protection of Personal Information Act, No. 4 of 2013. 	<p>EP takes note of the requirements of the mentioned documents and will comply with them where relevant.</p>
<p>25. <u>Provincial and Municipal Bylaws</u></p> <p>The MLM and BPDM have developed local bylaws and various policies relating to waste disposal, water, economic development, air quality etc. The following provincial and Municipal Bylaws are applicable to EM:</p> <ul style="list-style-type: none"> ■ Madibeng Local Municipality: Air Quality Management By-Laws, 2013, as amended; ■ Madibeng Local Municipality: Waste Management By-Laws, 2008, as amended; ■ Madibeng Local Municipality: Storm water management By-laws, 2013, as amended; and ■ Madibeng Local Municipality: Water & Sanitation By-Laws, 201, as amended. 	<p>EP will ensure that such policies and bylaws are adhered to during the commencement and operation of the EM PV Solar Project and its operations in general.</p>

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
<p>26. <u>Standards and Guidelines</u></p> <p>In addition to the abovementioned Acts and their associated Regulations, the following guidelines and standards have been taken cognisance of during the application process:</p> <ul style="list-style-type: none"> ■ SANS 10103 of 2008. ■ SANS 10210 of 2004. ■ NEMA Implementation Guidelines: Sector Guidelines for Environmental Impact Assessment Regulation (published under GN 654 in GG 3333 of 29 June 2010). ■ DEA (2011): A user friendly guide to the National Environmental Management: Waste Act, 2008. South Africa, Pretoria. ■ Department of Environmental Affairs and Tourism (2004): Criteria for determining Alternatives in EIA, Integrated Environmental Management, Information Series 11. ■ Guideline for Implementation: Public Participation in the EIA Process (published in under GN 807 in GG 35769 of 10 October 2012). ■ Publication of Public Participation Guideline (GN 807 of 10 October 2012 GG No. 35769) 	<p>EP will ensure that such standards and guidelines, as far as possible, are adhered to during the EM PV Solar Project.</p>
<p>27. <u>Eland Platinum Safety Health and Environmental Policy (SHE)</u></p> <p>A copy of EP's SHE Policy can be found under Appendix 5.</p>	<p>EP will ensure that its SHE Policy is adhered to during the EM PV Solar Project construction and operation.</p>

7. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES.

The EM PV Solar Project's probable need and desirability has been identified as the following:

a) Solar resource

The viability of a solar PV renewable project is dependent on the solar irradiation values of the area where it is located. The Global Horizontal Irradiation for the EM PV Project Area is between 1972 and 2118 kWh/m²/annum, which is favourable for solar projects.

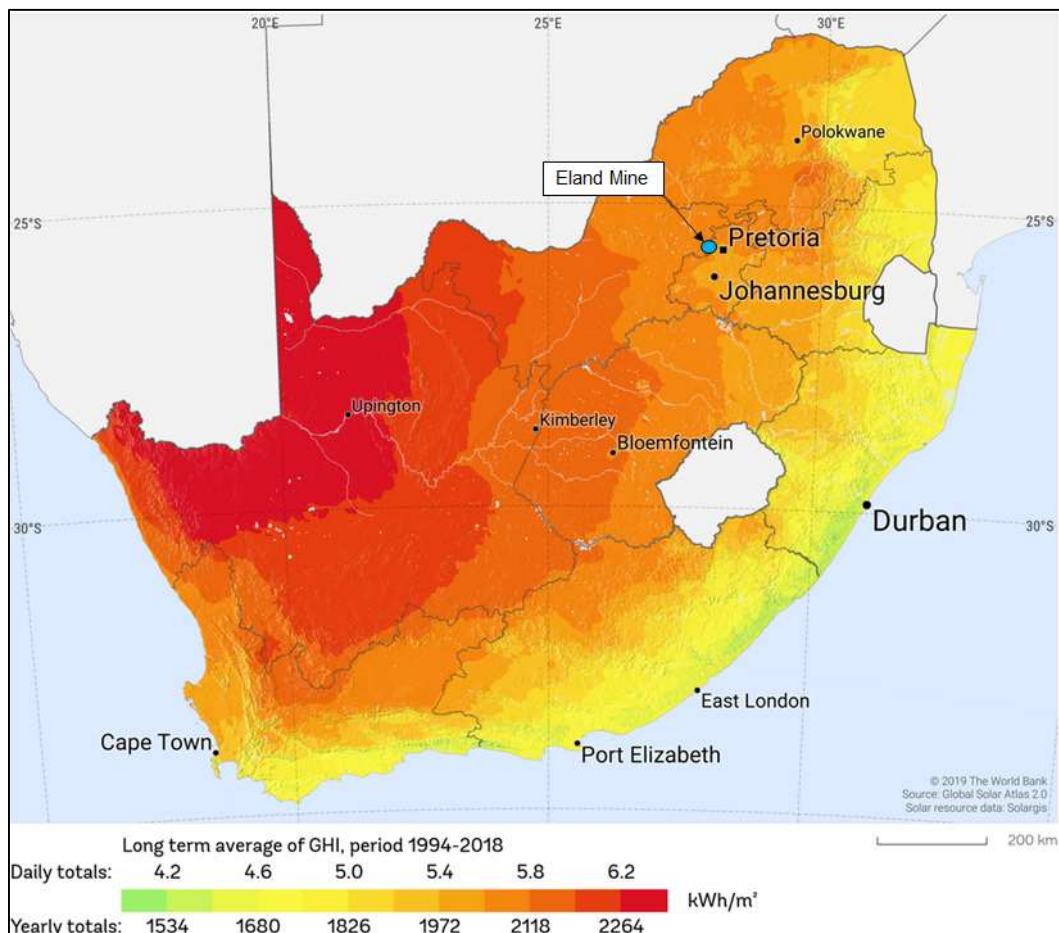


Figure 11: South African Global Horizontal Irradiation (GHI) Map for South Africa and the Eland Mine (Global Solar Atlas 2.0).

b) Landscape and Topography

The topography of the EM PV Project Area is relatively flat with a slope of 0-3%. The topography is ideal for construction and civil activities. The 40MW PV Project Area will be

located on previous agricultural crop fields and the 5MW PVHFC Project Area on previously disturbed mining areas.

c) Access to Facility and Existing Land-use

The EM PV Solar Project will be located within the existing EM Surface Area, that has already been impacted by anthropogenic activities, such as mining and agricultural. The site infrastructure has to a large extent been established over the entire EM Surface Area. The EM is accessed by the R566 Provincial Road and the existing tarred and dirt roads on the EM Site.

The existing De Wildt Solar Project is located directly east of the EM Surface Area and will therefore fit in with the surrounding land-uses. The EM PV Solar Project will utilise previously disturbed land within the boundary of the EM Surface Area.

d) Job Creation

The EM PV Solar Project will create temporary (construction phase) and a limited number of permanent (operational phase) job opportunities. Both skilled and unskilled temporary employment opportunities would be created through the Project. This will have a beneficial impact on the local economy through salaries and local spending.

e) Increase Competitiveness of Eland Mine

South Africa industry and residents are consistently impacted by load reduction and high energy costs. The Project will likely reduce economic losses sustained by EP from load reductions/ operational downtime; and increase EM's competitiveness, by reducing its reliance on Eskom Holding SOC Ltd ("**Eskom**") supply and its energy costs, whilst promoting sustainable self-energy generation and demand management.

f) Promotion of sustainable development

It is likely that the EM PV Solar Project will reduce the Scope 2 Greenhouse Gas ("**GHG**") emissions generated by the EM. This is in line with Northam's renewable energy strategy to reduce GHG emissions and supports the international and South African Government commitments to the Paris Climate Accord. The reduction of GHG emissions will also have environmental benefits for the local and provincial environmental health.

g) Capital Investment

Northam intends to make a capital investment of R120 million in sustainable infrastructure and technology for EM and the local economy. This will result in likely small business opportunities and procurement opportunities for local contractors and suppliers.

h) Climate Change and GHG Emission Reduction

There is a proliferation of policies, legislation and associated regulations aimed at or which include reference to the just transition to a low carbon economy and the various energy issues currently affecting South Africa.

The SDF, 2016: North West Province sets out that one of its spatial development values is the optimum use of renewable energy potential and that several strategic requirements need to be addressed in order to meet the vision for the North West Province, including the creation of opportunities for renewable energy development. This is in line with the broader country strategy, as underpinned by the National Development Plan 2030 that sets out on various occasions the importance of renewable energy resources in South Africa's future plans, and National Climate Change Adaptation Strategy, 2020 which supports the South Africa's ability to meeting its obligations in terms of the Paris Agreement. In September 2021, South Africa updated its Nationally Determined Contribution ("**NDC**"). The updated NDC contains South Africa's first Adaptation Communication, detailing the country's adaptation goals to be implemented via the National Climate Change Adaptation Strategy, and updated mitigation targets for 2025 and 2030. This updated NDC provides that: *"Implementing the NDC will require the implementation of South Africa's Integrated Resource Plan (most recently finalised in 2019), which contemplates a massive investment in renewable energy over the next decade."*

Accordingly, it is clear that the development of a renewable energy facility such as the EM PV Solar Project is in line with the policies, legislation and associated regulations in South Africa related to climate change, spatial planning and energy.

7.1 Period for which the environmental authorisation is required

The EM PV Solar Project will form an important part of the EP operations going forward. It will be required for the Life of Mine ("**LOM**") of EM. The EA will thus for a minimum be required for an estimated thirty-year period for the LOM of EM.

7.2 Description of the process followed to reach the proposed preferred site.

As mentioned previously, the EM PV Solar Project will be located within the existing EM Surface Area. The **site selection** was done primarily on the location of the EM operation and site infrastructure. The following factors were considered in the final site selection:

- Location of existing disturbed footprints;
- Existing and future infrastructure and servitudes e.g., future plant upgrades, mining etc.;
- Position and distance of the EM PV Solar Project in relation to other operational infrastructure;
- Area and footprint available for proposed activities;
- Environmental and social constraints;
- General topography;
- Geology of the site;
- Surface geotechnical conditions in the footprint zone;
- Geohydrological features and optimal resource locations;
- Watercourse locations;
- Land use;
- Burial and archaeological sites;
- Security and safety concerns;
- Mining and associated activities (i.e. blasting and dust)
- Land ownership; and
- Proximity to settlements.

7.3 Alternatives

Alternatives considered for the EM PV Solar Project comprises of the following, and will be further investigated in the EIAR:

7.3.1 **Technology Alternatives**

Different technology alternatives were investigated for energy generation by means of solar radiation. Solar PV was determined as the most suitable option considering the climatic conditions, topography and location of the EM. Savannah (2021) in another application for the Northam Group identified several other Solar PV technology alternatives, namely:

- Bifacial PV Panels;
- Monofacial PV Panels;
- Fixed mounted PV Systems (Static/fixed-tilt panels);

- Single axis tracking or double axis tracking systems (with solar panels that rotate around a defined axis to follow the sun's movement); and
- Monocrystalline modules, polycrystalline modules or thin film modules.

Monofacial and bifacial panels are being considered for the EM PV Solar Project.

7.3.2 Energy Source Alternatives

As part of the initial feasibility of the EM PV Solar Project, different renewable and/or energy sources were investigated. The sources included wind, solar and combustible fuel burning. The wind and combustible fuel burning sources were found to not feasible based on the lack of adequate wind levels, the high emission levels associated with burning of fuels and the sustainability of fuel sources in the long term.

7.3.3 Site Alternatives

As part of the feasibility assessment of the EM PV Solar Project several site alternatives within the EM Surface Area were considered, Refer to **Figure 12**). The Alternative locations were rejected based on the location of sensitive features, security and vandalism risks, existing mining and operational infrastructure and site constraints (i.e. dust, blasting and active mine areas) that would influence the efficiency of the Project.

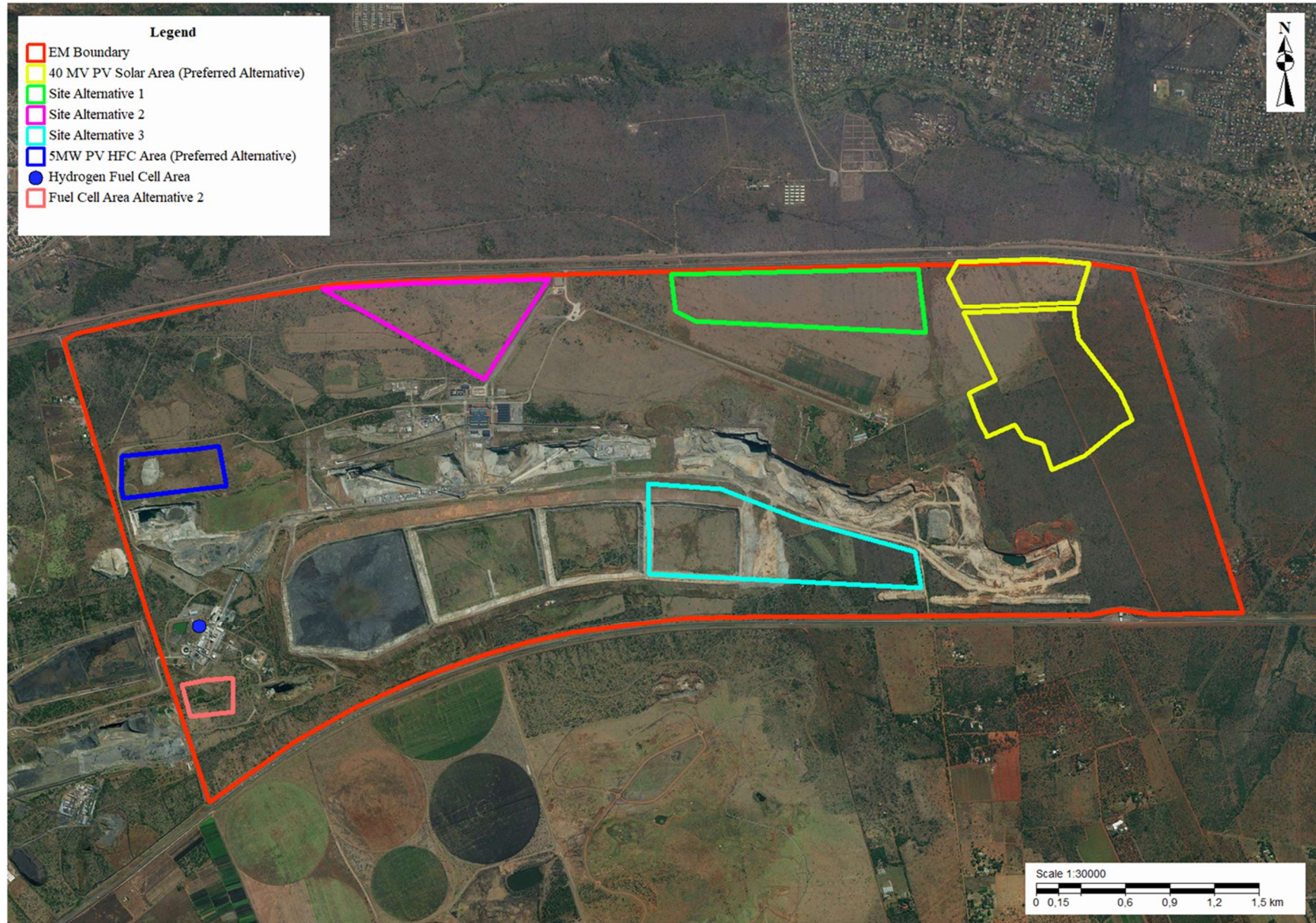


Figure 12: Map indicating the Preferred Alternatives and the Location Alternatives.

7.4 Details of all alternatives considered.

7.4.1 Alternative 1 (proposed, preferred Alternative)

The EM PV Solar Project has been identified with the goal of optimising existing infrastructure; upscaling production and processing capacities and efficiency; reducing operational cost; improving sustainability of operational practices; and optimising resource utilisation.

The **preferred alternative** was based on the following:

- The proposed activities will be located within the established EM Surface Area, where the necessary services (i.e., roads and water supply) have already been developed.
- The majority of the EM PV Project Area has previously been disturbed by mining and agricultural activities.
- Lowest security and vandalism risks;
- Existing mining operations and activities (i.e. blasting, dust etc.);
- Economic benefits due to resource optimisation and increase competitiveness.
- Reduce the Scope 2 GHG Emissions.
- Enable EP to implement electricity demand and supply management.

The preferred alternative will be situated on the following properties, refer to

Table 8: List of the Alternative 1 (preferred alternative) activities and the applicable property description.

Table 8: List of the Alternative 1 (preferred alternative) activities and the applicable property description.

Facility	Activity Description	Property Description
40MW PV Plant	<ul style="list-style-type: none"> - 40MW Solar Panels - substation to facilitate the connection between the solar PV facility and mine electrical distribution system as needed. - telecommunications mast - 11 kV or 33 kV transmission line and transmission towers - on-site facility substation to facilitate the connection between the PV Plant and mine electrical distribution system as needed. - operations and maintenance buildings - new access road - internal roads - perimeter fencing - access control gate - security guard hut 	<p><u>Zilkaatsnek 439 JQ</u> Portion 83 (a portion of Portion 58)</p> <p><u>Schietfontein 437 JQ</u> Remaining Extent of Portion 13 (a portion of Portion 2); and Portion 14 (a portion of Portion 2).</p>

Facility	Activity Description	Property Description
	<ul style="list-style-type: none"> - temporary offices - construction yard - temporary laydown area 	
5 MW PVHFC	<ul style="list-style-type: none"> - 5MW PV Plant, linked to the HFC installation, - HFC installation, including a hydrogen pressurised storage tank, an electrolyser and a battery storage system - on-site facility substation to facilitate the connection between the 5MW PV Plant and mine electrical distribution system as needed. - telecommunications mast - 11 kV or 33 kV transmission line and transmission towers - operations and maintenance buildings - access roads - internal roads - perimeter fencing - access control gate - temporary offices - construction yard - temporary laydown area 	<u>Elandsfontein 440JQ</u> Portion 37 (a portion of Portion 16).

7.4.2 Alternatives (various)

Alternatives for the EM PV Solar Project will include technology, layout and site alternatives. Refer to **Table 9**.

Table 9: Detail of the Alternatives (Alternative) activities that will be considered.

Preferred Activities	Alternatives
40MW PV Plant	<p>Three Alternative site locations, namely:</p> <ul style="list-style-type: none"> - <u>Alternative 2:</u> Portion 61 (a portion of Portion 32) and Remaining Extent of Portion 59 (a portion of Portion 58) of the Farm Elandsfontein 440JQ - <u>Alternative 3:</u> Remaining Extent of Portion 15, Remaining Extent of Portion 59 and 58 (a portion of Portion 58) of the Farm Elandsfontein 440JQ. - <u>Alternative 4:</u> Portion 30 (a portion of Portion 17), Remaining Extent of Portion 32 (a portion of Portion 18) of the Farm Elandsfontein 440JQ; Portion 197 (a portion of Portion 4), Portion 97 (a portion of Portion 4); Remaining Extent of Portion

	58; Portions 86, 87 and 228 (a portion of Portion 58) of the Farm Zilkaatsnek 439 JQ.
	Alternative layout of the PV Panels and Operational and Maintenance Building.
	Alternative PV Technology, namely - Fixed mounted PV Systems (Static/fixed-tilt panels) - Single axis tracking or double axis tracking systems (with solar panels that rotate around a defined axis to follow the sun's movement); and - Monocrystalline modules, polycrystalline modules or thin film modules.
5 MW PVHFC	One Alternative site location, on Portion 37 (a portion of Portion 16) of the Farm Elandsfontein 440JQ.
	Alternative layout of the PV Panels and Operational and Maintenance Building.
	Alternative PV Technology, namely - Fixed mounted PV Systems (Static/fixed-tilt panels) - Single axis tracking or double axis tracking systems (with solar panels that rotate around a defined axis to follow the sun's movement); and - Monocrystalline modules, polycrystalline modules or thin film modules. - Selection of a HFC in combination with a PV plant. The solar plant will be utilised to power the hydrogen fuel whilst sunshine is available and charge batteries to power the fuel cell electrolyzer during other times. This will ensure that the hydrogen power, which is a clean fuel, is fully utilised to run portions of the EM.

7.4.3 No Go Alternative

The no-go option entails that none of the EM PV Solar Project's activities are undertaken. Based on the preliminary risk identified if the No Go Alternative is considered and described below in **Table 10**:

Table 10: No Go Alternative option and the preliminary risks identified for each activity.

No Go Alternative	Risks
40MW PV Plant	Negative: - No gain in economic value - Increased long term Scope 2 GHG Emissions - No additional employment and procurement opportunities - EM operation impacted by national load reduction and curtailment, which will have a negative economic impact

No Go Alternative	Risks
	<ul style="list-style-type: none"> - Long term sustainability of the EM operation will be impacted negatively - Long term energy cost for the EM Operation - Reduced competitiveness of Northam in the industry <p><u>Positive:</u></p> <ul style="list-style-type: none"> - No vegetation clearance - No water usage for construction of Plant and PV Panel washing - No soil disturbance and compaction - Limited levels of possible pollution of the surface and groundwater - Retain agricultural land - Limited biodiversity disturbance (as area will continue to be used for agricultural processes).
5 MW PVHFC	<p><u>Negative:</u></p> <ul style="list-style-type: none"> - No gain in economic value - Increased long term Scope 2 GHG Emissions - No additional employment and procurement opportunities - EM operation impacted by national load reduction and curtailment, which will have a negative economic impact - Long term sustainability of the EM operation will be impacted negatively - Long term energy cost for the EM operation - Reduced competitiveness of Northam in the industry <p><u>Positive:</u></p> <ul style="list-style-type: none"> - No vegetation clearance - No water usage for construction of the PVHFC and PV Panel washing - No soil disturbance and compaction - Limited levels of possible pollution of the surface and groundwater - Retain agricultural land - Limited biodiversity disturbance (as area will continue to be used for agricultural processes).

8. DETAILS OF THE PUBLIC PARTICIPATION PROCESS (PPP) FOLLOWED

The Stakeholder Engagement Process that was undertaken during the project announcement and Scoping phase will be undertaken in terms of Regulations 40 and 41 of the 2014 EIA Regulations.

