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SITE VERIFICATION REPORT

SITE VERIFICATION REPORT FOR THE PROPOSED DEVELOPMENT OF A 160 MEGAWATTS LEANO ALPHA ENERGY SOLAR PROJECT LOCATED ON PORTIONS 16,17,18,21,22 AND 23 ON FARM SPITSKOP 333 KT IN STEELPOORT WITHIN THE JURISDICTION OF FETA-KGOMO TUBATSE LOCAL MUNICIPALITY, SEKHUKHUNE DISTRICT MUNICIPALITY, LIMPOPO PROVINCE

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List of Abbreviations

DFFE	Department of Forestry, Fisheries and the Environment
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
FTSEZ	Fetakgomo-Tubatse Special Economic Zone
GIS	Geographic Information System
I&AP	Interested and Affected Party
LEDET	Limpopo Department of Economic Development, Environment and Tourism
NEMA	National Environmental Management Act
NWA	National Water Act
PV	Photovoltaic
RFI	Radio Frequency Interference
SVR	Site Verification Report
WULA	Water use License

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SECTION ONE

EXECUTIVE SUMMARY

1.1 INTRODUCTION AND OUTLINE

QEMS Management and Business Solutions cc (QEMS) was appointed by ASCENG (Pty) Ltd to undertake all environmental approvals for the proposed development of a 160 Megawatts Leano Alpha Energy Solar Project and its associated infrastructure. The said development would be located on Portions 16,17,18,21,22 and 23 on Farm Spitskop 333 KT in Steelpoort within the jurisdiction of Feta-Kgomo Tubatse Local Municipality, Sekhukhune District Municipality, Limpopo Province. The proposed development falls within the Fetakgomo-Tubatse Special Economic Zone (FTSEZ) which already has an approved Environmental Authorisation (EA) with reference number: 12/1/9/2-GS72 from the Limpopo Department of Economic Development, Environment and Tourism (LEDET) issued 29 June 2022. The existing EA approved the following listed activities:

Notice and description	Activity Number and description	Related activity in the proposed development/expansion
Notice 2: R. 984 of 2014	Activity 15 – “The clearance of an area of 20 hectares or more of indigenous vegetation.	Clearance of area of 1220 ha for buildings, fencing, and other logistics.
Notice 1: R. 983 of 2014	Activity 24 – “The development of a road- (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres”.	Associated with the development is the construction of internal roads. The Engineer will determine the sizes thereof when the siting of all infrastructure is finalised.

The proposed development of a 160 Megawatts solar energy project and its associated infrastructure activities therefore, trigger Norms and Standards for the exclusion of the development and expansion of solar photovoltaic facilities in area of low or medium environmental sensitivity, in terms of section 24(10) of the National Management Environmental Act, 1998 (Act No.107 of 1998) and exclude, in terms of section 24(2)(d) of the National Environmental Management Act, 1998 (Act No.107 of 1998) activities identified in terms of section 24(2)(a) and (b) of the National Environmental Management Act, 1998 (Act

No.107 of 1998) for the expansion of solar photovoltaic facilities, including any associated activity or infrastructure, from the requirement to obtain an environmental authorization, based on compliance with the norm. The Screening Tool Report (STR) is generated from the DFFE's national online GIS-based 'National web-based Environmental Screening Tool' and provides detail on the environmental sensitivity, restriction, exclusion or prohibition zones and specific requirements, including specialist studies that are applicable to a proposed development site, based on the national sector classification and the environmental sensitivity of the site.

Before commencing with the Norms and Standards for exclusion of the development and expansion of Solar Photovoltaic process and specialist assessments, the current land use and environmental sensitivity of the site under consideration, as identified in the STR, must be confirmed by undertaking site sensitivity verification. A Site Sensitivity Verification Report (SVR) is then required in response to the STR through the 'Protocols for Assessment and Minimum Report Content Requirements for Environmental Themes for Activities requiring Environmental Authorisation published in Government Notice Regulation 320 of 20 March 2020 under Section 24 (5)(a), (h) and 4 of the NEMA.

This is the SVR which verifies the data contained in the DFFE STR compiled for the proposed Leano Alpha solar plant.

1.2 PURPOSE OF THIS REPORT

This report provides an overview of the following:

- Project location, description and required services
- DFFE Screening Tool outcomes and identified environmental sensitivity themes related to the project site and types;
- Desktop based analysis of available GIS Database;
- Motivation and evidence (photos) of either the verified/different use of the land and environmental sensitivity identified in the STR
- A confirmation / refute on the need for the various specialist study inputs required by STR;
- Any potential fatal flaws that may render the development undesirable at the project location.

1.3 TERMS OF REFERENCES

The general requirements for site sensitivity verification for activities requiring environmental authorisation have been published in Government Notice Regulation 320 of 20 March 2020 under Section 24 (5)(a), (h) and 4 of the NEMA. However, the environmental authorization for this project will not be required as the proposed development falls within the Fetakgomo-Tubatse Special Economic Zone (FTSEZ).

GNR 320 requires that prior to commencing with any specialist assessment for the EIA Study, the current land use and the environmental sensitivity of the site under consideration as identified by the national web based environmental screening tool (screening tool), must be confirmed by undertaking a site sensitivity verification. The site sensitivity verification must be undertaken by an environmental assessment practitioner and/or a specialist.

The site sensitivity verification must be undertaken through the use of:

- a) A desktop analysis, using satellite images or any available means
- b) A preliminary on-site inspection; and
- c) Any other relevant information.

The outcome of the site verification must be recorded in the form of a report that: -

- a) Confirms or disputes the current use of land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;
- b) Contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity; and
- c) Is submitted with the relevant assessment report in accordance with the requirements of the EIA Regulations

1.4 ASSUMPTIONS AND LIMITATIONS

The spatial data contained in the National web-based Environmental Screening Tool' used to generate the STR, according to DFFE has been collected as accurately as possible. Although the greatest care has been taken to ensure that the data is up to date and spatially accurate, the Department of Forestry, Fisheries and the Environment and its entities give no warranty, express or implied, as to the accuracy, reliability, utility or completeness of this data.

The spatial data used for the environmental screening purposes, used to generate the STR, has been collected from various data sets and sources and its correctness cannot be guaranteed. The database is updated over time and can change without notice. Given the limitation, it is essential to independently verify the data contained in the report on-site. Discrepancies have been identified between the STR and the onsite verification and are detailed in the sections below.

1.5 METHODOLOGY


QEMS conducted a desktop analysis; using satellite imagery of the project site including the GIS historical vegetation covers for specific years (2023, 2014 and 2005) and generating a STR for the project site on 14 May 2024. The findings of the STR have been verified through a site inspection by various specialists and environmental assessment practitioner.

SECTION TWO

ENVIRONMENTAL ASSESSMENT PRACTITIONERS AND SPECIALISTS

2.1 DETAILS OF THE EAP

The on-site sensitivity verification was undertaken by specialists and Dr Patrick Sithole who also prepared the Site Verification Report (SVR) for the site. His details are as follows:

Environmental Assessment Practitioner:	QEMS Management and Business Solutions cc	
Contact Person:	<p>Dr. Patrick Sithole</p> <p>Registered EAP (EAPASA)</p> <p>Registered Pr.Sci.Nat. (SACNASP)</p> <p>Registered Pest Control Operator (PCO)Registered Process Controller-IV (DWS)</p>	
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E-mail/ Website	sitholetp@qems.co.za / www.qems.co.za	
Expertise	<p>A Registered natural scientific professional (SACNASP – Environmental and Chemical scientist), Registered Environmental Assessment Practitioner (EAPASA), social and sustainability expert with 21 years of experience, Patrick Sithole specialises in Strategic Environmental, Social and Sustainable Development projects, Climate Change and Health, Environmental Management issues and Construction Supervision of all infrastructural projects. DrSithole is also involved in vegetation clearance and pest control projects along infrastructural projects e.g. roads, railway lines, power lines, golf courses and buildings like complexes, houses, malls, etc. Patrick has a very strong business development mindset that has seen him winning and working on projects across Africa and in Europe. His key experience includes the following areas; Environmental (Natural Resource) Management; Environmental Compliance; Social Facilitation and Consultation; Compensation of</p>	

	Land Claims; Climate Change; Climate (Change) and Human Health; Air Quality Management; Renewable Energy; Waste Management; Land Rehabilitation; Water Quality/Demand Management; Strategic Environmental Assessment; Waste Water (sewer) Treatment; Project Management; ISO 9001 and ISO14001; Vegetation Control Bush Clearance (Invasive plants)
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2.2 DETAILS OF THE SPECIALISTS

The on-site sensitivity verification was conducted by various specialists, including Ms. Dikonketso Tlaamela, Mr. Tshuxekani Maluleke, Mr. Tshiamo Setsipane and Mr. Trust Mlilo, who also prepared the Site Verification Report (SVR) for the site. Their details are as follows:

Terrestrial Biodiversity and Plant Specialist:	Naledzi Environmental Consultants
Contact Person:	Ms. Dikonketso Tlaamela MSc. Botanical Sciences Registered Pr.Sci.Nat. (SACNASP)
Address:	141 Thabo Mbeki Street, Fauna Park, Polokwane, 0699, South Africa
Telephone	+27813753508/ 0665636015
E-mail/ Website	dtlaamela@naledzi.co.za
Expertise	Ms Dikonketso Tlaamela is a Masters graduate in botany who worked for SANBI from March 2019 till April 2021, conducting risk analysis of alien invasive taxa, field surveying, risk evidence and profiling of invasive alien species, map species occurrences and conduct research on invasions. She is a registered professional scientist with SACNASP, Botanical Sciences field. She worked as project co-ordinator for the bush encroachment clearing project at Radzambo Cultural Foundation and Matsila Development Community Trust from September 2021 to December 2021. She also served as a service provider for Enviro Innovation Consulting, focusing on conducting risk analysis of alien plant species from October 2021 till March 2022. In addition, she was involved in various projects amongst them including Filling Station, Plant transplantation plan, Road upgrade, Environmental Audit in mining and Invasive Species Management.

Terrestrial Biodiversity, Animal and Aquatic Specialist:	Ntumbuluko Consulting Pty (Ltd)
Contact Person:	Mr. Tshuxekani Maluleke MSc Environmental Sciences BSc Hons Zoology BSc Hons Animal, Plant and Environmental Sciences Registered Pr.Sci.Nat. (SACNASP)
Address:	5 13th Avenue, Fairlands, Randburg 2170
Telephone	0716859247
E-mail/ Website	info@ntumbulukoconsulting.co.za
Expertise	Mr. Tshuxekani Maluleke is a SACNASP registered Environmental Scientist, with a strong background in Conserving Biodiversity, Sciences of Freshwater Management and Environmental Management. He holds an MSc in Environmental Sciences from the University of the Witwatersrand, where he specialized in Conserving Biodiversity Foundations, Environmental Management, Sciences of Freshwater Management, and Sustainability in Mining and Industry. He has professional experience in conducting Environmental Impact Assessments, Feasibility Studies, Environmental Compliance Auditing, Biodiversity Impact Assessments and Wetland Studies for various projects. He recently drafted a Biodiversity Strategy for Shell Downstream South Africa Pty Ltd. The strategy was aimed at identifying the risks posed by Shell operations to the country's biodiversity, and the appropriate strategies to mitigate and minimise the impacts on the country's Biodiversity.

Agricultural specialist	Enviro-Solum Consulting (ESC)
Contact Person:	Mr Tshiamo Setsipane M.Sc. (Agric): Soil Science B.Sc. (Agric) Honours: Soil Science B.Sc. (Agric): Soil Science and Agrometeorology Pr.Sci.Nat. (SACNASP)
Address:	25 Ernest Oppenheimer Ave, Bruma, Johannesburg 2026
Telephone	061 710 5481
E-mail/ Website	tshiamomcdonald@yahoo.com
Expertise	<p>Conducting Soil, Land Use and Land Capability Assessments: Assess existing information for rainfall data and current land uses.</p> <p>Conduct a desktop assessment within the study area using the digital satellite imagery and other suitable digital aids.</p> <p>A soil classification survey and agricultural potential will be conducted within the proposed development area.</p> <p>A soil classification survey and agricultural potential will be conducted within the proposed development area.</p> <p>Provide recommended mitigation measures to implement to manage the anticipated impacts and to comply with the applicable legislations.</p> <p>Compile a report on the findings of the assessment and presented in an electronic format.</p> <p>Conducting Hydropedological Impact Surveys: Identify dominant hillslopes (from crest to stream) of the project area using terrain analysis.</p> <p>Conduct a transect soil survey on each of the identified hillslope.</p> <p>Hydrological behaviour of the identified hillslope described according to the identified hydropedological groups;</p>

	<p>Graphical representation of the dominant and sub-dominant flowpaths at hillslope scale prior to development and post development.</p> <p>The impact of the proposed development on the hydrogeological behaviour described in a report format.</p> <p>Quantification of hydrogeological fluxes using the Soil and Water Analysis Tool (SWAT+) to determine the losses to the wetland systems through the proposed project</p> <p>Conducting Land Contamination Assessments and Soil Monitoring Assessments: Assessments of historic and current storage of hazardous waste and materials on soils.</p> <p>Topsoil stockpile quality assessment for future usage.</p> <p>Monitoring programme to determine the dust suppression impact on soil chemical parameters.</p>
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Archaeology and cultural heritage specialist)	Mudzunga Consulting & ICT (Pty) Ltd
Contact Person:	<p>Mr Trust Mlilo</p> <p>PhD <i>cand</i>,</p> <p>MA. (Archaeology),</p> <p>BA Hons, PDGE and BA</p> <p>ASAPA (Professional affiliation member)</p>
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<p>Expertise</p>	<p>Trust Mlilo, PhD <i>cand</i> (Wits), MA. (Archaeology), BA Hons, PDGE and BA & (Univ. of Pretoria) ASAPA (Professional affiliation member) and more than 15 years of experience in archaeological and heritage impact assessment and management. Mlilo is an accredited member of the Association for Southern African Professional Archaeologists (ASAPA), Amafa akwaZulu Natali and Eastern Cape Heritage Resources Agency (ECPHRA). He has conducted more than hundred AIA/HIA Studies, heritage mitigation work and heritage development projects over the past 15 years of service. The completed projects vary from Phase 1 and Phase 2 as well as heritage management work for government, parastatals (Eskom), and several private companies such as BHP Billiton and Rhino Minerals.</p>
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SECTION THREE

THE PROPOSED DEVELOPMENT/PROJECT

3.1 BACKGROUND

ASCENG PTY (Ltd) wants to establish a 160 Megawatts Leano Alpha Energy Solar plant development and its associated infrastructure. The development would be located on Portions 16,17,18,21,22 and 23 of the Farm Spitskop 333 KT in Steelpoort within Feta-Kgomo Tubatse Local Municipality, Sekhukhune District, Limpopo Province. The proposed development falls within the Fetakgomo-Tubatse Special Economic Zone (FTSEZ) which already has an approved Environmental Authorisation (EA) with reference number: 12/1/9/2- GS72 from the Limpopo Department of Economic Development, Environment and Tourism (LEDET) issued 29 June 2022.

The proposed Leano Alpha Energy Solar plant development site is on an approximately 300ha piece of land. The approximate central coordinates of the site are 24°50'0.16"S, 30° 8'25.21"E. The project entails the construction of Solar plant of 160 Megawatts, Battery Energy Storage System of 20MW, grid connection and boasting a capacity of 105 Megawatts (MW) (AC), to the Eskom distribution grid. This connection will be facilitated through a 132 kilovolt (kV) Overhead transmission line leading to a 3x40MVA substation, Internal roads and auxiliary buildings.

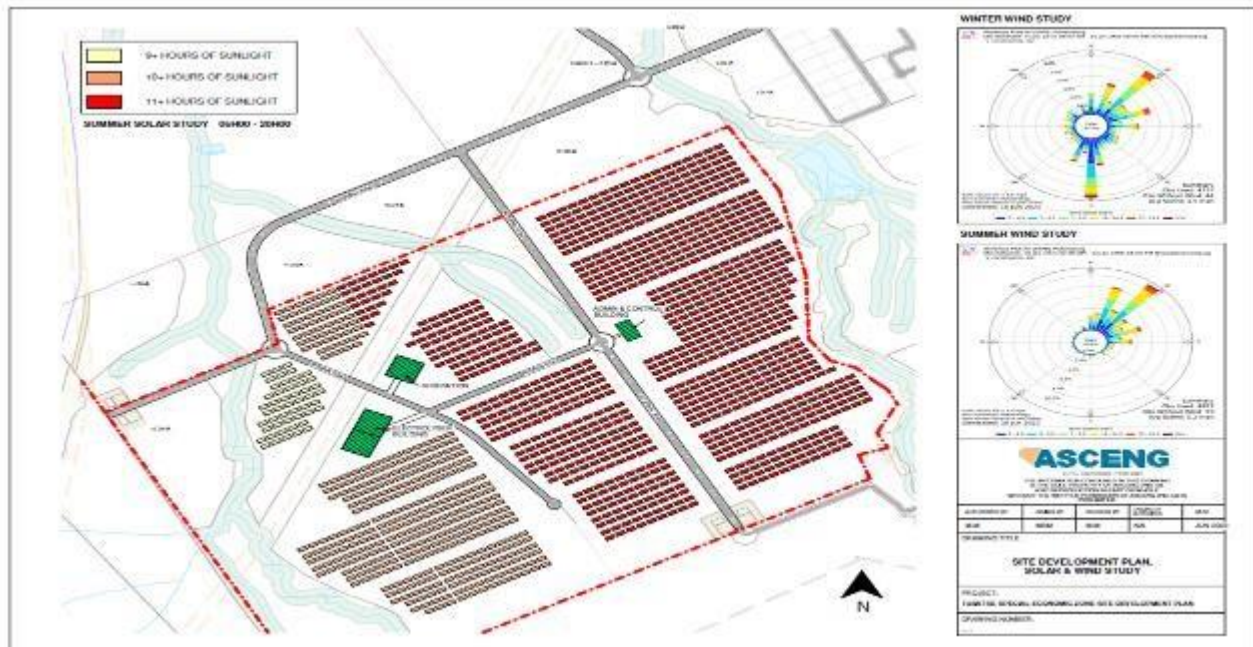


Figure 1: Proposed Development Layout Plan Map

3.1.1 Electricity Supply

During the construction phase electricity will either be supplied using a generator or alternative connection to the existing power lines on site supplying some of the FTSEZ units. On completion of the project and during the operational phase, electricity will be supplied by the new facility.



Figure 2: Site picture showing powerlines within the site.

3.1.2 Water and Sewage supply

Water will be needed during the construction phase. The site offices will connect to the nearest point on the existing pipeline within the site. Chemical mobile toilets will be used during the construction phase. Permanent water supply and sewer treatment systems will be installed during the operational phase. These plans have already been catered for by FTSEZ.

3.1.3 Waste Management

Waste that will be generated during construction and operational phase will be disposed of at the nearest registered land fill site in Steelpoort.

3.1.4 Stormwater Infrastructure

During the construction basic localized stormwater controls would be put in place where runoff is discharged. Such measures would include measures to spread water across the site, rather than to collect or concentrate flow and could take the form of small mounds/ berms, swales, infiltration strips, and/or trenches where required. In terms of landscaping, screening around the perimeter of the facility which correspond with property boundaries would have screen planting. Permanent stormwater management

systems will be implemented during the operational phase. The detailed designs will be finalised on approval of this submission.

3.2 LOCALITY AND ENVIRONMENTAL FEATURES

3.2.1 Location

The proposed development is located on Portions 16,17,18,21,22 and 23 of the Farm Spitskop 333 KT in Steelpoort within the jurisdiction of Feta-Kgomo Tubatse Local Municipality, Sekhukhune District Municipality, Limpopo Province. The proposed Leano Alpha Energy Solar plant development site is on an approximately 300ha piece of land. The approximate central coordinates of the site are 24°50'0.16"S, 30° 8'25.21"E.

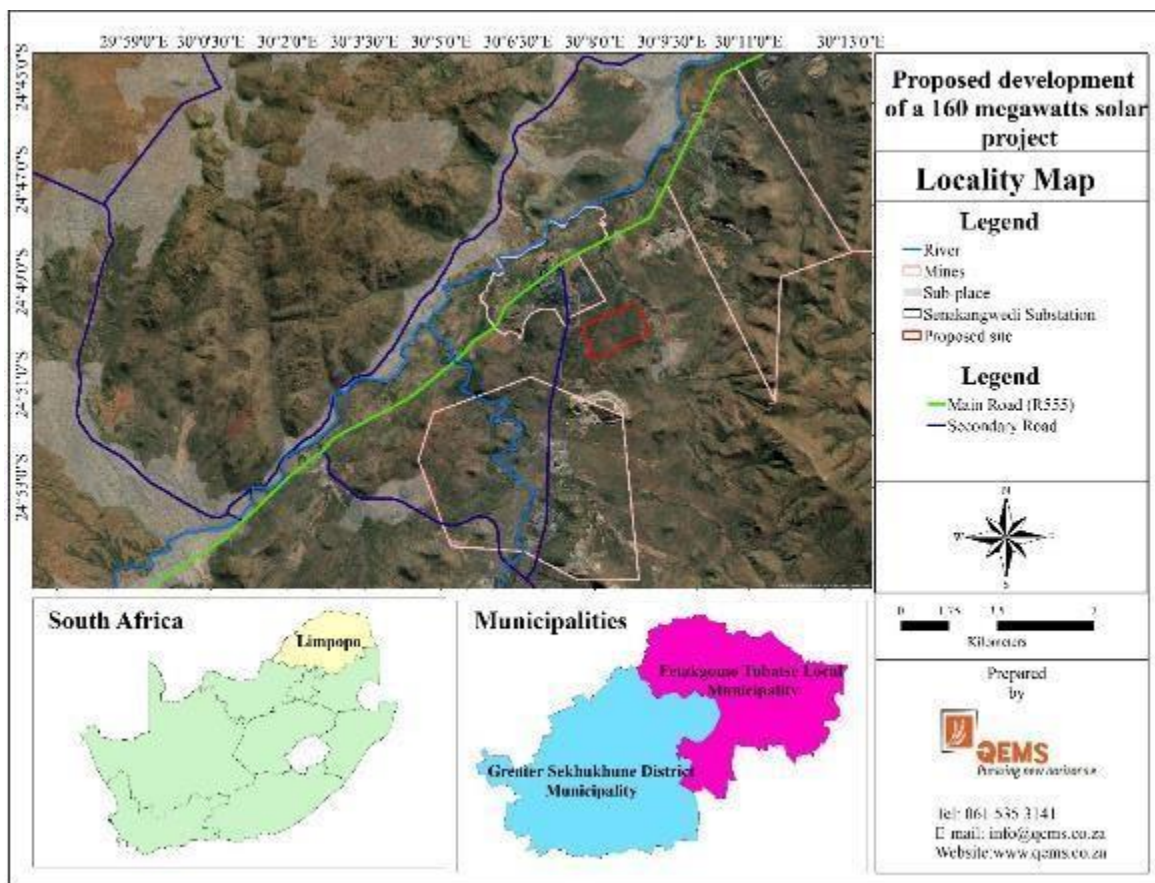


Figure 3: Proposed Development Site Locality Map

3.2.2 Distribution

The site consists of a lowland area from Burgersfort and the lower basin of the Steelpoort River in the south, northwards through the plains of the Motse River basin to Jobskop and Legwareng (south of the Strydpoort Mountains), continues up the basin of the Olifants River to around Tswaing and the valleys of the Lepellane and Mohlaletsi Rivers. The altitude of the site and area is mostly about 700– 1100 m.

3.2.3 Vegetation & Landscape Features

Mainly semi-arid plains and open valleys between chains of hills and small mountains running parallel to the escarpment. Predominantly short, open to closed thornveld with an abundance of Aloe species and other succulents. Heavily degraded in places and overexploited by man for cultivation, mining and urbanisation. Both man-made and natural erosion dongas occur in areas containing clays rich in heavy metals. Encroachment by indigenous microphyllous trees and invasion by alien species is common throughout the area.

Important Taxa

Tall Trees: *Acacia erioloba*, *Philenoptera violacea*.

Small Trees: *Acacia mellifera* subsp. *detinens*, *A. nilotica*, *A. tortilis* subsp. *Heteracantha*, *Boscia foetida* subsp. *rehmanniana*, *Acacia grandicornuta*, *Albizia anthelmintica*, *Balanites maughamii*, *Combretum imberbe*, *Commiphora glandulosa*, *Maerua angolensis*, *Markhamia zanzibarica*, *Mystroxydon aethiopicum* subsp. *schlechteri*, *Ptaeroxylon obliquum*, *Schotia brachypetala*, *Ziziphus mucronata*.