PPP will adhere to the requirements of the COVID 19 Regulations as contained in the Disaster Management Act (Act No. 57 of 2002): Directions regarding measures to address, prevent and combat the spread of COVID-19 relating to national environmental management permits and licence. The proposed PPP Plan is detailed in the EA Application form and is attached under **Appendix 6 – I&AP Consultation Report** of the DSR, which will both be submitted to and approved by the NWDEDECT. This will be detailed in the DEIAR. The declaration required under the COVID Directions, signed by the EAP, is attached under **Appendix 6** and will be attached in the FSR and EIAR. Evidence of PPP that will be conducted will be appended under **Appendix 6 – I&AP Consultation Report**:

- Newspaper advertisements will be placed in at least two local newspapers;
- SMS and electronic mobile messages will be sent to I&APs;
- Site notices will be erected at the following locations:
 - Site Entrance of the EM and MM;
 - Madibeng Local Library;
 - Mmakau Police Station Notice Board;
 - Mothotlung Municipal Services Building;
 - Damonsville Community Library;
 - Odi Primary School
 - Oukasie Community Hall;
 - Moumong Store in Mmakau;
 - De Wild Helpmekaar Offices;
- Public notices / flyers and letters will be distributed to the following stakeholders and I&APs:
 - Government Departments (i.e., NWDEDECT; DWS; DFFE; DMRE; MLM; and BDPM), and Department of Agriculture, Land Reform and Rural Development (“**DALRRD**”);
 - Eskom;
 - Ward No. 21 Councillor in the MLM;

- Surrounding Ward Councillors (Wards 13, 17, 18, 19, 20, 21 and 35 of the MLM);
 - Bakgatla-Ba-Mmakau Tribal Council;
 - Landowner and neighbouring farms surrounding the EM Surface Area;
 - Villages, Townships and Small Dorpies (VTSD) Forum;
 - Land Claims Commissioner (“**LCC**”);
 - EP employees and contractors;
 - Surrounding Mines; and
 - Community Members.
- Correspondence will be uploaded to online platforms.
 - A public meeting will be held during the Scoping and EIA Phases (considering the Covid19 regulations and restrictions).
 - Stakeholder forum meetings will be held with farmers, community forums and other stakeholders.

The I&APs Register will continuously be maintained and updated. The existing Stakeholder Database from EP will be utilised as the baseline. The I&APs Register will be continuously updated as necessary (i.e., with new contact details, new I&APs etc.). In terms of section 13 (1) (f) (ii) of the Protection of Personal Information Act (Act No. 4 of 2013, “where ... access to that information is protected by law”, the I&APs will be asked to indicate whether their personal contact details may be recorded in the (public) FSR and I&AP Database; and, if this is not forthcoming, the contact details will only be included in the I&AP register submitted as a confidential document to the CA, and the details will be retained by the CA, Applicant, the P2 Practitioner and the EAP for the duration of the LOM until closure of the EM, to ensure that the I&APs can be contacted to communicate, for example, ongoing monitoring reports, audits and any potential changes to the EMP_r during potential future applications for EAs.

All comments received from the I&APs during the project announcement phase will be incorporated into the FSR together with a preliminary response from EP, for example, if and where relevant to this EA Application, how it would be incorporated into the specialist studies of the EIA. The I&APs will be informed of the availability of the DSR for comment; where/how these reports can be accessed and the commenting timeframes; and how comments can be submitted to the EAP. Proof of the PPP undertaken during the Impact Assessment Phase will be appended to all reports produced. Tasks to be performed to inform the registered I&APs of the availability of the documents for comment is as follows:

- All registered I&APs will be informed of the availability of the reports for comment by means of notices sent via a legal notice in a newspaper, registered letters, e-mails, facsimile and SMS;
- The draft reports will be made available to the public for a 30-day commenting period;
- The I&APS will be notified of EP's intent to submit the final reports;
- These reports will be made available for comment at following locations:
 - EM Security Office;
 - MM entrance;
 - Madibeng Local Library in Brits;
 - Moumong Store in Mmakau;
 - The Community Library (at the Community Hall) Damonsville;
 - The Community Hall in Mothotlung;
 - The Community Hall in Oukasie;
 - De Wildt Helpmekaar Organisation; and
 - Mmakau Police Station next to the Bakgatla-Ba-Mmakau Tribal Council offices.

8.1 Summary of issues raised by I&AP's

Table 11: Table summarising comments and issues raised, and reaction to those responses

Interested and Affected Parties	Date Comments Received	Issues raised	EAP's Response to the issues raised	Section and paragraph
Affected Parties				
<u>Landowners</u>				
Eland Platinum Mines (Pty) Ltd			The EP is the lawful occupier of the land.	Section 3 and Appendix 6
<u>Lawful occupier/s of the land</u>				
EP is the lawful occupier of the land.				Section 3 and Appendix 6
<u>Landowners or lawful occupiers on adjacent properties</u>				
Salene Mining (Pty) Ltd			Will be notified as part of the project announcement process.	Section 3 and Appendix 6
Kleinsmit Familie Trust				
M C Botha				
Barplats Mines (Pty) Ltd				
Madibeng Local Municipality				
Jo-Fana Roses CC				
National Housing Board				
Suid - Afrikaanse Ontwikkelings Trust				
Republic of South Africa Government				
Salene Mining (Pty) Ltd				
GOSA				
Hernic Ferrochrome (Pty) Ltd				
Zilkaats Wildlife Estate				
Zolograph Investments (RF) (Pty) Ltd				
Bakwena N1 and N4 Toll Concession				
Madibeng Local Municipality				
National Housing Board				
South African National Roads Agency SOC Ltd				
<u>Municipal councillor</u>				
Ward 21 – Eland Platinum situated in the Ward			Will be notified as part of the project announcement process.	Section 3 and Appendix 6

Interested and Affected Parties	Date Comments Received	Issues raised	EAP's Response to the issues raised	Section and paragraph
Mr MW Motlhasedi				
Ward 13 – Surrounding Ward Cllr Molekoa				
Ward 17 – Surrounding Ward Mr MA Mokgoko				
Ward 18 – Surrounding Ward Mr Barney A Maubane				
Ward 19 – Surrounding Ward Mr TS Bogale				
Ward 20 – Surrounding Ward Mr Chris Seabi				
Ward 35 – Surrounding Ward Ms Nomsa Maqakamba				
Ward 31 – Surrounding Ward in Tshwane Metropolitan Municipality Mr Tshepo Kgaje				
<u>Municipality</u>				
Bojanala District Platinum Municipality;			Will be notified as part of the project announcement process.	Section 3 and Appendix 6
Madibeng Local Municipality;				
<u>Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWS etc.)</u>				
NWDEDECT			Will be notified as part of the project announcement process.	Section 3 and Appendix 6
DWS				
DMRE				
SAHRA				
Eskom				
South African Weather Services (SAWS)				
South African National Defence Force (SANDF)				
Transnet				
<u>Communities</u>				
Damonsville Community			Will be notified as part of the project announcement process.	Section 3 and Appendix 6
Mothotlung Community				
Moumpong Community				
Mmakau Community				
De Wildt Community				
<u>Traditional Leaders / Land Claimants</u>				
Bakgatla-Ba-Mmakau Tribal Council			Will be notified as part of the project announcement process.	Section 3 and Appendix 6

Interested and Affected Parties		Date Comments Received	Issues raised	EAP's Response to the issues raised	Section and paragraph
<i>Land Claimants for Portion 61</i>					
<i>Bakgatla ba Moiletswane</i>					
<i>Bakgatla Ba Rampakong</i>					
<u>Dept. Forestry , Fisheries and Environmental</u>					
<i>Director: Environmental Authorisations</i>				<i>Will be notified as part of the project announcement process.</i>	<i>Section 3 and Appendix 6</i>
<u>Other Competent Authorities</u>					
<i>Department of Public Works Road and Transport</i>				<i>Will be notified as part of the project announcement process.</i>	<i>Section 3 and Appendix 6</i>
<i>DALRRD</i>					
<i>Department of Local Government and Traditional Affairs</i>					
<i>LCC</i>					
<u>Other Affected Parties</u>					
<i>Agri North West</i>				<i>Will be notified as part of the project announcement process.</i>	<i>Section 3 and Appendix 6</i>
<i>Madibeng Business Support Centre</i>					
<i>VTSD Forum</i>					
<u>Interested Parties</u>					
<i>Culverwell Group of Companies</i>				<i>Will be notified as part of the project announcement process.</i>	<i>Section 3 and Appendix 6</i>
<i>De Wildt Farmers</i>					
<i>Conservation Areas and NGOs</i>					
<i>MTN</i>					
<i>Vodacom</i>					
<i>Cell C</i>					
<i>Neotel</i>					
<i>Multichoice</i>					
<i>Sentech</i>					
<i>Civil Aviation Authority</i>					

9. BASELINE ENVIRONMENT OF THE EM SURFACE AREA

This section describes the existing status of the environment that may be affected by the EM PV Solar Projects.

The following information has mostly been extrapolated from previous EMP(s), recent EIAR and Specialist Studies submitted on behalf of EP. The purpose of this section is to provide a baseline description for the EM PV Solar Project Area and surrounds; and to identify the scope of work for the EIA phase. This has been compiled based on the following:

- Available information from the EM's environmental licences, particularly recently submitted EIARs;
- Specialist reports conducted in and around the Project Area for previous applications lodged;
- South African Weather Service ("**SAWS**");
- South African National Biodiversity Institute ("**SANBI**");
- Statistics South Africa;
- MLM IDP;
- Existing information on the environmental parameters of the EM Surface Area and surrounds; and
- Stakeholder and I&AP comments received (from previous EA Applications and processes).

9.1 Regional Setting

The EM PV Solar Project will be taking place within the EM Surface Area. It falls within the MLM and is situated to the eastern part of BPDM (NWP). The town of Brits is located 10 km east of the EM and Tshwane Metropolitan (Pretoria) 60 km west. Neighbouring communities in proximity to the EM Surface Area include Damonville, Mothotlung, Moumong, De Wilt and Mmakau.

The EM PV Solar Project Area is surrounded by the N4 Bakwena highway to the south and the R566 Brits-Rosslyn Provincial Road to the north. The EM Surface Area is located within Ward 21 of the MLM and the nearby towns and residential areas are given in **Table 12** (line-of-sight distances).

Table 12: Line of sight distances to nearest towns in terms of the border of EM Surface area.

Town	Distance Km	Direction
Damonsville	1 Km	North of the EM Surface Area
Moumong	1.2 Km	North-east of the EM Surface Area
Mothotlung	2 Km	North of the EM Surface Area
Tshwara	2.1 Km	North-east of the EM Surface Area
Ramolapong	2.4 Km	North-east of the EM Surface Area
Mmakau	3.0 Km	North of the EM Surface Area
De Wilt	3.7 Km	East of the EM Surface Area
Ga-Kwate	3.7 Km	North-east of the EM Surface Area
Brits	10 Km	West of the EM Surface Area
Pretoria	60 Km	East of the EM Surface Area

More detailed information on the regional and local setting will be provided in the EIAR

9.2 Socio Economic Environment

9.2.1 North West Province

The EM PV Solar Project Area is located within the NWP, which is bordered by the Northern Cape, Free State, Gauteng, and Limpopo Provinces, as well as Botswana. Comprising a total land area of 118 797 km², the NWP is the third smallest province in South Africa. It is predominately a rural province, and only 35% of its 4 108 816 inhabitants live in urban areas. (www.nwpg.gov.za).

The economy is dominated by mining, which generates more than half of the province's Gross Domestic Product (“GDP”). The Rustenburg and Brits districts produce 94% of South Africa’s platinum, which is more than any other single area in the world. The NWP also produces a quarter of South Africa's gold, as well as granite, marble, fluorspar and diamonds. Mining in the NWP therefore provides jobs for a quarter of the NWP’s workforce and contributes approximately 23% towards the South African mining industry (www.nwpg.gov.za).

The eastern and southern parts of NWP are crop-growing regions where maize, sunflowers, tobacco, cotton, and citrus fruits are produced. The northern and western parts of NWP have many sheep farms, cattle and game ranches.

9.2.2 Bojanala Platinum District Municipality

The EM PV Solar Project Area is located within the BPDM of the NWP. The district includes five Local Municipalities: Rustenburg (Marikana, Mooiooi, Phatsima and Tlhabane), Madibeng (Brits and Hartebeespoort), Moses Kotane (Mogwase and Madikwe), Kgetlengrivier (Derby, Koster and Swartruggens) and Moretele.

BPDM has a total population of 1 670 000 inhabitants, comprising 44% of the population of the NWP (BPDM, IDP, 2020/21). Its population comprises 52% males and 48% females, which is typical of districts with labour intensive industries, such as mining, and is projected to grow at an average annual rate of 1.5% from 1.67 million in 2016 to 1.8 million in 2021. (BPDM, IDP, 2020/21).

The 2016 employment statistics for BPDM show that 54% of the population, comprising 894,102 people, are employed and in 2016 the BPDM contributed 52% to the GDP of the NWP, amounting to R137bn (up from R 51.9 billion in 2006). The major sector contributions to the BPDM's GDP are mining 51.2%, financial 10.5%, trade 9.6%, tourism 5.6% and manufacturing 5.5%. BPDM is rich in mineral deposits; half of the RSA's chromite production comes from it; and the area is the world's largest platinum producer. The MLM contributes the most to the GDP of the BPDM, with a total of R 46.5 billion or 37.41%. (BPDM, IDP, 2020/21).

9.2.3 Madibeng Local Municipality

The EM PV Solar Project Area is located within the MLM in the NWP. MLM is one of the five local municipalities in the BPDM. The MLM covers a total land area of 3 839 km². It includes three towns (Brits, Hartebeespoort, and Mooiooi), rural areas, villages, farm portions and an established industrial area in Brits, which is MLM's main economic centre (MLM, IDP, 2017/21).

The MLM has 41 Wards and is governed by a Council, comprising eighty-one council members. Forty-one council members are allocated to Ward Councillors, elected by the Wards they represent, and the remaining forty seats are awarded to political parties in proportion to the number of votes received. (MLM, IDP, 2017/21).

9.2.3.1 Demographics

According to WEBHIS data (2020), the total population of the MLM is 574 491 inhabitants, comprising 229 672 households with an average household size of 4 people per household. Men account for 53% of the population and females 47% (Community Survey, 2016). Children under the age of 14 account for 26% of the population; and 69% of the population are between the ages of 15 and 65 (Community Survey, 2016). This is higher than the BPDM, where 65%

of the population are aged between 15 and 65 (BPDM, IDP, 2020/21). The racial composition of the MLM population comprises 92.23% Black Africans; 6.92% White; 0.54% Coloured; and Indian/Asian 0.3%. (MLM, IDP, 2017/21).

Some 55% of the MLM population speak Setswana. This is followed by Xitsonga, which is spoken by 9% of the population, Sepedi 7%, and Afrikaans 6%. Other languages spoken include Sesotho and Isizulu. (Community Survey, 2016).

9.2.3.2 Education

The education statistics for the MLM show that 4.3% of the population aged 20 or more have no schooling. While the literacy rate for the area is 89%, 15% of the population aged 20 or more have completed Grade 12; 37.9% have completed some primary schooling; and 33.9% have completed some secondary schooling (Community Survey, 2016). In 2016 2% of the MLM population had completed higher education, and 94% of children between the ages of 5 and 17 years were in school. (Community Survey, 2016).

9.2.3.3 Basic Services

The HIV/AIDS prevalence in the MLM is 45.5%, which is significantly higher than the NWP prevalence rate of 26.7% (MLM, IDP, 2017/21). Men and women between the ages of 26 and 35 seem to have higher infection rates than other age groups in the MLM population infection. The MLM has 28 registered NGOs rendering HIV/AIDS related programmes, including voluntary testing, counselling, and treatment services. (MLM, IDP, 2017/21).

According to the MLM IDP (2017/21), 15% of households do not have access to basic water supply. Of the 78% of households that have access to municipal water services (either bulk, full, intermediate, informal intermediate, or basic supply), 22.2% of these households have piped water inside their formal dwellings. Only 49% of households have access to basic sanitation (including flushing toilets, ventilated pit latrines, pit latrines or septic tanks) (MLM, IDP, 2017/21); and of these households 27.2% have a flush toilet.

Water resources in the MLM include the Crocodile River, Hartbeespoort Dam, Rooikoppies Dam and Klipvoor Dam. Three main wastewater treatment plants in the MLM are situated in Brits, Mooi-nooi, and Hartbeespoort. Due to increasing demand, the bulk water infrastructure's capacity (including WTPs) is insufficient to cater for the demand. As a result, the MLM has established or re-commissioned boreholes to augment the bulk water supply.

From available information, it is estimated that 81% of MLM households in urban areas have access to electricity for lighting. In the rural areas of MLM, it is estimated that only 30% of households make use of electricity for lighting. The use of lighting forms other than electricity is predominant in informal dwellings. (MLM, IDP, 2017/21).

Only 25.7% of the population have access to weekly refuse removal and waste removal in the MLM is a serious challenge. (MLM, IDP, 2017/21). The Hartbeespoort Regional Landfill Site, which is located between the towns of Brits and Hartbeespoort, is the only licensed and operational landfill site in the MLM.

9.2.3.4 Housing

In the MLM 59.2% of the population reside in formal dwellings and 54.1% of these formal dwellings are either privately owned or paid off. (MLM, IDP, 2017/21). MLM has more than 34 informal settlements, which have about 48 212 households (excluding backyard dwellers). Almost 30% of the MLM population reside in informal settlements and, according to the MLM IDP (2017/21), the high number of informal settlements is a result of immigration due to mining in the area and farm evictions.

9.2.3.5 Economy

The MLM economy is primarily dependent on mining, agriculture, tourism, and industrial manufacturing. The mining sector in MLM contributes considerably to job creation in the local economy and mainly comprises PGM, chromium and intensive granite and sand mining. (MLM, IDP, 2017/21). In 2016 agriculture accounted for 17.7% of the GDP, manufacturing 13.3%, and tourism 11%. (MLM, IDP, 2017/21). According to the MLM IDP (2017/21), MLM's economy is projected to grow at an average annual rate of 2%.

The MLM has three major tourism attractions, including the Hartbeespoort Dam; Cradle of Humankind, which is a proclaimed World Heritage Site, and Magaliesberg Mountain Range. The MLM area is well known for privately owned game farms, holiday accommodation and camping sites. It also hosts the following four RCI Resorts; Magaliespark, Mount Amanzi, Seasons Spa and Dikhololo. (MLM, IDP, 2017/21).

9.2.3.6 Employment

MLM's employment statistics indicate that 45% of the working population are employed, 20% are unemployed, 4% are discouraged work seekers, and 31% are economically not active (Community Survey, 2016). According to the MLM IDP (2017/21), 23.3% of the population are poverty stricken, with no monthly income; 27.3% of the population earn up to R800 monthly; 43.3% between R800 and R6 500; and 6.3% earn more than R6 500.

Female headed households account for 30.3% of the MLM population. (MLM, IDP, 2017/21). Support provided to indigent households includes free basic services, social grants and job creation through the Expanded Public Works Programme.

9.2.3.7 Municipal priorities

The MLM IDP (2017/21) identifies the following service delivery priorities:

- Water and sanitation;
- Roads and storm water;
- Electricity;
- Social services;
- Land and housing; and
- Local economic development.

In addition, the MLM identifies the following development challenges facing it (SES, 2021):

- Water crisis in the MLM;
- Illegal connection in relation to water and electricity;
- Lack of resources and budget constraints;
- Lack of available land for residential purposes; and
- High level grant dependency.

9.2.4 Local Socio-Economic Baseline Description

The communities in proximity to the EM PV Solar Project Area are (SES, 2021):

- Damonsville, a multi-cultural urban suburb, located 7 km east of Brits and 1 km north of EM;
- Mothotlung, a well-established peri-urban settlement, 12 km east of Brits and 2 km north of EM;
- Mmakau, a semi-rural settlement falling under the Mmakau Tribal Office, located 16 km east of Brits and 3 km north of EM; and
- Oukasie, a well-established township, situated adjacent to the town of Brits, and 12 km from EM. Founded in 1931 Oukasie is one of the oldest Black townships in South Africa. In recent years it has become home to several African immigrants and is characterised by 13 sprawling informal settlements.

Communities that form part of the labour sender areas are located within 12 km from EM, as detailed in EM's SLP.

9.2.4.1 Communities in proximity to the EM Surface Area

Population figures for communities in proximity to the EM Surface Area (“**Local Communities**”) were gathered in key informant interviews with clinic staff at Oukasie and

Mmakau Clinics and verified using WEBHIS data, provided by Brits District Hospital (SES, 2020). **Table 13** provides an overview of the population figures for the Local Communities. Oukasie is the largest community, as it accounts for 32% of the population of the Local Communities; this is closely followed by Mothotlung, which accounts for 31%

Table 13: Population figures for communities in proximity to the EM Surface Area.

Community	Population	Estimate Households
Oukasie	35 338	8 835
Damonsville	15 403	3 851
Mothotlung	34 289	8 572
Mmakau	24 539	6 135
Total	109 569	27 392

(Source: SES, 2020).

9.2.4.2 Project Area Demography

As in the BPDM and MLM, the Local Communities comprise more males than females, refer to **Table 14**. This is likely due to more male than female job seekers moving to the area in search of employment opportunities.

Table 14: Age distribution of communities in the Project Area

Age	Oukasie	Mothotlung (including Damonsville)	Mmakau	Project Area
0 - 14 years	28.5%	25.4%	26.2%	26.7%
15 – 64 years	69.2%	69.3%	68.4%	68.9%
Elderly (+65)	2.3%	5.3%	5.4%	4.3%

(Source: Community Survey, 2016)

Although Tswana is the dominant ethnic group (59%) within the Local Communities, this does vary across the different communities. Refer to **Table 15**. Tswana is followed by Pedi (10%), Tsonga (9%), and Zulu (4%). Few households speak Afrikaans or English within the Local Communities and the dominant languages include Setswana, Xitsonga, and Sepedi.

Table 15: Local Communities Languages

Language	Oukasie	Mothotlung (including Damonsville)	Mmakau	Project Area
Afrikaans	2.5%	0.8%	0.5%	1.27%
English	2.1%	2.4%	2.4%	2.30%
IsiNdebele	2.4%	1.7%	1.9%	2.00%
IsiXhosa	1.9%	1.5%	1.0%	1.47%
IsiZulu	4.3%	3.4%	3.1%	3.60%
Sepedi	16.7%	6.1%	8.2%	10.33%
Sesotho	2.6%	2.5%	2.1%	2.40%
Setswana	39.9%	73.7%	63.0%	58.87%
Sign Language	0%	0.5%	0%	0.17%

SiSwati	1.2%	0.9%	0.7%	0.93%
Tshivenda	4.1%	0.8%	2.2%	2.37%
Xitsonga	14.9%	4.3%	7.8%	9.00%
Other	7.2%	1.3%	6.9%	5.13%

(Source: Community Survey, 2016).

9.2.4.3 Basic Services

The MLM is tasked with providing water, sanitation, transportation facilities, electricity, primary health services, education, housing and security to the Local Communities. During the socio-economic study, several social facilities were identified and are detailed in **Table 16**.

Overall, the statistics on access to social services detailed in the MLM IDP (2017/21) present a strikingly different reality to what is experienced by households in the Local Communities. Like many municipalities struggling with service delivery in South Africa, the quality and efficient delivery of basic services to the Local Communities remains a huge challenge for the MLM. Although most households have access to electricity, water and sanitation, high levels of unemployment lead to non-payment of municipal services.

Service delivery is not only a challenge experienced at a household level. Schools and healthcare facilities in the area regularly experience water shortages and power outages for extended periods that further exacerbate the MLM's ability to provide basic services to the Local Communities.

Table 16: Social and commercial services in the Project Area

Social Service	Oukasie	Damonsville	Mothotlung	Mmakau
Education				
Primary school	4	0	3	5
Secondary School	1	0	2	1
Combined school	0	1	0	0
Crèche/play school	Many	2	Many	Many
Library	1	1	1	0
Refuse removal				
Landfill site	0	0	0	0
Churches				
Church (estimate)	9	6	10	6
Social grants				
SASSA pay-out point	1	0	1	1
ATM	1	0	1	2
Post office	0	0	1	1
Commercial				
Spaza shops	Many	5	Many	Many
Liquor store	Many	0	Many	Many
Taverns	Many	5	Many	Many
Supermarket	Many	1	5	5
Petrol station	1	0	1	1
Community organisations				
Homebased care	21	Unknown	5	3
Farmers Association	0	0	0	1
Recreational				
Community Hall	1	1	1	1
Recreational park	1	1	4	1
Sports field	2	1	1	1

Security				
Police station	0	0	1	1
Municipal offices	1	0	0	0
Magistrates court	0	0	0	0
Health				
Clinic	1	1	1	1
Hospital	0	0	0	0
Cemetery	1	1	1	1

(Source: SES, 2020)

9.2.4.4 Education facilities

The MLM area has 12 primary schools, 4 secondary schools, and 1 combined school located. Education statistics for the area show that at least 20% of the population is illiterate and, of the Local Communities, Oukasie has the most uneducated population (13.6%). 2.9% of Mothotlung's population have received no schooling (SES, 2020). Refer to **Table 17**.

Table 17: Education statistics for the Local Communities in relation to the EM Surface Area

Education	Oukasie	Mothotlung (including Damonville)	Mmakau	Project Area
No schooling	13.6%	2.9%	6.1%	7.53%
Some primary	13.3%	9.6%	15.0%	12.63%
Completed primary	5.8%	4.1%	6.0%	5.30%
Some secondary	41.2%	34.5%	43.0%	39.57%
Completed Matric	24.2%	36.2%	25.9%	28.77%
Higher education	2%	12.7%	4.0%	6.23%

(Source: Community Survey, 2016)

9.2.4.5 Housing

The Local Communities have a variety of housing types and structures. Some housing types include large freestanding houses, comprising three or four bedrooms; others include RDP houses and shanties, erected from corrugated iron. Informal settlements are evident, particularly in Oukasie and in the areas between Damonville and Mothotlung, where a few hundred shanties have been erected.

17.40% of the Local Communities own motorcars, 15.7% satellite television, and 13.70% computers (SES, 2020).

9.2.4.6 Development Challenges

Ward Councillors in MLM identified the following key development challenges (SES, 2020):

- High levels of unemployment;
- Immigration and the development of informal settlements;
- Poor support to agriculture development projects;

- Poor service delivery (i.e., roads, water and sanitation);
- Few SMME opportunities;
- Few skills development and training opportunities; and
- High prevalence of HIV and AIDS.

Although the Ward Councillors understand that the Local Government is responsible for service delivery and infrastructure development, they also feel that local businesses, and EP, have a role to play in improving the lives of the Local Communities.

The potential impacts associated on the socio-economic environment will be further considered during the Impact Assessment Phase.

9.3 Topography

The NWP, the sixth largest province in the RSA, occupies a total area of 116 320 km² (9,5% of the total area of the RSA). It is geographically situated between 25° and 28° south of the equator and between 22° and 28° longitude east of Greenwich Meridian. With altitudes ranging from 920 m - 1782 m above sea level, the NWP is professed to have the most uniform terrain of all provinces.

The topography of the EM PV Solar Project Area is relatively flat, with koppies and hills to the north, and the Magaliesberg mountain range to the south. The Area is located approximately 6 km north of Hartbeespoort Dam and 5 km west of the Crocodile River. The average elevation of land in and surrounding the Project Area is 1 170 m above mean sea level ("**mamsl**"). Mountain peaks in the nearest section of the Magaliesberg rise to 1 500 – 1 600 mamsl; and the Hartbeespoort Dam lies at an altitude of approximately 1 200 mamsl. The Crocodile River flows from the Hartbeespoort Dam in a north-westerly direction and passes about 5 km to the west of the EM Surface Area at an altitude of about 1 110 mamsl. The Karee Spruit flows north-east to south-west into the Crocodile River and runs directly north of the Area.

The overall slope of the EM Surface Area is 1:35. The slope increases slightly to the north near the Msilitwane koppie (Trig beacon no. 16), which peaks at 1 317.2 mamsl. The lowest point on the site is at 1 142 mamsl, where a non-perennial stream leaves the EM mining right area ("**Mine Area**"), along the western boundary north of the railway line. The topography in parts of the EM Surface Area has been altered by existing infrastructure and operation.

The potential impacts associated with site topography will be further considered during the Impact Assessment Phase, with specific mention of the decommissioning phase.

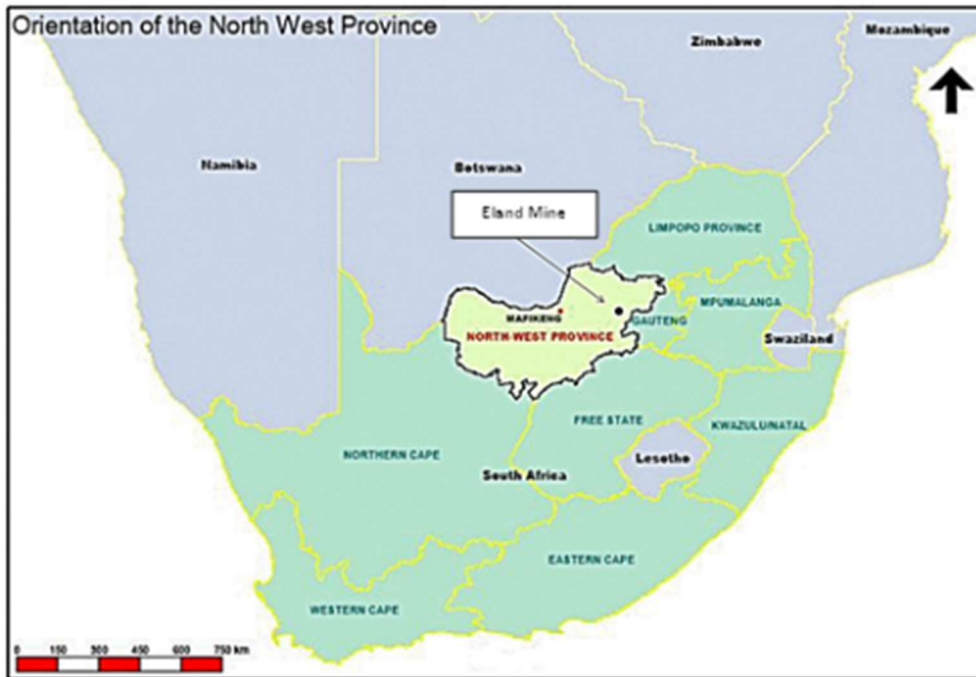


Figure 13: Orientation of the NWP – South Africa.

9.4 Climate

EM falls within the Highveld Climatic Zone, as defined by Schulze (1974). The average climate for the EM PV Solar Project Area is presented in **Figure 14**, using the outcome of the investigation into rainfall and evaporation for the site. While evaporation is showing as greatly exceeding rainfall, this is representative of the maximum A-Pan equivalent potential evapotranspiration that could occur, assuming no limitations are placed on evaporative demand. The combination of rainfall, evaporation and temperature results in a hot semi-arid climate, according to the Köppen climate classification. Detailed features of this climatic zone are outlined below (CHEMC, 2019):

- Temperatures in this climatic zone are generally mild, but low minima can be experienced in winter due to clear night skies. Average annual precipitation ranges from 650 mm (west) to 900 mm (east);
- Rain generally occurs in summer from October to March;
- 85% of the mean annual precipitation ("**MAP**") falls during summer thunderstorms. The thunderstorms generally occur every 3 to 4 days in summer and are of short duration and high intensity, accompanied by strong gusty south-westerly winds;
- Hail frequency is high tending to occur 4 to 7 times per season;
- Average of 75 storms occurs per year;

- Summer average daily temperatures range from 17 to 27°C, with maxima of 38°C. In winter average daily temperatures range from 0 to 13°C;
- Frosts may occur from May to September for about 120 days; and
- Light north-easterly and south-westerly winds prevail. However, strong gusty south westerly winds often accompany thunderstorms.

Various weather stations managed by both the SAWS and the DWS are located close to EM. The SAWS and DWS stations (A2E001) are located approximately 5km and 7.5km from the from the EM Surface Area, respectively. The DWS station has a rainfall record length of 91 years (1926 - 2017).

Lynch (2004) was also used as a source of rainfall data for the EM Surface Area and is the source of the MAP data. A comparison of DWS station A2E001 and Lynch (2004) average monthly rainfall is presented in **Table 18**. MAP for DWS station A2E001 is 686mm. MAP from Lynch (2004) indicates a MAP at the centre of the EM's TSF of 552mm.

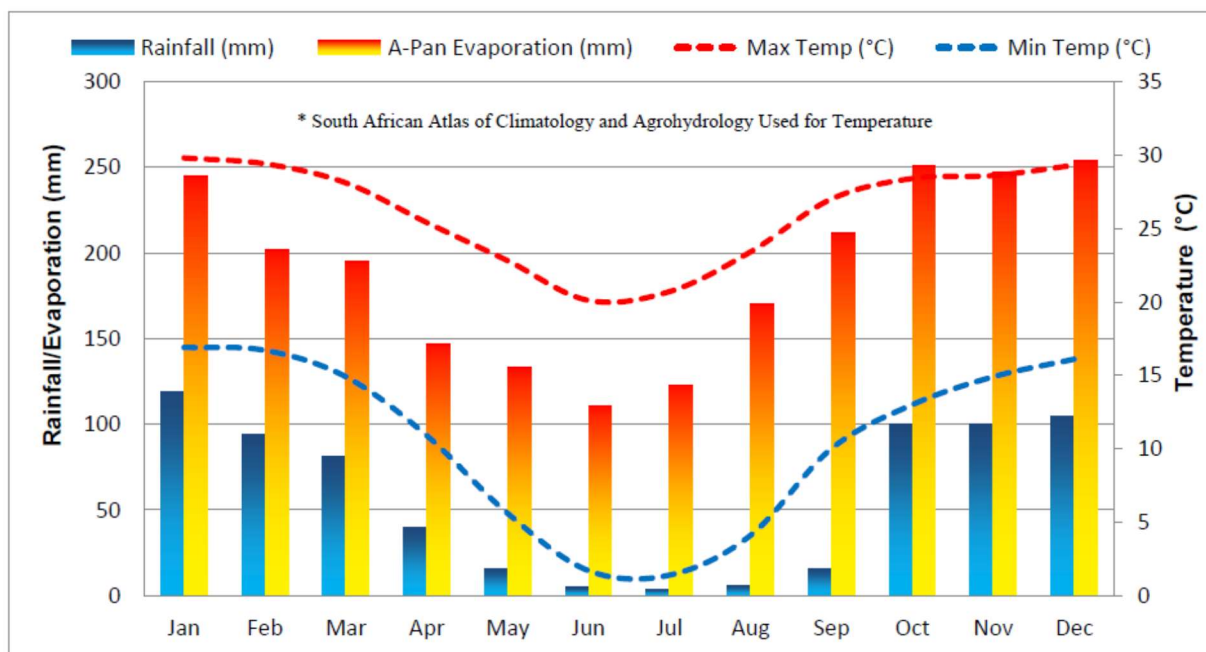


Figure 14: Average Monthly Climate for the EM Surface Area (Highlands Hydrology, 2018).

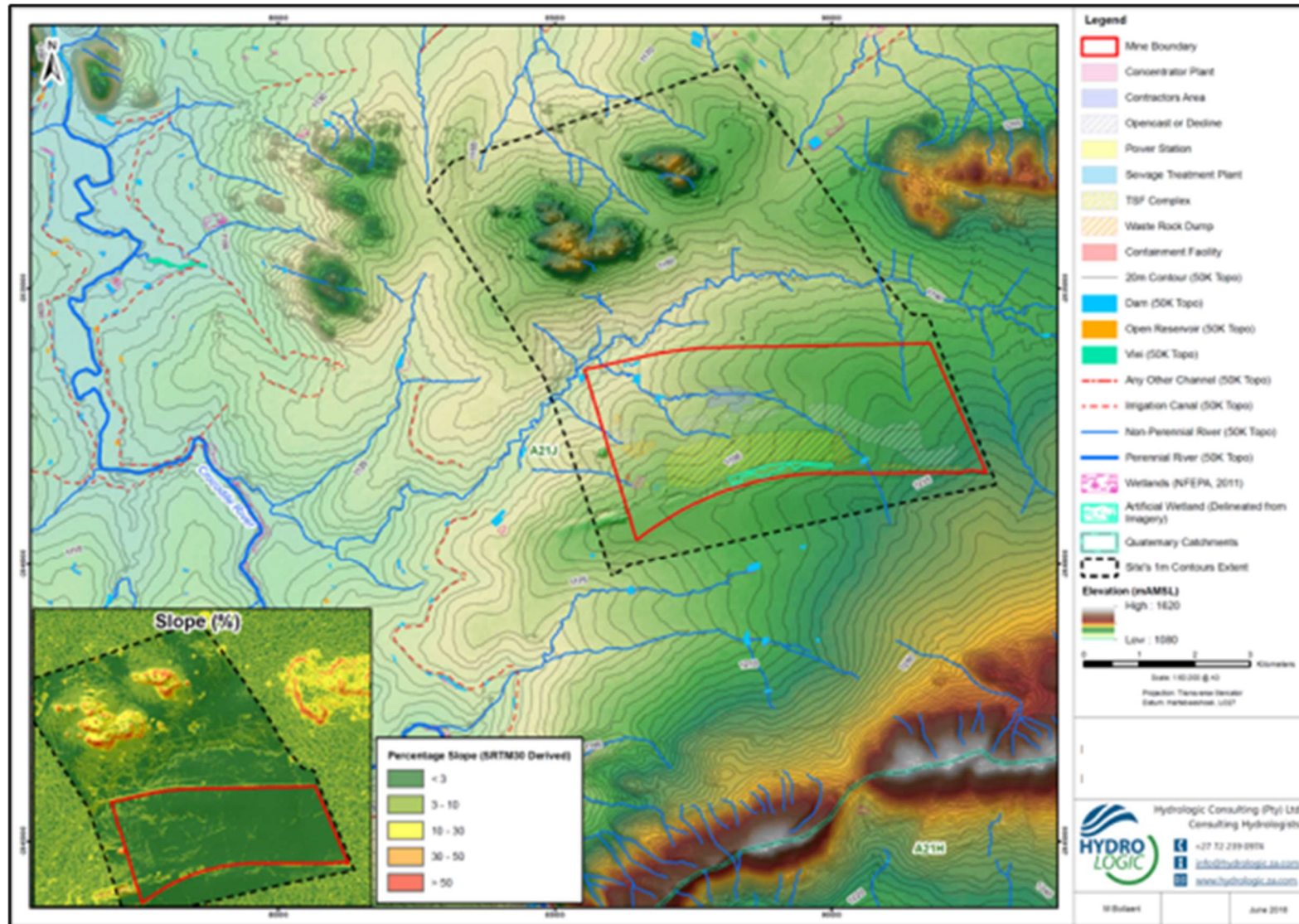


Figure 15: Local Topography of the EM Surface Area and Surrounding Area (not to scale), Highlands Hydrology, 2018.

Table 18: Average Monthly Rainfall Distribution (Highlands Hydrology, 2018).

Rainfall (mm)		
Month	A2E001	Lynch (2004)
Jan	126	119
Feb	94	94
Mar	86	81
Apr	45	40
May	19	16
Jun	8	5
Jul	5	4
Aug	6	6
Sep	15	16
Oct	60	100
Nov	108	100
Dec	114	105

9.4.1 Wind Direction and Speed

Winds vary diurnally and between seasons. The predominant wind direction in the Brits area is from the east, with frequent winds also occurring from the north-east and south. During the day there is an increase in winds from the north-west and north-east. At night, wind flow occurs mainly from the east and south, with north-westerly and south-easterly winds decreasing at night. Night-time conditions also reflect a difference in wind speed ranging from 1-4 m/s at night in comparison to daily wind speed, which ranges between 2 – 13 m/s. During the summer months strong winds from the east and north-east dominate, with wind speeds of up to 17 m/s from the east. In winter, winds from the east dominate, and strong and frequent winds from the south also occur.

The potential impacts associated on the air quality will be further considered during the Impact Assessment Phase.

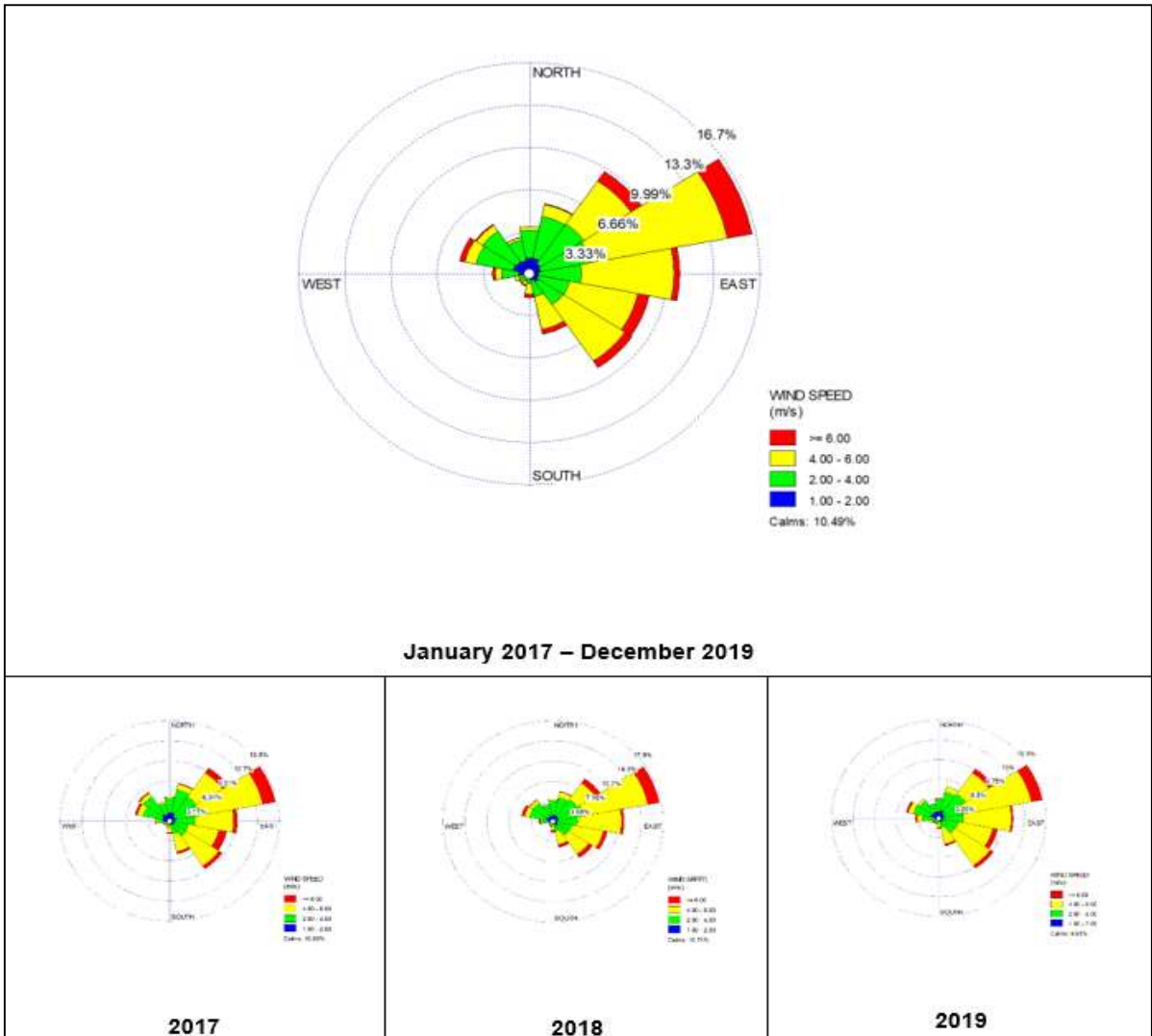


Figure 16: Period Wind Rose Plots for January 2017 - December 2019 (Rayten, 2021).