Succulent Tree: *Euphorbia tirucalli*.

Tall Shrubs: *Rhus engleri*, *Cadaba termitaria*, *Dichrostachys cinerea*, *Ehretia rigida* subsp. *rigida*, *Grewia bicolor*, *Karomia speciosa*, *Maerua decumbens*, *Rhigozum brevispinosum*, *R. obovatum*, *Tinnea rhodesiana*, *Triaspis glaucophylla*.

Low Shrubs: *Felicia clavopilosa* subsp. *Transvaalensis*, *Seddera suffruticosa*, *Gnidia polycephala*, *Gossypium herbaceum* subsp. *africanum*, *Jamesbrittenia atropurpurea*, *Jatropha latifolia* var. *latifolia*, *Lantana rugosa*, *Melhania rehmannii*, *Monechma divaricatum*, *Myrothamnus flabellifolius*, *Pechuel-Loeschea leubnitziae*, *Plinthus rehmannii*.

Succulent Shrubs: *Aloe cryptopoda*, *Euphorbia enormis*, *Kleinialongiflora*, *Aloe castanea*, *A. globuligemma*. Woody SucculentClimber: *Sarcostemma viminale*.

Herbaceous Climbers: *Cocciniarehmannii*, *Decorsea schlechteri*.

Graminoids: *Cenchrus ciliaris*, *Enneapogon cenchroides*, *Panicum maximum*, *Urochloa mosambicensis*, *Aristida adscensionis*, *A. congesta*, *Eragrostis barbinodis*, *Paspalum distichum*, *Schmidtia pappophoroides*, *Stipagrostis hirtigluma* subsp. *patula*, *Tragus berteronianus*.

Herbs: *Becium filamentosum*, *Phyllanthus maderaspatensis*, *Blepharis integrifolia*, *Corchorus asplenifolius*, *Hibiscus praeteritus*, *Ipomoea magnusiana*. Geophytic Herbs: *Drimia altissima*, *Sansevieria pearsonii*.

Biogeographically Important Taxa

(Northern Sourveldendemic, Central Bushveld endemic, Sekhukhune endemic, Broadly disjunct distribution)

Small Tree: *Lydenburgia cassinoides*.

Tall Shrub: *Nuxia gracilis*.

Low Shrubs: *Amphiglossa triflora*, *Asparagus fourei*, *Hibiscus barnardii*, *Orthosiphon fruticosus*, *Petalidium oblongifolium*, *Rhus batophylla*.

Woody Climber: *Asparagus sekukuniensis*.

Herb: *Aneilema longirrhizum*.

Geophytic Herb: *Chlorophytum cyperaceum*.

Succulent Herb: *Piaranthus atrosanguineus*.

Conservation

According to Mucina and Rutherford (2006), this vegetation type is regarded as vulnerable with a target of 19% set for conservation. Nearly 2% of this vegetation type is statutorily conserved in Potlake, Bewaarkloof and Wolkberg Caves Nature Reserves. Approximately 25% of this area has been transformed and is mainly under dry-land subsistence cultivation. A small area is under pressure from chrome and platinum mining activities and the associated urbanisation. Depending on commodities, this threat could increase in the future. There is a high level of degradation of much of the remaining vegetation by unsustainable harvesting and utilisation. Erosion widespread at usually high to very high levels with donga formation. Alien *Agave* species, *Caesalpinia decapetala*, *Lantana camara*, *Melia azedarach*, *Nicotiana glauca*, *Opuntia* species, *Verbesina encelioides* and *Xanthium strumarium* are widespread but scattered.



Figure 4: Site pictures showing the succulent species

3.2.4 Geology & Soils

This vegetation type is characterized by complex geology, with rocks mainly mafic and ultramafic intrusive rocks of the main to lower zones of the Rustenberg Layered Suite on the eastern lobe of the Bushveld Igneous Complex (Vaalian). The zones (subsuites) are dominated by concentric belts of norite, gabbro, anorthosite and pyroxenite, with localised protrusions of magnetite, chromitite, serpentinised harzburgite, olivine diorite, shale, dolomite and quartzite. Most of the area consists of red apedal soils.

Deep, loamy Valsrivier soils are characteristic of the plains and shallow Glenrosa soils are found on the lowlying, rocky hills. Patches of erodable black, melanic structured horizons are common around small mountains. Some Steendal soils are underlain by gypsum. Land types mainly Ae, Ib, Ea and Ia.

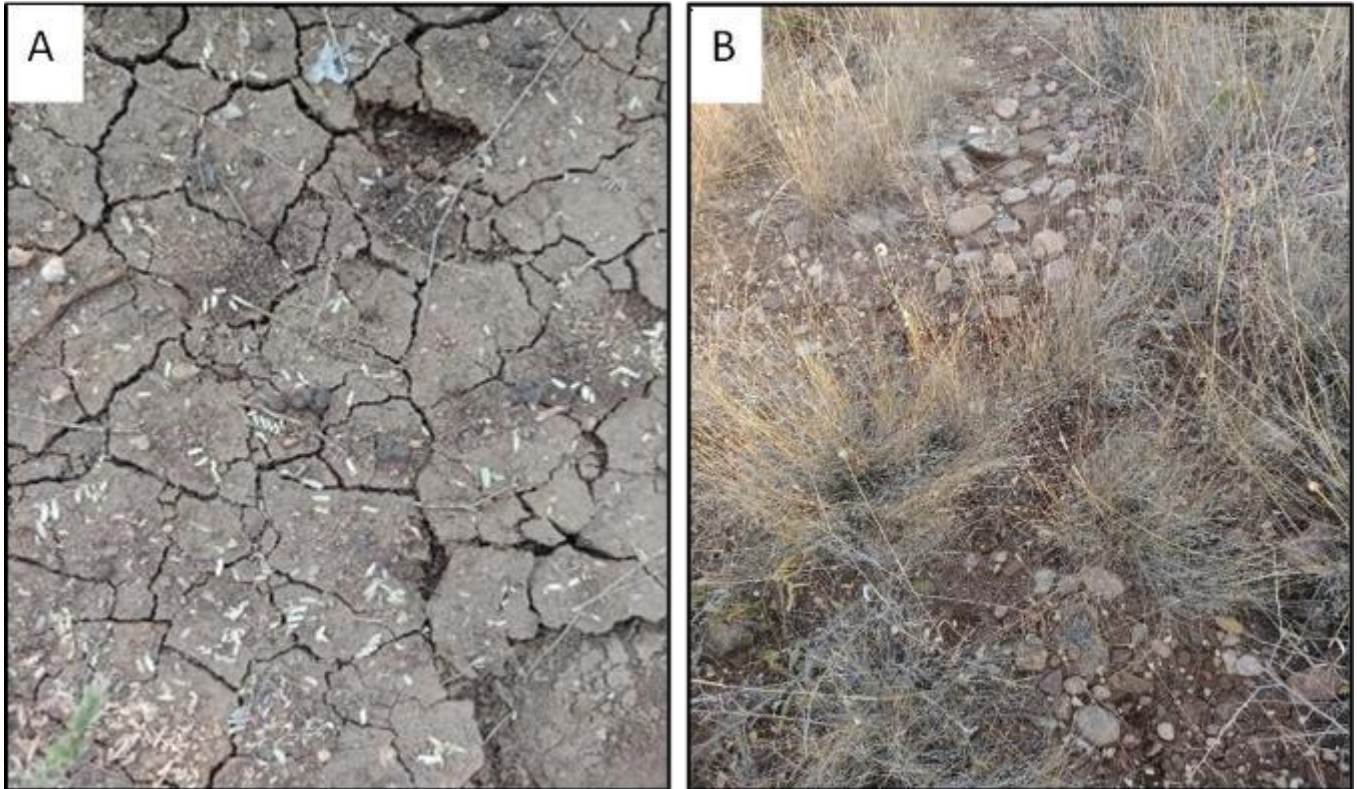


Figure 5: Pictures showing Loamy soils (A) and stony areas (B) within the proposed site

3.2.5 Climate

The proposed development site is characterized by summer rainfall with very dry winters. The Mean Annual Precipitation ranged between 400–600 mm, but at the lower end of this range on the central plains increasing to about 500 mm on the plains east of the Leolo Mountains. Frost is very infrequent within this vegetation type. Mean monthly maximum and minimum temperatures for Tswelopele 37.3°C and –0.9°C for January and June, respectively. Daily temperatures vary considerably at different localities, with higher temperatures on the western plains and lower temperatures on higher-lying plateaus.

3.2.6 Land use

The area has been used for agriculture on a small portion and the remaining section remains vacant, primarily utilized for grazing livestock and gathering firewood. Additionally, there are installations of

dust monitoring equipment within the site. This can be supported by historical pictures of the site for different years. The three images below illustrate the various changes that took place as far back as 2005.



Figure 6: A satellite map showing the vegetation of proposed area in 2005.



Figure 7: A satellite map showing the vegetation cover of the proposed site in 2014.



Figure 8: A satellite map showing the vegetation cover of the proposed site in 2023.



Figure 9: Site picture showing dust monitoring equipment.

SECTION FOUR

PROJECT LEGAL REQUIREMENTS

4.1 Norm and standards

Over the last few years, the National Department of Forestry, Fisheries and the Environment (DFFE) has published a suite of Norms and Standards and Regulations for excluding certain renewable energy-related developments from needing an Environmental Impact Assessment (EIA) in terms of the National Environmental Management Act (NEMA).

In March 2024, DFFE published an adoption of the solar exclusion norm and exclusion of the development and expansion of solar photovoltaic facilities from the requirement to obtain an environmental authorisation according to National Environmental Management Act, 1998 (Act no.107 of 1998).

In paragraph 3 the activities which are the subject of this exclusion relate to the development of a facility for the generation of electricity from solar photovoltaic technology, where such development or expansions triggers activity 1 or Activity 36 of listing notice 1 or Activity 1 of listing notice 2 and any associated activity identified in listing notice 1,2 or 3 necessary for the realization of such facilities.

Identified activities for the development or expansion of battery storage facilities, associated with and integral to the operation of solar photovoltaic facility, are to be registered under this norm and not the norm for the exclusion of identified activities associated with the development and expansion of battery storage facilities in areas of low and medium environmental sensitivity.

The proposed development triggers activities:

1. Activity 3.1.2 (GNR 4558 27 March 2024): of Norm for the Exclusion of the Development and Expansion of Solar Photovoltaic Facilities in Areas of Low or Medium Environmental Sensitivity in terms of section 24(10) of the National Environmental Management Act (Act No.107 of 1998).

4.2 NWA

The site is under the management of the Limpopo Economic Development Agency (LEDA) and hence they are responsible for acquiring most permits and licenses for the overall site. If however, additional water uses are required beyond the ASCENG allocation and beyond the current approvals, a formal water use license application (WULA) will be lodged with the Department of Water and Sanitation in terms of Section 21 of the National Water Act (Act No

36 of 1998). The WULA Procedure is regulated under the ‘Procedural Requirements for Water Use License Applications and Appeals (GNR 267, 24 March 2017) published in terms of the NWA.

Table 1: Water Use Activity Triggered under NWA

WULA Triggered Activity	Description	Relevance
Section 21(b)	Storing water	Storing water in the reservoir
Section 21(c)	Impeding or diverting the flow of water in a watercourse	The proposed development site is located within a 32m regulated zone from a water source
Section 21(i)	Altering the bed, banks, course or characteristics of a watercourse	The proposed development site lies within 32m of water source

SECTION FIVE

DFFE SCREENING TOOL REPORT (STR) FINDINGS

5.1 STR FINDINGS

The screening tool was generated from the DFFE on 14/05/2024 and the National Sector Classification Category selected to produce the Screening Tool Report: Utilities Infrastructure|Electricity|Generation|Renewable|Solar|PV. The location of the area that the screening tool generated for is depicted in figure



Figure 10: Locality Map Generated by Screening Tool

5.1.1 Wind and solar developments with an approved environmental authorization or applications under consideration within 30 Km of the proposed area.

No	EIA Reference No	Classification	Status of	Distance from proposed
1	14/12/16/3/3/2/2079	Solar PV	Approved	7.7

5.1.2 Environmental Management Frameworks

The proposed projects area falls within a protected area of Olifants Environmental Management Framework.



Figure 11: A Map depicting the Environmental Management Frameworks

5.1.3 Relevant Development Incentives, Restrictions, Exclusions or Prohibitions

The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to this site are indicated below:

Incentive, restriction prohibition	Implication
Strategic Transmission Corridor-International corridor	https://screening.environment.gov.za/ScreeningDownloads/DevelopmentZones/Combined EGI.pdf

5.1.4 Environmental Themes which are sensitive to the development

Table 2: Environmental Themes Which are Sensitive to the development

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme		X		
Animal Species Theme			X	
Aquatic Biodiversity Theme				X
Archaeological and Cultural Heritage Theme				X
Avian Theme				X
Civil Aviation (Solar PV) Theme			X	
Defence Theme				X
Landscape (Solar) Theme	X			
Paleontology Theme			X	
Plant Species Theme			X	
RFI Theme				X
Terrestrial Biodiversity Theme	X			

SECTION SIX

SITE VERIFICATION

6.1 Site verification findings

The following specialists studies were conducted:

- Agricultural Impact Assessment
- Plant Impact Assessment
- Animal Impact Assessment
- Aquatic Impact Assessment
- Terrestrial Biodiversity Impact Assessment
- Archeology and Cultural Heritage Impact Assessment

6.2 Environmental sensitivity themes applicable to the project and site

6.2.1 Agriculture

Screening Tool: The report indicates that the land capability is medium to high, resulting in **High** sensitivity rating.

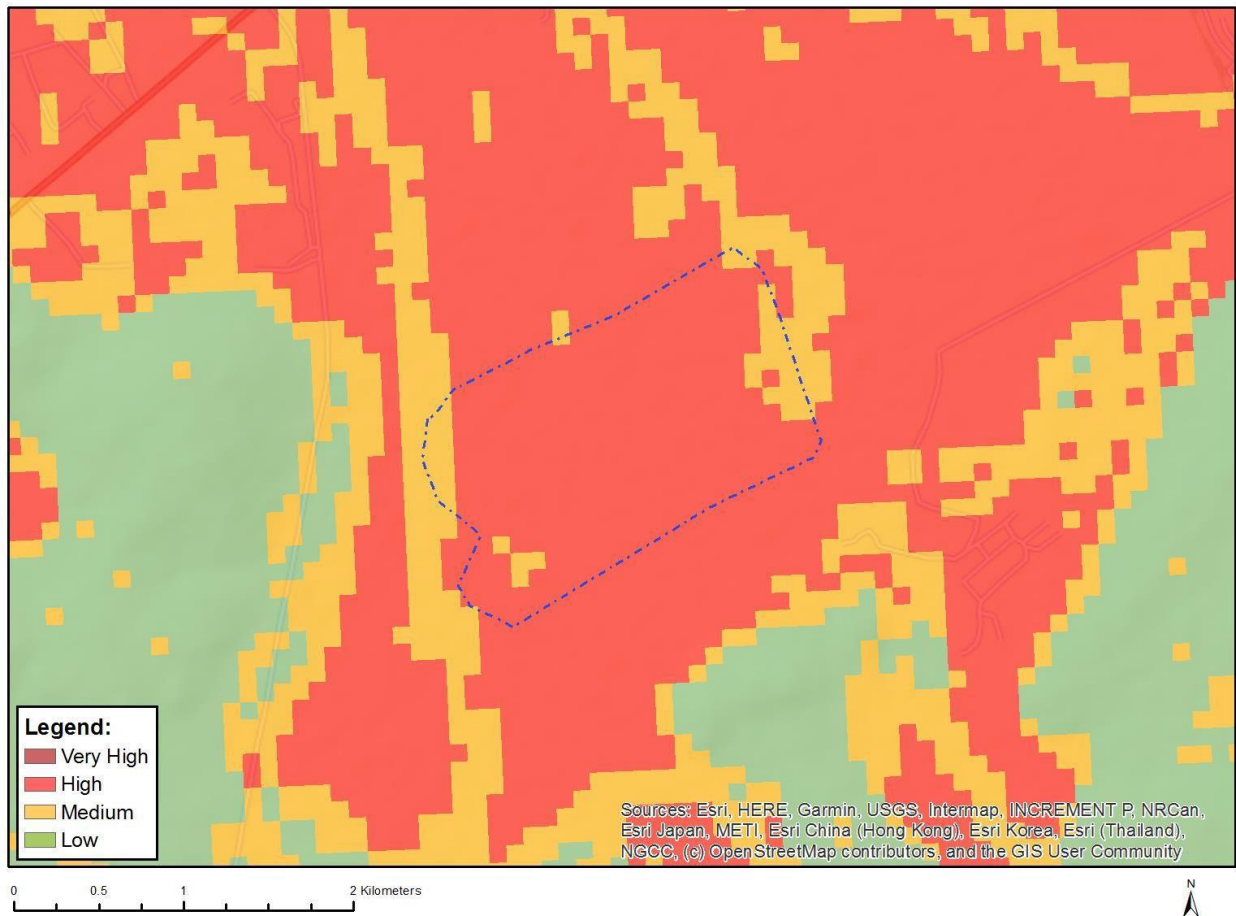


Figure 12: Agricultural Sensitivity Map

Sensitivity Features:

Sensitivity	Feature(s)
High	Land capability;09. Moderate-High/10. Moderate-High
Medium	Land capability;06. Low-Moderate/07. Low-Moderate Moderate

Findings by the Specialist: The site visit was done on the **09 September 2024**. The findings of study area (**Appendix A**) are summarized below:

The majority of the study area is characterised by shallow soils (50.6% of the study area), which are more suited for grazing activities. Arable soils constitute 49.3% of the total study area. With that said, an agricultural impact is any alteration that influences the future capacity for agricultural production on a specific land area. This alteration often occurs when agriculture is excluded from a region undergoing

development. Furthermore, the reduction in agricultural production potential can be due to factors like soil erosion, compaction, pollution, and deterioration. The development footprint presents areas of livestock grazing and abandoned cultivation practices. This can be attributed to constraints such as limited rainfall, low-water nutrient holding capacity, low nutrient holding capacity, limited soil depth in some places and limited drainage. Because of these constraints, the site is considered marginal for viable rainfed cropping. Although there may have been farming activities at the location in the past, its limited potential presents a significant economic risk. It's essential to acknowledge that the feasibility of growing crops changes as the agricultural industry progresses over time. Areas previously used for farming may be deserted because they are not suitable for a more demanding agricultural economy with higher input costs. According to the desk-based assessment (i.e., sourced from the Natural Agricultural Resource Atlas of South Africa database), the grazing capacity for this area is 5 Hectares per livestock unit, which is considered marginal for large-scale livestock farming. The proposed solar project is not expected to significantly impact agriculture, as the existing grazing activities can be relocated to other portions of the farm.

Conclusion: In this case, the study area is considered below the threshold for needing conservation as agricultural production land due to its limitations that make it unsuitable for cropping. If this land were used for non-agricultural purposes, it would lead to minimal loss of agricultural production potential in relation to national food security. As a result, the overall adverse agricultural impact of the development (loss of future agricultural production potential) is regarded as having low significance. Therefore, the site area is rated **Low sensitivity**.

6.2.2 Plant Species

Screening Tool: The report indicates that the site’s plant theme is **Medium** Sensitivity.

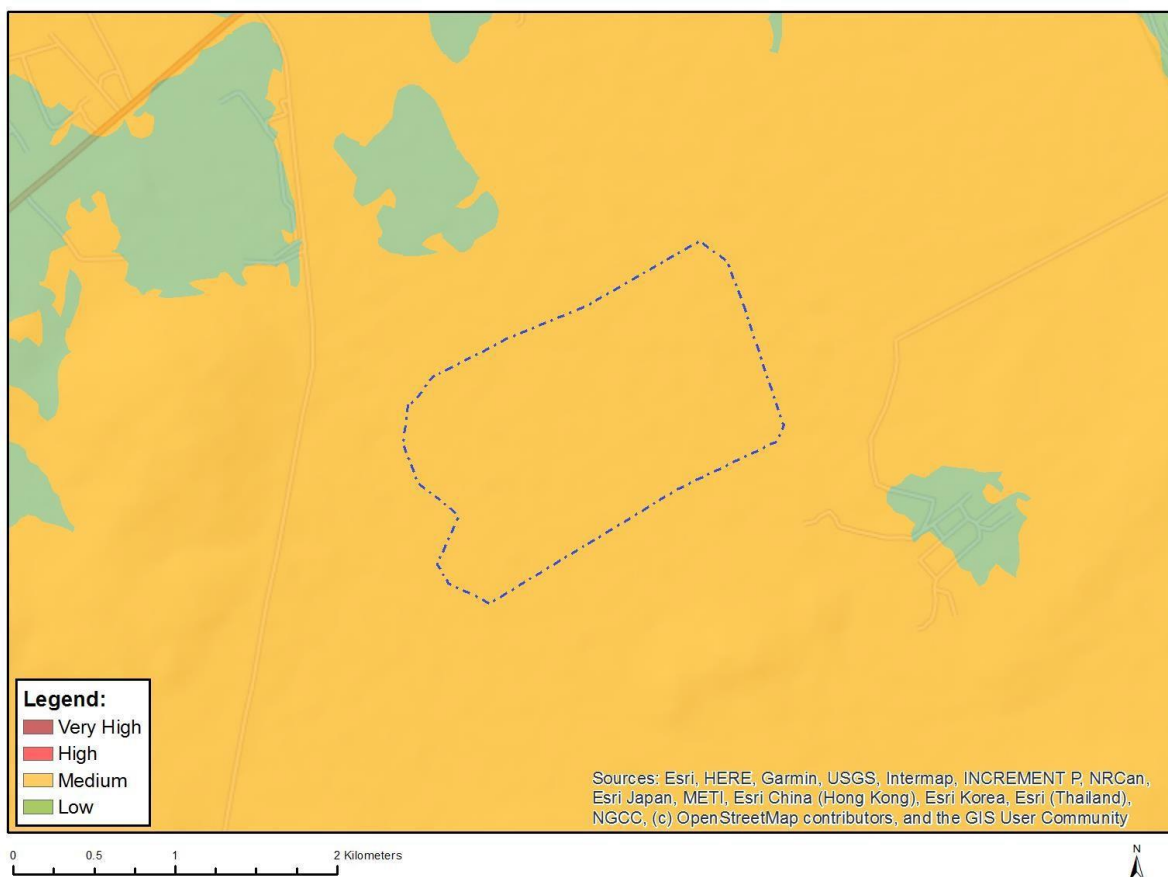


Figure 13: Plant Sensitivity Map

Sensitivity features:

Sensitivity	Feature(s)
Medium	Sensitive species 1252
Medium	Sensitive species 587
Medium	Asparagus fourrei
Medium	Sensitive species 124
Medium	Polygala sekhukhuniensis
Medium	Searsia batophylla
Medium	Searsia sekhukhuniensis
Medium	Combretum petrophilum

Findings by the Specialist: The field inspection was conducted on 25 may and 07 June 2024 confirmed that plant species diversity on the proposed land is very low. It was worth noting that all sensitive species depicted by the screening tool were not recorded during the field visit. In addition, the assessment reported (**Appendix B**) no species of conservation concern. This is also supported by the approval of the area for Fetakgomo-Tubatse Special Economic Zone (FTSEZ).

Conclusion: The sensitivity theme for plant species is considered of Low sensitivity.

6.2.3 Animal Species

Screening Tool: The report indicates that the animal theme rating is **Medium** Sensitivity.

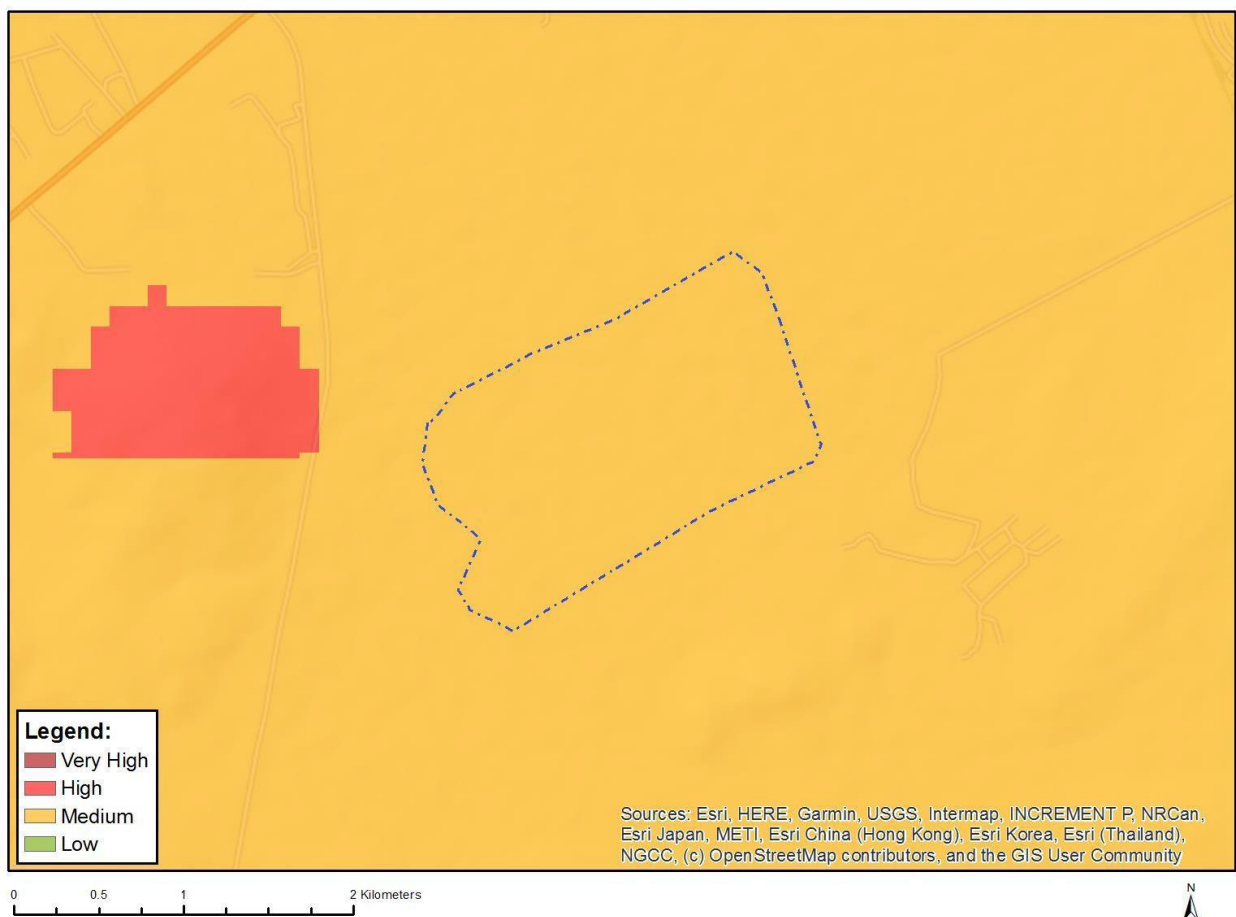


Figure 14: Animal Sensitivity Map

Sensitivity features:

Sensitivity	Feature(s)
Medium	Aves-Podica senegalensis
Medium	Aves-Sagittarius serpentarius
Medium	Aves-Aquila rapax
Medium	Mammalia-Crocidura maquassiensis
Medium	Mammalia-Lycaon pictus
Medium	Reptilia-Kinixys lobatsiana

Findings by the Specialist: The site visit was done on the 09 September 2024. The site visit entailed walking through the entire study site while investigating both fauna and flora. The findings of the study are summarized below:

According to the 2018 Limpopo Province Map of Critical Biodiversity Areas, the study area is located within an Ecological Support Areas (ESA 1)

The study area consists of the SVcb 27 Sekhukhune Plains Bushveld vegetation type, The broader area has been degraded in places and overexploited by man for cultivation, mining and human settlements, and thus creating the following habitats groups:

- Open to closed thornveld Habitat;
- Wetland/Aquatic Habitats; and
- Disturbed Areas.

None of the sensitive mammals which were expected were spotted on site except for droppings of smaller mammals such as hare or rabbit species.

A few avifaunal species were spotted onsite during the site visit, the species were observed within a watercourse and within the development area. None of the Red Data bird species that are likely to found onsite were observed during the site inspection. The study area is expected to have only “Least Concern” species of butterflies. A single butterfly specie was observed onsite (Least concern specie), in addition that was evidence of a snail and spiderwebs.

The National Web Based Screening Tool rated the Animal Species Theme for the study area as ‘Medium Sensitivity’ on account of the potential presence of several threatened fauna species. One species highlighted in the screening report as a sensitive feature was Sagittarius serpentarius which was not

observed on-site during the site inspection. Based on the findings of this study (**Appendix C**), the sensitivity rating for the study area is therefore rated ‘**Medium**’

Conclusion: In accordance with the outcomes of the impact assessment, and taking cognisance of the baseline conditions presented herein, as well as the impact management measures, the proposed Project, is not deemed to present significant negative ecological issues or impacts, and it should thus be authorised. In addition, the online screening tool indicated that the site has a medium sensitivity for animal species theme, as the specialist I can confirm that sensitivity is medium due to the decreased number of species over the last 50 years. The large mammals have either moved away due to the disturbance or have been hunted.

6.2.4 Aquatic Biodiversity

Screening Tool: The report indicates that the Aquatic Biodiversity theme rating is **Low** Sensitivity

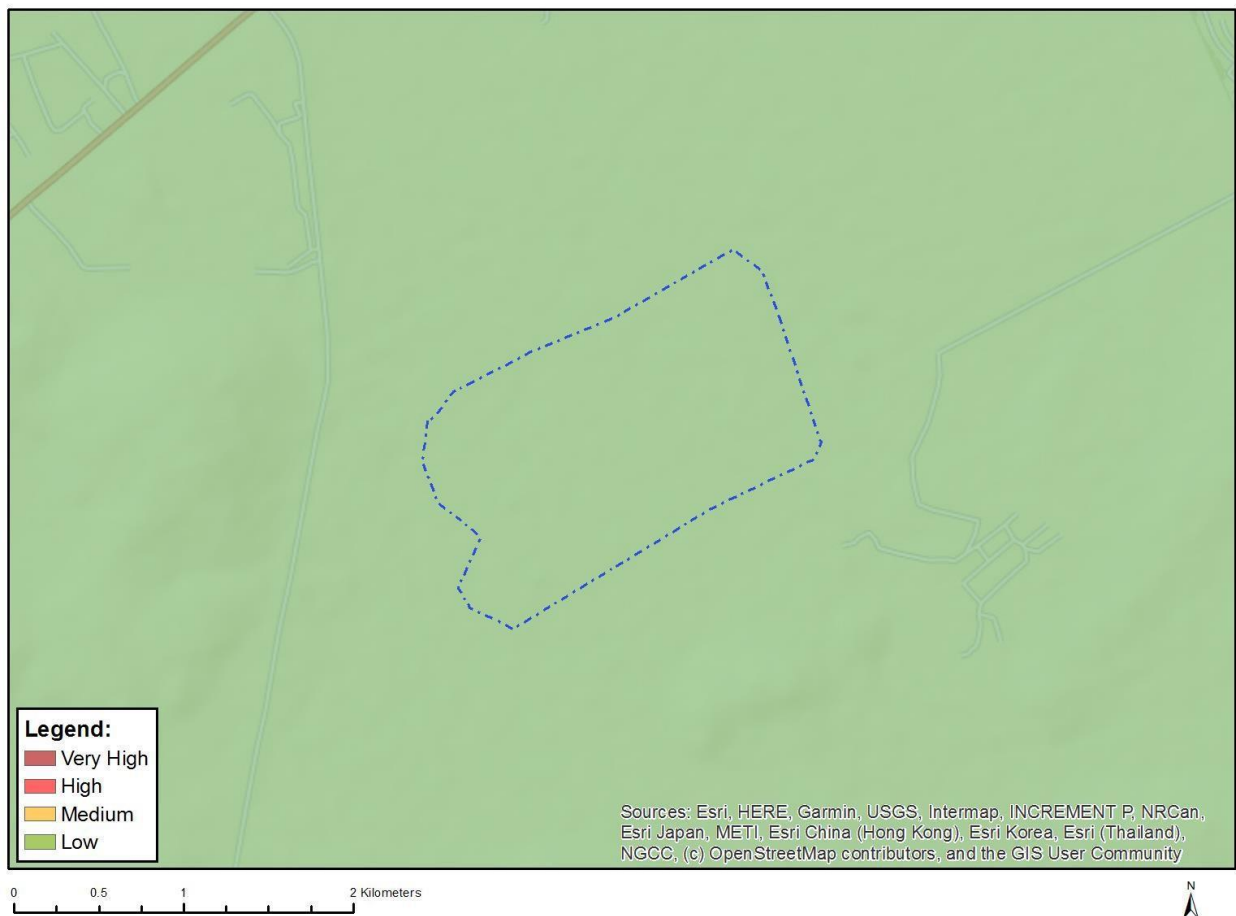


Figure 15: Aquatic Sensitivity Map

Sensitivity features:

Sensitivity	Feature(s)
Low	Low sensitivity

Findings by the Specialist: The survey was conducted towards the beginning of the spring season, on the 09 September 2024. The proposed development is located within 500m of the two non-perennial rivers, which are located on the northeast and southwest. The watercourse located northeast of the study area is linked to a wetland, which was also observed to be dry during the site inspection. The vegetation associated with this watercourse serves a habitat for avifauna species and smaller species. The watercourses play a critical role in conveying water during and immediately after rainfall events. The watercourse on the southwest does not retain water for long compared to the watercourse on the northeast, because it did not have any hydrophytes.

Conclusion: The study site falls under the Olifants Water Management Area (WMA=3), under the Steelpoort Sub Water Management Area (SWMA=63). The site is located within 500m of two watercourses (Non-Perennial Rivers) and a single natural wetland. The online screening tool report identified the Aquatic Biodiversity Theme as “Low”, which can be attributed to the presence of watercourses on the both the northeast and southwest of the property boundaries. Based on the site inspection (**Appendix D**) the sensitivity of Aquatic Biodiversity theme is indeed “Low”, due to the non-perennial nature of the watercourses onsite. The ecological significance of the dry watercourses should be viewed in the context of the overall level of functionality of the catchment, and the integrity of the freshwater ecosystem.

6.2.5 Terrestrial Biodiversity

Screening Tool: The report indicates that the Terrestrial Biodiversity theme rating is **Very High** Sensitivity

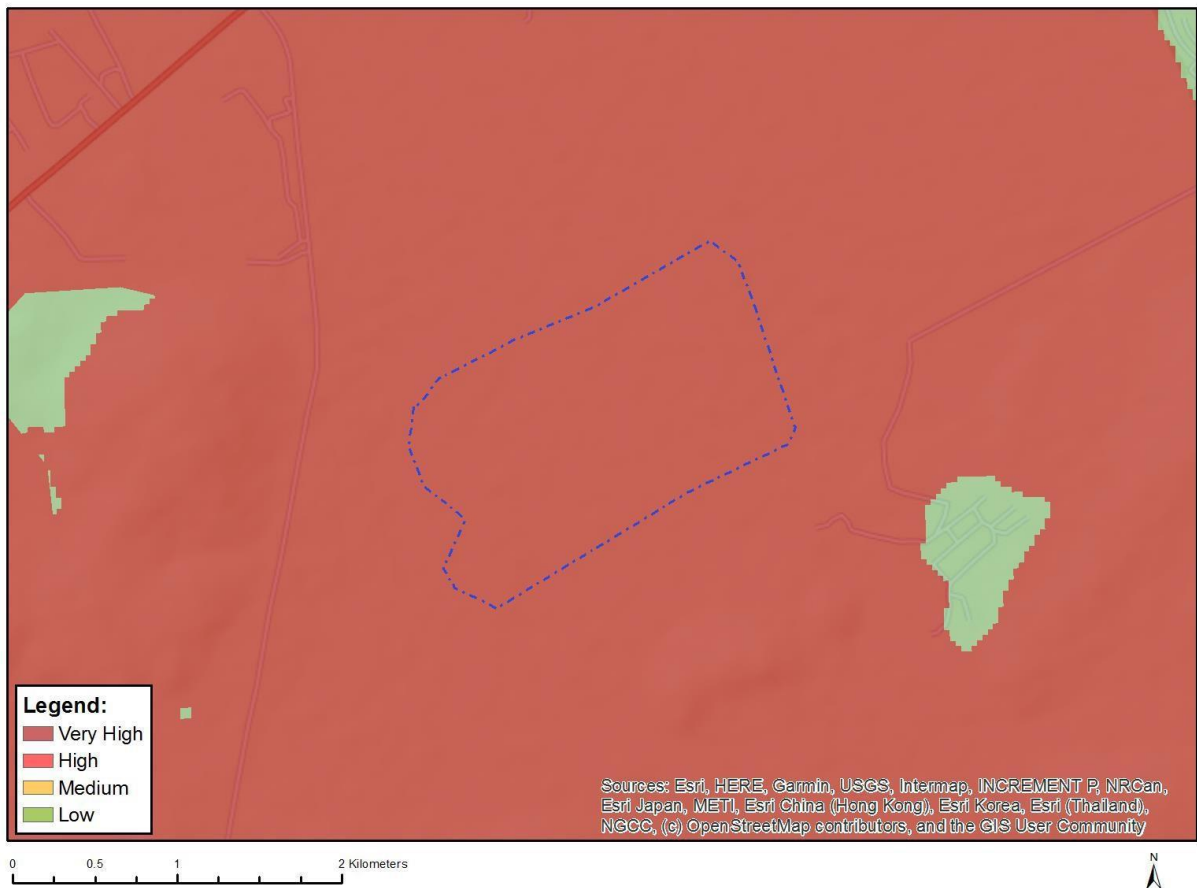


Figure 16: Terrestrial Biodiversity Sensitivity Map

Sensitivity features:

Sensitivity	Feature(s)
Very High	ESA 1
Very High	EN_Sekhukhune Plains Bushveld

Findings by the Specialist: The proposed site is said to be of medium sensitivity theme because it falls within the Ecological Support Area 1. However, the site doesn't have the presence of strategic water source areas (SWSAs) or freshwater ecosystem priority area (FEPA). Furthermore, there are no sensitive

species and within the site and it are dominated by indigenous species of least concern. Moreover, there is a less diversity of species recorded within the site. (Appendix E)

Conclusion: Based on our findings, the proposed site is said to be of “medium” sensitivity.

6.2.6 Avian

Screening Tool: The report indicates that the Avian theme rating is Low Sensitivity

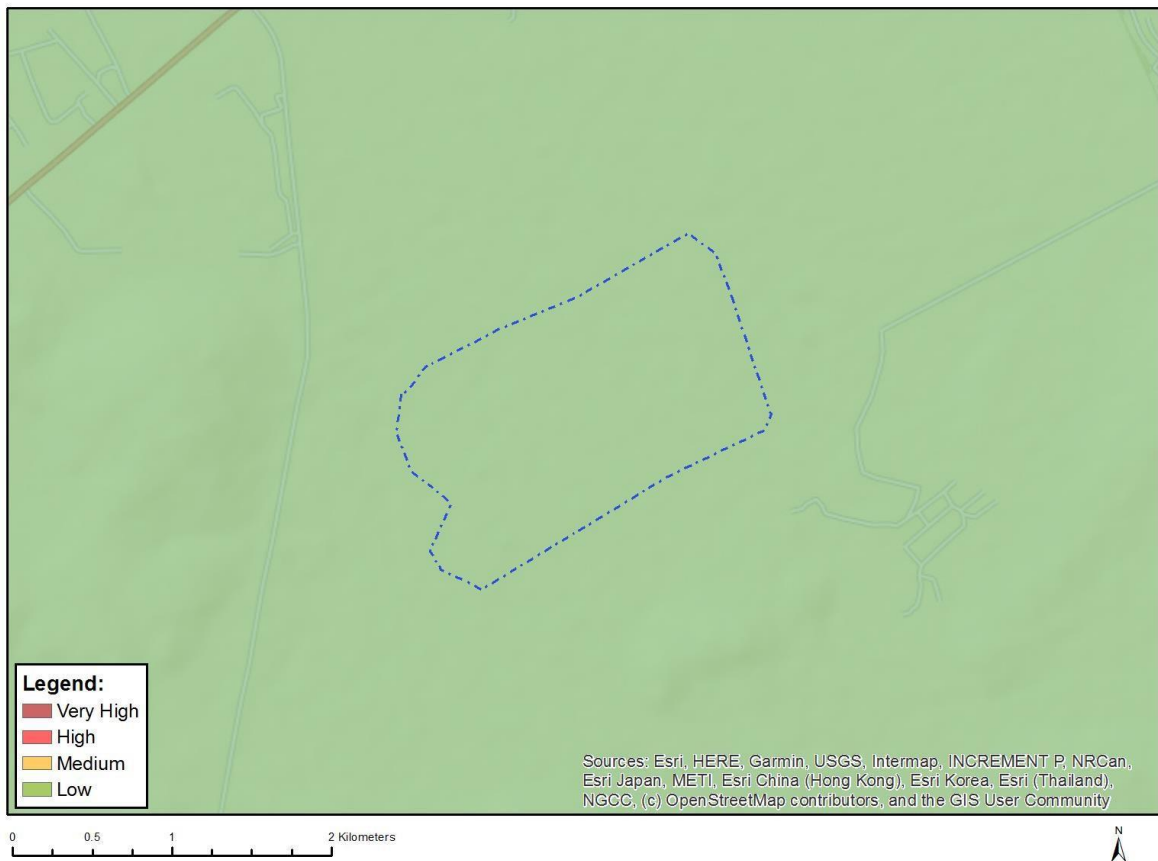


Figure 17: Avian Sensitivity Map

Sensitivity features:

Sensitivity	Feature(s)
Low	Low Sensitivity

Findings by the EAP: The proposed development does not encompass the construction of tall infrastructure that might have a negative impact on the avian

Conclusion: Therefore, the STR finding is accepted.

6.2.7 Civil Aviation

Screening Tool: The report indicates that the Civil Aviation theme rating is **Medium** Sensitivity

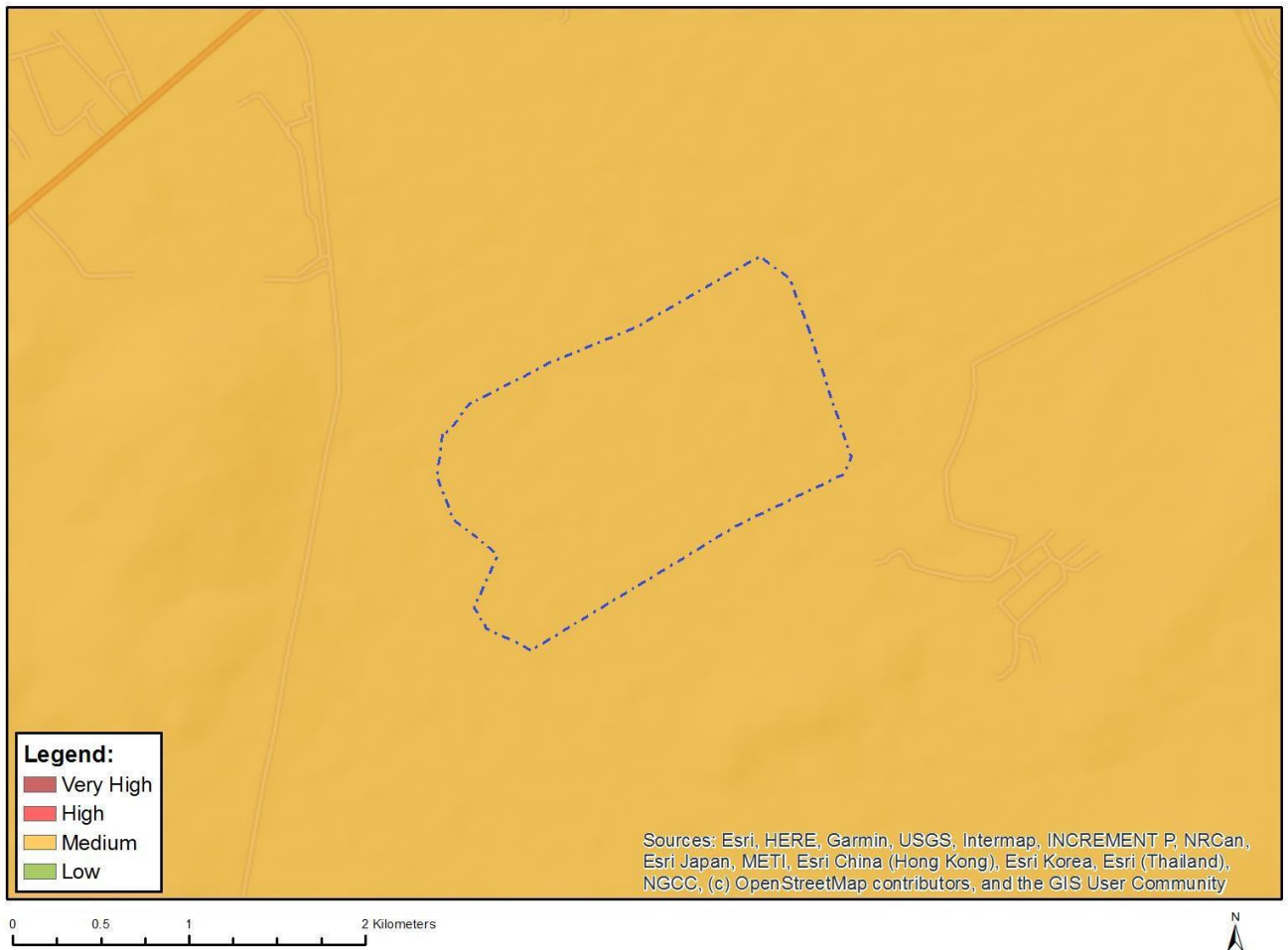


Figure 18: Civil Aviation Sensitivity Map

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Within 8 km of another civil aviation aerodrome

Findings by the EAP: The STR finding found that the subject site is not located between 8 and 15 km of civil aviation, the aviation which is near the site is located 98.16 km which is the Hoedspruit Airport.

However, the proposed development does not encompass the construction of tall infrastructure that might have a negative impact on the aerodrome routes.

Conclusion: The analysis did not observe any impacts on civil aviation as the aviation is located at 98.16 km from the site. The impact of the development on civil aviation is deemed to be medium by the EAP. Therefore, the STR finding is accepted.

6.2.8. Defence

Screening Tool: The report indicates that the Defence theme rating is **Low Sensitivity**

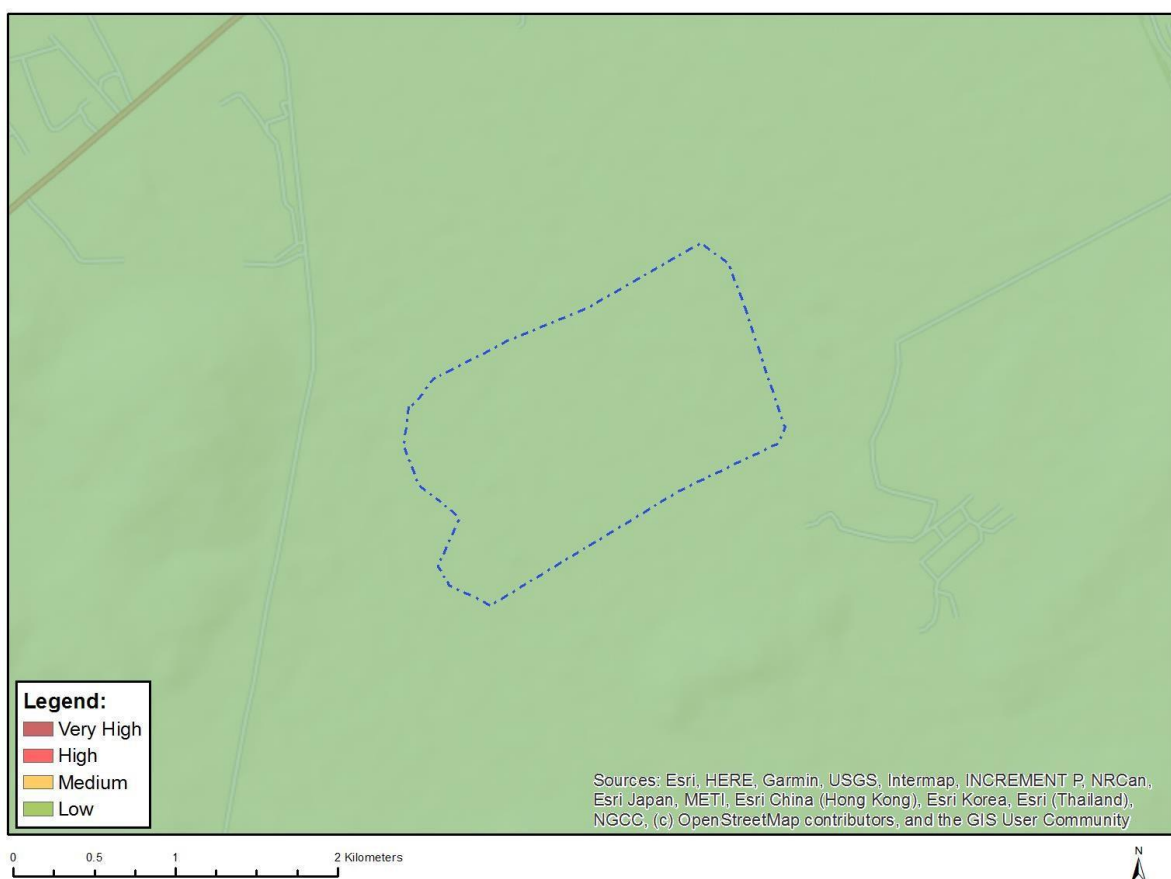


Figure 19: Defence Sensitivity Map

Sensitivity features:

Sensitivity	Feature(s)
Low	Low sensitivity

Findings by EAP: The impacts on defence will be low, as the defence force is located 104,20 km from the site.