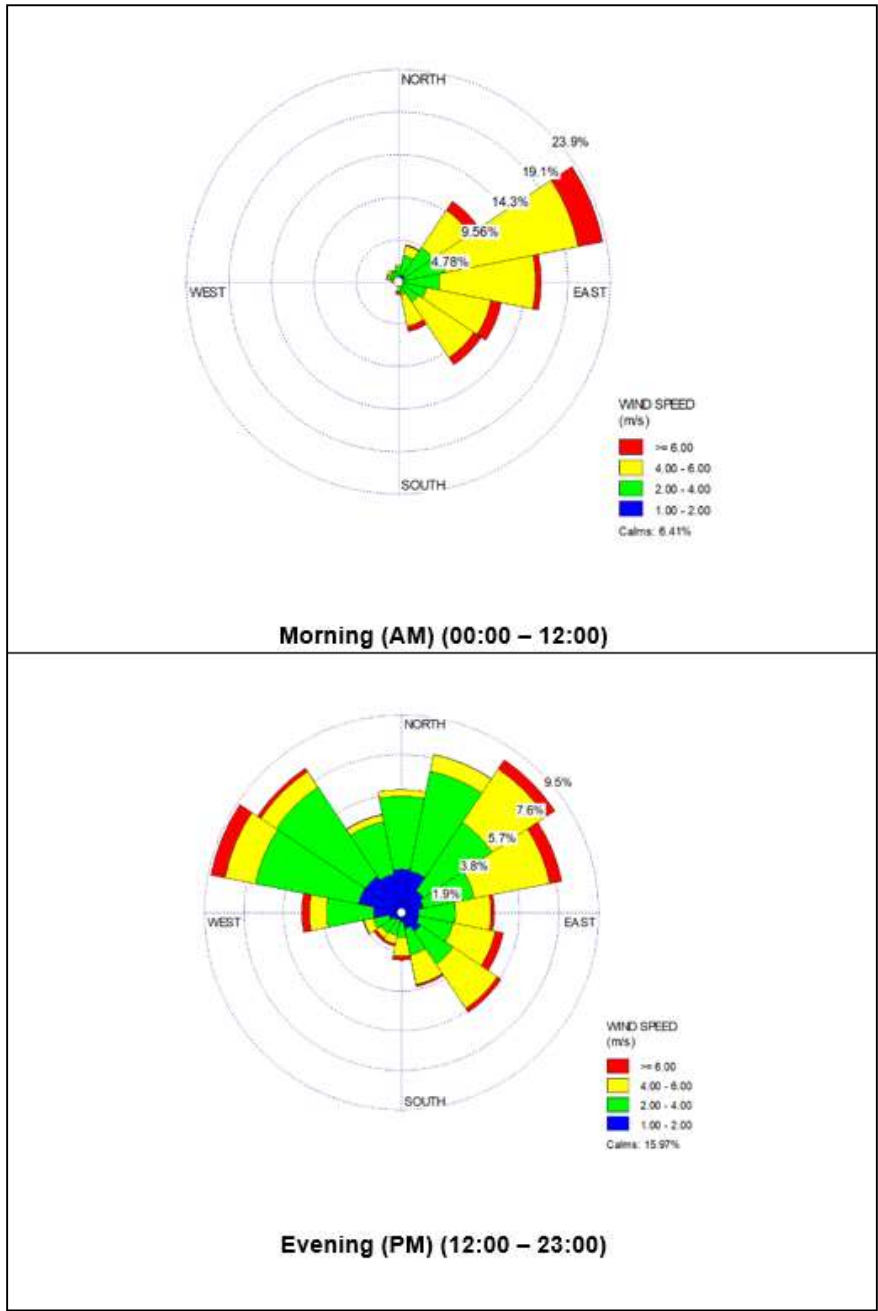


Figure 17: Morning (AM) (00:00 - 12:00) and Evening (PM) (12:00 - 23:00) Period Wind Rose Plots for January 2017 - December 2019 (Rayten, 2021).

9.5 Geology

9.5.1 Regional Geology

Southern Africa is characterised by the presence of large mafic to ultramafic layered complexes, the best known of which are the Great Dyke in the Zimbabwe Craton and Bushveld and Molopo Complexes in the Kaapvaal Craton (SLR, 2012). By far the largest, best-known and economically most important of these is the Bushveld Igneous Complex (“**BIC**”), which was intruded about 2060 million years ago into rocks of the Transvaal Supergroup, largely along an unconformity between the Magaliesberg quartzite of the Pretoria Group and overlying Rooiberg felsites. The total estimated extent of the BIC is some 66 000 km², of which about 55% is covered by younger formations. The Rustenburg Layered Suite (“**RLS**”) comprises the mafic phase of the BIC and is host to several economically extracted minerals, such as chromite, vanadium and platinum group elements (PGM). The RLS is divided into five zones known as the Marginal, Lower, Critical, Main and Upper Zones from the base upwards (**Figure 18**). Both the Merensky Pyroxenite and UG2 Reef occur within the Upper Critical Zone.

The Critical Zone is divided into the Lower Critical and Upper Critical (**Figure 19**). The transition between the Lower and Upper Critical Zone is defined as the last occurrence of upper most Middle Group (MG) chromitite horizon, usually the MG4. The MG1 and MG2 chromitite layers are extensively mined for chrome.

The Upper Critical Zone is characterised by regular and often fine-scale rhythmic, or cyclic, layering of well-defined layers of cumulus chromite within pyroxenites and olivine-rich rocks.

The first important cycle is the lower of the two Upper Group Chromitite Layers (the UG1 Chromitite Layer). This unit consists of a chromitite layer and underlying footwall chromitite layers that are interlayered with anorthosite. The overlying UG2 chromitite is important because it contains economic concentrations of PGMs and is extensively mined.

The two uppermost cycles of the Critical Zone are the Merensky and Bastard cycles. The former is also of great economic importance, as it contains at its base the PGM-bearing Merensky Reef, a pegmatitic feldspathic pyroxenitic assemblage, with associated thin chromitite layers. The top of the Critical Zone is generally defined as the top of the robust anorthosite (the Giant Mottled Anorthosite) that forms the top of the Bastard cyclic unit.

The economically viable chromite reserves of the BIC, most of which are hosted in the Critical Zone, are estimated at 68% of the world's total, whilst the BIC also contains 56% of all known PGM.

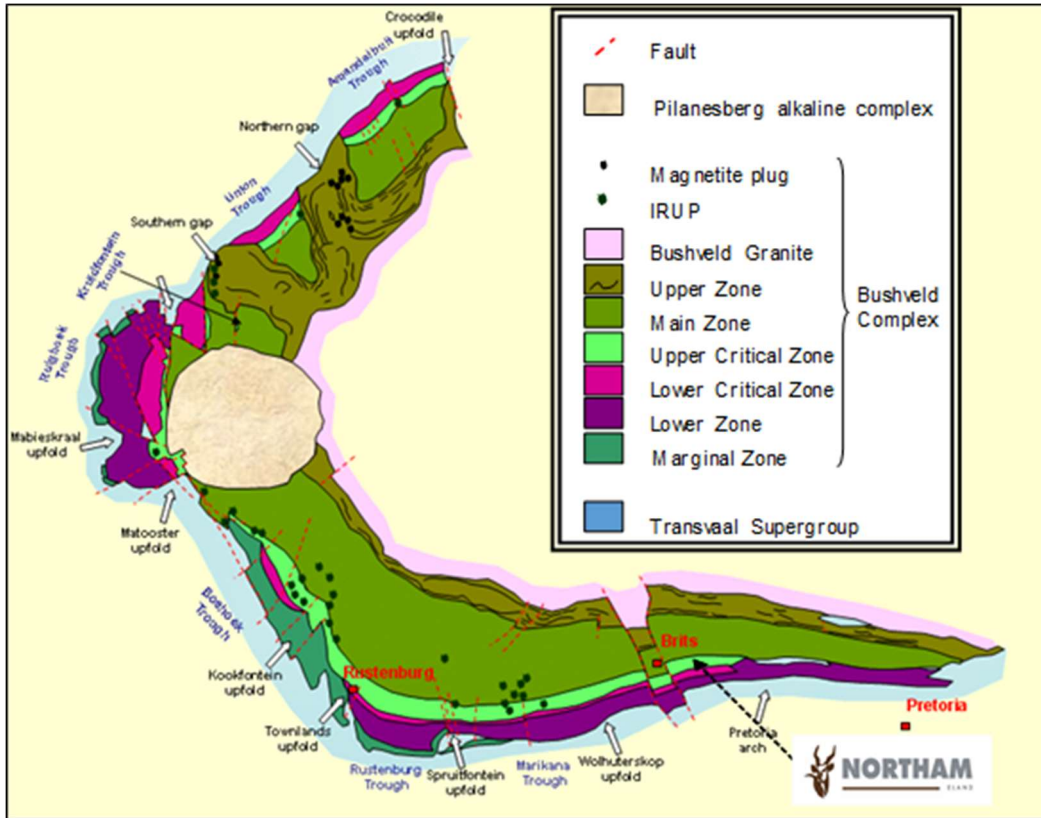


Figure 18: Generalised layout of the western Bushveld Complex

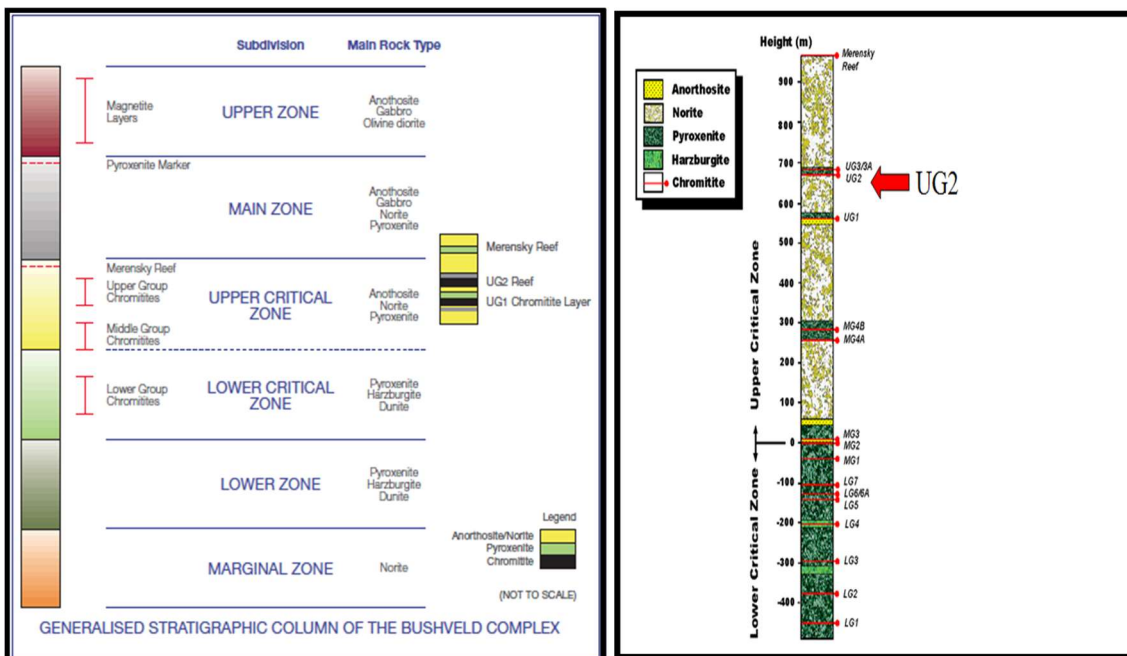


Figure 19: Generalised stratigraphy on the western Bushveld Complex

9.5.2 Local Geology

A generalized local stratigraphy at the EM Surface Area is provided in **Figure 20** below. The potential impacts associated with the geology will be further considered during the Impact Assessment.

STRATIGRAPHIC COLUMN OF ELAND PLATINUM MINE			
MARKERS		LITH	LOCAL STRAT
		GN (Gabbro Norite)	MZ
END OF MAIN ZONE			
START OF CRITICAL ZONE		MA (Mottled Anorthosite)	MH5a
CAT FEET		SA (Spotted Anorthosite)	MH5b
GIANT MOTTLES		MA (Mottled Anorthosite)	MH5c
		AN (Anorthositic Norite)	MH4
BASTARD REEF		PxN (Pyroxenitic Norite)	MH3a
		MA (Mottled Anorthosite)	MH3b
		N (Norite)	MH2
		MA (Mottled Anorthosite)	MH1a
		SA (Spotted Anorthosite)	MH1b
MERENSKY		PX (Pyroxenite)	MR
		MA (Mottled Anorthosite)	MF1
		N (Norite)	MF2
BOULDERS		MA (Mottled Anorthosite)	MF3a
		N/SA	MF3b
BANDED BSN		PxN (Pyroxenitic Norite)	MF4
		N (Norite)	MF5
		SA/MA	MF6
		SA (Spotted Anorthosite)	U2H2
		MA (Mottled Anorthosite)	
		SA (Spotted Anorthosite)	
		MA (Mottled Anorthosite)	
		SA/N	
		PX (Pyroxenite)	U2H1a
			U2H1b
UG2		CR (Chromitite)	U2U
		AN/PX/Cr (Anorthosite or Pyroxenite with chromitite stringers/lenses)	IWP
		CR (Chromitite)	U2L
		An/PPx (Pegmatoidal Pyroxenite)	U2F1
		N (Norite)	U2F2

Figure 20: Local Stratigraphic column of at the EM Surface Area.

9.6 Soils

Soils are a significant component of most ecosystems. Soil acts as an ecological driver; soil is the medium in which most vegetation grows and a range of vertebrates and invertebrates exist.

The major soil types encountered on the EM Mine Area include those of the orthic phase Mispah, Glenrosa and Hutton along with the more structured forms, including the Milkwood, Mayo, Shortlands, Sterkspruit, Swartland and Valsrivier with most of the hydromorphic forms classifying as Sepane Form.

The structure of the soils varies from moderate crumby and moderate blocky structure to strong blocky and massive, where the soils are either colluvially derived or associated with the more basic dolerite parent materials. The soils range from silty clay loams to clay loams.

The potential impacts associated with the soil disturbance will be further considered during the Impact Assessment Phase.

9.7 Land Use

Prior to mining activities, the EM PV Solar Project Area was used mainly for growing sunflower crops. Currently the land is used for mining and mineral processing related processes, with areas of open veldt, agricultural lands and mining infrastructure. The EM PV Solar Project will be located within the existing EM Surface Area that has been fenced with access control (Refer to **Figure 21** for the EM Surface Infrastructure Plan).

Land surrounding the Project Area is mainly used for livestock grazing, agriculture, mining (Maroelabult Mine, Herculite Ferrochrome's Smelter and Mine, and granite mining further north); renewable power (De Wildt Solar Power Station); and several community residential area and related activities. The Zilkaatsnek Eco-estate (mixed land-use development), small holdings and other businesses are located directly to the south (across the N4 highway), with several conservancy and protected areas further to south (i.e., Magaliesberg Biosphere Area, Peglerae Conservancy and De Wildt Cheetah Research Area, etc.) and resorts, such as the Tutuwedzo Lodge. Future land users also include the potential Q4 Filling Stations on Portions 41 and 21 of the Farm Schietfontein 437 JQ.

The potential impacts associated with the existing and future land-use aspects will be further considered during the Impact Assessment Phase.

9.7.1 Land Capability

EM is an established mining operation. Details of the existing mining, processing and auxiliary infrastructure are captured in the **Table 19** below. Refer to **Figure 21** for the infrastructure plan for EM, indicating the existing land-uses and infrastructure.

Table 19: Details of the current land capability of the EM operation.

Operation	Established	Surface area/extent	Existing Infrastructure
Eland Mine	2006	+/- 1624 Ha	<ul style="list-style-type: none"> • Workshops and Stores; • Overburden and Topsoil Stockpiles; • Opencast Mining Pits; • Concentrator Plant; • Water Management Infrastructure (i.e., dams, channels and pipelines); • Sewage and Water Treatment Plant; • Two Incline Shafts (Kukama and Nyala) and supporting infrastructure; • TSF (four Paddocks); • Offices and auxiliaries, including a mine clinic, laboratory and training centre; • Recreational Area (Game Farm); • Agricultural fields; and • Haul and internal Roads.

Suitable land capabilities for the post decommissioning phase will be considered during the Impact Assessment Phase.

9.8 Surface Water

The EM Surface Area falls within quaternary catchment A21J of the Crocodile River West Catchment, which is in the Limpopo Water Management Area (previously the Crocodile West Marico Water Management Area) (Highland Hydrology, 2018). Most of the drainage on the EM Surface Area is primarily by sheet flow in preferential storm water paths and mine-related stormwater control measures (Highland Hydrology, 2018). The general direction of flow across the EM Surface Area and its surrounding area occurs in a westerly direction (CHEMC, 2019).

None of the EM PV Solar Project Area is directly influenced by watercourses and wetlands. The 40MW PV Plant is located to the east of an existing ephemeral watercourse.

No perennial watercourses are located on the wider EM Surface Area, however non-perennial watercourses (tributaries of the Kareespruit) are located and traverse the areas. The tributary of the Kareespruit prior to the construction of the TSF was situated from south-east to north-west. EP however received a sections 21 (c) and (i) WUL to divert the watercourse (EP WUL).

The EM Surface Area lies within an agricultural district, which is served by canals from the Hartbeespoort Irrigation Scheme. There are no canals on the EM Surface Area; the closest canal to the EM Surface Area is the west canal, flows in a south to north direction approximately 5km to the west.

Surface water quality in the region generally exhibits high levels of nitrate (Water Hunters, 2018), which are elevated above the recommended DWAF domestic use guidelines (DWAF Water Quality Guidelines, 1996). Water in the Crocodile River (the nearest perennial water source to the EM Surface Area) does not meet applicable irrigation standards for total dissolved solids and manganese concentrations (Water Hunters, 2018).

Surface water sampling is conducted by EM on set points in the non-perennial streams and watercourses surrounding the Project Area. Sampling is undertaken monthly, as required in the EP WUL. The sampling locations are shown on **Figure 23**.

The potential impacts associated with the hydrological and stormwater management aspects will be further considered during the Impact Assessment Phase.

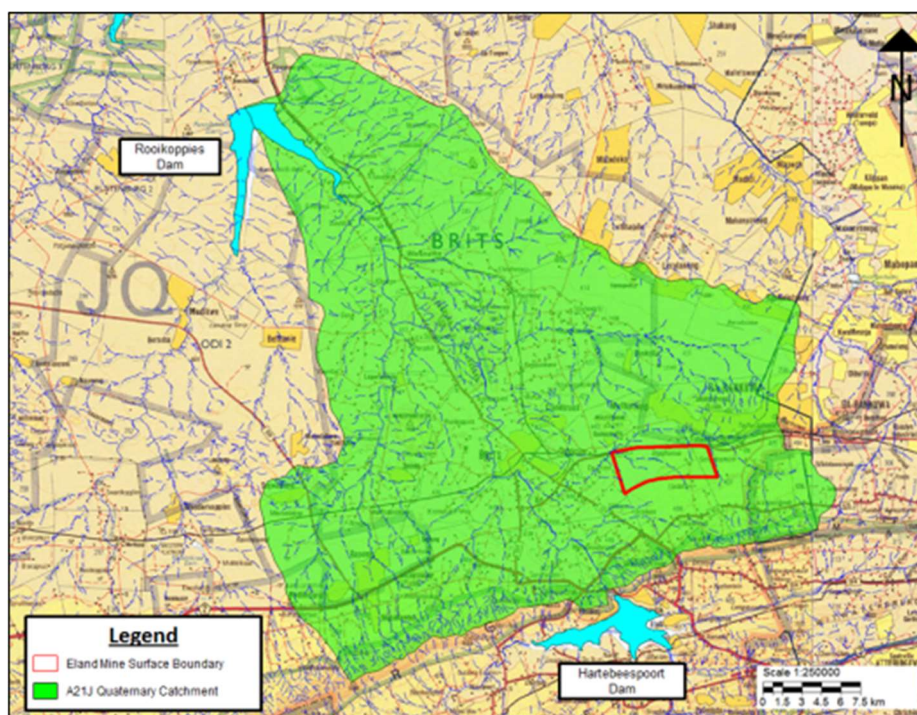


Figure 22: Location of the EM in relation to its catchment and receiving water bodies.

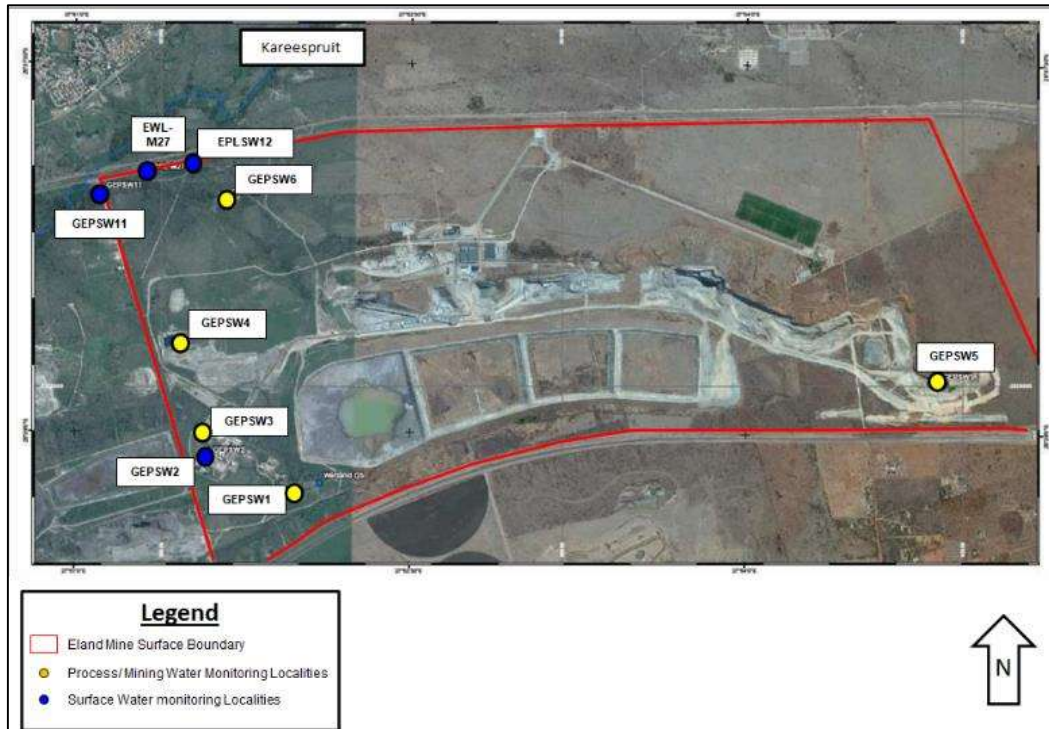


Figure 23: Aerial map of the EM surface and process water monitoring localities (Aquatco, 2020).²

9.9 Geohydrology

Groundwater is a valuable resource and is defined as water which is located beneath the ground surface in soil/rock pore spaces and in the fractures of lithological formations (Water Hunters, 2018). Groundwater in and surrounding the EM Surface Area is used mainly for mining, domestic supply and agricultural irrigation.

There are four aquifers present at the EM area as detailed below (Water Hunters, 2018).