Conclusion: The analysis did not observe any impacts on defence as it is located 104,20 km from the site therefore, the finding of the STR is hereby accepted.

6.2.9 Landscape and visual impact

Screening tool: The report indicates that the site’s Landscape theme is **Very High** Sensitivity.

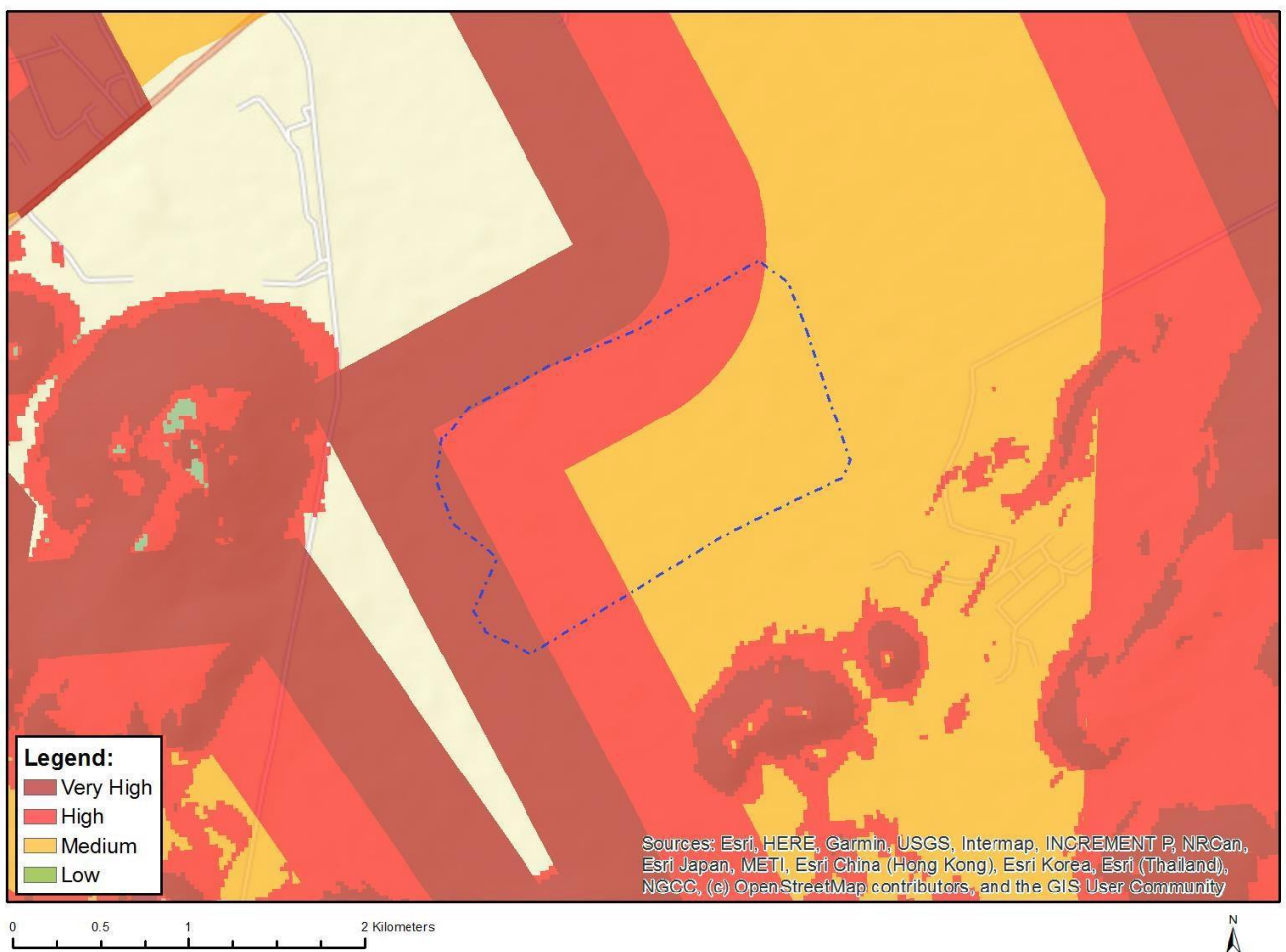


Figure 20: Landscape and visual Sensitivity Map

Sensitivity Features:

Sensitivity	Feature(s)
High	Between 500 and 1000 m of a town or village
Medium	Between a and 2 km of a town or village

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Medium	Between 3 and 5 km of a nature reserve
Very High	Within 500 m of a town or village

Findings by the EAP: The site is located between mines and within 500m of a village. However, the landscape of the area has been disturbed by the mining activities and the landscape associated with the solar project can be managed through the implementation.

Conclusion: The site has been zoned as the Fetakgomo- Tubatse Special Economic Zone (FTSEZ). And there are no towns near it expect mines and a village where people are intruding the Economic Zone. Therefore, the STR findings is deemed to be **medium** Sensitivity.

6.2.10 Paleontological

Screening Tool: The report indicates that the site’s paleontological theme is **Medium** Sensitivity.

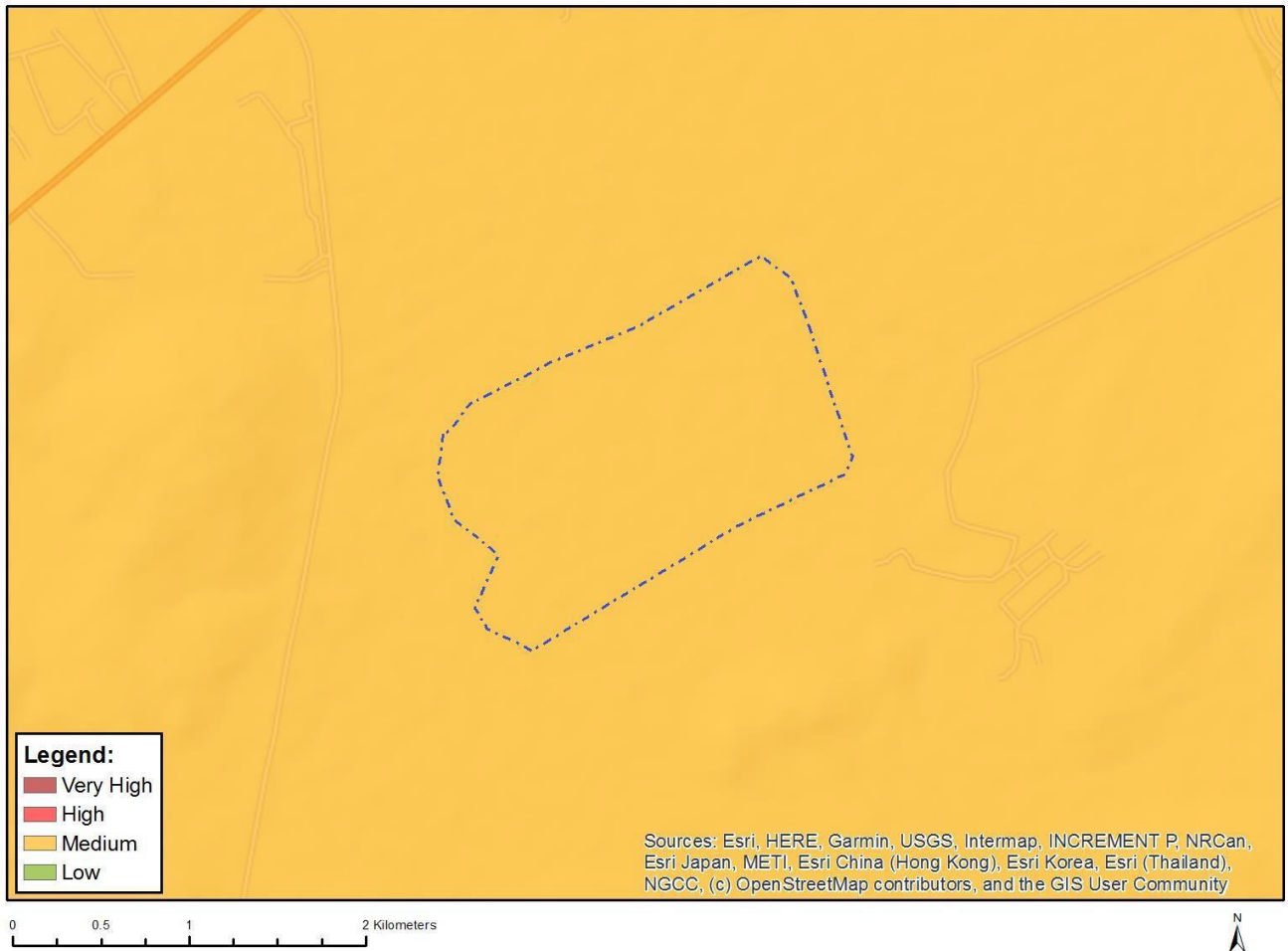


Figure 21: Paleontology Sensitivity Map

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Features with a Medium paleontological sensitivity

Findings by the EAP: The site is on plain land without paleontological artefacts to be in existence. However, if buried artefacts are exhumed during excavations; in such a situation proper channel of notifying LIHRA/ SAHRIS will be followed.

Conclusion: The desktop analysis and site inspection were not able to observe paleontological artefacts as this cannot be seen on bare ground usually observed during excavations. The effects of the development are therefore low, hence, the finding of the STR is refuted.

6.2.11 RFI

Screening Tool: The report indicates that the site RFI theme is **Low** Sensitivity.

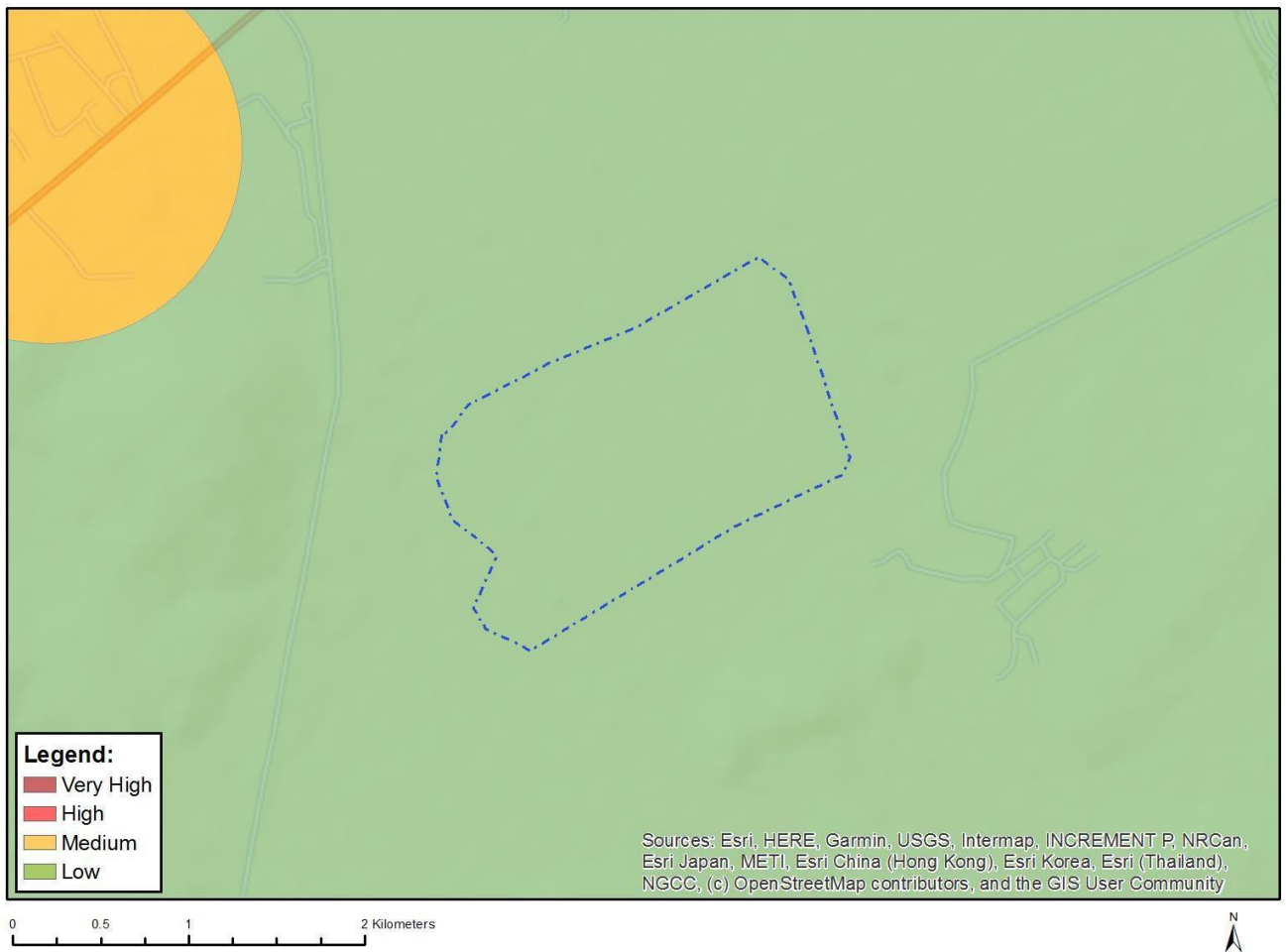


Figure 22:RFI Sensitivity Map

Sensitivity features:

Sensitivity	Feature(s)
Low	Low sensitivity

Findings by the EAP: There is no Radio frequency near the site.

Conclusion: The site is low in RFI activities, therefore the STR finding is accepted.

6.2.12 Archeology and Cultural Heritage

Screening Tool: The report indicates that the site Archeology and cultural theme is **Low** Sensitivity.

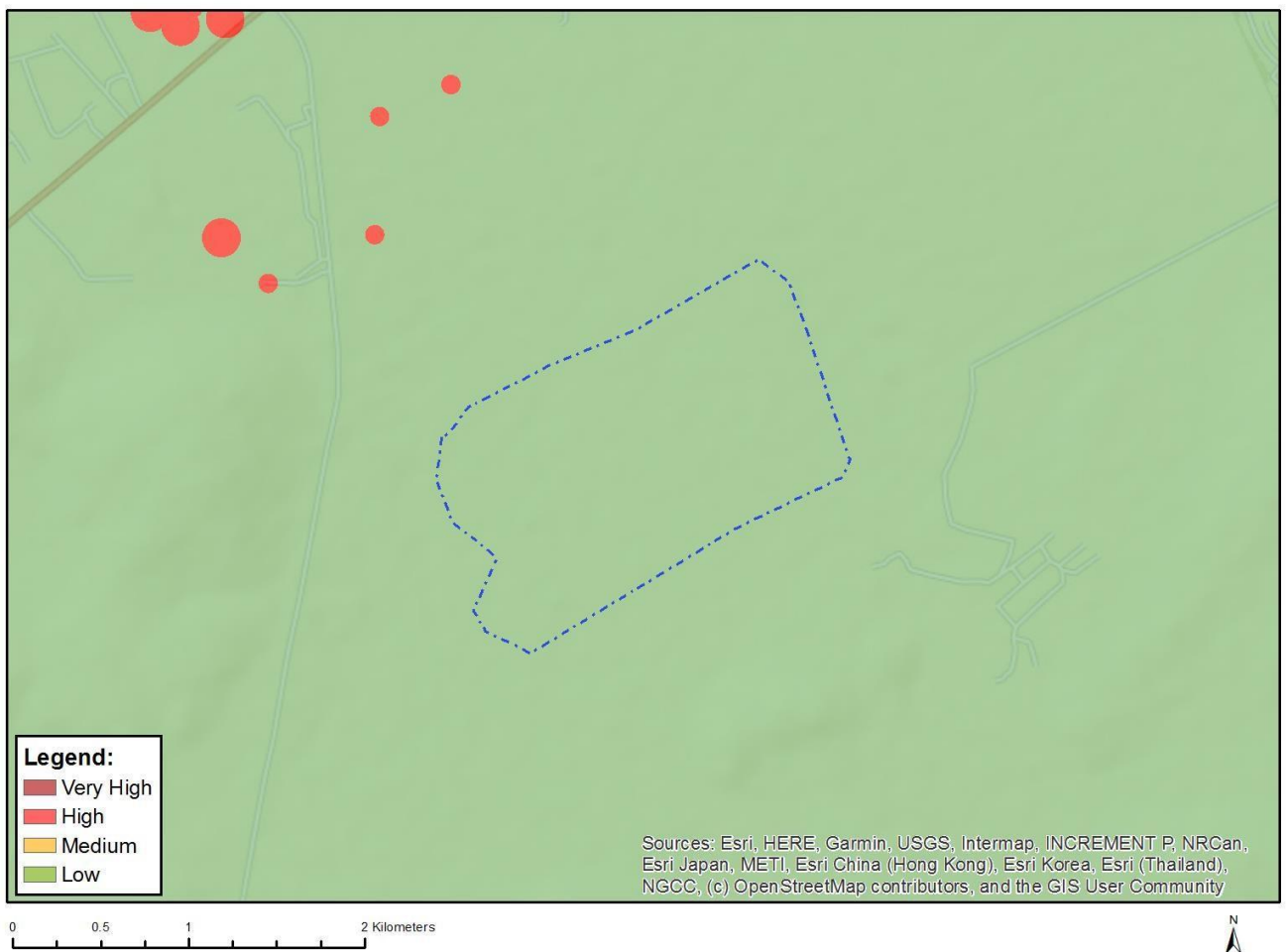


Figure 23: Archeology and Cultural Heritage Sensitivity Map

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

Findings by Specialist: The site visit was conducted on 09 August 2024 and the study (**Appendix F**) identified grinding stones, stone lining and potsherds within the proposed development site. The survey also recorded a burial site that is protected in terms of Section 36 of the NHRA. In terms of Section 34 of the NHRA, the survey recorded water reservoirs associated with previous agriculture activities within the proposed Leano Alpha Energy Solar development site. However, the ages of these structures could not be established during the survey. Given that the site yielded significant archaeological and historical signatures, it is imperative that a professional archaeologist must be appointed to monitor during clearance and earth moving activities at the proposed development site. The potential for chance finds is medium to high at the development. The Site is therefore rated **Medium** sensitivity.

Conclusion: It is important to note that due to the extensive disturbance from agricultural activities, water pipelines, roadworks, and livestock movement, archaeological findings mainly grinding stones and pottery have been exposed to destruction. This damage has reduced their size, leaving behind scattered fragments that may only be identified during land clearing, deep excavations, or construction activities. The chances of uncovering significant archaeological materials and midden(s) is high. As a result, the site is considered to have low archaeological significance. However, the site is protected in terms of Section 35 of the NHRA, as it remains part of a cultural landscape with the potential to yield important heritage resources. The primary goal is to avoid disturbing heritage sites. To meet this objective, construction activities should be monitored by a professional archaeologist, who will manage any incidental discoveries in accordance with the NHRA.

6.3 Summary of the Findings

Environmental Theme	STR Findings	Specialist/EAP Findings	Reports
Agriculture Theme	High	Low	Appendix A
Animal Species Theme	Medium	Medium	Appendix B
Aquatic Biodiversity Theme	Low	Low	Appendix C
Archaeological and Cultural Heritage Theme	Low	Medium	Appendix F
Avian Theme	Low	Low	-
Civil Aviation (Solar PV) Theme	Medium	Medium	-
Defence Theme	Low	Low	-
Landscape (Solar) Theme	Very High	Medium	-

Paleontology Theme	Medium	Low	-
Plant Species Theme	Medium	Low	Appendix D
RFI Theme	Low	Low	-
Terrestrial Biodiversity Theme	Very High	Medium	Appendix E

6.4 The Sensitivity Maps of the Area

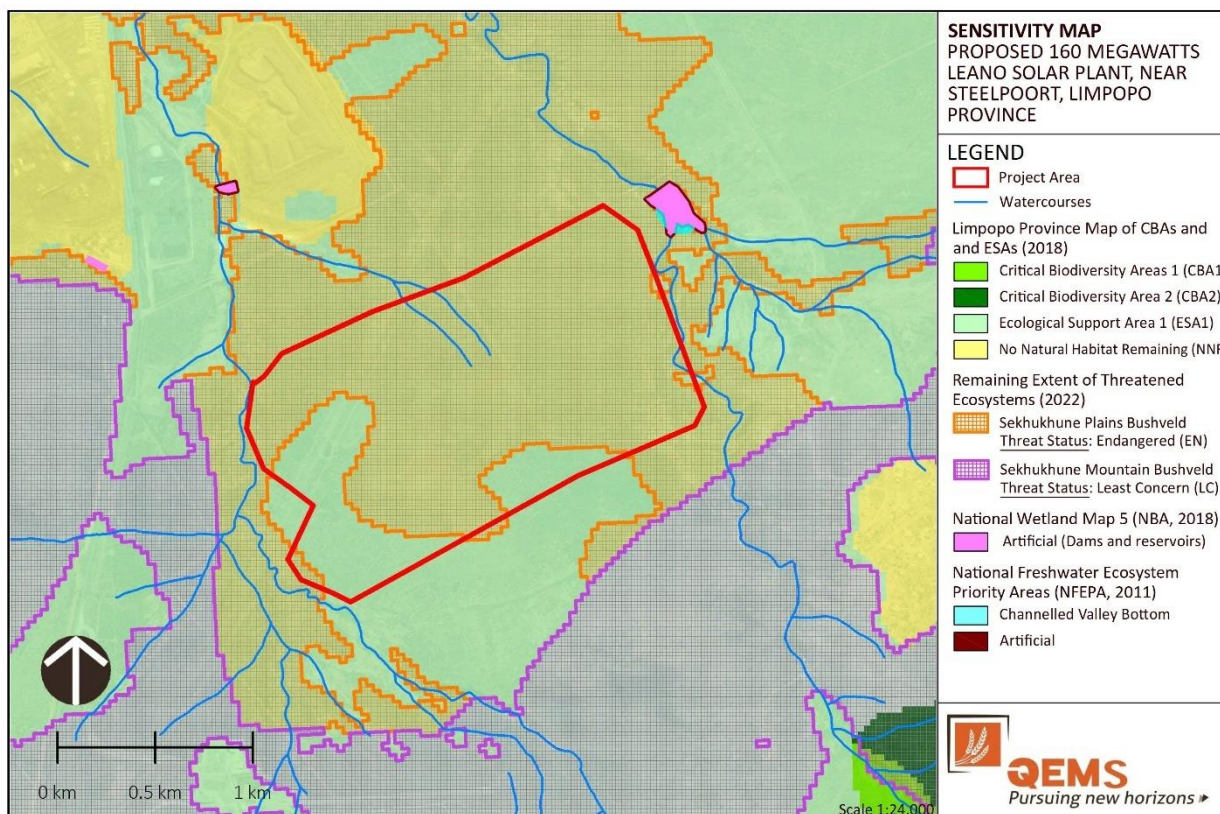


Figure 24: Sensitivity Map

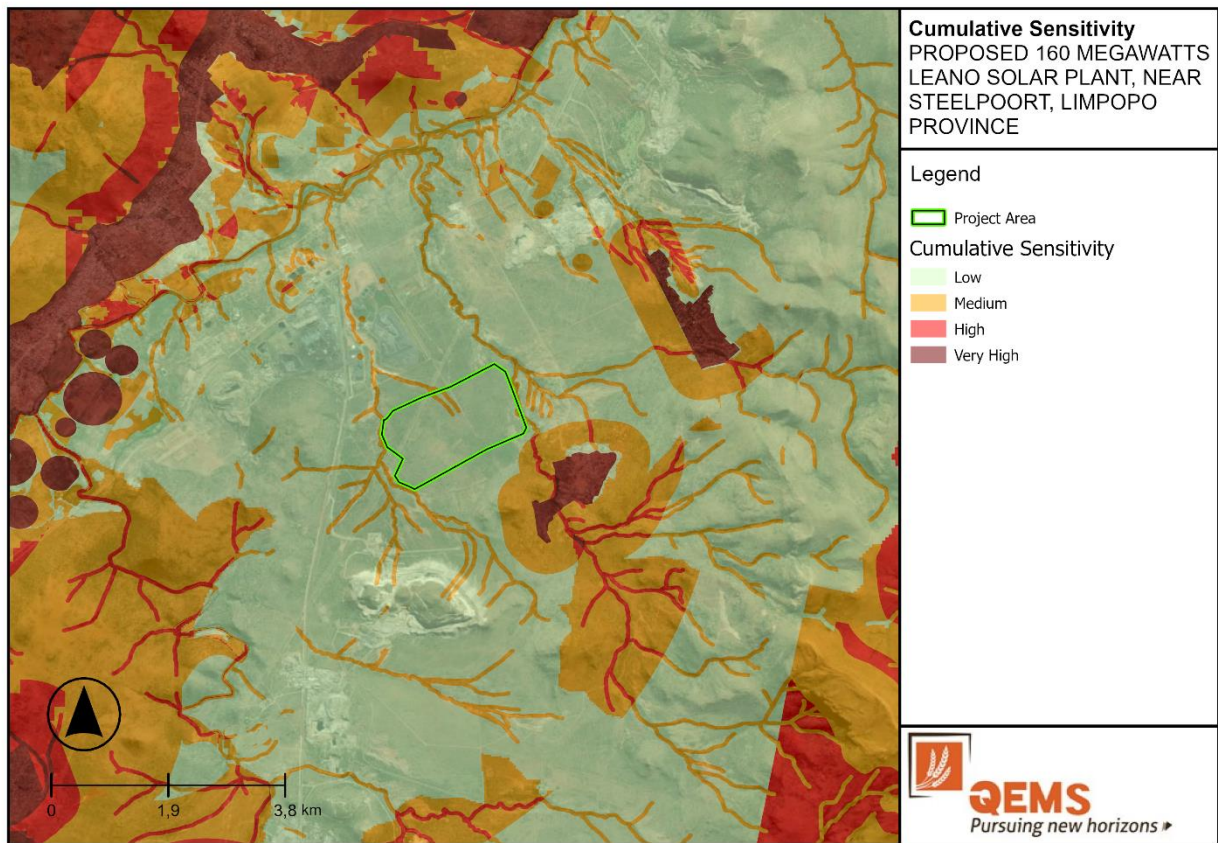


Figure 25: Cumulative Sensitivity Map

SECTION SEVEN: POTENTIAL IMPACTS FROM THE PROPOSED DEVELOPMENT

7.1. Introduction

The following are the possible potential impacts of the proposed project in the area during construction and operation phase. The mitigating measures are included in EMPr.

a. Dust

Construction

Dust from construction activities will be from construction vehicles, the dust will be below the regulated standards, and it can be easily mitigated through using dust suppression measures.

Operation

No dust will be produced during the operational phase of the proposed development.

b. Noise

Construction

High level of construction noise from the movement of heavy construction vehicles and machinery may be produced however to mitigate or manage construction noise construction vehicles can be fitted with noise suppressing equipment such as noise barriers, mufflers, and silencers, Since the proposed development is located near a residential area it is deemed necessary to limit the operating hours and frequency of noisy activities.

Operation

During operational phase noise from the proposed development will be below the regulated limits, noise is considered negligible during the operational phase.

c. Potential Soil Contamination

Construction

Construction vehicles may release hazardous waste which can contaminate the soil; however, this can be managed effectively by making use of drip trays on site.

Operation

No possible soil contamination impact is anticipated during the operational phase of the proposed project.

d. Potential Water Contamination

Construction

No potential water contamination is anticipated during the construction phase. However possible water contamination may be from leaking construction vehicles, in such an event mitigating measure will be outlined in the EMPr.

Operation

No potential water contamination is anticipated during the operational phase of the proposed project.

e. Visual Impacts

Construction

During the construction phase visual impacts will be caused by stockpiles and construction activities.

Operation

Visual impact will be due to infrastructural development. The proposed development may cause light pollution to the neighbours and drivers driving on the R555 road.

f. Biodiversity

Construction

During construction phase, loss of potential habitat due to vegetation clearance to construct the said development.

Operation

No impacts on fauna or flora are anticipated during the operational phase.

g. Soil and Agricultural Potential

Construction

Soil erosion, loss of topsoil, deterioration of topsoil quality due to excavation. The subsistence agricultural land will be lost as a small portion of farming is within the proposed development. However, the site is located in the area zoned as a business development.

Operation

No loss of agricultural land is anticipated during the operational phase.

I. Archaeological, Heritage and Cultural Resources

Construction

No heritage or cultural sites were found on the project site. However, during construction phase archaeological artefacts can be exhumed and destroyed, if any artefacts are encountered construction works should cease immediately; LIHRA and SAHRIS and should be notified within 24hrs of the findings.

Operation

No impacts are anticipated during operational phase.

j. Social Environment

Construction

During construction phase job opportunities will arise which will attract a lot of people seeking employment to flood the area in search of job opportunities. The influx of people to the site area will compromise the safety of neighbours as some of these people might resort to stealing.

Operation

The proposed development will have positive impacts during the operational phase. Some residents will be appointed to work during operation phase. The infrastructural development in the area will eliminate areas targeted and or used by criminals as hideouts. The project will enhance the availability of electricity in the area.

SECTION EIGHT

ANY FATAL FLAWS

In conducting this environmental screening and site verification, no major concerns considered fatal were identified. The following environmental features with the project site should receive sufficient consideration in further specialist environmental studies:

Ground suitability - Condition of the grounds ability to support the proposed Solar and its associated infrastructure.

Solar plant infrastructures are usually built with steel installed in the ground. It is important to establish the rock and soils stability through a proper Geotech study. Moreover, specialist will help with identification of geohydrological conditions on the site, identification of groundwater impacts, define the groundwater quality and propose a groundwater management plan.

Project design considerations:

- Specialist studies may recommend repositioning infrastructure based on findings
- The layout plan submitted with the Environmental Impact Report may therefore still change.

SECTION NINE

ASSUMPTIONS AND LIMITATIONS

The findings of this SVR are based on the available project information, the site verification conducted from 25 May 2024 to 09 September 2024, and GIS based desktop information available for the project site.

This report was conducted based on desktop studies particularly the DFFE Screening Tool and a comprehensive site visit. It should be noted that the DFFE screening tool provides description based on spatial data from various datasets. It is therefore essential to verify the data contained in the DFFE screening report on-site. Some of the discrepancies were identified between the DFFE screening report and the onsite verification and are detailed in the sections above. Furthermore, the findings discussed in this report may change as further studies are undertaken.

SECTION TEN

CONCLUSIONS

This SVR was prepared for the proposed establishment of Leano Alpha Energy Solar Plant Development and its associated infrastructure on 300 ha piece of land. The said development would be located on portions 16,17,18,21,22 and 23 in Spitskop 333 KT Farm within Feta-Kgomo Tubatse Local Municipality, Sekhukhune District Municipality, Limpopo Province.

The environmental screening and verification exercise was conducted based on available project information, the site inspection conducted from 25 May 2024 to 09 September 2024, and a desktop analysis of the project site.

The possible environmental authorisation processes and associated permit application has been identified based on the project scope of activities. The project authorisation and permit requirements include:

- Norms and Standards for the exclusion of the development and expansion of solar photovoltaic facilities in area of low or medium environmental sensitivity.in terms of section 24(10) of the National Management Environmental Act, 1998 (Act No.107 of 1998) and exclude, in terms of section 24(2)(d) of the National Environmental Management Act, 1998 (Act No.107 of 1998) activities identifies in terms of section24(2)(a) and (b) of the National Environmental Management Act, 1998 (Act No.107 of 1998) for the expansion of solar photovoltaic facilities, including any associated activity or infrastructure, from the requirement to obtain an environmental authorization, based on compliance with the norm.
- A Water use license from DWS (if necessary, since LEDA should provide all the tenants with this)

The above environmental authorization processes will be integrated as far as possible.

Based on the environmental screening exercise and site verification conducted for the project the following specialist studies was conducted:

- Agricultural Impact Assessment
- Plant Impact Assessment
- Animal Impact Assessment

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- Aquatic Impact Assessment
- Terrestrial Biodiversity Impact Assessment
- Archeology and Cultural heritage Impact Assessment

Based on the environmental screening exercise and site verification conducted for the project the following specialist studies will be conducted:

- Visual Impact Assessment during the operational phase
- Geotechnical investigation

More studies or input requirements may be identified through the norm and standards process, public consultation, or authority involvement, yet it is the considered view of the EAP that the above specialist investigations are adequate to inform the decision making of the DFFE.

APPENDICES



QEMS

Pursuing new horizons ▶

ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE PROPOSED DEVELOPMENT OF A 160 MEGAWATTS LEANO ALPHA ENERGY SOLAR PROJECT LOCATED ON PORTIONS 16,17,18,21,22 AND 23 OF THE FARM SPITSKOP 333 KT IN STEELPOORT WITHIN THE JURISDICTION OF FETA-KGOMO TUBATSE LOCAL MUNICIPALITY, SEKHUKHUNE DISTRICT, LIMPOPO PROVINCE.

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Prepared For:

ASCENG (Pty) LTD
62 Clydesdale Avenue Waterfall Equestrain
Sunninghill, 2052

SEPTEMBER 2024

DOCUMENT SYNOPSIS


Item	Description
Proposed development and location	The Proposed Development of a 160 Megawatts Leano Alpha Energy Solar Project Located on Portions 16,17,18,21,22 And 23 of the farm Spitskop 333 KT in Steelpoort within the Jurisdiction of Feta-Kgomo Tubatse Local Municipality, Sekhukhune District, Limpopo Province.
Purpose of the study	Environmental Management Programme for the proposed development of a 160 Megawatts Leano Alpha Energy Solar Project Located on Portions 16,17,18,21,22 And 23 of the farm Spitskop 333 KT in Steelpoort within the Jurisdiction of Feta-Kgomo Tubatse Local Municipality, Sekhukhune District, Limpopo Province.
1:50 000 Topographic Map	Attached as Appendix A1
Coordinates	24°50'0.16"S, 30° 8'25.21"E.
Municipalities	Feta-Kgomo Tubatse Local Municipality.
Predominant land use of surrounding area	Mining
Applicant	ASCENG (Pty) Ltd
Prepared for:	ASCENG (Pty) Ltd 62 Clydesdale Avenue Waterfall Equestrain Sunninghill 2052
Prepared by:	QEMS Management and Business Solutions 7 Munnik Avenue Sterpark Polokwane 0700
Author	Dr T. P. Sithole
Date of Report	SEPTEMBER 2024
Signature	Signature: 

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ACKNOWLEDGEMENTS

The author acknowledges ASCENG (Pty) Ltd for their assistance with project information, layouts and associated project background information documents (BID) as well as responding technical queries related to the project.

TERMS AND DEFINITIONS

AUDIT: Regular inspection and verification of Construction activities for implementation of the approved EMP.

CONTRACTOR: Construction companies are appointed on behalf of the client to undertake the Construction activities, as well as their subcontractors and suppliers.

DEVELOPMENT SITE: Boundary and extent of development works and infrastructure.

DFFE: Department of Forestry, Fisheries and the Environment.

DWS: Department of Water and Sanitation

EAP: Environmental Assessment Practitioner.

EMERGENCY SITUATION: An incident, which potentially has the ability to significantly impact on the environment, and which, could cause irreparable damage to sensitive environmental features. Typical situations entail amongst others.

EMP: Environmental Management Plan.

EMPR: Environmental Management Programme Report. The EMPR for the project sets out general instructions that will be included in a contract document for the Construction phase of the project. The EMPR will ensure the Construction activities are conducted and managed in an environmentally sound and responsible manner.

ENVIRONMENT: The environment means the surroundings within which humans exist and that could be made up of water, air, soil, sand, plants and animals.

ENVIRONMENTAL ASPECT: An environmental aspect is any component of a contractor's Construction activity that is likely to interact with and on the environment.

ENVIRONMENTAL CONTROL OFFICER: A qualified person nominated by the appointed contractor and/or client who will ensure the day-to-day implementation of the EMP by contractors during Construction and operation of the project.

ENVIRONMENTAL IMPACT: An impact or environmental impact is the change to the environment, whether desirable or undesirable, that will result from the effect of a Construction activity. An impact may be the direct or indirect consequence of a Construction activity.

ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr): A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive environmental impacts and limiting or preventing negative environmental impacts are implemented during the life-cycle of the project. This EMPr focuses on the construction phase, operation (maintenance) phase and decommissioning phase of the proposed project.

GENERAL WASTE: Domestic waste, commercial waste, non-hazardous industrial waste and builders rubble e.g. paper, plastics, food, tins, wood, etc.

GROUNDWATER: All subsurface water in rocks and soil pore spaces and in the fractures of rock formations, and it moves under the influence of gravitation.

HAZARDOUS WASTE: It is any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.

HERITAGE RESOURCES: This means any place or object of cultural significance, including all human-made phenomena and intangible products that are the result of the human mind. Natural, technological or industrial features may also be part of heritage resources, as places that have made an outstanding contribution to the cultures, traditions and lifestyles of the people or groups of people of South Africa

HERITAGE: That which is inherited and forms part of the National Estate (historical places, objects, fossils as defined by the National Heritage Resources Act, 1999 (Act No. 25 of 1999).

IEM: Integrated Environmental Management.

IMPACT: A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

LEDET: Department of Economics Development, Environment and Tourism Limpopo

MITIGATION: Are measures designed to prevent, reduce or remedy adverse impacts.

NEMA: National Environmental Management Act.

NEMAQA: National Environmental Management Air Quality Act.

NEMWA: National Environmental Management Waste Act.

PALAEONTOLOGY: Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

POLLUTION: The National Environmental Management Act, 1998 (Act No. 107 of 1998) defined pollution to mean any change in the environment caused by – substances; radioactive or other waves; or noise, odours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.

- Potential damage, erosion and slumping of unstable river embankments or drainage channels.
- Potential event of impeding the continuous flow of water to downstream water users dependent on the flow.

PROJECT/SITE MANAGER: A person who represents the client and is responsible for enforcing the technical and contractual requirements of the project.

SAHRA: South African Heritage Resource Agency

SITE INSPECTION: Is an Environmental Inspection/regular check in to ensure compliance with the EMP. To ensure safety standards and working conditions are met. The findings of these inspection must be recorded on the Site Environmental Control Report.

SOLAR PLANT: is any facility that converts sunlight directly, like photovoltaics, or indirectly, like solar thermal plants, into electricity.

SOLID WASTE: All solid waste, including Construction debris, chemical waste, excess cement/concrete, wrapping material, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

- Spill of petroleum products and lubricants into the aquatic system;
- that is identified as a waste by the relevant Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but—
- that is surplus, unwanted, rejected, discarded, abandoned or disposed of;
- that must be treated or disposed of; or

The Site Environmental Control Report must be submitted to the Project Manager on regular times. In case of non-compliance, the Project Manager and the contractor must be notified immediately.

TOPSOIL: The layer of soil covering the earth which provides a sustainable environment for the germination of seeds, allows water penetration, and is a source of micro-organisms and plant nutrients.


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

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

WATER POLLUTION: The National Water Act, 1998 (Act No. 36 of 1998 defined water pollution to be the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it – less fit for any beneficial purpose for which it may reasonably be expected to be used; or harmful or potentially harmful to the welfare, health or safety of human beings; to any aquatic or non-aquatic organisms; to the resource quality; or to property.

ENVIRONMENTAL ASSESSMENT PRACTITIONER

QEMS Management and Business Solutions cc (QEMS) is an independent environmental consultancy appointed by ASCENG (Pty) Ltd to undertake the required Environmental Management Services for the proposed development Leano Alpha Energy Solar Plant in Steelpoort within the jurisdiction of Feta-Kgomo Tubatse Municipality in Limpopo Province. Refer to Table 1 below for EAP's details.

Environmental Assessment Practitioner:	QEMS Management and Business Solutions cc	
Contact Person:	Dr. Patrick Sithole Registered EAP (EAPASA) Registered Pr.Sci.Nat. (SACNASP) Registered Pest Control Operator (PCO) Registered Process Controller-IV (DWS)	
Address:	7 Munnik Avenue, Sterpark, Polokwane, 0699, South Africa	
Telephone	+ 27 15 297 8658/+27 76 859 8796	
E-mail/ Website	sitholetp@qems.co.za / www.qems.co.za	
Expertise	A Registered natural scientific professional (SACNASP – Environmental and Chemical scientist), Registered Environmental Assessment Practitioner (EAPASA), social and sustainability expert with 21 years of experience, Patrick Sithole specialises in Strategic Environmental, Social and Sustainable Development projects, Climate Change and Health, Environmental Management issues and Construction Supervision of all infrastructural projects. Dr Sithole is also involved in vegetation clearance and pest control projects along infrastructural projects e.g. roads, railway lines, power lines, golf courses and buildings like complexes, houses, malls, etc. Patrick has very strong business development mindset that has seen him winning and working on projects across Africa and in Europe. His key experience includes the following areas; Environmental (Natural Resource) Management; Environmental Compliance; Social Facilitation and Consultation; Compensation of Land Claims; Climate Change; Climate (Change) and Human Health; Air Quality Management; Renewable Energy; Waste Management; Land Rehabilitation; Water Quality/Demand Management; Strategic Environmental Assessment; Waste Water (sewer) Treatment; Project	

	Management; ISO 9001 and ISO14001; Vegetation Control Bush Clearance (Invasive plants)
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1. INTRODUCTION AND BACKGROUND

QEMS Management and Business Solutions cc (QEMS) has been appointed by ASCENG(Pty) Ltd to undertake the environmental services for the proposed development of Leano Alpha Solar Energy on Portions 16,17,18,21,22 and 23 of the Farm Spitskop 333 KT in Steelpoort within the jurisdiction of Feta-Kgomo Tubatse Local Municipality, Sekhukhune District Municipality, Limpopo Province. The proposed development falls within the Fetakgomo-Tubatse Special Economic Zone (FTSEZ) which already has an approved Environmental Authorisation (EA) with reference number: **12/1/9/2-GS72** from the Limpopo Department of Economic Development, Environment and Tourism (LEDET) issued 29 June 2022. The existing EA approved the following listed activities:

Notice and description	Activity Number and description	Related activity in the proposed development/expansion
Notice 2: R. 984 of 2014	Activity 15 – “The clearance of an area of 20 hectares or more of indigenous vegetation.	Clearance of area of 1220 ha for buildings, fencing, and other logistics.
Notice 1: R. 983 of 2014	Activity 24 – “The development of a road-(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres”.	Associated with the development is the construction of internal roads. The Engineer will determine the sizes thereof when the siting of all infrastructure is finalised.

The proposed Leano Alpha Solar Energy is to be undertaken on approximately 300ha piece of land. The following are the proposed infrastructure associated with the proposed development.

- 160 Megawatts solar plant
- Battery storage system 20MW
- 105MW (AC) connected to the Eskom Distribution grid via a 132kV Overhead transmission line 3x40MVA substation.
- Internal roads
- Fencing
- Auxiliary buildings

The proposed project is located on Portions 16,17,18,21,22 and 23 of the Farm Spitskop 333 KT in Steelpoort within Feta-Kgomo Tubatse Local Municipality, Sekhukhune District, Limpopo Province. The approximate central coordinates of the site are 24°50'0.16"S, 30° 8'25.21"E.

This document was prepared on the basis of a Norms and Standards registration in line with the Norm for exclusion of the Development and Expansion of Solar Photovoltaic Facilities (GNR No.4558) in Areas of Low or Medium Environmental Sensitivity, supported by the following specialist studies:

- Terrestrial Impact Assessment
- Animals Impact Assessment
- Plants Impact Assessment
- Agriculture Impact Assessment
- Aquatic Impact Assessment

QEMS scope of work includes the development of an EMPr which outlines the environmental management guideline measures as outlined in Appendix 4 of the EIA Regulations (GNR 326) as amended on the 07 April 2017 that will be undertaken to avoid and minimize impacts on the environment throughout all phases of the proposed development.

When developing this Environmental Management Programme, the conditions set out in the granted Environmental Authorisation with **Authorisation Reference Number: 12/1/9/2 – GS72, NEAS Number: LIM/EIA/00011363/2021** were considered. Additionally, this EMPr is aligned with the EMPr that goes with the said EA.

1.1. PROJECT AREA DESCRIPTION

The project is located on Portions 16,17,18,21,22 and 23 of the Farm Spitskop 333 KT in Steelpoort within Feta-Kgomo Tubatse Local Municipality, Sekhukhune District, Limpopo Province. 24°50'0.16"S, 30° 8'25.21"E.

The proposed site is situated between BRC mine and Glencore mine and on the southern side of R555 road. The centre coordinates of the study site are as follows: 24°50'0.16"S, 30° 8'25.21"E.

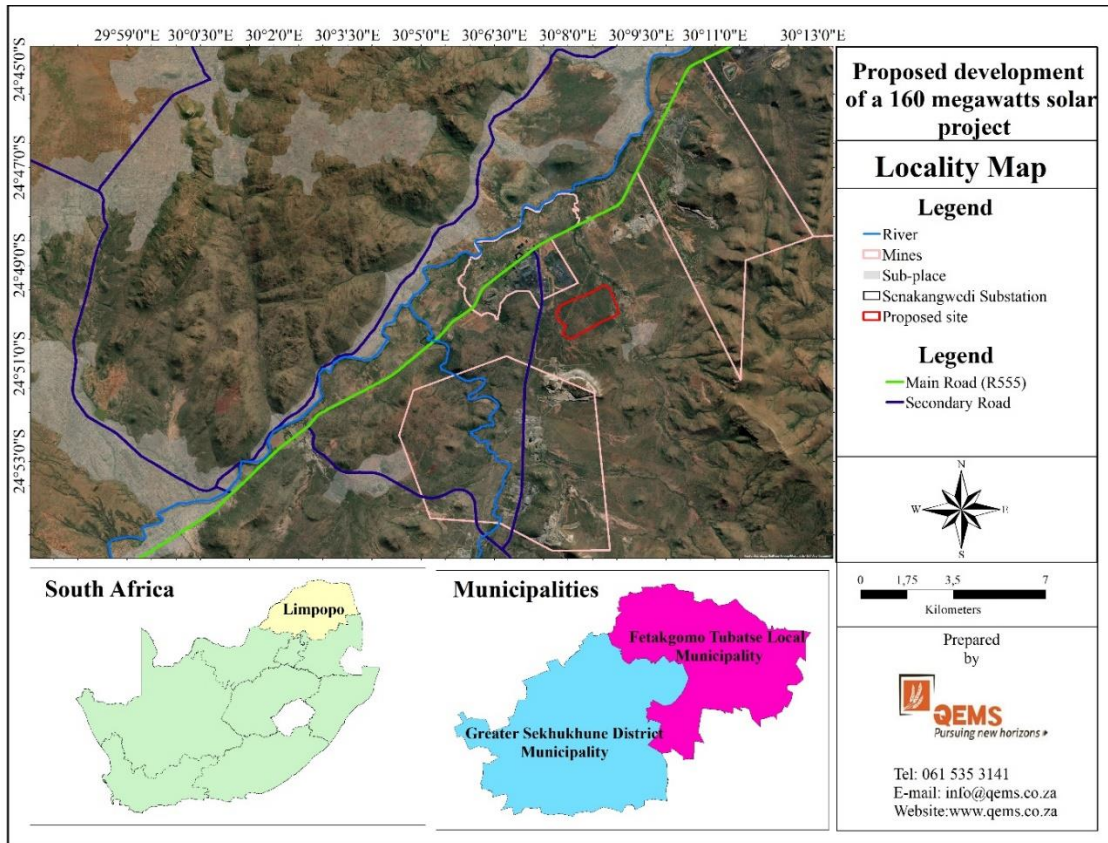


Figure 1: Locality Map

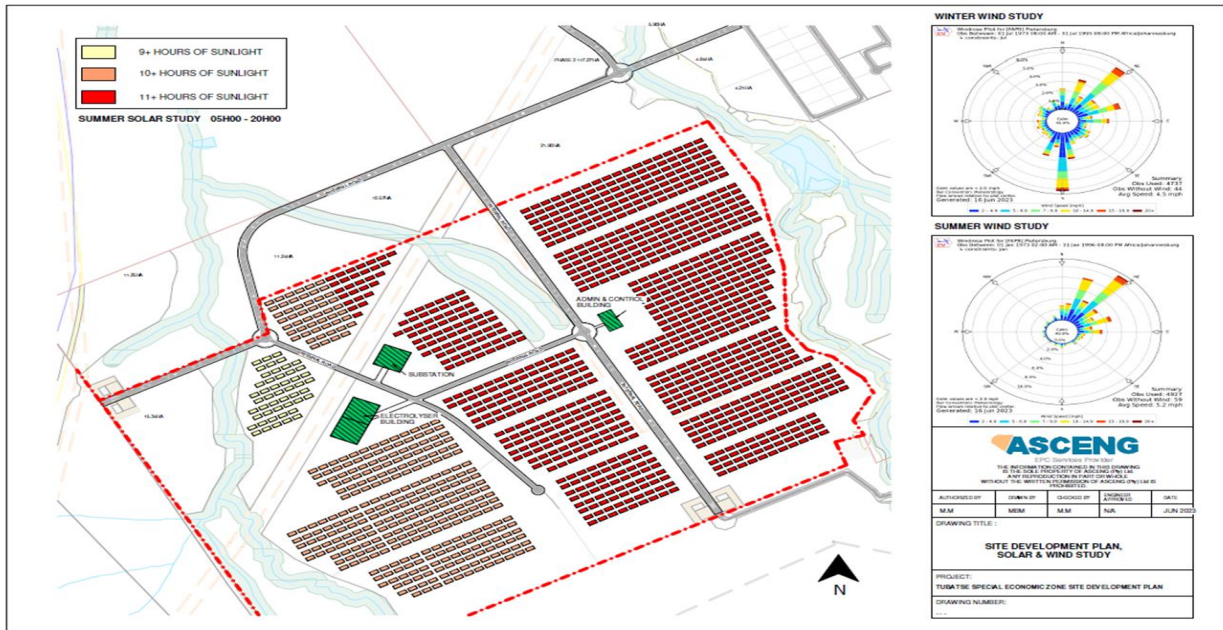


Figure 2: Layout Plan

1.2. ENVIRONMENTAL REQUIREMENTS

In terms of (Government Gazette number No 4558 dated 27 March 2024), the Norm for the Exclusion of the Development and Expansion of Solar Photovoltaic Facilities in Areas of Low or Medium Environmental Sensitivity in terms of section 24(10) of the National Environmental Management Act, 1998 (Act No.107 of 1998)(NEMA) and exclude, in terms of section 24(2)(d) of the NEMA activities identified in terms of section 24(2)(a) and (b) of the NEMA, for the development and expansion of solar photovoltaic facilities, including any associated activity or infrastructure, from the requirement to obtain an environmental authorisation, based on compliance with the Norm.