- The soil contains a layer of black turf clay in the uppermost horizons. The soil/alluvium layer is between 1 and 5m thick.
- The weathered zone of the gabbro, norite and anorthosite is overlain by hill wash and weathered quartzite from the Magalies Mountains, forming a semi-confined, shallow weathered zone aquifer between 5-30m.
- The weathered gabbro forms one of the low potential aquifers in the Area and it is underlain by solid and fractured bedrock.
- Fault zones in the weathered/fractured gabbro formations form preferential pathways for groundwater flow and there are two distinctive faults.

² Note - Yellow dots represent process water points and blue dots surface water points.

The aquifer beneath the EM Mine Area would classify as a Minor Aquifer (Parsons, 1995), due to the general yields of less than 2.5 l/s (Water Hunters, 2018). The fractured systems could form Major Aquifer zones within the larger Minor Aquifers. Refer to the map below indicating the geological features of the EM Surface Area, including the surrounding boreholes - **Figure 24**.

EM has an extensive groundwater monitoring network. Any reduced groundwater quality is actively identified through the groundwater monitoring programme. The location of the groundwater monitoring network is illustrated in **Figure 25**.

The potential impacts associated with the geohydrological aspects will be further considered during the Impact Assessment Phase.

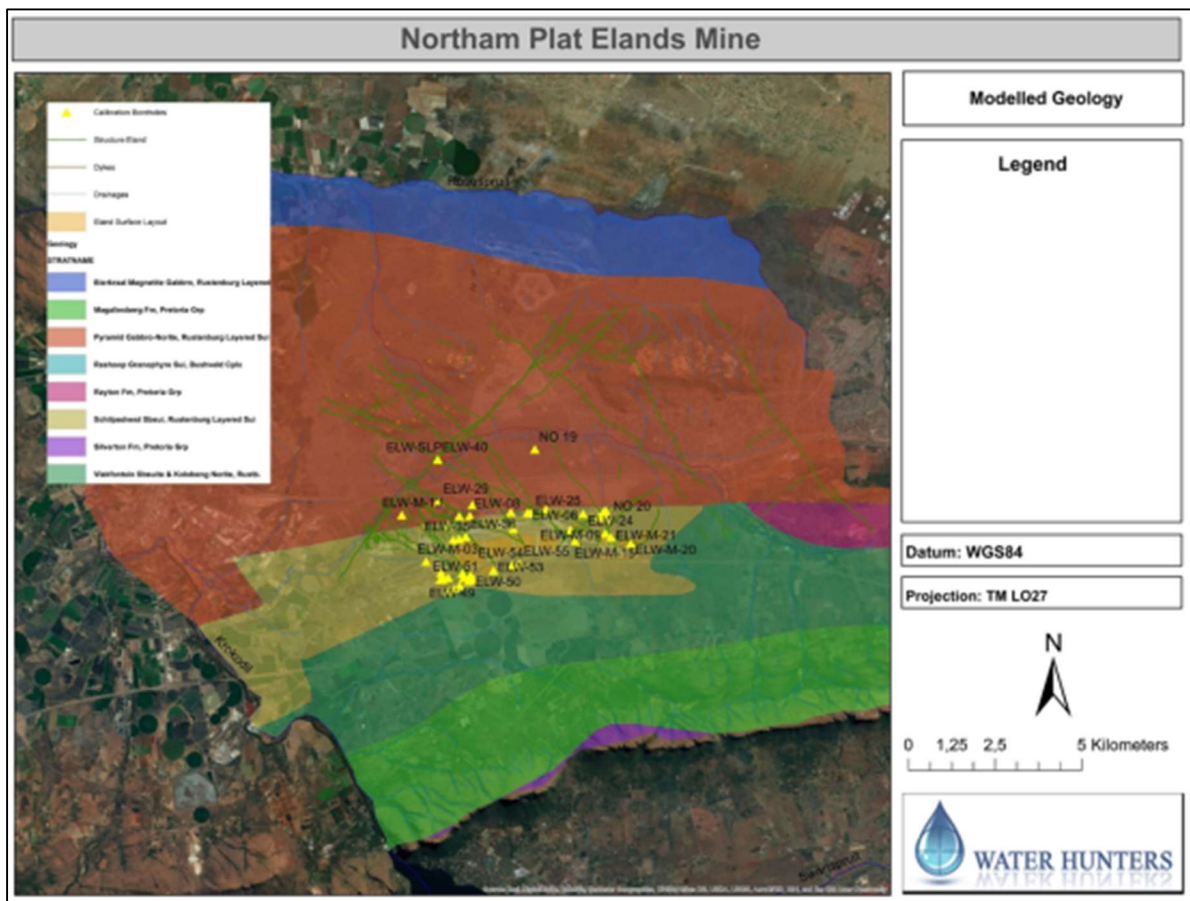


Figure 24: Geology and the surrounding boreholes (Water Hunters, 2018).

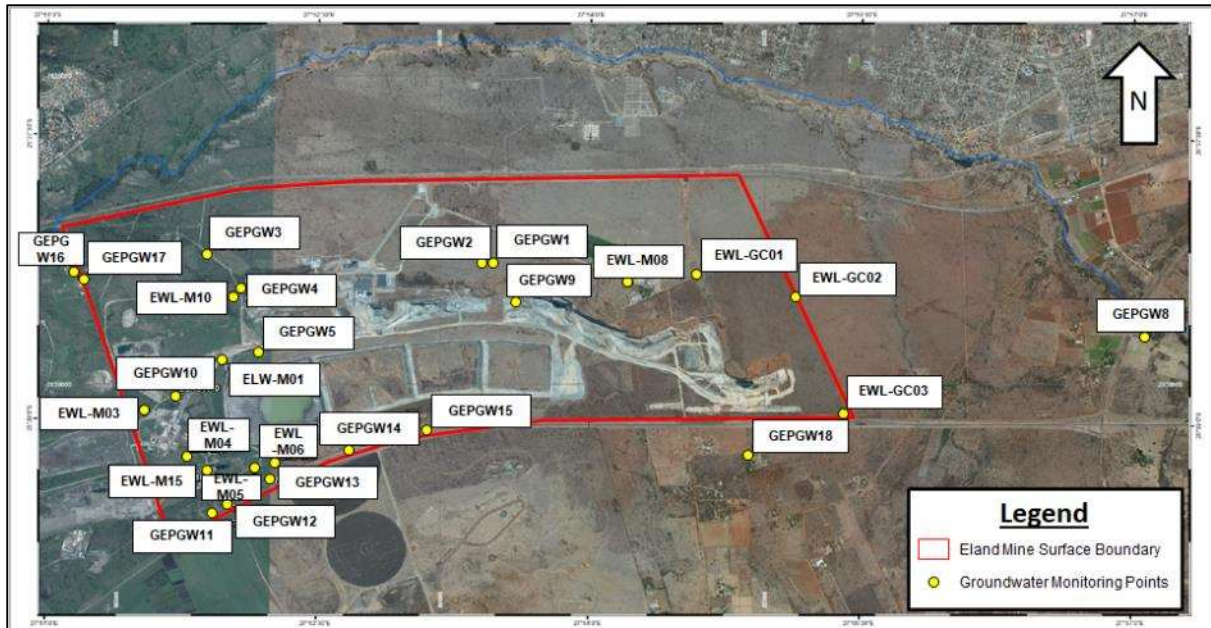


Figure 25: Location of the groundwater monitoring wells on EM (Aquatico, 2020).

9.10 Ecology

The EM PV Solar Project Area is located within the Savanna Biome and is depicted in **Figure 26** below (Rutherford & Westfall, 1994 and Mucina & Rutherford, 2006). The Savanna Biome is regarded as the spatially largest biome in South Africa, comprising some 32.5% of the country (Rutherford & Westfall, 1994). According to Mucina & Rutherford (2006) the Project Area falls in the Marikana thornveld and the Moot Plain Bushveld biome.

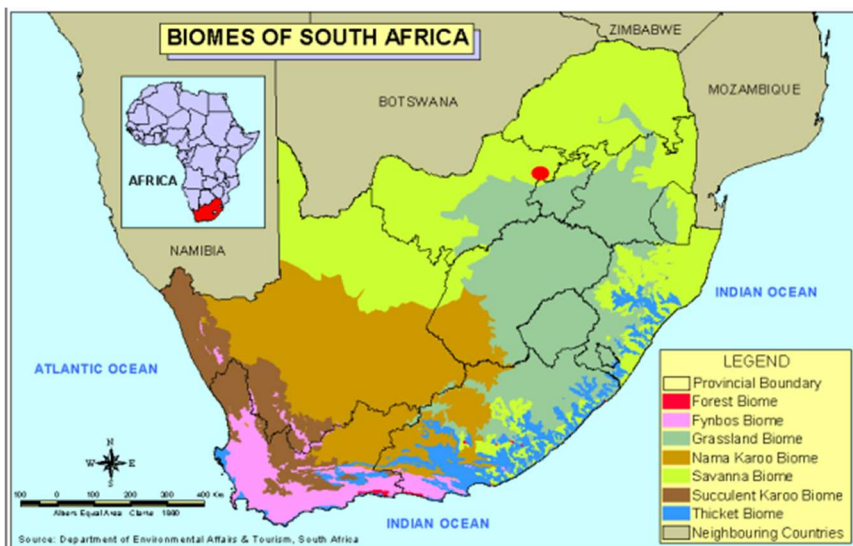


Figure 26: Biomes associated with the Project Area.

Table 20: Summary of the conservation characteristics for the EM PV Solar Project area within the wider EM Surface Area (SAS Environmental, 2018).

DETAILS OF THE EM SURFACE AREA IN TERMS OF MUCINA & RUTHERFORD (2012)		DESCRIPTION OF THE VEGETATION TYPE(S) RELEVANT TO THE EM SURFACE AREA (MUCINA & RUTHERFORD 2012)	
Biome	The Project Area is situated within the Savanna Biome .	Vegetation Type	Marikana Thornveld
Bioregion	The Project Area is located within the Central Bushveld Bioregion	Climate	Summer rainfall with very dry winters
Vegetation Type	The Project Area is situated within the Marikana Thornveld	Altitude (m)	1050 - 1450
CONSERVATION DETAILS PERTAINING TO THE EM SURFACE AREA (VARIOUS DATABASES)		MAP* (mm)	682
National Biodiversity Assessment (2011)	The Project Area falls within an area that is currently not protected.	MAT* (°C)	19.4
National Threatened Ecosystems (2011)	A significant section of the EM PV Solar Project is located in the vulnerable Marikana Thornveld Ecosystem.	MFD* (Days)	21
		MAPE* (mm)	2284
SACAD (2017), SAPAD (2017) & National Protected Areas Expansion Strategy ("NPAES") (2009)	According to SACAD (2018, Q1) the EM PV Solar Project Area falls within the Magaliesberg Biosphere Reserve. The SAPAD (2018, Q1) and NPAES (2009) database indicate that the Magaliesberg Protected Natural Environment is situated ± 3.4km south of the EM. SAPAD (2018, Q1) additionally shows the Hartbeespoort Dam Nature Reserve to be located ± 3.9km south-west and the M'Nandi Private Nature Reserve ± 3km east of the Project Area. No other protected areas are located within 10 km of the Project Area.	MASMS* (%)	76
		Distribution	North-West and Gauteng Provinces
		Geology & Soils	Most of the area underlain by mafic intrusive rocks of the RLS of the BIC. Rocks include gabbro, norite, pyroxenite and anorthosite. The shales and quartzites of the Pretoria Group (Transvaal Supergroup) also contribute. Mainly vertic melanic clays with some dystrophic or mesotrophic plinthic catenas and some freely drained, deep soils.
IBA (2015)	The EM PV Solar Project Area is located within the Magaliesberg Important Bird Area ("IBA"). The most important trigger species in the IBA is the globally threatened Cape Vulture.	Conservation	Endangered. Approximately 3% conserved. Conservation target is 24%.
		Vegetation & landscape features (Dominant Floral Taxa in Appendix B)	Open <i>Vachellia karoo</i> woodland, occurring in valleys and slightly undulating plains, and some lowland hills. Shrubs are denser along drainage lines, on termitaria and rocky outcrops or in other habitat protected from fire.
NORTH WEST BIODIVERSITY SECTOR PLAN (NWBSP, 2015)			
<p>Large portions of the EM PV Solar Project Area, particularly areas along the edges, are situated within a terrestrial CBA2, while the remaining central and southern portions of the Study Area are identified as ESA1 and ESA2.</p> <p>CBA2s are terrestrial or aquatic areas of the landscape that need to be maintained in a natural or near natural state, to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. The CBA 2 is considered a critical corridor linkage, forms part of the 5km Protected Areas buffer, and is an IBA in a natural state. Critical linkages in the provincial biodiversity corridor network where existing conversion of natural landscapes to other land uses has severely restricted options for maintaining connectivity in the natural landscape. If these areas are not in a natural state, they are then categorised as ESA2.</p> <p>ESAs are terrestrial and aquatic areas that are not essential for meeting biodiversity representation targets (thresholds), but which nevertheless play an important role in supporting the ecological functioning of CBA2s and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration. The ESA1 within the EM Surface Area is identified as an IBA (corresponds with the Magaliesberg IBA). The ESA2 areas form part of the 5km Protected Areas buffer (Magaliesberg Protected Environment) that is not natural, with the north-eastern patches considered biodiversity corridors consisting of cultivated areas.</p>			

MAT = Mean annual temperature; MAPE = Mean annual potential evaporation; MFD = Mean Frost Days; MASMS = Mean annual soil moisture stress (% of days when evaporative demand was more than double the soil moisture supply).

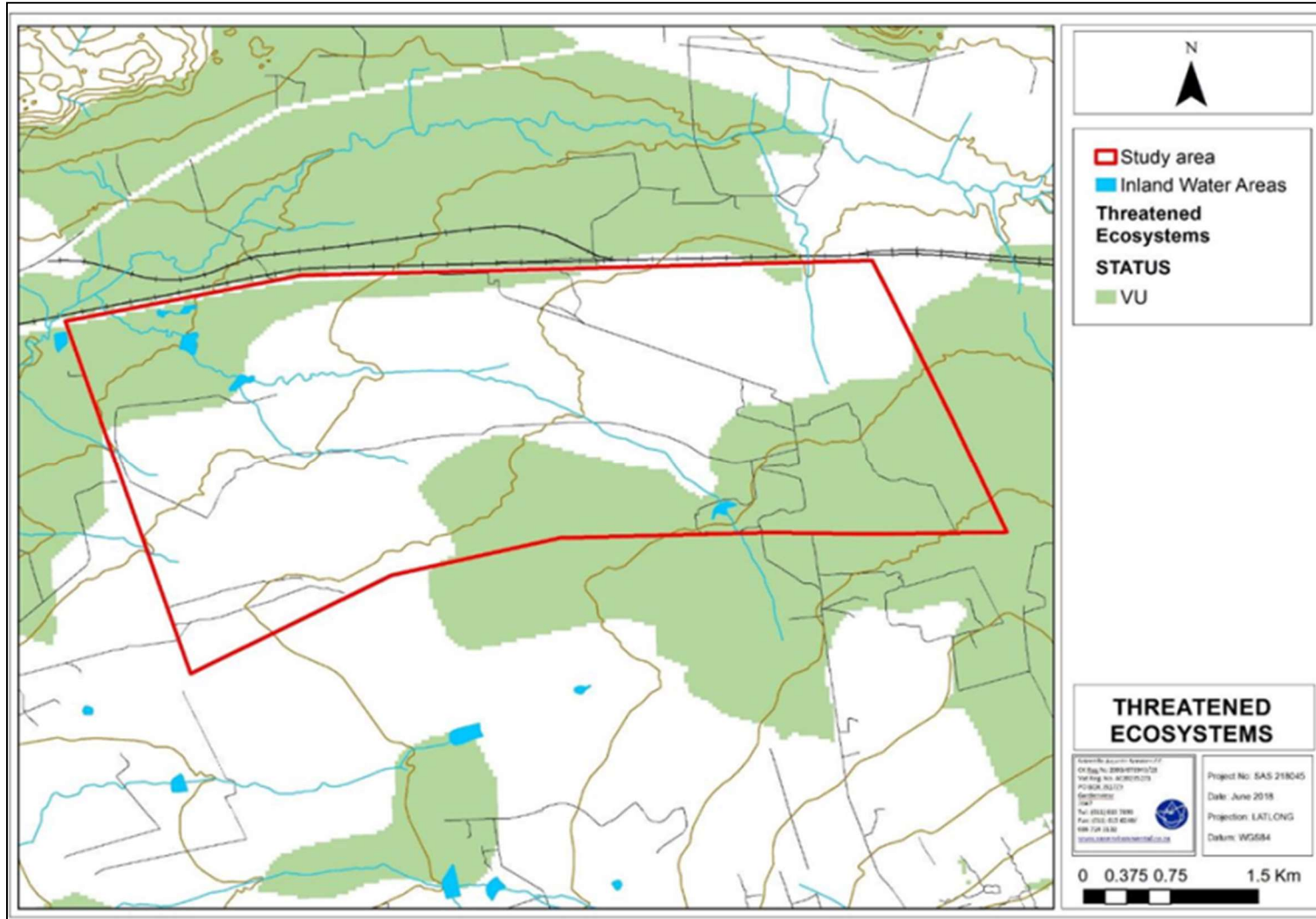


Figure 27: The EM Surface Area in relation to the Vulnerable Marikana Thornveld Threatened Ecosystem (National Threatened Ecosystems, 2011).

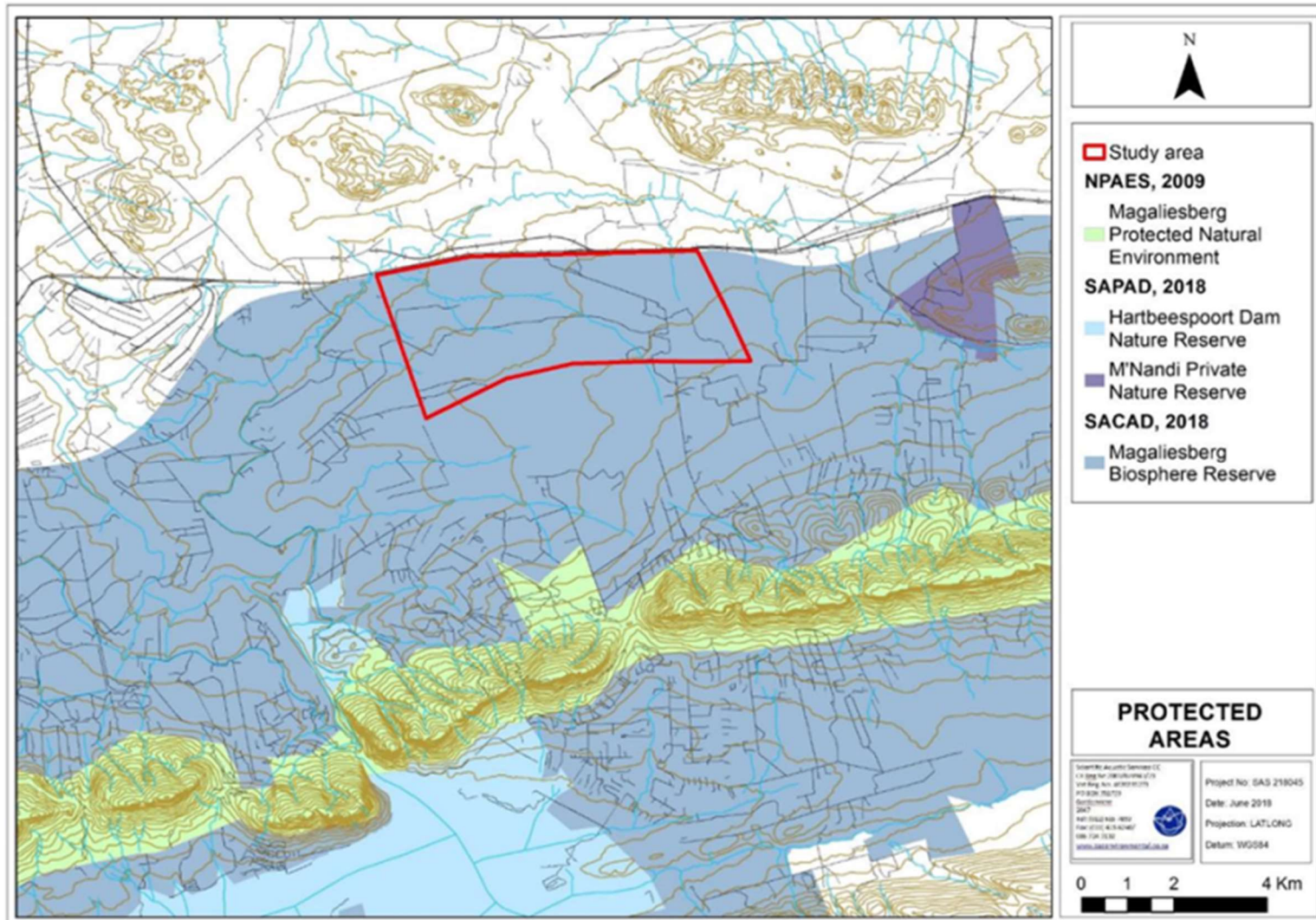


Figure 28: The EM Surface Area in relation to protected areas (NPAES 2009 & SAPAD 2018) and important conservation areas (SACAD 2018).