The activities which are the subject of this exclusion relate to the development of a facility for the generation of electricity from solar photovoltaic technology, where such development or expansions triggers activity 1 or Activity 36 of listing notice 1 or Activity 1 of listing notice 2 and any associated activity identified in listing notice 1,2 or 3 necessary for the realization of such facilities. The proposed development triggers activities:

- ❖ **Activity 3.1.2** (GNR No. 4558, 27 March 2024): of Norm for the Exclusion of the Development and Expansion of Solar Photovoltaic Facilities in Areas of Low or Medium Environmental Sensitivity in terms of section 24(10) of the National Environmental Management Act (Act No.107 of 1998).

The National Water Act (Act No. 36 of 1998):

The applicant should lodge and application with department of Water and Sanitation as the proposed development will include altering the bed, banks course of a watercourse, impeding or diverting the flow of water in a watercourse and storage of water. This project triggers the following water uses in terms of the NWA:

- ❖ **Section 21 (b)(c)(i)**

1.3. PURPOSE OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

The EMPr forms part of the contractual obligations to which all contractors/employees involved in construction and operational phase of a project must be committed. It also forms an integral part of the contract document, as it outlines the environmental methodology and duties required for construction and operation for the authorised activity. It serves as a guideline and baseline information document for describing how negative impacts will be managed, rehabilitated, and monitored and how positive impacts will be maximised and aims to comply with section 24N of

the National Environmental Management Act, 1998 (Act No. 107 of 1998), as well as the Environmental Impact Assessment Regulations, 2014 as amended.

This section outlines the environmental management guideline measures as outlined in **Appendix 4** of the EIA Regulations as amended that will be undertaken to avoid or minimize impacts on the environment throughout all phases of the proposed development.

The main objectives of this EMPr are therefore to:

- Outline environmental management measures related to project activities and provide project contractors with guidelines for carrying out Construction activities in such a way as to minimize environmental impacts.
- Be used as a foundation for the specific environmental management instructions contained in Construction contract documents, where compliance will be a contractual obligation for contractor(s);
- Be used as an educational tool, for orientation and training of project personnel and contractors.
- To outline functions and responsibilities of responsible persons;
- To state standards and guidelines, which are required to be achieved in terms of environmental legislation;
- To create management structures that address concerns and complaints of the I&APs with regard to the development;
- To establish methods of monitoring and auditing environmental management practices during all phases of the development;
- To outline mitigation measures and environmental specifications which are required to be implemented for all phases of the project in order to minimize the extent of environmental impacts, and to manage environmental impacts associated with the proposed project; and
- To prevent long-term or permanent environmental degradation.

1.4. STRUCTURE OF THE EMPR

An EMPr provides mitigation and management measures for the two phases namely construction and operational phase. Refer to Table 1 for phase of the development.

Table 1: Structure of the EMPr

Category	Phases	Description
Category A	Pre-Construction	This section will provide guidelines on construction activities including site establishment; environmental induction and training and awareness; site access and health and safety. Also provide guidelines on the construction methods and considerations.
Category B	Construction	This section will provide guidelines on the construction methods and considerations. This section also specifies environmental actions, procedures and responsibilities that are required.
Category C	Operation	This section will provide guideline on the practice and responsibility as required for various activities during operation.
Category D	Rehabilitation	This section of the EMPr provides management principles for the rehabilitation phase of the Development. This will include best practice, procedures and responsibilities as required for various associated activities.

1.5. EMPr as a Live Document

The approach adopted for this EMPr is derived from the Deming Cycle (Figure 3), a cycle of continuous improvement that entails the reiterative actions of plan, do, check, act, and then return to the planning phase.



Figure 3: Deming Cycle

❖ Plan

Project-specific planning for the proposed project involves consideration of the legal triggers, the specifics of the proposed development, and the nature of the receiving environment. This provides a starting point for targeted environmental management objectives. Environmental performance indicators are then determined with measurable targets prescribed to monitor the environmental performance of the project. Achieving the targets depends on compliance with this EMPr and the legislative requirements that underpin it.

❖ Do

Throughout the development's life-span, the developer will be required to develop and maintain a Quality Management System (QMS)—designed to ensure that best management practices are implemented on day-to-day management. Such a QMS should at least include the following information:

- Location and extent of associated infrastructure;
- Resources and experience required (staffing);
- Materials and equipment to be used;
- Management actions;
- Human resources used;
- Construction-operation monitoring activities;
- Emergency /disaster incident and reaction procedures.

These topics will be cross-linked into the contracts related to the development of the project.

❖ Check

A system of assessing monitoring results has been developed to check the environmental management performance. Continuous assessment facilitates proactive management of the environmental issues. Mitigation measures can then be successfully implemented on an ongoing basis to keep environmental indicators within their target thresholds. Moreover, the assessment system also enables the assessment of the efficiency of the EMPr. Regular auditing of environmental performance is prescribed to prove and preserve accountability.

❖ Act

The assessments and monitoring of the results and findings of the regular audits must be documented within a reporting system. Precautionary mitigation measures and corrective actions will be prescribed, and instructions will be given in order to implement these in the field. The findings of monitoring and auditing programmes can also be used to update the EMPr. Although the EMPr is a project-specific document, it is dynamic and should be updated regularly to address the changing circumstances of the scheme.

1.6. ENVIRONMENTAL CODE OF CONDUCT

One of the objectives of the EMPr is to ensure that all the workforce, contractors, sub-contractors, construction and operation staff have an understanding of environmental issues and potential impacts on-site activities. This environmental code of conduct provides the basic rules that must be strictly adhered to.

It is the responsibility of the Site Environmental Officer, the Environmental Officer and ECO (as appointed) to ensure that each contractor, sub-contractor and workforce understand and adhere to the Code of Conduct.

All persons are obliged to keep to the rules of this code of conduct. Ignorance, negligence, recklessness or a general lack of commitment resulting in environmental degradation or pollution must not be tolerated.

Environmental Rules:

- Do not waste electricity, water or consumables,
- Only use authorised accesses,
- Do not litter,
- Dispose solid waste to the correct waste containers provided,

- Prevent pollution,
- Use the toilet facilities provided,
- Do not dispose contaminated wastewater to the storm water or the environment,
- Immediately report any spillage from containers, plant or vehicles,
- Do not burn or bury any waste in the soil,
- Do not trespass onto private properties,
- Know the environmental incident procedures.

2. IMPACT ASSESSMENT METHODOLOGY

In order for us to establish the significant issues that need to be addressed on this Solar Leano project, an impact assessment needs to be conducted to give insight into the key considerations. An environmental impact is the change to the environment, whether desirable or undesirable, that will result from the effect of an activity. An impact may be the direct or indirect consequence of an activity. A description of potential impacts or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

2.1. IMPACT ASSESSMENT METHODOLOGY

The section below is the method used for determining the significance of impacts. Each of the impacts were listed taking into consideration the different phases (construction and operation). A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment was provided. Impacts and risks were identified, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts - (a) can be reversed; (b) may cause irreplaceable loss of resources; and (c) can be avoided, managed or mitigated.

The specialist studies are synthesised and integrated into the overall impact assessment and recommendations for mitigation are included in the EMPr (full reports are included as Appendices). The contents of all specialist reports include information as prescribed in Regulation 32(3) of the EIA Regulations, 2010 and provide preference ranking of the site.

In addition, the following was identified:

- positive and negative impacts that the proposed activity will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.

The following methodology was applied to the prediction and assessment of impacts/risks. Potential impacts were rated in terms of the direct, indirect and cumulative:

Table 2: Potential Magnitude/Intensity/Severity Rating

Potential Intensity Description (negative)	Intensity	Score
Change is slight, often not noticeable, natural functioning of environment not affected.	Minor	2
Natural functioning of environment is minimally affected. Natural, cultural and social functions and processes can be reversed to their original state.	Low	4
Environment remarkably altered, still functions, if in modified way. Negative impacts cannot be fully reversed.	Moderate	6
Cultural and social functions and processes disturbed – potentially ceasing to function temporarily.	High	8
Natural, cultural and social functions and processes permanently cease, and valued, important, sensitive or vulnerable systems or communities are substantially affected. Negative impacts cannot be reversed.	Very high	10

- Direct impacts are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.
- Indirect impacts of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken, or which occur at a different place as a result of the activity.
- Cumulative impacts are those that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

Nature of impact - this reviews the type of effect that a proposed activity will have on the environment and should include “what will be affected and how?”

Spatial extent – The size of the area that will be affected by the risk/impact:

Table 3: Potential Extent

Criteria: EXTENT – Describes the physical extent or spatial scale of the potential impact.		
RATING		DESCRIPTION
1	Site Specific	Impacts extending as far as the activity, limited to the site and its immediate surrounding
2	Local	Impacts extending within 5km from the site boundary.
3	Regional	Impacts extending to the district (20km from the boundary of the site)
4	Provincial	Impacts extending to provincial scale e.g. Limpopo Province.
5	National	Impacts extending to within the country i.e. South Africa.
6	International	Impacts extending beyond international border/ the borders of South Africa

Duration – The timeframe during which the risk/impact will be experienced:

Table 4: Potential Duration

Criteria: DURATION –Defines the temporal scale (For how long will the impact endure).		
RATING		DESCRIPTION
1	Immediate	Less than 1 year
2	Short term	1-5 years
3	Medium term	6-15 years
4	Long term	Between 16-30 years
5	Permanent	Over 30 years. Where mitigation either by natural processes or by human invention will not occur in such a way or in such time span that the impact can be considered transient.

Using the criteria above, the impacts were further be assessed in terms of the following:

- Probability – The probability of the impact/risk occurring:

Table 5: Probability

Criteria: PROBABILITY –Defines the likelihood of impact occurring.		
RATING		DESCRIPTION
1	Improbable	Where the possibility of the impact occurring is low.
2	Low	Where there is a low possibility that the impact will occur.
3	Medium	Where there is a medium possibility that the impact will occur (50 and 70%)
4	High	Where it is most likely that the impact will occur.
5	Definite	Where the impact will occur regardless of any prevention measures.

- Magnitude–The anticipated severity of the impact (Intensity + Extent + Duration):
- Extreme (extreme alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they permanently cease);
- Severe (severe alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they temporarily or permanently cease);
- Substantial (substantial alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they temporarily or permanently cease);
- Moderate (notable alteration of natural systems, patterns or processes, i.e. where the environment continues to function but in a modified manner); or
- Slight (negligible alteration of natural systems, patterns, or processes, i.e. where no natural systems/environmental functions, patterns, or processes are affected).
- Significance – Will the impact cause a notable alteration of the environment? To determine the significance of an identified impact/risk, the consequence is multiplied by probability.

Impact Magnitude = Potential Intensity + duration + extent

Significance rating = Impact magnitude * Probability

Table 6: Guide to assessing risk/impact significance as a result of consequence and probability

<p>“Significance”- attempts to evaluate the importance of a particular impact with mitigation measures included and also excluded. The significance was calculated using the following formula:</p> <p>Significance = (Extent + Duration + Magnitude) X Probability</p>		
<p>Significance of Predicted NEGATIVE Impacts</p>		
Low	0 – 30	Where the impact will have a relatively small effect on the environment and will require minimum or no mitigation and as such have a limited influence on the decision
Medium	31 – 60	Where the impact can have an influence on the environment and should be mitigated and as such could have an influence on the decision unless it is mitigated.
High	61 - 100	Where the impact will definitely have an influence on the environment and must be mitigated, where possible. This impact will influence the decision regardless of any possible mitigation.
<p>Significance of Predicted POSITIVE Impacts</p>		
Low	0 – 30	Where the impact will have a relatively small positive effect on the environment.
Medium	31 – 60	Where the positive impact will counteract an existing negative impact and result in an overall neutral effect on the environment.
High	61 - 100	Where the positive impact will improve the environment relative to baseline conditions.

- Significance was rated as follows (based on Table 7 above)
 - Very low (the risk/impact may result in very minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);
 - Low (the risk/impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision making);
 - Medium (the risk/impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated); or

- High (the risk/impacts will result in a considerable alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision making).
- Very high (the risk/impacts will result in major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision making
(i.e. the project cannot be authorized unless major changes to the engineering design are carried out to reduce the significance rating).

Impacts have been described both before and after the implementation of the proposed mitigation and management measures. The scenario “without mitigation” considers all management actions already proposed by the proponent as part of the project description. “With mitigation” assesses the significance rating of the potential impact, taking into account any additional management actions recommended by the specialist.

Linked to the above, for each impact assessment, mitigation measures are generally listed under the following three categories (as applicable):

- Mitigation measures inherent to the project design (i.e. mitigation/management actions that the proponent had planned to implement as part of the project description);
- Key management actions proposed by specialist (pertinent measures that will be written into, and enforced through the EMPr (Appendix E) for implementation to ensure that the significance of the associated impact is acceptable); and
- Additional management actions proposed by the specialist (management actions to be considered by proponent and authority).

The impact assessment has attempted to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are used as a measure of the level of impact.

Note that the concept of “irreplaceable loss of a resource” is to be taken into account in the Potential Intensity score of an impact. Irreplaceability of resource loss caused by impacts –

- High irreplaceability of resources (project will destroy unique resources that cannot be replaced, i.e. this is the least favourable assessment for the environment. For example, if the project will destroy unique wetland systems, these may be irreplaceable);
- Moderate irreplaceability of resources;
- Low irreplaceability of resources; or
- Resources are replaceable (the affected resource is easy to replace/rehabilitate, i.e. this is the most favourable assessment for the environment).

3. ASSESSMENT OF POTENTIAL IMPACTS

This Chapter identifies and evaluates the actual and potential environmental consequences of the proposed activity. Furthermore, the potential for mitigation of negative impacts and enhancement of positive impacts are described. The below impacts on the biophysical, socio-economic, and cultural/historical environment have been assessed based on the methodology provided in Chapter 2. For each impact assessed, mitigation measures have been proposed to reduce or avoid negative impacts and enhance positive impacts. These mitigations were also incorporated in the EMPr to ensure that they are implemented during the various phases of the road maintenance project.

Table 7: Impact Significance of Air pollution

Theme		
Phases	Construction	Operation Phase
Nature and Status of Impact.	<ul style="list-style-type: none"> • Generation of dust from construction activities. • Atmospheric pollution caused by engine emissions from construction activities. • Impacts on air quality 	<ul style="list-style-type: none"> • Generation of dust and atmospheric pollution from vehicles monitoring the site
Extent	Local (2)	Local (2)
Duration	Temporary (1)	Long Term (4)
Intensity/Magnitude	High (8)	Moderate (6)
Probability	Definite (5)	High (4)
Confidence		
Level of Significance before mitigation (Inherent risk)	$(2+1+8)*5= 55$ Medium (-)	$(2+4+6)*4= 48$ Medium (-)
Mitigation Measures	Construction <ul style="list-style-type: none"> • Loading and unloading materials slowly; • Speed restrictions on site • Dust suppression to minimise dust • Proper maintenance of vehicles and equipment. • Fumes emitted from vehicles and equipment shall be monitored and quickly be controlled. • Avoid much movement of construction vehicles over an un-surfaced road. 	Operational phase <ul style="list-style-type: none"> • Dust suppression to minimise dust • Proper maintenance of vehicles

	<ul style="list-style-type: none"> No waste shall be burned during construction. Only clear areas that is going to be worked on. Sanction off the construction site by dust screens. Cover construction materials and stockpiles with tarps or other materials to prevent dust emissions. 	
Level of Significance with Mitigation (Residual risks)	Low	Low

Table 8: Impact Significance of Terrestrial Fauna and Flora

Theme		
Phases	Construction	Operation Phase
Nature and Status of Impact.	<ul style="list-style-type: none"> Loss of faunal habitat and disturbance of fauna. Destruction and loss of degraded bushveld including loss of fragmentation of vegetation communities in the adjacent natural areas. Spreading of the alien invasive vegetation 	<ul style="list-style-type: none"> The presence of the overhead powerline connecting the solar PV plant to the electricity grid has the potential to generate bird-collisions in the area.
Extent	Site(1)	Site(1)
Duration	Long Term (4)	Long Term (4)
Intensity	Minor (2)	Minor (2)
Probability	Definite (5)	Definite (3)
Confidence		
Level of Significance before mitigation (Inherent risk)	(1+4+2)*5= 35 Medium (-)	(1+4+2)*3=21 Low (-)
Mitigation Measures	<p>Construction</p> <ul style="list-style-type: none"> An Alien Invasive Species Management Plan must be put in place for the duration of the construction phase of the project which must make provision for the following: <ul style="list-style-type: none"> ➤ Identification of the alien invasive species that have settled on the site 	<p>Operational Phase</p> <ul style="list-style-type: none"> The design of the planned overhead powerline requires careful consideration of the following suggestions: Provision of bird perches along the powerline to make the powerline more visible to birds.

	<ul style="list-style-type: none"> ➤ Clear instructions on how to eradicated these species ➤ A schedule of eradication ➤ A schedule of regular monitoring of the success of the implementation of the eradication. <ul style="list-style-type: none"> • A qualified Environmental Control Officer must be present when clearing begins. • Drivers must keep a maximum speed of 30km/h keep the fauna species at their area. • Install rumble strips on roadsides to create noise and vibration, deterring animals from crossing roads. • Maintain vegetation near roadsides to reduce cover for possible wildlife attempting to cross. • The area to be developed must be demarcated to avoid impacting on an area that must not be used. • Minimise the impacted area and clear only what is required. • Maintain vegetation near roadsides to reduce cover for wildlife attempting to cross. 	<ul style="list-style-type: none"> • Making provision to have the powerline as low as possible. It is generally accepted that the lower the powerlines are above ground level, a reduction in the risk of bird-strikes will take place. • The Alien Invasive Management Plan must be established and implemented for the operational phase of the development. This plan must be in place when the development goes operational.
Level of Significance with Mitigation (Residual risks)	Low	Low

Table 9: Impact on Aquatic Ecosystems (Groundwater)

Theme		
Phases	Construction	Operation Phase
Nature and Status of Impact.	<ul style="list-style-type: none"> Loss of catchment area and decreased water inputs. Aquatic features were identified within the boundaries of the study site and near the site. Contamination of the area as a result of leaking portable toilet facilities. 	<ul style="list-style-type: none"> N/A
Extent	Regional (3)	
Duration	Long Term (4)	
Intensity	Moderate (6)	
Probability	High (4)	
Confidence		
Level of Significance before mitigation (Inherent risk)	(3+4+6)*4= 52	
	Medium (-)	
Mitigation Measures	<p>Construction</p> <ul style="list-style-type: none"> Monitor and maintain construction equipment and material within banded areas to avoid Leaking on the ground. Chemical/mobile toilets must be maintained on regular basis to prevent leakage. Monitor and maintain machines and vehicles for oil leaks. Provide spill response kits near machines and vehicles for quick containment and cleanup of small leaks. Develop and communicate an emergency response plan in case of large leaks or spills. Store fuels and chemicals in secure containers and tanks to prevent leaks during storage. A Stormwater Management Plan must be put in place for the construction phase of the development that will allow all the rainwater that fall within the study area to be allowed to percolate into the substrate for continuous supply of the local groundwater. 	<p>Operational Phase</p> <ul style="list-style-type: none"> N/A
Level of Significance with Mitigation (Residual risks)	Low	N/A

Table 10: Waste management

Theme		
Phases	Construction	Operation Phase
Nature and Status of Impact.	<ul style="list-style-type: none"> • Pollution on site with general waste from construction activities (Domestic and construction waste) • Contamination of the area as a result of leaking portable toilet facilities. 	<ul style="list-style-type: none"> • Domestic waste from maintenance workers replacing the batteries and security guards in the site. Contamination by leaking sewage from ablutions facilities.
Extent	Site specific (1)	Site specific (1)
Duration	Immediate (1)	Long Term (4)
Intensity	High (8)	Minor (2)
Probability	Definite (5)	Improbable (1)
Level of Significance before mitigation (Inherent risk)	(1+1+8)*5= 50	(1+4+2)*1= 7
	Medium (-)	Low (-)
Mitigation Measures	<p>Construction</p> <ul style="list-style-type: none"> • Provide bins at a demarcated area on site to dispose waste • Waste should be collected at regular basis • Waste generated must be disposed at a licensed landfill site • All construction materials should be stored in designated areas and removed regularly. • Waste bins should be provided at a designated area at the construction site. • Implement a waste separation program, ensuring that workers separate recyclables from non-recyclables at the source. • Educate construction workers and contractors about waste reduction practices, recycling procedures, and the importance of minimizing waste generation. • Ensure the mobile toilets are on level ground to prevent sewage spillage. • Ensure an adequate number of mobile toilets are available to meet the needs 	<p>Operational phase</p> <ul style="list-style-type: none"> • Appropriate waste bins with lids must be provided. • The waste must be disposed at a licensed waste disposal landfill site. • Create a waste reduction policy for your workplace that outlines goals and guidelines for minimizing waste generation. • Ensure the mobile toilets are on level ground to prevent sewage spillage.