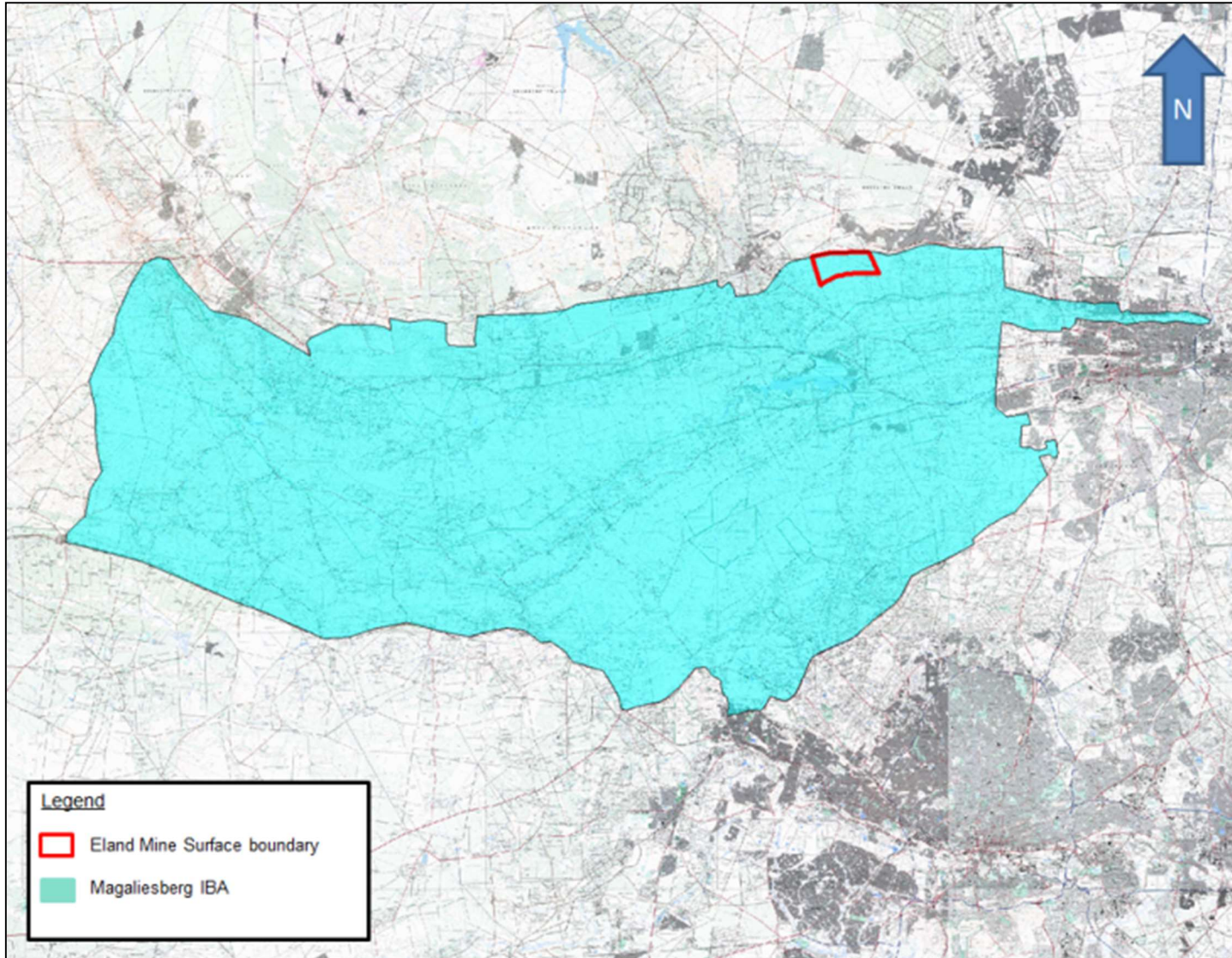


Figure 29: The EM Surface Area in relation to the Magaliesberg Important Bird and Biodiversity Area (IBA, 2015).

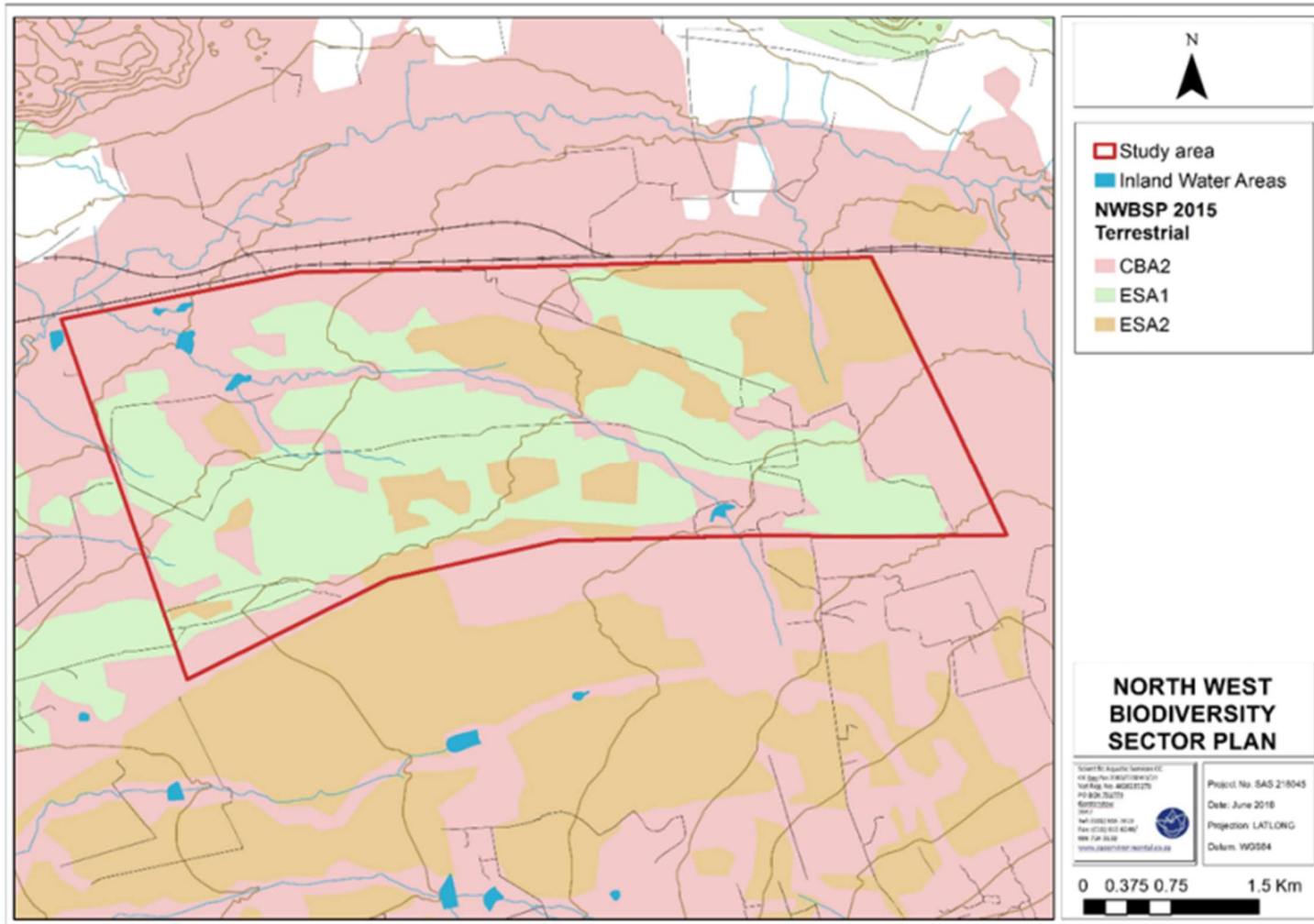


Figure 30: CBA 2, ESA 1 and ESA 2 areas located on the EM Surface Area according to the North West Biodiversity Sector Plan (2015).

9.10.1 Flora

In the pre-mining environment, the natural vegetation was dominated by various Acacia species, particularly *Acacia tenuispina* (a shrublet associated with black turf soils) (SLR, 2012). Where natural vegetation still occurs, these species are still dominant. Along drainage lines not disturbed by existing mining activities, the vegetation associated with these features includes *Rhus lancea* (Karree), *Diospyros lycioides* (Blue Bush), *Erhetia ridida* (Puzzle Bush), *Pappea capensis* (Jacket Plum), *Grewia* spp. (Raisin Bush) and *Zizyphus mucronata* (Buffalo Thorn). **Table 21** below list the common floristic species observed within the EM Surface Area.

9.10.1.1 Invader or exotic species

Several alien invasive species are common to the EM Surface Area. These include *Jacaranda mimosifolia* (Jacaranda), *Melia azederach* (Syringa), *Datura stromium* and *ferox* (Thorn Apple), *Agave sisalana* (Sisal hemp), *Argemone ochroleuca* (White-flowered Mexican poppy), *Cereus jamacaru* (Queen of the night), *Lantana camara* (Lantana), *Nicotiana glauca* (Wild tobacco) and several others.

Table 21: Common Floristic and grass species observed in and around the EM Surface Area (SLR, 2012).

Scientific Name	English name
Floristic Species	
<i>Acacia tenuispina</i>	-
<i>Diospyros lycioides</i>	Blue Bush
<i>Erhetia ridida</i>	Puzzle Bush
<i>Pappea capensis</i>	Jacket Plum
<i>Grewia</i> spp.	Raisin Bush
<i>Lanea discolor</i>	Live Long
<i>Sclerocarya birrea</i>	Marula
<i>Gymnosporia</i> spp.	Kraal Thorn
<i>Faurea saligna</i>	Boekenhout
<i>Peltophorum africanum</i>	Weeping Wattle
<i>Vitex zeyheri</i>	Silver Pipe-stem Tree
<i>Diplorhynchus condylocarpon</i>	Horn Pod
<i>Obetia tenax</i>	Mountain Nettle
<i>Croton gratissimus</i>	Lavender Feverberry
<i>Pouzolzia mixta</i>	Soap Nettle
<i>Ficus ingens</i>	Red-leaved Fig
<i>Ficus thonningi</i>	Common Fig
<i>Diospyrus whyteana</i>	Bladder-nut
<i>Euphorbia ingens</i>	Common Tree Euphorbia
<i>Acacia karroo</i>	Sweet Thorn
<i>Dichrostachys cinerea</i> subsp. <i>Africana</i>	Small-leaved Sickle Bush
<i>Peltophorum africanum</i>	Weeping Wattle
<i>Rhus lancea</i> Karree	Karree
<i>Rhus leptodictya</i>	Mountain Karree
<i>Zizyphus mucronata</i>	Buffalo Thorn

Scientific Name	English name
<i>Grewia flava</i>	Velvet Raisin
<i>Dombeya rotundifolia</i> var. <i>rotundifolia</i>	Wild Pear
<i>Combretum molle</i>	Velvet Bush-willow
<i>Euclea crispa</i> subsp. <i>Crispa</i>	Blue Guarri
<i>Olea europaea</i> subsp. <i>Africana</i>	Wild Olive
<i>Boophone disticha</i>	Century plant
Grass species	
<i>Digitaria eriantha</i>	Finger grass
<i>Bothriochloa insculpta</i>	Pinhole Grass
<i>Eragrostis</i> spp.	Love Grass
<i>Hyparrhenia hirta</i>	Thatching Grass
<i>Aristida congesta</i>	Three-awn Grass
<i>Ischaemum afrum</i>	Turf Grass
<i>Setaria</i> sp.	Bristle Grass
<i>Cymbopogon plurinoides</i>	Turpentine Grass
<i>Panicum</i> spp. -	-
<i>Themeda trianda</i> Redgrass	Redgrass
<i>Panicum maximum</i> Guinea grass	Guinea grass
<i>Heteropogon contortus</i> Spear Grass	Spear Grass

9.10.2 Fauna

The EM PV Solar Project Area comprises mainly of disturbed land as a result of mining, anthropogenic and agricultural activities, with small patches of relatively undisturbed land (CHEMC, 2019). The occurrence of animal life within the Area is influenced by vegetation habitat (described above); human settlement (in the surrounding areas); and current mining activities. The vegetation habitat and human settlement were factors that already influenced the pre-mining site.

Table 22: List of faunal species that may potentially occur on and around the EM Surface Area.

English Name	Scientific Name
Brown Hyaena	<i>Hyaena brunnea</i>
Common Duiker	<i>Sylvicapra grimmia</i>
Forest Shrew	<i>Mysorex varius</i>
Giant Bullfrog	<i>Pyxicephalus adspersus</i>
Greater Dwarf Shrew	<i>Suncus lixus</i>
Honey Badger	<i>Melivora capensis</i>
Lesser Grey-brown Shrew	<i>Crocidura silacea</i>
Lesser Red Musk Shrew	<i>Crocidura hirta</i>
Marsh Sylph Butterfly	<i>Metisella meninx</i> Marsh
Reddish-grey Musk Shrew	<i>Crocidura cyanea</i>
Rock Dormouse	<i>Graphiurus platyops</i>
Rock Hyrax	<i>Procavia capensis</i>
Rusty Bat	<i>Pipistrellis rusticus</i>
Serval	<i>Leptailurus serval</i>
Short-snouted Elephant Shrew	<i>Elephantulus brachyrhynchus</i>
Slender Mongoose	<i>Galerella sanguinea</i>
South African Hedgehog	<i>Atelerix frontalis</i>

English Name	Scientific Name
South African Python	<i>Python natalensis</i>
Spotted-necked Otter	<i>Lutra maculicollis</i>
Steenbok	<i>Raphicerus campestris</i>
Swamp Musk Shrew	<i>Crocidura mariquensis</i>
Tiny Musk Shrew	<i>Crocidura fuscomurina</i>
Tree Squirrel	<i>Paraxerus cepapi</i>
Welwitsch's Hairy Bat	<i>Myotis welwitschii</i>

Table 23: List of important birds possibly occurring at the EM Surface Area and surrounding areas.

English Name	Scientific Name
African Grass Owl	<i>Tyto capensis</i>
Marsh Owl	<i>Asio capensis</i>
Black Stork	<i>Ciconia nigra</i>
Yellow-billed Stork	<i>Mycteria ibis</i>
Secretary Bird	<i>Sagittarius serpentarius</i>
Cape Vulture	<i>Gyps coprotheres</i>
African White-backed Vulture	<i>Gyps africanus</i>
Ayres' Hawk Eagle	<i>Hieraaetus ayeresii</i>
Tawny Eagle	<i>Aquila rapax</i>
Martial Eagle	<i>Polmeatus bellicosus</i>
Lanner Falcon	<i>Falco biarmicus</i>
Lesser Kestrel	<i>Falco naumanni</i>
Blue Crane	<i>Anthropoides paradisea</i>
Yellow-throated Sandgrouse	<i>Pterocles gutturalis</i>
Red-billed Oxpecker	<i>Buphagus erythrorhynchus</i>

The potential impacts associated with the disturbance of biodiversity (i.e., flora, fauna and wetlands) will be further considered during the Impact Assessment Phase.

9.11 Air Quality

The Brits-Rustenburg Region is the industrial hub of the NWP, with all the platinum, chromium and vanadium mines located in this Region. EM falls within the Waterberg-Bojanala National Priority Area, as contemplated in section 18(1) of NEM:AQA, 2004. The Waterberg-Bojanala National Priority Area was established due to the exceedance of the ambient air quality standards or alternatively that a situation exists within the Area which is causing or may cause a significant negative impact on air quality in the Area and the Area requires specific air quality management action to rectify the situation.

Existing key sources of air pollution surrounding the EM Surface Area were identified during a desktop exercise and include:

- Mining activity (north and south-west of the EM Surface Area);

- Vehicle dust entrainment on unpaved roads (surrounding areas);
- Commercial agricultural activities (surrounding areas);
- Industrial activity (west of the EM Surface Area);
- Domestic fuel burning at informal settlements (north and north-east of the EM Surface Area).

Dust-fall, PM10 and PM2.5 are key pollutants of concern associated with existing and proposed operations at the EM Surface Area and are emitted from the following key sources:

- Particulate Emissions:
 - Wind erosion from exposed areas;
 - Storage of material (stockpiles, TSF);
 - Truck loading and offloading operations;
 - Material handling (front-end-loaders / excavators);
 - Blasting;
 - Bulldozing material (moving material, shaping stockpiles, etc);
 - Conveyor transfer points;
 - Crushing and screening; and
 - Vehicle dust entrainment on unpaved haul roads.

9.11.1 Dust Monitoring

EM comprise of both open pit and underground mining activities and the Concentrator Plant, with surface auxiliary activities. Sources of atmospheric pollutants identified include dust from drilling and blasting operations in the opencast pits; raw materials handling operations, such as tipping and material loading; wind erosion from the open storage piles; vehicle entrained dust from roads; and conveyor transfer points (CHEMC, 2019). Crushing and screening are also significant sources of ambient dust.

EP operates a network of single dust fallout monitoring buckets to monitor monthly fallout in and around the area of operation. The monitoring network consists of 11 monitoring buckets located strategically in and surrounding the EM mining operation. The location of the existing dust fallout monitoring stations is illustrated in **Figure 31**. The potential impacts of the EM PV Solar Project on the air quality will be further considered during the Impact Assessment Phase.

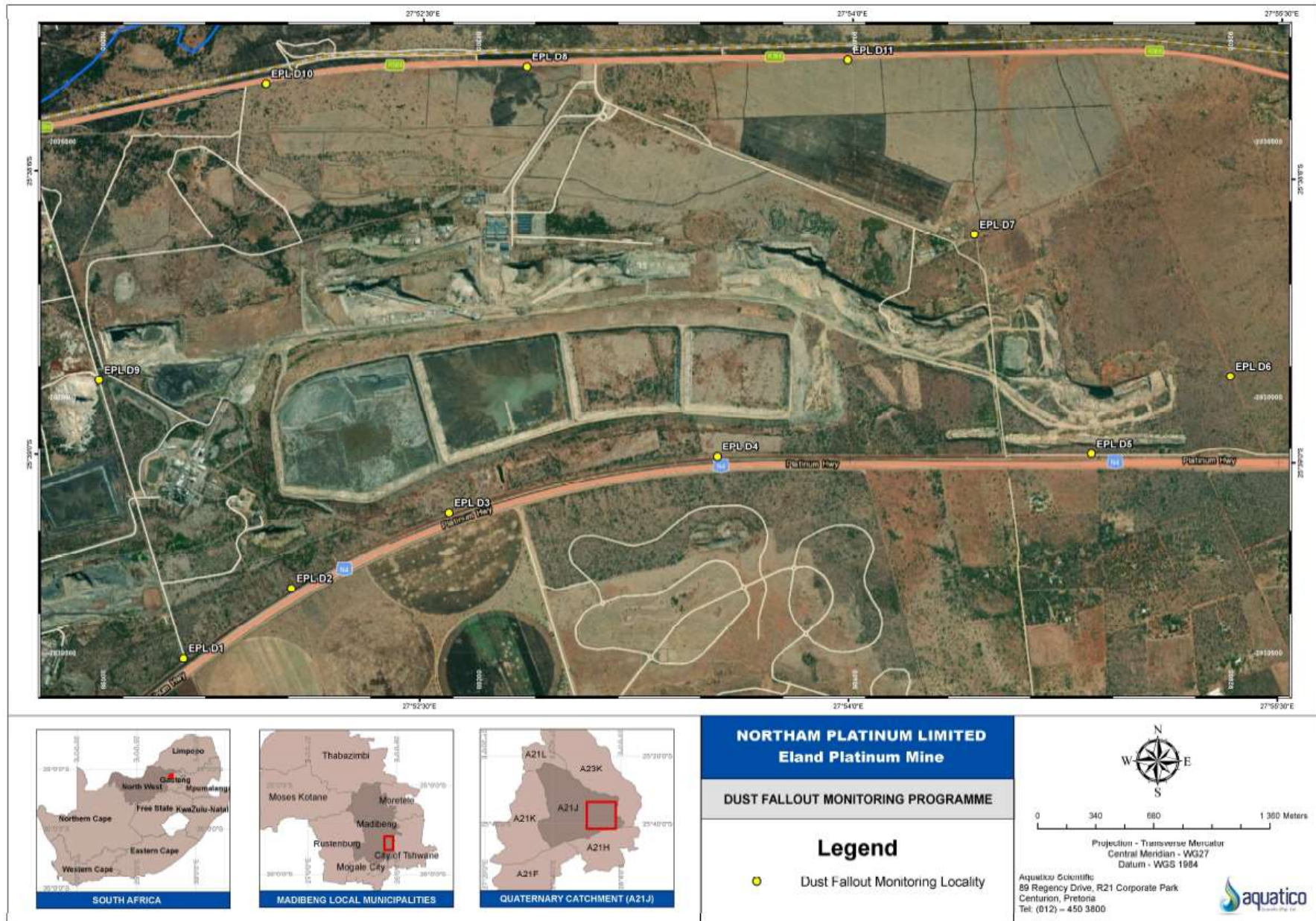


Figure 31: Monthly dust fallout monitoring locations for Eland Platinum (Aquatico, 2020).

9.12 Noise

The general noise climate in the EM PV Solar Project Area and surrounds can be described as industrial / semi-rural (SLR, 2012). The noise climate in the Area is characterised by activities associated with farms and smallholdings, industrial and mining operations national roads and local communities.

Ambient (background) noise levels were measured during February 2016 and September 2020, in accordance with SANS 10103:2008 *"The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication"* and the protocols defined in the DFFE Screening Tool.

The following noise levels were considered as part of the baseline noise levels of and around the EM Operation:

- Traffic:
 - Internal and external traffic on the EM and surrounding roads (i.e., N4 Highway and R566).
- Mining Activities:
 - Conveyors and hauling activities;
 - Concentrator Plant and auxiliaries;
 - Ventilation Shafts and associated activities; and
 - Other mining related activities.
- Surrounding land users
 - Farming and agricultural processes

The potential noise impacts associated with the proposed activities during the construction phase will increase the combined ambient level of the EM Operations, however it will be a temporary impact. The operational noise levels of the EM PV Solar Project will be relatively similar to the existing and previous EM operation. The potential noise impacts will be further considered during the Impact Assessment Phase.

9.13 Visual quality

Data on the visual resource was collected from 1:50 000 topographical maps and available satellite imagery for the site (SLR, 2012). EM is located within a "mining belt", characterised by semi-industrial and mining related activities.

9.13.1 Landscape Character

The topography of the EM PV Solar Project Area is relatively flat, with koppies and hills bordering the Area to the north, and the Magaliesberg mountain range to the south. The average elevation of land in and surrounding the Project Area is 1 170 mamsl. Mountain peaks in the nearest section of the Magaliesberg rise to 1 500 – 1 600 mamsl; and the Hartbeespoort Dam lies at an altitude of approximately 1 200 mamsl.

The EM Surface Area has been impacted by mining activities since it commenced in 2006 (SLR, 2012). Currently the Project Area is used for mining activities and infrastructure, with some areas of open veldt and agricultural lands impacted by anthropogenic activities. The surrounding area is characterised by a mixture of agriculture, urban areas, mining and industrial activities. The EM PV Solar Project will be located within the EM Surface Area. EM has existing distinctive visual features, i.e., TSF, Concentrator Plant, WRDs and surface infrastructure.

9.13.2 Views

9.13.2.1 *Sensitive viewing areas*

Some of the most sensitive receptors in the area include:

- People who live and work adjacent to the EM PV Solar Project Area;
- Communities where development results in changes in the landscape setting or valued views enjoyed by the community;
- People travelling through or past the affected landscape on the N4 or R556; and
- Tourist and people using recreational facilities in the area.

The most sensitive viewing areas are along the foothills of the Magaliesberg and the Magaliesberg itself. The Magaliesberg and Magaliesberg Protected Natural Environment's boundary is situated approximately 3.4 km from the Project Area (NLA, 2006). The EM PV Solar Project and supporting infrastructure will be visible from the surrounding communities situated to the north of the R556.

The EM PV Solar Project will likely increase the current visual impact of EM, with the addition of the PV Panels. The potential visual impacts will be further investigated during the Impact Assessment Phase.

9.14 Heritage Environment

9.14.1 Cultural Landscape

The EM PV Solar Project Area falls within a transitional environmental region in the NWP, known as the Bankenveld, situated between the Highveld in the south and the Pyramid Hills in the north. As a result of peculiar geo-processes, in particular the formation of the BIC, a landscape comprising a latitudinal series of hills and valleys came into existence, which fostered early human settlement and later accommodated a series of communities and cultures.

After Magaliesberg's formation, a continuous process of weathering, erosion and faulting resulted in the formation of neks (such as Saartjiesnek) and poorts (such as Hartbeespoort). Hartbeespoort was considered ideal for the construction of a dam to store water for irrigation by early white farmers, which eventually led to the construction of the present dam in the early 1920s.

The different periods associated with the region is as follow:

9.14.1.1 Stone Age

An abundance of water, lush natural vegetation, large numbers of game, mild climate and the presence of quartzite for making tools and weapons were factors that attracted Stone Age communities to the area about half a million years ago. Evidence of periodic occupation since the Early Stone Age (“**ESAg**”) is found at the Wonderboom Hand-Axe Site close to Wonderboom Nek in Pretoria. This site is one of the richest ESA depositories in South Africa. Signs of occupation by Middle Stone Age groups have also been found on the Magaliesberg and along river courses. The Late Stone Age (“**LSA**”) is also well represented in the area, probably because LSA communities preferred to occupy rock shelters like caves and cliffs. During the latter part of the LSA the Hartbeespoort Dam area was probably occupied from time to time by the San (Bushman) people's ancestors. The larger region is known for its Stone Age sites, such as Rissik, Jubilee Shelter, Silkaatsnek, Elizabeth Shelter, Cave James, Serpent Quarry, Xanadu, Hope Hill Shelter and Kloofendal Shelter (Wadley 1988).

9.14.1.2 Iron Age

The expansion of early farmers, who, among other things, cultivated crops, raised livestock, made ceramic containers (pots), mined ore and smelted metals, occurred in this area between AD 400 and AD 1100 and brought the Early Iron Age (“**EIAg**”) to South Africa. They settled in semi-permanent villages. These communities migrated from the Lowveld and coastal areas to the higher regions in the interior (such as the Bankenveld) during the latter part of the EIAg.

An important early settlement site, with evidence of iron smelting and working, is located near Broederstroom (provincial heritage site) in the Brits area (Huffman 1993). Sites were found within 100 m of water, either on a riverbank or at the confluence of streams.

New groups succeeded these EIAg communities about 600 years ago, speaking Bantu languages, like Nguni and Tswana-Sotho. By that time, groups of Tswana and Ndebele speaking people were moving into the area, occupying the different hills and outcrops, using the ample resources such as grazing, game and metal ores. These Late Iron Age (“LIA”) farmers were moving to new farming areas, like the Highveld and Bankenveld, where due to climate changes, grasslands provided enough grazing. Because of a lack of trees in many areas, settlements were built with natural stone, mud and thatch. Remains of such stonewalled settlements and kraals can be found all over the Magaliesberg.

In 1821 a Nguni group, led by Mzilikazi, left KwaZulu-Natal and moved to the regions north of the Vaal River. Their numbers increased when they absorbed other refugees and conquered some of the indigenous communities. This was the origin of the Matabele (Ndebele) empire. Having established themselves originally in Sekhukhuneland (Mpumalanga and Limpopo Provinces), they relocated to the Tshwane region in the early 1830s and conquered the local Sotho, Tswana and Ndebele-speaking communities. It is possible that Mzilikazi established a major settlement, known as eKungwini, near Wonderboompoort. The Matabele relocated again to the Marico region (NWP) in the mid-1830s.

The difaqane coincided with the penetration of the interior of South Africa: travellers and hunters such as Cornwallis Harris and Andrew Smith, traders Robert Schoon and Andrew McLuckie, and missionaries James Archbell and Robert Moffat (Carruthers 2007).

9.14.1.3 Historic period

The Matabele conquest was followed by permanent occupation by white settler-farmers in the mid- 1840s, and hence few traces of Iron Age occupation by earlier communities have been left behind. Voortrekker farmers established the farms that today form the area around Meerhof. These farms were subdivided many times over in more recent years and more farmsteads were established. Gradually the entire area was divided into farms. However, it was only since the 1880s that these farms were formally surveyed and mapped and when not only their names but also the names of rivers and other features became permanent fixtures on maps.

The Second South African War (1899-1902) Battle of Silkaatsnek (11 July 1900) took place in the area and some elements of the British garrisons guarding Silkaatsnek and Kommandonek were located where Melodie is today. Before the Second South African War, General Hendrik

Schoeman (son of Stephanus Schoeman) constructed a primitive dam in the Crocodile River. The potential of damming the river at the poort was recognised after the War. Between 1905 and 1910 the Transvaal Department of Irrigation conducted various preliminary investigations, which led to the passing of the Hartbeespoort Irrigation Scheme (Crocodile River) Act (Act No. 32) of 1914. This Act authorised the construction of a large dam in the Hartbeespoort gorge. World War I delayed the project, which was successfully completed only in 1923.

Johan Schoeman, son of General Hendrik Schoeman and grandson of the first owner of the farm, now covered by the lake, established the townships of Kosmos, Schoemansville and Meerhof (the latter on the Farm Rietfontein 485 JQ) in 1923 on the shores of the lake. The existing railway line passing the EM Surface Area was originally completed in 1906, but, due to continuous increase in freight weight and usage, has been much upgraded in the past.

During the past 40 years, up until the early 1990s, the area north of the EM Surface Area has been part of the former Bophuthatswana, where large numbers of so-called “surplus” people were resettled after being removed from “white” areas. This led to the rapid increase in urban development in the region. Several well-known townships were developed: GaRankuwa, Soshanguve, Winterveld, etc.

9.14.2 Site specific review

Three Phase 1 HIAs have been conducted for the EM Surface Area to identify heritage resources and their conservation importance. Several heritage resources exist within the larger EM mine area, of which majority occur to the north of the R566 provincial road.

No heritage resources were identified within the EM PV Solar Project Area (Pistorius, 2006 and 2010; Van Schalkwyk 2020).

The impact on Heritage and Palaeontology resources will be discussed and the findings will be included in the EIAR.

9.15 Description of the current land uses.

Refer to **Table 8** for the property description on which the EM PV Solar Project will be located (Refer to *Error! Reference source not found.* and *Error! Reference source not found.*). The details of the properties and their respective ownership is detailed in **Table 4**. Other than the mining and mineral processing infrastructure situated on the properties, they are also utilised for agricultural uses (i.e., crop production as part of the Mines SLP initiative, etc.) and services (i.e., electricity and roads).

Refer to **Figure 21** for the current EM Surface Area Infrastructure Plan and **Figure 32** the land-uses associated with the EM PV Solar Project Area.

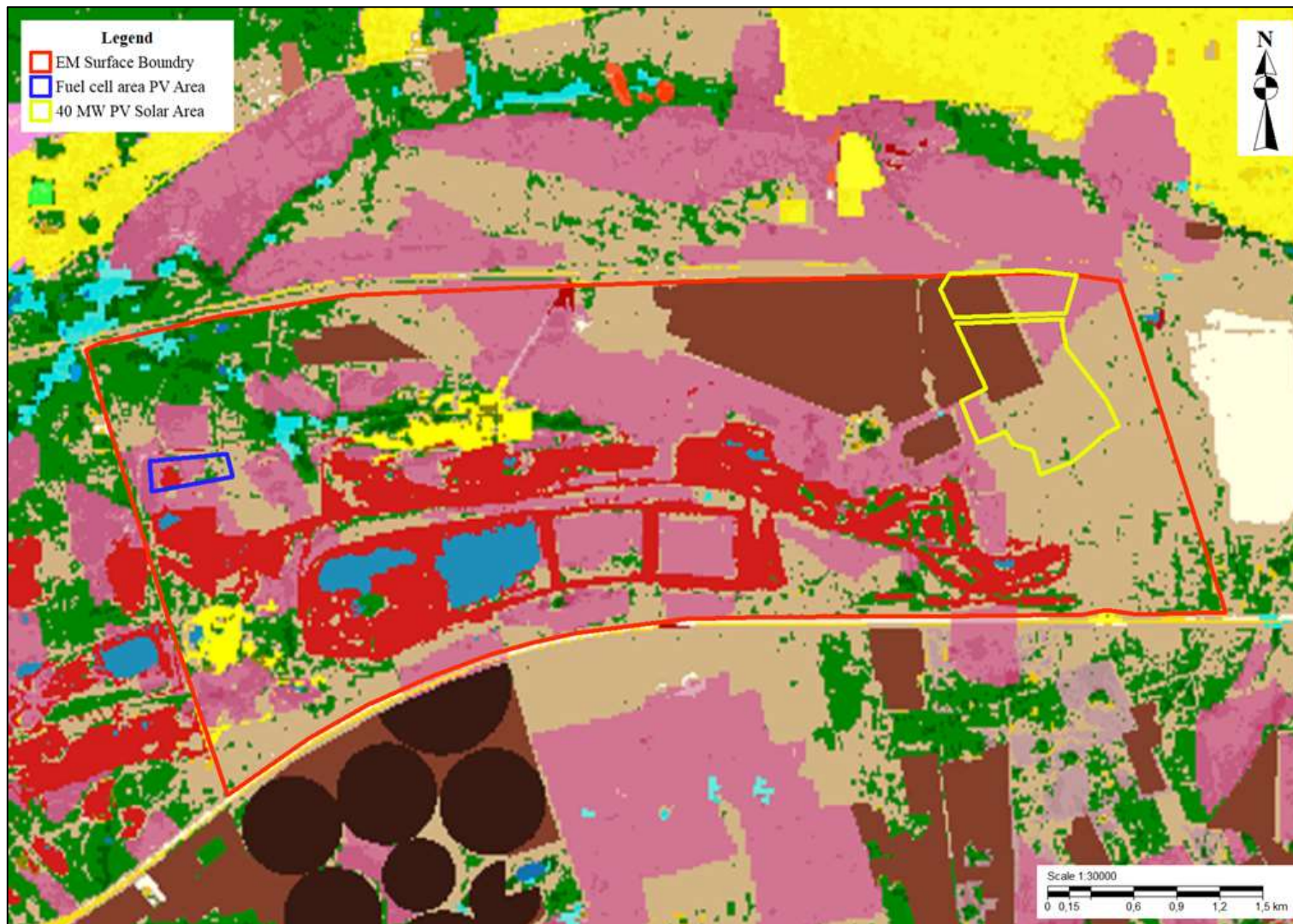


Figure 32: Land Cover Map for the EM PV Solar Project Area

10. IMPACTS IDENTIFIED

This part of the document focuses on the identification of the major potential environmental and socio-economic impacts as a result of activities, processes and actions associated with the EM PV Solar Project on the surrounding environment (as required in terms of Regulation 21(3) of the 2014 EIA Regulations).

10.1 Alternative 1 (Preferred Alternative)

10.1.1 Phases of Impacts

For the purposes of this impact identification, the project timeframe will be subdivided into the following four phases:

- Planning and Construction Phase.
- Operational Phase.
- Decommissioning and Closure Phase.
- Post Closure Phase.

Potential cumulative and residual impacts have also been identified, where applicable.

10.1.1.1 *Planning and Construction Phase*

Activities that will be carried out during the Construction Phase include the following:

- Establishing of temporary construction camp and laydown area;
- Erection of a fenced area;
- Vegetation Clearance bulk earth moving activities;
- Earthworks, i.e., excavation and removal of soil and material;
- Concrete mixing and casting;
- Construction of the:
 - 40 MW PV Plant;
 - 5 MW PVHFC;
 - Hydrogen Pressurised Storage Tank;
 - Inverter Station;
 - Transformer Station;
 - Substation complex for both facilities;
 - Telecommunication Mast;

- Operation and maintenance buildings (i.e., workshops; small storage areas; offices and ablutions facilities for staff, security and visitors; guard hut, services and ablution facilities; water storage tanks or covered lined ponds; pipelines; waste collection and storage area; and parking area).
- Transmission lines;
- Upgrading and expansion of internal roads for the transportation of material and general equipment movement;
- Expansion of existing and the development of new pipelines for the conveying of water and sewage;
- Managing building rubble and construction waste generated during the construction;
- Continued ground and surface water monitoring; and
- Dust suppression and monitoring.

10.1.1.2 Operational Phase

Activities that will be conducted in the Operational Phase include the following:

- Operation of the 40 MW PV Plant and 5 MW PVHFC;
- Maintenance of solar panels and distribution facilities;
- Continuous inspection of the proposed facilities, to ensure they meet the EA and WUL requirements;
- Monitoring of the dust fallout, surface and groundwater for pollution;
- Continued ground and surface water monitoring; and
- Dust suppression and monitoring.

10.1.1.3 Decommissioning and Closure Phase

Decommissioning and closure activities will be conducted as per the closure plan for the EM Surface Area. A summary of the decommissioning and closure phase activities will included include the following:

- Identify the infrastructure (i.e., pipelines, channels, roads and other services); buildings (i.e., laboratory, offices and workshops); and post mining structures (i.e., dams, Concentrator Plant, WTP, etc.) that will remain post closure of the mining operation;

- Decommissioning of infrastructure and structures as the closure of EM commences;
- Rehabilitation of the disturbed areas as per the Rehabilitation and Closure Plan; and
- Monitoring of environmental features as decommissioning activities continues (i.e., surface and ground water, soil quality, contaminated land and dust fall-out monitoring).

This list is provisional and will be revised annually, with a focussed and detailed evaluation and revision five years before planned end of the LOM.

10.1.1.4 Post-Closure Phase

Post-closure activities will gradually be phased in during the decommissioning and closure phase to ensure a stable post closure ecosystem. Possible activities that might be conducted during the post-closure phase include the following:

- Monitoring of surface and groundwater for pollution;
- Implementation of a judicious soil nutrient supplementation and grazing management system, to ensure the ground cover develops to a sustainable and acceptable level;
- Monitoring the rehabilitated areas for signs of erosion, poor vegetation growth, fertility etc.;
- Monitoring the sustainability of rehabilitation; and
- Replacement of topsoil (if topsoil was lost due to erosion and remediation of the cause of the erosion).

10.1.2 Impacts identified

The main potential impacts preliminarily identified for the EM PV Solar Project are listed below; these impacts will be further investigated during the EIA phase. The EIAR will include a full risk assessment of all environmental impacts as per the methodology set-out under **Section 11.7**. The EIAR and EMPR, in terms of NEMA, will set out mitigation measures to be implemented during the Construction, Operational, Decommissioning and Closure and Post-Closure Phases. **Table 24** below lists the potential impacts that have been identified as part of the proposed activities.

Refer to **Section 11.7** of this Scoping Report for the Impact Assessment methodology that will be followed as part of the EIA process.

Table 24: List of the potential impacts associated with the proposed activities

Potential Impact	Aspect
Air Quality	- Dust and associated emissions during construction, operational and decommissioning phases of the EM PV Solar Project.
	- Dust emissions during operation, particularly associated with loading and offloading of material and the transport of material via either truck or conveyor.
	- Dust emissions associated with the clearance of large areas.
	- Fugitive dust emissions associated with the wind entrainment of large areas of exposed earth that will be created during the EM PV Solar Project.
	- Vehicle emissions associated with the construction, operation and decommissioning phases.
Visual	- Potential visual impact on nearby communities and users of roads near proposed infrastructure.
	- Post closure residual visual impact due to the land disturbed by decommissioning activities.
Surface water	- Increased sedimentation and silt loads of storm water and run-off.
	- Impacts on the storm water and run-off quality.
	- Habitat modification of the established drainage areas and watercourses
	- Changes to the Water- and Salt Balance.
Groundwater	- Changes in the flow regime of the diverted and existing non-perennial watercourses.
	- Possible groundwater contamination due to hydrocarbon spillages.
	- Formation of a contamination plume due to infiltration of contaminants into the groundwater
Noise	- Post-closure liability on the groundwater quality.
	- Noise impact from construction and decommissioning machinery and vehicles.
Fauna and Flora	- Establishment of alien invasive plants
	- Loss of ecosystem goods and services
	- Clearance of endemic vegetation
	- Disturbance of fauna due to noise, light and dust
	- Increase in road traffic kills of fauna
	- Lack of functional vegetation at closure phase due to absence of: <ul style="list-style-type: none"> • adequate and incorrect rehabilitation practices; • monitoring; and • corrective follow-up action.
Waste	- Building rubble and construction waste will be generated during the construction and decommissioning of the EM PV Solar Project.
Land	- Disturbance of the land capability on undisturbed footprints.
	- Loss of potential arable land
Traffic	- Increase in traffic leading to traffic incidents and accidents.
	- Construction of new access roads will likely influence traffic flow patterns and result in delays.
Socio-economic	- Social unrest due to conflicts between work seekers.
	- Increased pressure on local infrastructure and services.
	- Population influx.

Potential Impact	Aspect
	Unemployment at closure phase that will likely lead to loss of income and collapse of social projects and possible increase in alcohol and substance abuse.
	- Loss of revenue for MLM.
Soil	- Disturbance to the functionality and productivity of the soil stripped for excavations and bulk sampling.
	- Disturbance of the soil profile.
	- Soil erosion by means of water and wind movement.
	- Soil pollution due to hydrocarbon spillages.
	- Soil compaction due to vehicle and machinery movement.
	- Soil degradation due to lack of / or incorrect rehabilitation and potential erosion during the Closure Phase.
Heritage resources	- Possible identification of resources with archaeological and heritage significance during the construction phase.
Other Services	- Possible electromagnetic interference to other service providers within the area (e.g. telecommunication, radio, etc.) - Possible impact on Civil Aviation.
Greenhouse Gases (positive)	- Overall reduction of Scope 2 GHG Emissions for EM
Climate change (positive)	- Reduce EM dependency on electricity generated from non-renewable “dirty” sources that will ultimately lead to reduced climate change impacts associated with the burning of fossil fuels for electricity generation.
Health and Safety (Positive)	- Optimal ventilation of underground workings
Socio-Economic (Positive)	- Creation of temporary jobs during the Construction Phase.
	- Increase the competitiveness of EM, by reducing energy cost to operate EM
	- Skills transfer and development.
	- Multiplier effects on the local economy.
	- Contribution to the local, regional, provincial and national economy.
	- Establishment of post mining land uses.
Land (Positive)	- Continuation of business opportunities, additional to the mining after closure of EM
	- Historical disturbed area will be used for the location of majority of the activities. - Promotion of post mining land-uses.

10.1.3 Cumulative Impacts

The proposed potential cumulative impacts, as presented in **Table 25** below, have been preliminarily identified and will be investigated further during the EIA phase.

Table 25: Proposed potential cumulative impacts

Aspects originating to the Cumulative Impacts	Cumulative impacts
Biodiversity - Avifauna	
Impact on avifauna in the region	Potential loss of species of concern located within the region.
Biodiversity-Alien species	
<ul style="list-style-type: none"> • Invasive and alien plant establishing on disturbed areas; • Soil compaction on stockpiles and un-vegetated areas; 	Aspects will likely result in habitat degradation, which will likely reduce the fauna and flora specie distribution and diversity.
Aquatic Ecosystem	
<ul style="list-style-type: none"> • Increased sedimentation to soil disturbance; • High stormwater velocity flows; and • Contamination of drainage lines and watercourses. 	Aspects will likely result in a cumulative impact on the downstream water quality, which will likely impact on the aquatic species and biodiversity.
Groundwater	
Infiltration of hydrocarbon spillages into the groundwater.	Aspect can potentially have an impact on the groundwater quality of surrounding water users. Water user's dependant on groundwater will likely impact their livelihood.
Surface Water	
<ul style="list-style-type: none"> • Increased sedimentation to soil disturbance; • High stormwater velocity flows; and • Contamination of drainage lines and water courses. 	Aspects will likely result in a cumulative impact on the downstream water quality, which will likely impact on water users (i.e., agriculture, industry, etc.).
Socio-economic	
Mine closure will raise unemployment levels in the region and would increase significantly as more mines close.	The EM PV Solar Project will be decommissioned in correlation with the closure of the EM. Closure of EM will result in the cessation of jobs and demand for goods and services.
Agricultural Potential	
Increased erosion and soil degradation	Loss of agricultural potential of the area.
Climate Change (positive impact)	
Reduced dependency on non-renewable energy sources for electricity generation and supply.	Electricity supplied to EM is sourced from Eskom that produces electricity by burning non-renewable fossil fuels, which produce high levels of GHG emissions that influence climate change.

10.2 Alternative 2

Alternatives 2 include technology, layout and location alternatives in relation to Alternative 1. The impacts will be similar to Alternative 1 and will be considered as part of the EIAR (Refer to **Table 24** and **Table 25**).

11. METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

The potential impacts were determined by evaluating the different phases associated with the establishment and development of the EM PV Solar Project. These phases were determined to be as follow:

- Pre-Construction Phase (I);
- Construction Phase (C);
- Operational Phase (O); and
- Closure and Post-Closure Phase (P).

Different impacts are associated with the different phases of the EM PV Solar Project. Potential impacts that may be/may have been caused by the Project will be identified using input from the following:

- Views and inputs from the I&APs (local knowledge);
- Existing information and studies;
- Specialist investigations;
- Site visit with the project team; and
- Regulatory requirements.

The 2014 EIA Regulations requires that all identified potential impacts associated with the EM PV Solar Project be assessed in terms of their overall potential significance on the biophysical and socio- economic environment. The criteria identified in the 2014 EIA Regulations include the following:

- Nature of the impact;
- Extent of the impact;
- Duration of the impact;
- Probability of the impact occurring;
- Degree to which impact can be reversed;

- Degree to which impact may cause irreplaceable loss of resources;
- Degree to which the impact can be mitigated;
- Cumulative impacts; and
- Residual Impacts

The impact assessment methodology used to determine the significance of impacts prior and after mitigation is presented below.