	<p>of the users, reducing overuse and overflow.</p> <ul style="list-style-type: none"> • Encourage the use of biodegradable toilet papers reducing the environmental impact of waste. • Properly dispose of sewage waste by transporting it to a wastewater treatment facility or approved disposal site. • Develop a plan to address potential spills or emergencies, including spill containment, cleanup procedures, and reporting mechanisms. • Skips must be made available on-site into which all construction waste can be discarded. • All construction waste must be cleared from the site on a daily basis and placed in these skips. • The capacity of these skips must be monitored on a daily basis to ensure that a replacement skip can be arranged on the same day as the filled skips are removed. • The disposal of the content of these skips must be done at a municipal landfill site. • No dumping of construction waste on open areas on the property will be allowed. • No burial of construction waste within the project site or in the surrounding areas will be allowed. 	
<p>Level of Significance with Mitigation (Residual risks)</p>	<p>Low</p>	<p>Low</p>

Table 11: Impact on Landscape and Visual Aspects

Theme		
Phases	Construction	Operation Phase
Nature and Status of Impact.	<ul style="list-style-type: none"> Visual intrusion, dust and noise. Disruption of current land use (grazing and firewood collection) Heavy construction equipment can be visually prominent and change the appearance of the construction site. Piles of construction materials stored onsite can be visually intrusive. 	<ul style="list-style-type: none"> Reflection of sunlight from the solar panels could adversely affect birds Night lights pollution impact
Extent	Site (1)	Local (2)
Duration	Immediate (1)	Permanent (5)
Intensity	Low (4)	Moderate (6)
Probability	Definite (5)	Low (2)
Confidence		
Level of Significance before mitigation (Inherent risk)	$(1+1+4)*5=30$ Low (-)	$(2+5+6)*2=26$ Low (-)
Mitigation Measures	Construction <ul style="list-style-type: none"> Make use of the existing access road Correct clothing (PPE) should be worn during construction. Gradual removal of vegetation will reduce visual intrusion. The construction site must be kept clean, free from litter and there must be proper littering bins within the site. Use covering or wraps on construction equipment or fencing. Design construction site lighting to minimize light pollution and glare. Implement regular site clean-up to remove construction debris and litter, keeping the site and its surroundings visually appealing. 	Operational Phase <ul style="list-style-type: none"> The lighting of the facility should not exceed, in number of lights and brightness, the minimum required for safety and security. Low-pressure sodium light sources should be used to reduce light pollution. Use shielded and directional lighting fixtures to minimize light spillage beyond the site boundaries. Planting the trees at the boundaries site.
Level of Significance with Mitigation (Residual risks)	Low	Low

Table 12: Noise Pollution

Theme		
Phases	Construction	Operation Phase
Nature and Status of Impact.	<ul style="list-style-type: none"> Noise and vibration from construction machines and vehicles. Noise from Construction activities 	<ul style="list-style-type: none"> N/A
Extent	Local (2)	
Duration	Immediate (1)	
Intensity	Moderate (6)	
Probability	Definite (5)	
Confidence		
Level of Significance before mitigation (Inherent risk)	$(2+1+6)*5=45$	
	Medium Low (-)	
Mitigation Measures	Construction/ Maintenance Phase	Operational Phase
	<ul style="list-style-type: none"> All construction vehicles and equipment are to be kept in good repair to reduce operational noise levels. Put silencer on machinery to minimize noise pollution. Work within the set time for working to maintain noise (07h00 to 17h00). A community noise complaint register should be kept onsite. Respond to complaints regarding noise generation by reducing the impacts. 	<ul style="list-style-type: none"> N/A
Level of Significance with Mitigation (Residual risks)	Low	N/A

Table 13: Impacts on Traffic and Road Network

Theme		
Phases	Construction	Operation Phase
Nature and Status of Impact.	<ul style="list-style-type: none"> Change in quality of surface condition of the roads. Impact on traffic 	<ul style="list-style-type: none"> N/A
Extent	Local (2)	
Duration	Immediate (1)	
Intensity	Low (4)	
Probability	Definite (5)	
Level of Significance before mitigation (Inherent risk)	$(2+1+4)*5= 35$	
	Low (-)	
Mitigation Measures	Construction	Operation Phase
	<ul style="list-style-type: none"> Vehicles must be road worthy, drivers must be qualified, and stick to the road limit speed. Safety signs must be placed within the construction site. Limit movement of vehicles during peak periods. Enforce and display speed limits within the construction site to reduce the risk of collisions between vehicles and pedestrians. Implement a traffic management plan. Heavy vehicle crossing signs and entrance signs must be placed along the R555 road. Minimize the use of heavy vehicles to and from the construction site. Develop a comprehensive transportation plan for construction vehicles that considers the condition and load-bearing capacity of roads. Traffic safety measures must be put in place during the construction phase, this includes traffic warning signs and flagmen. Enforce and display speed limits within the construction site to reduce the risk of collisions between vehicles and pedestrians. 	<ul style="list-style-type: none"> N/A
Level of Significance with Mitigation (Residual risks)	Low	N/A

Table 14: Impact on Heritage Aspects

Theme		
Phases	Construction	Operation Phase
Nature and Status of Impact.	<ul style="list-style-type: none"> • There is no trace of archaeological or heritage evidence, should any heritage or archaeological resources be exposed during construction the construction will have to stop. • Destruction of archaeological remains • Disturbance of graves • Disturbance of buildings and structures older than 60 years old • Destruction public monuments and plaques 	<ul style="list-style-type: none"> • N/A
Extent	Site specific (1)	
Duration	Short Term (2)	
Intensity	Low (4)	
Probability	Medium (3)	
Level of Significance before mitigation (Inherent risk)	(1+2+4)*3= 21 Low (-)	
Mitigation Measures	<p>Construction</p> <ul style="list-style-type: none"> • Should any heritage or archaeological resources be exposed during construction the construction will have to stop and be report to the PM and wait for a specialist to assess the place. • Modify the project design to avoid or minimize impacts on culturally and historically significant areas. • Use appended Chance find procedure to cater for accidental finds. • Construction management and workers must be educated about the value of historical buildings and structures. • Mitigation is not required because there are no public monuments within the project site 	<p>Operation Phase</p> <ul style="list-style-type: none"> • N/A
Level of Significance with Mitigation (Residual risks)	Low	N/A

4. MANAGEMENT AND MONITORING PROCEDURE

4.1. ORGANIZATIONAL STRUCTURE AND RESPONSIBILITY

This section indicates the party responsible for implementing the environmental measures and action plans laid out in this EMPr.

Formal responsibilities are necessary to ensure that key procedures are executed. Specific responsibilities of the Project Proponent, Project Manager, Environmental Site Officer, Contractor/Operator and Environmental Control Officer are as detailed below.

❖ **Project Manager shall:**

The Project manager is the one responsible for ensuring that workers are complying with the environmental management measures and complying with all National Legislation and Standards that relates to management of the environment. The following responsibilities are to be fulfilled by the project manager:

- Be fully conversant with the EMPr for the project.
- Ensure that the Project Manager and the Contractor/Operator are aware of all specifications, legal constraints, standards and procedures pertaining to the project specifically with regard to the environment.
- Maintain the complaints register and queries by public at the site office.
- Ensure that all stipulations within the EMPr are communicated and adhered to by the Project Manager and the Contractor/Operator.
- Monitor the implementation of the EMPr throughout the project by means of regular site visits and meetings.
- Through the recommendation from the Environmental Officer the Project Manager can order the removal of any person(s) and/or equipment in contravention of the specifications of the EMPr.
- Enforce the Environmental specification on site; and
- Monitor the complaints with the EMPr.

❖ **The Contractor shall:**

- Be fully conversant with the EMPr.
- Ensure compliance with the EMPr.
- Ensure that all the environmental specifications contained within this EMPr are adhered to at the site.

- Regularly liaise with the Site Manager on matters relating to the environment; and
- Confine activities to the demarcated construction site.
- Provide information on previous environmental management experiences in terms of a relevant form contained in the contract document; and
- Comply with requirement of the ESO in terms of these specification and the project's specifications.

The above responsibilities listed for the Contractor will also apply to any appointed sub-consultants.

❖ **The Environmental Control Officer (ECO) shall:**

- Be fully conversant with the EMPr.
- Be fully conversant with all environmental legislation and ensure compliance.
- Monitor all site activities monthly, and report findings to the project manager and contractor.
- Ensure that all the environmental specifications contained within this EMPr are adhered to at the site.
- Regularly liaise with the Site Manager on matters relating to the environment; and
- Compile monthly reports as to the progress of the construction phases and report to all parties involved (Site Manager, Project Proponent).
- Conduct a once off training with the contractor on the EMPr and a general environment awareness.
- Come up with corrective action for any environmental non-compliance at the site.

❖ **Environmental Site Officer (ESO) shall:**

- Be fully conversant with the EMPr
- Be conversant with the EMPr and all relevant environmental legislation applicable to the project, comply with them;
- Monitor site activities with compliance with the occupational health and safety standards and EMPr conditions;
- Collect and compile a comprehensive project health and safety risks assessment (HSRA)
- Assist the contractor with investigations of major incidents
- Conducting daily inspections
- Compiling a daily report and a monthly safety, health and environmental audit report
- Identify environmental incidents;

- If the specifications contained in the EMPr are not followed take appropriate actions.
- Maintain an environmental register that keeps record of all environmental incidents which occurred on site during construction.

4.2. ENVIRONMENTAL AWARENESS TRAINING

Training and environmental awareness is an integral part of a complete EMPr. The overall aim of the training will be to ensure that all site staff is informed of their relevant requirements and obligations pertaining to the relevant authorizations, licences, permits and the approved EMPr and protection of the environment. Environmental awareness training courses should be run for all personnel on site. Two types of courses should be run, one for the Contractor's and all site staff and labourer's management and one for operational staff workers. Courses shall be run in the morning during normal working hours at a suitable venue provided by the Project Manager. All attendees shall remain for the duration of the course and sign an attendance register on completion that clearly indicates participant's names, a copy of which shall be handed to the ECO. It is vital that all personnel are adequately trained to perform their designated tasks and duties to an accepted standard.

- The Project Manager shall allow for sufficient sessions to train all personnel. Subsequent sessions shall be run for any new personnel coming onto site. A Method Statement with respect to the organization of these courses shall be submitted.
- Notwithstanding the specific provisions of this clause, it is incumbent upon the Project Manager to convey the sentiments of the EMPr to all personnel and Subcontractors involved with the Works.

The training will be a once off event unless a new member joins, however, the contractor shall make provision for weekly training or Toolbox Talks which can correlate with construction activities undertaken week. The training and environmental awareness must be conducted among the project's workforce to encourage the implementation of environmentally practices throughout the project duration.

4.2.1. TOPICS COVERED BY THE ENVIRONMENTAL AWARENESS PROGRAMME SHOULD INCLUDE:

- What is meant by "Environment"?
- Why does the environment need to be protected and conserved?
- How can construction and operational activities impact on the environment?
- What can be done to mitigate against such impacts?
- Awareness of emergency and spills response provisions.

- What to do in case of emergency?
- In case of spills of hazardous chemical what action you must take?

4.2.2. EMERGENCY PREPARATION AND RESPONSE PLANS

The Solar plant owner must ensure the safety of his/her staff workers, ensure that emergency procedures are set up prior to commencement work. The emergency procedures shall include, but not be limited to:

- Fire;
- Spills (ground contamination);
- Loss of utilities;
- Injuries and serious health conditions.
- Natural disaster;
- Use of hazardous substances.
- Physical threat, security breach, crime

The emergency procedure shall include responsible personnel and contact details of the emergency services. It shall be available to all relevant personnel and be clearly demarcated at the relevant location around the construction site/Solar Plant site.

The responsibility of the Solar plant owner in responding to emergency situation include:

- The safety of all staff, management and guest
- Physical and emotional well-being of all staff, management and guest
- Protection of the Solar plant facility, property, and the belongings of staff, management and guest

Contact	Phone number
SA Police	10111
Fire disaster management	031 361 0000
Ambulance	10177
Building inspectorate	031 311 7883
Water fault & pollution	083 707 3013
Metro police	031 361 0000
Electricity Fault & breakdown	80 131 3111
SCPA	015 291 1088

5. LEGISLATION AND GUIDELINES

All the applicable environmental standards contained within the environmental legislation will be adhered to. Below are applicable legislations and guidelines for the proposed development and have been identified as applicable:

The Constitution of South Africa, 1996 (Act No.108 of 1996).

The Constitution of the Republic of South Africa, 1996¹ provides that, everyone has a right to an environment that is not harmful to their health or well-being. It further provides that, the environment should be protected for future generations through the implementation of the reasonable legislative and other measures that prevent pollution and ecological degradation.

National Environmental Management Act, 1998 (Act No.107 of 1998) as amended.

The National Environmental Management Act, 1998 (Act No.107 of 1998) (NEMA) is a 'principles-based Act' and is an overarching statute regulating various aspects of natural resources use, integrated environmental management and pollution control. The Act provides for the right to an environment that is not harmful to the health and wellbeing of the South African people; sustainable development, environmental protection, equitable distribution of natural resources; and the formulation of environmental management frameworks. Its definition of the environment includes the land and water of the earth, microorganisms, plant and animal life or a combination of those things, and the inter relationships among them. The Act aims to provide for cooperative environmental governance by establishing principles for decision making on matters affecting the environment, institutions that will promote cooperative governance, and procedures for coordinating environmental functions exercised by organs of state. Section 24 Provides for the prohibition, restriction and control of activities which are likely to have a detrimental effect on the environment.

GNR No. 4558 27 March 2024

The Norms and Standards for the exclusion of the development and expansion of solar photovoltaic facilities in area of low or medium environmental sensitivity, in terms of section 24(10) of the National Management Environmental Act, 1998 (Act No.107 of 1998) and exclude, in terms of section 24(2)(d) of the National Environmental Management Act, 1998 (Act No.107 of 1998) activities identifies in terms of section 24(2)(a) and (b) of the National Environmental Management Act, 1998 (Act No.107 of 1998) for the expansion of solar photovoltaic facilities, including any associated activity or infrastructure, from the requirement to obtain an environmental authorization, based on compliance with the norm.

Environmental Impact Assessment Regulation, 2014 as Amended

The Environmental Impact Assessment (EIA) Regulations promulgated under NEMA in 2014 provide a list of activities which are subject to an Environmental Authorisation (EA) process prior to construction or implementation. In accordance with the 2014 EIA Regulations, (as amended) an EIA process is required if any of the listed activities are triggered during the course of the project. According to the NEMA Regulations these activities may not commence without environmental authorization from the competent authority which requires the investigation, assessment and statement of potential impact of activities and must follow the procedure as described in the EIA Regulations.

National Water Act, 1998 (Act No.36 of 1998).

In terms of chapter 3 section 12-20, water resources are to be protected, used, developed, conserved, managed and controlled. This Act recognizes that water is a scarce resource; it is a natural resource that belongs to all of South Africa's people. The National Department of Water and Sanitation is responsible for the nation's water resource and also the Minister of Department of Water and Sanitation ensures that the water resource is "protected, used, developed, conserved, managed and controlled" through the implementation of this Act (National Water Act 36 of 1998).

This Act makes provisions for the protection of surface water and groundwater resources and their sustainable management for the prevention and remediation of the effects of pollution, and for the control of emergency occurrences. Section 21 of the National Water Act (NWA) lists water uses for which a Water Use License will be required.

National Environmental Management: Air Quality Act, 2004 (Act No.39 of 2004)

The main objective of the Air Quality Act (NEMAQA) is the protection of the environment and human health in a sustainable (economic, social and ecological) development framework, through reasonable measures of air pollution control.

Occupational Health and Safety Act, 1993 (Act No.85 of 1993).

The Occupational Health and Safety Act make provisions in regulations Section 8 for the general duties of employers to their employees. The act provides for the health and safety of people at work utilising machinery and the protection of others against health and safety risks associated with activities on site/work. General Administrative Regulations (2003) describe the administration of the various OHS Regulations, including the designation of health and safety committees, the reporting and recording of incidents and occupational diseases. This Act is applicable to all contractors during the planning, construction and operational phases of the project.

To provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work.

The Conservation of Agricultural Resources Act, 1983 (Act No.43 of 1983).

The main focus of this act is upon agricultural resources, but it has an indirect implication for rivers and provides for the protection of agricultural land while regulations provide for the implementation of control measures for alien and invasive plant species. It is one of the primary statutes through which agricultural activities which negatively affect rivers may be regulated. Of particular importance are the promulgated regulations. The Act regulates rehabilitation of rivers insofar as that activity falls under the definition of conservation which, in relation to the natural agricultural resources, includes the protection, recovery and reclamation of those resources. The Minister of Agriculture may prescribe control measures with which all land users must comply. Relevant to rivers are:

- The irrigation of land;
- The prevention or control of water logging or salination of land;
- The utilization and protection of vleis, marshes, water sponges, water courses and water sources;
- The regulation of the flow pattern of runoff water;
- The utilization and protection of vegetation;
- The control of weeds and invader plants;
- The protection of water sources against pollution on account of farming practices, and
- Any other matter, which the Minister may deem necessary or expedient in order to achieve the object of the Act.

Hazardous Substance Act (No.15 of 1973).

Provides for the definition, classification, use, operation, modification, disposal or dumping of hazardous substances.

National Environmental Management: Waste Act, 2008 (Act No.59 of 2008).

During construction waste will be produced, in either liquid, solid and/or hazardous state, and this waste will be required to be adequately and appropriately disposed of. There are several Regulations or Acts that are applicable to the proposed development in terms of waste management. To reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards

for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for the licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.

National Heritage Resource Act (No 25 of 1999) and Regulations

No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site. No person may, without a permit issued by the South African Heritage Resource Agency (SAHRA) or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. Grave is widely defined in the Act to include the contents, headstone or other marker of such a place, and any other structure on or associated with such place.

National Forests Act (Act No.84 of 1998)

The purposes of this Act are to promote the sustainable management and development of forests for the benefit of all wherein 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 of Agriculture, Forestry and Fisheries.

This EMP process also takes consideration the following legislation

- **South African National Standard SANS 10103:2008 (The Measurement and Rating of Environmental Noise with Respect to Annoyance and Speech Communication).**
- **National Noise Control Regulations (1998).**

6. CONSTRUCTION ACTIVITIES

The “front-end” work of surveying, environmental flagging of preservation sites, access planning, and construction activities can result in localized environmental impacts. The following environmental management measures have been identified to avoid potential environmental concerns.

- Surveyors should make an effort to locate and mark all the activities that will be undertaken during construction.
- Work specifications will clearly define equipment limitation and procedures for working in the vicinity of these facilities.
- Typically, construction activities might include limited earthmoving, should earthmoving be required, appropriate erosion and sediment control measures will be developed and implemented.
- The contractor should follow **Engineering Council of South Africa (ECSA)** standards of putting up a standard board reflecting all the parties involved on the project and the details of the Emergency number.

7. CONSTRUCTION PHASE

This section of the EMPR provides management principles and mitigation measures for the construction phase of the project. Environmental actions, procedures and responsibilities as required during the construction phase are specified. These specifications will form part of the contract documentation and therefore the Contractor will be required to comply with these specifications to the satisfaction of the Project Manager and Environmental Control Officer. Please refer to Table 15 for the proposed mitigation measures.

Table 15: Impact and Mitigation Measures in Construction Phase

POTENTIAL ENVIRONMENTAL IMPACT (NATURE OF THE IMPACT)	RECOMMENDED MITIGATION MEASURES		
	MANAGEMENT AND MITIGATION MEASURES	TIMEFRAMES	RESPONSIBILITIES
CONSTRUCTION SITE ESTABLISHMENT			
1.Site Clearance	<ul style="list-style-type: none"> ❖ No areas falling outside of the approved footprint may be cleared for construction purposes. ❖ Adhere to SANS standards (SANS 2001-BS1:2008) or Eskom Bush Clearing procedure for site clearance. 	<ul style="list-style-type: none"> ❖ Prior before commencement of construction. 	<ul style="list-style-type: none"> ❖ Contractor
2.Site Offices	<ul style="list-style-type: none"> ❖ The site layout must be made available to facilitate ready access for deliveries, facilitate works and to curtail any disturbance or security implications for the daily functions of the Leano Alpha Solar Plant and that of the public using the area. ❖ The site office must include designated areas for prefabricated offices, ablution facilities, equipment, and stockpiles. 	<ul style="list-style-type: none"> ❖ Prior before commencement of construction. 	<ul style="list-style-type: none"> ❖ Contractor

	<ul style="list-style-type: none"> ❖ Down-lighting will be used at night and the Contractor shall ensure that lighting on site does not interfere with road traffic or cause a reasonably avoidable disturbance to the surrounding community or other users of the area. ❖ No accommodation facilities will be provided for on site. Those who are not local staff will be accommodated in suitable and established accommodation facilities in close proximity to the proposed PV Plant. ❖ The site office must include designated areas for prefabricated offices, ablution facilities, equipment, and stockpiles. ❖ Down-lighting will be used at night and the Contractor shall ensure that lighting onsite does not interfere with road traffic or cause a reasonably avoidable disturbance to the surrounding community or other users of the area. ❖ The development footprint must be fenced and access control measures implemented. ❖ The “no-go” areas must be demarcated to prevent workers from entering areas outside the construction domain. ❖ No washing of vehicles and equipment must be done on site unless a designated wash bay is on site. ❖ No servicing of vehicles must be done onsite, in the event of a breakdown or for emergency repairs suitable liner materials to protect the ground must be utilised, and the use of spill prevention measures must be adopted. 		
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3.Eating area	<ul style="list-style-type: none"> ❖ The Contractor must ensure that a designated eating area within the construction site area is provided. ❖ The eating area must provide protection from the elements (rain, wind, sun). ❖ The eating areas should also be located away from construction noise, dust, waste storage areas, hazardous materials stores, fuel storage and dispensing areas and any other activity that may contaminate food or impair comfort. ❖ The eating areas shall provide adequate seating to accommodate the staff. ❖ An adequate number of rubbish bins shall be provided to contain the waste generated and emptied daily or as when required. ❖ The eating areas shall make provision for a smoking area, including seating and a fireproof sand filled container for extinguishing cigarettes. Smoking shall otherwise be prohibited across the site and in the work areas. ❖ The eating area must be kept clean and tidy. 	❖ Prior before commencement of construction	❖ Contractor
FENCING AND GATES INSTALLATIONS			
4.Fencing, gates and Barricades.	<ul style="list-style-type: none"> ❖ The site area/construction area must be fenced to prevent trespassing ❖ In places where temporary fencing is required, the Contractor shall erect such fencing when and where required and re-erect and maintain temporary fencing as necessary. 	❖ Prior to the commencement of construction.	❖ Contractor to implement management actions.

	<ul style="list-style-type: none"> ❖ Temporary fencing shall remain in position either until it is replaced by permanent fencing or until completion of the works. ❖ Any fences damaged by the Contractor shall be repaired as soon as possible at his/her cost and shall be of the standard of the original fence. ❖ All fences erected for construction purposes (e.g., fences around camp sites, fencing around working area, etc.) should be inspected on a daily basis to detect whether any damage has occurred. ❖ Damaged fences/barricading shall be repaired immediately. 		<ul style="list-style-type: none"> ❖ Project manager.
SANITATION			
5.Ablution Facilities	<ul style="list-style-type: none"> ❖ Provide sufficient ablution facilities (e.g. mobile/portable/VIP toilets) at the construction camp/construction sites, which conform to all relevant health and safety standards and codes. ❖ A sufficient number of toilets shall be provided to accommodate the number of personnel working in any given area. ❖ Toilets may not be further than 100m from any working area. ❖ Toilet facilities supplied by the Contractor for the workers shall occur at a maximum ratio of 1 toilet per 10 workers. ❖ All staff to use the provided toilets at all times. All temporary/portable/mobile toilets shall be secured to the ground to prevent them from toppling over due to wind or any other cause. ❖ All sanitary fees that may be payable to any local authority shall be paid by the Contractor. ❖ Ablutions are to be cleaned/emptied on a regular basis, before they are full and contaminate the environment. 	<ul style="list-style-type: none"> ❖ Continuously 	<ul style="list-style-type: none"> ❖ Contractor to implement management action. ❖ Project manager and ❖ ECO to check.