The significance will be determined by calculating the extent (i.e., physical extent affected by the potential impact), duration (i.e., timeframe that the potential impact will be in effect), intensity (i.e., expected amplitude of the impact) and reversibility (severity of the impact) of the impact. Once the significance of the impact has been determined, the quantifiable likelihood or probability of the impact is given a percentage value that represents the significance of the impact. The environmental and socio-economic risk is determined by multiplying the significance with the probability of the impact occurring.

A description of the parameters used in this impact assessment is given in **Table 26** below.

Table 26: Impact Assessment Methodology.

Parameter	Description
Extent:	Physical extent affected by the potential impact: <ul style="list-style-type: none"> ■ Direct – Actual footprint of the activity (weight value – 1) ■ Onsite – Within specific mine/development boundary (weight value – 2) ■ Local – Within municipal boundary (weight value – 3) ■ Regional – Outside municipal boundary (weight value – 4) ■ National/International – Two or more provinces and ultimately outside the RSA (weight value – 5)
Duration:	Timeframe that the potential impact will be in effect <ul style="list-style-type: none"> ■ Immediate - 1 Year or less (weight value – 1) ■ Short term – 1-2 Years (weight value – 2) ■ Medium term – 2-5 Years (weight value –3) ■ Long term – 5-15 Years (weight value – 4) ■ Permanent – 15 years and beyond (weight value – 5)
Intensity:	The expected amplitude of the impact: <ul style="list-style-type: none"> ■ Minor - The activity will only have a minor impact on the affected environment in such a way that the natural processes or functions are not affected (weight value – 1) ■ Low – The activity will have a low impact on the affected environment (weight value – 2) ■ Medium – The activity will have a medium impact on the affected environment, but function and process continue, albeit in a modified way (weight value – 3) ■ High – The activity will have a high impact on the affected environment, which may be disturbed to the extent where it temporarily or permanently ceases (weight value – 4) ■ Very High - The activity will have a remarkably high impact on the affected environment, which may be disturbed to the extent where it temporarily or permanently ceases (weight value – 5)
Reversibility	The reversibility of an impact is the severity of the impact <ul style="list-style-type: none"> ■ Completely reversible - The impact is reversible without any mitigation measures and management measures (weight value -1) ■ Nearly completely reversible - The impact is reversible without any significant mitigation and management measures. Some time and resources required - (weight value -2) ■ Partly reversible - The impact is only reversible with the implementation of mitigation and management measures. Substantial time and resources required (weight value -3) ■ Nearly irreversible - The impact is can only marginally be reversed with the implantation of significant mitigation and management measures. Significant time and resources required to ensure impact is on a controllable level (weight value -4) ■ Irreversible - The impact is irreversible - (weight value -5)
Significance of Impact / Consequence	Significance is determined through a combination of the various impact characteristics and represents the combined effect of the Extent, Duration, Intensity and Reversibility $\text{Significance} = \text{Extent} + \text{Duration} + \text{Intensity} + \text{Reversibility}$
Probability:	The likelihood of an impact occurring:

	<ul style="list-style-type: none"> ■ Improbable - 0 – 25% chance (weight value – 1) ■ Low – 26 – 50% chance (weight value – 2) ■ Medium – 51 – 75% chance (weight value – 3) ■ High – 76 – 100% chance (weight value – 4)
Environmental Risk Refer to the table below	<p>Multiplication of the significance of the impact by the probability of the impact occurring produces a conclusion of the overall risk that an impact poses to the surrounding environment.</p> <p style="text-align: center;">Significance of Impact X Probability = High/Medium/Low Environmental Risk</p>

Table 27: Environmental risk and impact significance matrix.

		Significance of Impact		
		Low Impact (4-8)	Medium Impact (9-15)	High Impact (16-20)
Probability	Definite / Highly Likely 4	16-32	36-60	64-80
	Medium 3	12-24	27-45	48-60
	Low 2	8-16	18-30	32-40
	Improbable/ Unlikely 1	4-8	9-15	16-20
Environmental Risk		Guidelines for Control Strategies		
(H) – High		Proactively reduce risk level, short term response.		
(M - H) - Medium to High		Proactively reduce risk level, short term response.		
(M) – Medium		Management strategies to reduce risk level, short to medium term response.		
(L - M) - Low to Medium		Management strategies to reduce risk level, short to medium term response, operational control and housekeeping.		
(L) – Low		Operational control and housekeeping.		

11.1 The positive and negative impacts

11.1.1 Alternative 1 (Proposed Alternative)

Refer to **Table 24** and **Table 25** under **section 11.1**, for a description of the positive and negative impacts associated with the proposed alternative 1.

11.1.2 Alternative 2 (No Alternative)

Alternative 2 include layout, technology and location alternatives in relation to Alternative 1.

11.1.3 No-Go Alternative

The No-Go option entails that the EM PV Solar Project is not undertaken. Refer to **Table 10** for the preliminary risk identified if the No Go Alternative is considered.

11.2 The possible mitigation measures that could be applied and the level of risk.

The EIA process is based on the grounds that impacts and risks identified will be mitigated with measures that are necessary to avoid, minimize or offset predicted adverse impacts and, where appropriate, to incorporate these into an environmental management plan or system (DEAT, 2004). The following **objectives/ criteria** will be kept in mind while mitigation measures are identified during the EIA Phase, to:

- Find more environmentally sound ways of undertaking specific activities;
- Enhance any environmental and social benefits of a proposed activity;
- Avoid, minimise or remedy negative environmental impacts;
- Apply a lifecycle approach to resources and products (cradle to cradle); and
- Ensure that any residual negative environmental impacts are environmentally acceptable.

Identifying appropriate mitigation measures will be conducted in a hierarchal manner:

1. Preventative measures will be identified to avoid, where possible, negative impacts that may arise due to the proposed activity;
2. Measures will be identified to minimise and/or reduce the negative impacts to “as low as practicable” levels; and

3. Measures will be identified to compensate or remedy residual negative impacts that are unavoidable and cannot be minimised or reduced any further (DEA, 2006).

Proposed mitigation measures will be communicated to EP for review as part of compiling the draft EMP. EP will comment on the feasibility and practicality of implementing the mitigation measures. The mitigation measures may be adjusted based on EP's comments.

11.3 The outcome of the site selection Matrix. Final Site Layout Plan

The proposed site layout plan is attached under **Appendix 4**.

11.4 Statement motivating the preferred site.

The proposed activity's **locations** were based on the following criteria:

1. Resource distribution and previous geological investigation conducted.
2. Previous site investigation and specialist studies conducted.
3. The proximity and location of the EM PV Solar Project to existing mining infrastructure (i.e., Shafts, TSF and haul roads), Concentrator Plant, WTP and services (i.e., roads, electricity and storm water management features).
4. Majority of the activities will be located on previously disturbed footprints.
5. Existing dust fallout, ground and surface water monitoring system in place.
6. Underground workings and location of geological features.
7. Current and planned opencast workings.
8. Impacts of blasting from mining activities.
9. Topography and extent of development area required vs available land.
10. Security, safety and vandalism risks.
11. Surface rights ownership.
12. Clean and dirty water management system currently in place.

EM has an established dust fallout, surface and groundwater monitoring system and network in place. Therefore, there is sound baseline information available to establish whether the EM PV Solar Project may potentially have an impact on the Ground, Surface and Air Quality.

11.5 Description of the aspects to be assessed as part of the environmental impact assessment process

The EAP undertakes to assess aspects identified for each of the following four phases:

- Construction Phase;
- Operational Phase;
- Decommissioning and Closure Phase; and
- Post Closure Phase.

Potential cumulative impacts will also be assessed.

11.6 Description of aspects to be assessed by specialists

Detailed specialist studies have been undertaken for the areas impacted on by EM, as it is an existing and established operation (est. 2006). For the EM PV Solar Project, existing specialist studies will be revisited, to ensure that these are aligned with current regulatory requirements and newly impacted areas and activities are considered. The ongoing monitoring reports (i.e., Surface- and Groundwater and Dust Fallout) will also be used to establish the new baseline conditions for the EM PV Solar Project.

The existing specialist studies will be used, which were recently updated. The updated specialist reports will be compiled in accordance with Regulations 12 and 13 and Appendix 6 of the 2014 EIA Regulations. Due to the potential impacts that may arise as result of the EM PV Solar Project, the following additional specialist studies have been commissioned during the Impact Assessment Phase:

- Biodiversity Assessment, including aquatic (Avifauna, faunal, floral);
- Heritage Assessment;
- Social and Economic Assessment; and
- Visual Assessment.

11.7 Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives

A baseline identification of the major potential impacts has only been included in this Scoping Report. The prediction of the nature of each impact; evaluation of each impact by rating its significance; and management and mitigation measures adopted to address each impact, will be assessed during the EIA Phase.

The EAP commits to implement an impact assessments methodology that as a minimum will include and address the following:

- Clear processes for impact identification, prediction and evaluation;
- Specification of the impact identification techniques;
- Criteria to evaluate the significance of impacts;
- Design of mitigation measures to reduce and minimise impacts;
- Definition of the different types of impacts (indirect, direct, or cumulative); and
- Specification of limitations and assumptions.

The EAP commits as a minimum to provide the following as part of the EIA process:

- Identify and assess potential impacts of the EM PV Solar Project;
- Determine the duration, extent, magnitude and reversibility of identified potentially significant impacts;
- Develop, advise and identify a range of mitigation measures that will likely result in a reduced, minimised and/or avoided impact that is also practical and economical feasible for EP; and
- Evaluate the significant residual impacts that remain after the proposed mitigation measures are implemented and develop an EMPr that will monitor and manage the impacts.

The construction, operational and decommissioning and post-decommission phases of the EM PV Solar Project will be considered whilst identifying impacts. A detailed understanding of the EM PV Solar Project will be obtained, to ensure that all the potential impacts are identified, assessed and addressed in the EMPr.

12. PUBLIC PARTICIPATION TO FOLLOW

12.1 The stages at which the competent authority will be consulted

The CA for the EM PV Solar Project Environmental Application will be the NWDEDECT in Rustenburg.

The stages at which the CA will be and have been consulted in the process will be as per the 2014 EIA Regulations, and will include amongst other, the following:

- Pre-application meeting (Refer to Appendix for the Minutes);
- Initial project announcement;
- PPP for the Scoping Phase, which include:
 - 30 Days commenting period of the DSR;
 - Invitation to attend the Public Meeting and consultation engagements; and
 - Notification of the intent to submit the FSR.
- PPP for the EIA Phase, which includes:
 - 30 Days commenting period of the DEIAR and DEMPr;
 - Invitation to attend the Public Meeting and consultation engagements during the EIA Phase; and
 - Notification of the intent to submit the FEIAR and EMPPr.
- The FEIAR and FEMPr will be submitted to the NWDEDECT for a decision, for consideration of the EA Application and representations from I&APs will be considered; and
- Continued consultation with the NWDEDECT until the decision is issued.

12.2 Particulars of the public participation process with regard to the Impact Assessment process that will be conducted

12.2.1 Steps to be taken to notify interested and affected parties.

The PPP undertaken during the Scoping Phase will continue in the Impact Assessment Phase and be undertaken in terms of Regulations 41 to 44 of the 2014 EIA Regulations. I&APs will be notified in the Scoping Phase, in the manner discussed above and registered I&APs will be liaised with during the Impact Assessment Phase.

All comments received from the I&APs during the Impact Assessment Phase will be incorporated into the DEIAR and EIAR. The I&APs Register will be updated as necessary (i.e., with new contact details, new I&APs etc.). The I&APs will be informed of the availability of

reports for comment; where/how these reports can be accessed; the commenting timeframes; and how comments can be submitted to the EAP. Proof of the PPP undertaken during the Impact Assessment Phase will be appended to the EIAR.

12.2.2 Details of the engagement process to be followed.

The compilation of the EIAR and draft EMP, as per the 2014 EIA Regulations, will include, but is not limited to, the following PPP:

- submitting the DEIAR to the CA and public for a review period of 30 days;
- all comments, objections and/or representations received during the PPP will be included and addressed in the DEIAR and this document will be finalised for submission to the CA;
- I&APs will be given an opportunity to comment on the final EIAR; and
- I&APs will be consulted during the Impact Assessment Phase, in the same manner discussed above in relation to the Scoping Phase.

12.2.3 Description of the information to be provided to Interested and Affected Parties.

Tasks to be performed to inform the registered I&APs of the availability of the documents for comment are set out below.

All registered and I&APs will be informed of the availability of the reports for comment by means of notices sent via a legal notice in a newspaper, posted letters, e-mails and electronic messages (SMS, etc.) using the existing, proven channels of communication (forums and committees):

- The DEIAR will be made available to the public for a 30-day commenting period;
- A notification of EP's intent to submit the final EIAR;
- These reports will be made available for comment by means of Placement at the public places listed in **Section 8** of this Report – the same places used as during the Scoping Phase of the Project, including online platforms.

The DEIAR and final EIAR will include a site plan and sufficient detail of the EM PV Solar Project and its anticipated post-mitigation impacts of each activity, to enable I&APs to assess

what impact the activities will have on them or on the use of their land once the EMP has been implemented.

13. PLAN OF STUDY OF THE EIA PROCESS

13.1 Description of the tasks that will be undertaken during the environmental impact assessment process

A full EIA process will be conducted by JEMS (Pty) Ltd for the Proposed EM PV Solar Project. The DEIAR and final EIAR will be submitted to the CA for review and decision-making purposes.

The Scoping Phase is designed to give the registered I&APs the opportunity to identify impacts that have been preliminarily listed in this DSR and determine whether they require additional specialist investigation during the Impact Assessment Phase. The Plan of Study ("**POS**") for the EIA process provides an indication of the tasks to be undertaken during the Impact Assessment Phase of the Project. This includes:

- Impact and risk identification / verification and assessment process;
- Specialist investigations to be undertaken;
- I&AP consultation process;
- Stakeholder engagement process;
- Mitigation measure design and finalisation;
- Determination of the acceptability of the post-mitigation impacts and risks, and
- Details on the process assumptions and limitations.

The purpose of the POS is to proactively lay out an effective methodology to be followed during the assessment of impacts in line with the 2014 EIA Regulation and relevant legislative provisions and best practices, that will be acceptable to both the I&APs and CA.

13.1.1 Tasks to be undertaken during the Impact Assessment Phase

The objectives of the Impact Assessment Phase will be to (DEA, 2014):

- Identify and assess the environmental (biophysical and social) impacts of the construction, operation, decommissioning and post closure impacts of the EM PV Solar Project. The cumulative impacts of the Project will also be identified and evaluated;

- Alternative activities and locations will be determined and assessed in parallel with the proposed activity;
- Identify and evaluate potential management and mitigation measures that will reduce the negative impacts of the EM PV Solar Project and enhance the positive impacts;
- Compile monitoring, management, mitigation and training needs to mitigate identified impacts in the EMPr;
- Furnish the I&APs with sufficient and accurate information to provide informed comment on the EM PV Solar Project; and
- Provide the decision-making authorities with sufficient and accurate information to make an informed decision on the EM PV Solar Project.

13.1.2 Environmental Impact Assessment Methodology:

The anticipated impacts associated with the EM PV Solar Project will be assessed according to an industry standardised impact assessment methodology that is in line with the regulatory provisions. Different impacts are associated with the different phases of the EM PV Solar Project and the significance will be determined by making use of the parameters and methodology as detailed in **Table 26** and **Table 27**.

13.2 Measures to avoid, reverse, mitigate, or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

The preliminary proposed activities with the identified potential impacts, mitigation measures and the residual risk have been tabulated below in **Table 28**.

Table 28: The pre-liminary proposed activities with the identified potential impacts, mitigation measures and the residual risk.

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
Establishment of temporary construction camp and laydown area	Soil disturbance	Establish on a previously disturbed area.	Limited
Clearing of Vegetation	Vegetation Clearance Dust Noise Erosion Alien and Invasive Plants	Stormwater management Dust suppression Dust Fallout monitoring Operational controls Noise control Rehabilitate soil and revegetate Alien and Invasive plants control	Potential residual impact
Earthworks	Soil disturbance Dust Noise Erosion Alien and Invasive Plants	Stormwater management Dust suppression Dust Fallout monitoring Operational controls Noise control Rehabilitate soil and revegetate Alien and invasive plants control Maintenance of topsoil Stockpiles	Potential residual impact
Concrete mixing and casting	Soil disturbance Ground and Surface water contamination	Operational controls Surface and Groundwater Monitoring Limit to a designated area	Potential residual impact
Construction of the 40 MW PV Plant	Erosion Dust Visual Soil disturbance Vegetation clearance Alien and invasive plants establishment Ground- and surface water contamination Noise	Stormwater management Incorporation of visual mitigation measures Dust suppression Dust Fallout monitoring Operational controls Noise control Alien and invasive plants control Surface and Groundwater Monitoring	Potential residual impact
Construction of the 5MW PVHFC	Erosion Dust Visual	Stormwater management Incorporation of visual mitigation measures Dust suppression	Potential residual impact

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Soil disturbance Vegetation clearance Alien and invasive plants establishment Ground- and surface water contamination Noise	Dust Fallout monitoring Operational controls Noise control Alien and invasive plants control Surface and Groundwater Monitoring	
Construction of the new substations and associated electricity distribution infrastructure	Erosion Dust Visual Soil disturbance Vegetation clearance Alien and invasive plants establishment Ground- and surface water contamination Noise	Stormwater management Incorporation of visual mitigation measures Dust suppression Dust Fallout monitoring Operational controls Noise control Alien and invasive plants control Surface and Groundwater Monitoring	Potential residual risk
Expansion of existing and the development of new pipelines for the conveying of water and sewage	Erosion Soil disturbance Vegetation clearance Alien and invasive plants establishment Ground- and surface water contamination	Stormwater management Operational controls Alien and Invasive plants control Surface and Groundwater Monitoring	Potential residual risk
Upgrading and expansion of internal roads for the transportation of material and general equipment movement	Erosion Noise Visual Soil disturbance Vegetation clearance Alien and invasive plants establishment Ground- and surface water contamination	Stormwater management Incorporation of visual mitigation measures Dust suppression Dust Fallout monitoring Operational controls Noise control Alien and Invasive plants control Surface and Groundwater Monitoring	Potential residual risk
Operation of the 40 MW PV Plant	Water Usage	Complaints Register and Investigation Process	Potential residual impact

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Alien and invasive plants establishment Visual Erosion	Stormwater management Operational controls Alien and Invasive plants control Surface and Groundwater Monitoring Water Balance	
Operation of the 5MW PV for the HFC	Erosion Visual Alien and invasive plants establishment Ground- and surface water contamination Water Usage	Stormwater management Incorporation of visual mitigation measures Operational controls Alien and invasive plants control Surface and Groundwater Monitoring Water Balance Complaints Register and Investigation Process Emergency Preparedness and Response Plan	Potential residual impact
Operation of the HFC	Erosion Alien and invasive plants establishment Ground- and surface water contamination Water Usage Fire and Explosion	Stormwater management Incorporation of visual mitigation measures Operational controls Alien and invasive plants control Surface and Groundwater Monitoring Water Balance Complaints Register and Investigation Process Emergency Preparedness and Response Plan	Potential residual impact
Decommissioning of the temporary construction camp and laydown area	Soil disturbance Land pollution	Rehabilitate soil.	Limited to footprint area
Rehabilitation of disturbed footprints	Invader plant species	Implement and maintain the invader plant species programme.	Limited to footprint area
Maintaining and training of emergency preparedness and response plan	Fires Health and safety of workers	Train and implement the emergency incident and response procedure. Install fire equipment	Potential residual risk

13.3 Other Information required by the competent Authority

13.3.1 Impact on the socio-economic conditions of any directly affected person.

EM is an existing mining operations with its associated social and economic impacts. It is estimated that the EM PV Solar Project will contribute to existing impacts during the construction and operational phases. The new impacts associated with the Solar Project relates to beneficial attributes in terms of GHG emission reduction, electricity demand management, increased competitiveness and reputational gains.

The socio-economic impacts of the EM PV Solar Project will be assessed and addressed in the Socio-Economic Study that will be included in the EIAR.

13.3.2 Impact on any national estate referred to in section 3(2) of the NHRA

Phase 1 HIA(s) have been undertaken for the EM. The findings of the study and a copy of the HIA(s) will be included as part of the EIAR. The HIA will also be reviewed as part of the EIAR to include new areas planned to be disturbed as part of the EM PV Solar Project.

13.3.3 Other matters required in terms of sections 24(4)(a) and (b) of the Act.

Not applicable, please refer to **Section 7.4** for a description of alternatives.

14. CONCLUSION AND RECOMMENDATIONS

The EM PV Solar Project has the potential to reduce the South African electricity supply challenges by alleviating the reliance of EM on electricity generated by non-renewable resources, through independent-generation and demand management. In addition, the Project will result in a reduction of the Scope 2 GHG emissions generated by the EM, which will likely have a positive impact on climate change and its associated impacts.

The scoping phase and subsequent DSR have and will be undertaken in accordance with the NEMA, the 2014 EIA Regulations and best practices. The information provided in the DSR is intended to act as a preliminary description of the baseline biophysical and socio-economic environmental resources where the EM PV Solar Project Area.

The purpose of the baseline information is to ensure that the relevant authorities and registered I&APs have a clear understanding of the proposed activities and the predicted effect on the environment, such that they can make an informed decision and contribution to the application process, respectively. The interaction and symbiotic relationship between all involved, by means of inputs and guidance received will contribute to the rationale of the FSR and the subsequent EIA phase.

The information used in the screening and scoping process is based on a review of the existing specialist studies conducted since mining commenced in the 2006 at EM. This also includes the relevant EMPRs and WULs for the mining area.

The baseline impacts which the Assessment Team has preliminarily identified will be updated and complimented with the inputs received from stakeholders and I&APs in the FSR. In the next phase (EIA Phase), the significance of the impacts and the relative mitigation measures to reduce (if not prevented) will be assessed. The assessment above refers to impacts associated with activities undertaken during the construction, operation, decommissioning, closure, and post closure phase. The mentioned assessment will be included in the EIA Phase as part of the EIAR and EMPr.

The I&APs and stakeholders who have been identified will either receive access to or be notified of the availability and provision of the DSR.

15. UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I **G.S. Barkhuizen** herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected Parties have been correctly recorded in the report.



Signature of the EAP

DATE: 2-2-2022

16. UNDERTAKING REGARDING LEVEL OF AGREEMENT

I **G.S. Barkhuizen** herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with interested and Affected Parties and stakeholders have been correctly recorded and reported herein.



Signature of the EAP

DATE: 2-2-2022

17. REFERENCES

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