	<ul style="list-style-type: none"> ❖ The entrances to the toilets will be adequately screened from public view. ❖ Sanitary hygiene bins will be provided for female staff. ❖ Toilet paper shall be provided. ❖ The Contractor will ensure that no spillage occurs when the toilets are cleaned or emptied and that a licensed service provider removes the contents from site. ❖ Disposal of such waste is only acceptable at a licensed waste disposal facility and proof of such disposal should be kept on site. ❖ The mobile toilets should be placed at least 100m away from the stream, wetland or river. 		
STORM AND WASTEWATER MANAGEMENT			
<p>6. Decrease in groundwater and stormwater quality as a result of construction phase sedimentation and contamination</p>	<ul style="list-style-type: none"> ❖ Storm water drainage lines must be constructed by the Contractor to divert runoff water around the construction site to prevent contamination of the water and ponding. ❖ All storm water drainage lines shall contain water flow arrestors to prevent erosive action on the sides of the drainage lines. ❖ The following measures must be implemented, both as erosion prevention and storm water control measures: ❖ Straw barriers (replaced when needed) should be installed in drainage paths to reduce velocity, and as a sediment trap during construction. Suspended solids carried by overland flow would be intercepted. These erosion barriers must be placed at intervals of 25-50 m apart in the drainage paths which would intercept suspended solids from entering the natural drainage paths. 	<ul style="list-style-type: none"> ❖ On-going 	<ul style="list-style-type: none"> ❖ Project manager ❖ ECO ❖ Contractor

	<ul style="list-style-type: none"> ❖ Rip-rap should be placed as liners for channel spines. These comprise packed stones with an average diameter of 100 mm, packed in the channels as lining material to control flow velocities and hence erosion. ❖ Earth cut-off channels at boundaries of the facility. These would assist in directing flow away from the site and reduce the possibility of flooding from runoff origination from outside the site. ❖ Provide erosion protection at channel outfalls and positions of high flow concentration. These comprise packed stones with an average diameter of 200 mm, packed in the drainage path to control flow velocities and hence erosion. ❖ The sediment and erosion control measures should remain in place until construction is complete. The above noted sediment traps would require regular monitoring during construction and reinstatement as necessary. ❖ Road drainage to deflect storm water off the road surface will be required. This can be achieved effectively by constructing drainage deflection humps diagonally across the road surface. ❖ The drainage hump will reduce velocity. The following should be considered: <ul style="list-style-type: none"> ❖ Build the humps no more than 50m apart; ❖ Drainage humps must be constructed with a solid core of either stones or coarse gravel covered with road surface material to form a gradual slope on both sides, and should extend well beyond the edge of the roadway on each side to prevent water from simply flowing around the hump and back into the road; 		
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	<ul style="list-style-type: none"> ❖ To prevent soil erosion the outflow area must be lined with tightly packed stones, ❖ To create a cobblestone effect. This acts as a silt trap and the water flow force is broken up and spread, preventing erosion. ❖ Any wastewater and/or storm water that is discharged during the construction phase will have to comply with the requirements of the National Water Act, specifically with the conditions set by the General Standard (Regulation 9225, Government Gazette, 18 May 1984) unless a licence is issued that sets specific standards for selected variables. ❖ Any erosion channels which develop during the construction period must be suitably backfilled, compacted and restored to a proper condition. 		
NOISE MANAGEMENT			
7.Construction activities resulting in noise disturbance in the surrounding area.	<ul style="list-style-type: none"> ❖ Put silencers on machinery to minimize noise pollution. ❖ Vehicle drivers should avoid driving in reverse to avoid siren sounding. ❖ No loud music should be allowed on site. ❖ Vehicles should abide by the speed restriction. ❖ There should be a regular inspection and maintenance to reduce level of noise. ❖ Construction working hours and other noise generating activities should be restricted to between 06h00 and 18h00 on Mondays to 	❖ On-going	<ul style="list-style-type: none"> ❖ Contractor ❖ Project manager ❖ ECO

	Fridays, unless otherwise approved by the appropriate competent person in consultation with adjacent landowners/affected persons and ECO.		
HERITAGE RESOURCES			
8. Destruction identified graves during clearance.	<ul style="list-style-type: none"> ❖ Providing a 30m buffer zone from the identified graves. ❖ Use existing farm tracks and roads. ❖ Use chance find procedure to manage accidental finds. 	❖ On-going	<ul style="list-style-type: none"> ❖ Contractor ❖ ECO
PROTECTION OF FAUNA AND FLORA			
10. Construction activities could result in the disturbance of unseen ground species during site clearance construction activities	<ul style="list-style-type: none"> ❖ No trapping or hunting of fauna should be allowed on site during any phase of the proposed development. ❖ All activities must be contained within the PV Plant footprint to minimize disturbance outside these areas. ❖ A pollution control system/spill handling procedure must be implemented to limit impact of such occurrences and prevent discharge to the receiving environment. ❖ Edge effects of all construction activities, such as erosion and alien plant species. ❖ proliferation which may affect floral habitat, need to be strictly managed. 	❖ On-going	<ul style="list-style-type: none"> ❖ Contractor ❖ ECO
11. Introduction and the spread of invasive alien vegetation	❖ No vegetation is to be removed outside of the demarcated zones. This will prevent disturbance of natural vegetation and the establishment of alien and invader vegetation species specified by GNR 507 and 508 or any amendments to the legislation	❖ During construction	<ul style="list-style-type: none"> ❖ Contractor ❖ ECO

	<ul style="list-style-type: none"> ❖ Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used. 		
AIR QUALITY			
12. Air pollution from vehicle emissions as well as dust from vehicle movements and stockpiles may have a negative impact on air quality	<ul style="list-style-type: none"> ❖ Vehicles travelling to and from the construction site must adhere to the speed limits so as to avoid producing excessive dust and knocking off people animals (pets) and pedestrians especially within the residential areas. ❖ A speed limit of 30 km/h must be adhered to on the construction site. ❖ High winds may pick up dust from the stockpiles. Screening of stockpiles may be required by utilising wooden supports and shade cloth. ❖ Fires by construction or project personnel are strictly prohibited. ❖ Vehicles and machinery are to be kept in good working order and meet the manufacturer’s specifications. Should excessive emissions be observed, the contractor is to have the equipment checked/ maintained within 24 hours. ❖ Dust suppression should be undertaken daily during construction. 	<ul style="list-style-type: none"> ❖ On-going 	<ul style="list-style-type: none"> ❖ Contractor ❖ ECO
ACCESS ROAD			
13. Impact on traffic	<ul style="list-style-type: none"> ❖ The Contractor must comply with all driving, vehicle, licensing and driver ability requirements. ❖ Permission required from the Project Manager for the movement of any vehicles and/or personnel outside of designated working areas. ❖ Water suppression for unpaved areas to the site should be applied during dry windy periods, using a water cart and/or fixed sprinklers. 	<ul style="list-style-type: none"> ❖ During construction 	<ul style="list-style-type: none"> ❖ Project Applicant – employment target ❖ Project Manager to check

	<ul style="list-style-type: none"> ❖ The Principal Contractor shall organize the site in such a manner that pedestrians and vehicles can move safely and without risks to health, including sufficient and suitable traffic routes and safe walkways with relevant signage. ❖ Traffic safety measures (e.g. traffic warning signs, flagmen) to be implemented. ❖ The Contractor should develop a temporary Traffic Management Plan. 		<ul style="list-style-type: none"> ❖ Contractor to implement management actions
SOLID WASTE MANAGEMENT			
14. Pollution of the area with general waste (litter, construction material etc.) and hazardous waste (Oils, hydrocarbon etc.) produced during the construction phase may have negative impacts on the surrounding environment.	<ul style="list-style-type: none"> ❖ All waste produced during the construction should be removed and disposed of at a registered Landfill Site (or an alternative appropriate landfill site) nearest to the work area. ❖ The waste must be stockpiled in a designated area within the site camp and transported to the Landfill Site on a regular basis. ❖ All construction materials should be stored in designated areas. ❖ No dumping of construction waste or excess construction materials will be allowed in the open spaces surrounding the construction sites. ❖ No waste is to be buried or burned on site. ❖ Chemical toilets are to be maintained in a clean state and serviced on a regular basis. ❖ The contractor is to ensure that the surrounding open spaces are not being used as an ablution facility. ❖ Appropriate disposal facilities, such as litter bins, must be provided within the construction camp and work areas. 	<ul style="list-style-type: none"> ❖ Weekly during construction 	<ul style="list-style-type: none"> ❖ Contractor ❖ Project Manager. ❖ ECO

	<ul style="list-style-type: none"> ❖ Bins and/or skips must be emptied regularly, and waste must be disposed of at a registered landfill site and proof of disposal kept on site. 		
HAZARDOUS SUBSTANCES MANAGEMENT			
15. Pollution of the environment due to the use of hazardous chemicals/substances on site.	<ul style="list-style-type: none"> ❖ The hazardous substances on site shall be listed on a register or hazardous substances inventory. ❖ An inventory provides employees with a source of information to assist in the management of hazardous substances in the workplace. ❖ This register should be kept as a live document for necessary updates as the project progresses. ❖ The inventory should be readily accessible to any employees who may be exposed to hazardous substances on site. ❖ Ensure employees know where to find it. It may be kept in a central location or provide a copy to each work area. ❖ Containers must remain labelled until the contents have been removed and the container has been completely cleaned (free of the substance) or the contents have been neutralized, cured or chemically deactivated. ❖ Labels for hazardous substances must not be removed from the container, defaced or altered. ❖ If a label on a container is illegible or incorrect, remove the container from use until it is appropriately labelled. ❖ Ensure that mitigation measures determined during the risk assessment are fully implemented. ❖ Vehicles and/or trailers of goods in transport should be marked with a four-digit United Nations (UN) number. This number can be 	<ul style="list-style-type: none"> ❖ On-going 	<ul style="list-style-type: none"> ❖ Contractor ❖ ECO

	<p>referenced by first responders (Fire fighters, Police Officers, and ambulance personnel)</p> <ul style="list-style-type: none"> ❖ Emergency procedures on how to deal with accidental spillages should be available and known to the driver. ❖ Hazardous substances should only be stored in designated areas where potential spillages could be contained to prevent pollution of the environment e.g. use of permanent bunding and/or drip trays with sufficient capacity. ❖ The design and construction of hazardous substances storage facilities should be approved by engineer and should comply with SANS standards for hazardous substances. ❖ The site around the hazardous substance storage facilities should be kept free from obstructions and combustible rubbish. ❖ All hazardous substance storage facilities should be equipped with spill kits. ❖ Hazardous substance storage facilities need to be visually inspected on a regular basis for structural integrity. ❖ Whenever a bund wall has been damaged, develops cracks or is breached, the gap should be fixed immediately and not left unrepaired overnight while the tank contains product. ❖ No smoking shall be allowed within the vicinity of the hazardous substance storage area. ❖ Ensure that there is adequate fire-fighting equipment at the hazardous substance stores. ❖ The capacity of the bunded area as well as emergency numbers should be indicated in an easily readable position. 		
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	<ul style="list-style-type: none"> ❖ The appropriate symbolic signs should be displayed at the various hazardous substances storage facilities in accordance with the requirements of SANS 1186-1. ❖ The facility should always be locked, and the key should be easily available, especially for emergency conditions. ❖ The hazardous substances storage facilities should consist of bunded wall with floor that has smooth impermeable surface (concrete or at least 250 µm plastic) with a bund wall and oil-water separator or drainpipe with valve. ❖ No storage of combustible materials shall be permitted in any bunded area. ❖ The hazardous substances storage facility should be secured i.e. either fenced or have walls and lockable entrance. The facility should have adequate containment for all the different liquids. ❖ A Spill Response plan should be developed for the management of Hazardous Chemicals/ Substances on site. 		
SOCIAL ECONOMIC BENEFITS AND IMPACTS			
16. Job creation	<ul style="list-style-type: none"> ❖ Create opportunities for the employment of women. ❖ Use local labour as far as possible, where necessary (e.g. unskilled labour). ❖ Training of labour to benefit individuals beyond completion of the project. ❖ Local people should be employed to increase support for the project and reduce the potential for criminal activities. 	❖ On-going	<ul style="list-style-type: none"> ❖ Project Applicant – employment target ❖ Project Manager to check

			❖ Contractor to implement management actions
EXISTING SERVICES AND INFRASTRUCTURE			
17. Existing Services and Infrastructure.	<ul style="list-style-type: none"> ❖ Identify and record all existing services and infrastructure. ❖ Negotiations and agreements with owners and landowners regarding existing services and infrastructure to be undertaken prior to construction and adhered to throughout the project lifecycle. ❖ Conform to requirements of relevant service providers. Agreements to be in place. ❖ Ensure access to infrastructure is available to service providers and owners at all times. ❖ Immediately notify service providers of disturbance to services. Rectify disturbance to services, in consultation with service providers. Maintain a record of all disturbances and remedial actions on site. ❖ Notify landowners of any disruptions to essential services and infrastructure. ❖ Deviate/relocate landowners' existing services and infrastructure (e.g. reticulation, irrigation lines, pump houses), where possible and if necessary, to accommodate project activities. ❖ Land compensation (if necessary) to adhere to legal framework. ❖ Adequate reinstatement and rehabilitation of environment affected as a result of the project. 	❖ Continuously	<ul style="list-style-type: none"> ❖ Proponent – acquire permits. ❖ Project Manager and ECO - to check. ❖ Contractor to implement management actions.

BATCHING PLANTS			
18. Ground water and soil contamination	<ul style="list-style-type: none"> ❖ Mixing / decanting of all chemicals and hazardous materials takes place on a drip tray or impermeable surface. ❖ Ensure all hazardous storage tanks/drums/stores are designed and managed in order to prevent pollution of rains, groundwater and soils. ❖ No batching/mixing of cement shall occur directly on unprotected ground. ❖ Empty cement bags shall be stored for safe disposal of site in weatherproof containers to prevent windblown cement dust or be affected by rain or runoff events. ❖ The Contractor shall take all reasonable measures to prevent the spillage of cement/ concrete during batching and construction operations. During pouring, the soil surface shall be protected using plastic and all visible remains of concrete shall be physically removed on completion of the cement/ concrete pour and appropriately disposed of. All spoiled and excess aggregate/ cement/ concrete shall be removed and disposed of via the solid waste management system. ❖ Where “readymix” concrete is used, the Contractor shall ensure that the delivery vehicles do not wash their chutes directly onto the ground. ❖ Any spillage resulting from the “readymix” delivery shall be immediately cleared and disposed of via the solid waste management system. Readymix trucks shall not be permitted to dump drum wash on site unless into designated contaminated water 	<ul style="list-style-type: none"> ❖ During construction 	<ul style="list-style-type: none"> ❖ Contactor

	pond which is properly lined with impermeable materials, and which must be fully rehabilitated at completion.		
WATER SUPPLY MANAGEMENT			
19. Water abstraction, storage and conservation	<ul style="list-style-type: none"> ❖ Any abstraction and storage of water for construction purposes must be approved by DWS. ❖ No illegal connection of pipelines is permitted. ❖ The Contractor will take all practical measures to minimise water use on site and will immediately attend to any wastage. This will include but not limited to: <ul style="list-style-type: none"> ➤ Monitoring of pressure pipes for leaks. ➤ Closing taps when not in use. ➤ The quantity of water used for construction purposes must be monitored. ❖ Water derived from or generated through construction related activities that becomes contaminated must be treated to ensure compliance with National Water Act, specifically with the conditions set by the General Standard (Regulation 9225, Government Gazette, 18 May 1984) before being released back into the environment. ❖ The Contractor shall re-use or recycle as much of this water as possible. 	❖ On-going	❖ Contractor
VISULA IMPACTS			

<p>20. Visual intrusion on existing views of sensitive visual receptors</p>	<ul style="list-style-type: none"> ❖ Measures to reduce visual intrusion must be implemented during construction. These may include but not limited to: Screening off site during construction with the use of shade cloth. ❖ Put measures in place to ensure that construction boundaries are demarcated, the areas of surface disturbance are minimised, the construction site is neat, tidy and contained. ❖ Demarcate and strictly control parking areas so that vehicles are limited to specific areas only. ❖ Night lighting of the construction sites should be minimised within requirements of safety and efficiency. 	<ul style="list-style-type: none"> ❖ On-going 	<ul style="list-style-type: none"> ❖ Contactor ❖ ECO
<p>21. Night lighting impacts</p>	<ul style="list-style-type: none"> ❖ Timer switches or motion detectors (within safety requirements) should be used to control lighting in areas that are not occupied continuously. ❖ The lighting plan should include a process for promptly addressing and mitigating complaints about potential lighting impacts. ❖ Lighting of the facility should not exceed, in number of lights and brightness, the minimum required for safety and security. ❖ Low-pressure sodium light sources should be used to reduce light pollution. ❖ Light fixtures should not spill light beyond the project boundary. ❖ A lighting plan that documents the design, layout and technology used for lighting purposes should be prepared, indicating how nightscape impacts will be minimised. 	<ul style="list-style-type: none"> ❖ Once-off 	<ul style="list-style-type: none"> ❖ Contactor
<p>LANDSCAPING AND REHABILITATION</p>			

22. Landscaping and rehabilitation	<ul style="list-style-type: none"> ❖ Contractor shall prepare a Rehabilitation Plan and Method Statement that must include among other things, the following requirements: <ul style="list-style-type: none"> ➤ Control invasive plant species and weeds by means of uprooting, cutting or approved methods. ➤ Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers (or other approved method). If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. ➤ Re-vegetation must match the vegetation type, which previously existed. ➤ Clear the site of all inert waste and rubble, including surplus rock and foundations. After the material has been removed, the site shall be re-instated and rehabilitated. ➤ Topsoil shall be spread evenly over the surface. The final prepared surface shall not be smooth but furrowed to follow the natural contours of the land. ➤ Work areas will be rehabilitated as soon as possible after completion of construction activities in an area, to minimise the potential for erosion and maximise the established time after re-vegetation. ➤ Repair any damage to re-vegetated areas to maintain coverage. 	❖ During Construction	❖ Contractor
FIRE PREVENTION			
23. Fire	❖ A designated smoking area within the camp site area must be provided, a fireproof sand filled container for extinguishing	❖ On-going	❖ Project Manager

	<p>cigarettes. Smoking shall otherwise be prohibited across the site and in the works areas.</p> <ul style="list-style-type: none"> ❖ Employees must be aware of the procedure to be followed in the event of a fire. ❖ Fire drills must be conducted every six months or as otherwise required by the OHSA. ❖ Adequate fire protection measures and firefighting equipment must be available at each work area and the camp site area to deal with the type and nature of fire that may arise. ❖ The Contractor shall prepare a Fire Prevention and Fire Emergency Method Statement. The Method Statement should include, but not limited to the following: <ul style="list-style-type: none"> ➤ Fire Fighting training for designated site staff. ➤ Sources of fire risk ➤ Measures to comply with any requirements of local authority fire departments. ❖ Construct firebreaks around the site area before any other construction begins. 		❖ Contractor
STOCKPILING AND STOCKPILING AREAS			
24. Stockpiling and stockpiling areas.	<ul style="list-style-type: none"> ❖ Prior to site establishment and any earthmoving operations, the Contractor will strip and stockpile all topsoil within the footprint of the construction activities. ❖ The following shall apply for the stripping, stockpiling and storage of topsoil: 	❖ During construction	❖ Contractor

	<ul style="list-style-type: none"> ➤ Soil shall be stripped in a phased manner, so as to retain vegetation cover for as long as possible to avoid prolonged exposure of soils to wind and water erosion. ➤ All topsoil shall be stockpiled separately from spoil material. ➤ No imported topsoil will be used as the final backfill layer. ➤ Topsoil stockpiles shall be convex and shall not exceed 2 metres in height. ❖ All stockpiles will be positioned and sloped to create the least visual impact. ❖ All stockpiles will not be allowed underneath trees or against the trunks of trees. ❖ All stockpiles will be constructed and maintained to avoid erosion of the material and contamination of the surrounding environment (including measures such as berms and hessian sheets to prevent erosion and sedimentation). ❖ The heights of stockpiles should be minimised as far as possible to reduce wind. ❖ Entrainment and stockpiles should be located as far away as possible from sensitive receptors. ❖ Weed control must be administered on all stockpiles. ❖ If the stockpiles start to erode significantly or cause dust problems, they shall be covered with hessian this is to be determined by the ECO. ❖ Vehicles transporting spoil material must be covered before leaving site. 		
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EXCAVATION OF FOUNDATIONS, CABLE TRENCHES, AND DRAINAGES SYSTEMS			
25. Excavation of foundations, cable trenches and drainages systems	<ul style="list-style-type: none"> ❖ Before digging, use utility detection tools such as ground-penetrating radar or electromagnetic locators to identify the location of underground utilities such as gas lines, water pipes, and electrical cables ❖ Protect the edges of the excavated trenches, foundation pits by hard metal, wooden barrier or with suitable fencing, displaying appropriate warning signs, warning tape and reflective tape. ❖ Check the excavations before and after rain. ❖ Keep the excavated earth away from the trenches. ❖ Backfill all minor and major excavated trenches which are required for site execution. ❖ If water is accumulated in the dug trench, dewater the trench by the certified pump which is been run by the electrician taking all necessary precautions. ❖ Barricade the trenches required for execution immediately. 	❖ During construction	❖ Contractor
INSTALLATION OF FOUNDATIONS, CABLE TRENCHES, AND DRAINAGES SYSTEMS			
26. Installation of foundations, cable trenches, and drainages systems	<ul style="list-style-type: none"> ❖ Properly compact the soil beneath the foundation to achieve the required density and stability. ❖ Ensure proper grading and drainage around the foundation to prevent water accumulation and soil erosion. ❖ Engage qualified engineers or geotechnical experts to ensure that the foundation design meets safety standards and local building codes. ❖ Install cable trenches according to industry standards and specifications. 	❖ During construction	❖ Contractor

	<ul style="list-style-type: none"> ❖ Ensure proper depth and width of trenches to accommodate the cables and provide adequate protection. ❖ Use suitable backfill materials and compaction methods to prevent settling or damage to the cables. ❖ Design drainage systems to effectively manage surface water and prevent flooding or soil erosion. ❖ Use appropriate materials for drainage pipes and structures and ensure proper installation to prevent leaks or blockages. ❖ Implement measures to protect water quality, such as installing sediment traps or using environmentally friendly construction materials. 		
HEALTH			
27. Spreading of diseases	<ul style="list-style-type: none"> ❖ There should be an emergency plan to deal with an outbreak of diseases e.g. Covid 19. ❖ Train the staff regularly on the containments of disease outbreak and how to prevent further spread. ❖ Water must be inspected on regular basis by taking water samples to test and monitor the quality of water. ❖ Provide comprehensive training to staff on proper hygiene and sanitation. ❖ Provision of condoms in the site 	❖ On-going	<ul style="list-style-type: none"> ❖ Contractor ❖ ECO ❖ Project manager
SAFETY OF THE PUBLIC			
28. Traffic Management	<ul style="list-style-type: none"> ❖ Develop a traffic management plan to minimize disruptions and ensure the safe flow of vehicles around the construction site. 	❖ On-going	<ul style="list-style-type: none"> ❖ Contractor ❖ ECO

	<ul style="list-style-type: none"> ❖ Use signage, flaggers, and traffic cones to direct traffic and pedestrians safely. 		<ul style="list-style-type: none"> ❖ Project manager
29. Pedestrian Safety	<ul style="list-style-type: none"> ❖ Provide designated walkways and crossings for pedestrians, separate from construction areas and vehicle traffic. ❖ Use barricades or barriers to keep pedestrians away from hazardous construction zones. 	<ul style="list-style-type: none"> ❖ During construction 	<ul style="list-style-type: none"> ❖ Contractor
30. Community Engagement	<ul style="list-style-type: none"> ❖ Engage with local stakeholders, including residents, businesses, and community organizations, to address concerns and gather feedback. ❖ Consider community preferences and concerns when planning construction activities and mitigation measures. ❖ Ensure compliance with local building codes, environmental regulations, and permitting requirements. ❖ Obtain necessary permits and approvals from regulatory agencies before commencing construction. ❖ Communicate with the local community about the construction schedule, potential impacts, and safety measures. Establish channels for residents to report concerns or emergencies related to the construction site. 	<ul style="list-style-type: none"> ❖ Prior before commencement of construction 	<ul style="list-style-type: none"> ❖ Contractor ❖ Project manager
31. Management of Labour Force.	<ul style="list-style-type: none"> ❖ Prevent trespassing of construction workers onto private property. ❖ Construction workers must be provided with identity cards and must wear identifiable clothing and remain within the working servitude for the project. ❖ Make suitable provision for transport and/or accommodation of workforce. ❖ Creating nuisances and disturbances in or near communities shall be prohibited. 	<ul style="list-style-type: none"> ❖ On-going 	<ul style="list-style-type: none"> ❖ Contractor

	<ul style="list-style-type: none"> ❖ Machine/vehicle operators shall receive clear instructions to remain within demarcated access routes and construction areas. ❖ Designated and demarcated smoking areas should be provided, with special bins for discarding of cigarette butts. 		
WORKSHOP, EQUIPEINT MAINTENANCE AND STORAGE			
32. Workshop, equipment maintenance and storage	<ul style="list-style-type: none"> ❖ Locate the workshop in an area that minimizes disturbance to nearby residents and sensitive environmental areas. ❖ Design the workshop with proper ventilation and lighting to create a safe and comfortable working environment. ❖ Ensure adequate space for equipment maintenance, storage of tools, spare parts, and materials. ❖ Implement spill containment measures such as drip pans, absorbent materials, and spill kits to prevent contamination of soil and water in case of leaks or spills. ❖ Store hazardous materials such as lubricants, solvents, and chemicals in secure and properly labeled containers to prevent accidental spills. ❖ Regularly inspect storage areas for leaks or signs of contamination and address any issues promptly. ❖ Install soundproofing materials and acoustic barriers to minimize noise emissions from workshop operations. ❖ Schedule noisy maintenance activities during times when nearby residents are least likely to be disturbed. ❖ Use vibration isolation pads or mounts for heavy equipment to reduce vibrations transmitted to nearby structures. ❖ Develop and enforce strict safety protocols for equipment maintenance activities, including lockout/tagout procedures, 	❖ On-going	❖ Contractor

	<p>confined space entry protocols, and use of personal protective equipment (PPE).</p> <ul style="list-style-type: none"> ❖ Conduct regular safety training sessions for workshop personnel to ensure awareness of hazards and proper safety procedures. ❖ Maintain emergency response equipment such as fire extinguishers, first aid kits, and eye wash stations, and ensure all personnel are trained in their use. ❖ Establish a preventive maintenance program for workshop equipment to minimize breakdowns and ensure reliable operation. ❖ Conduct regular inspections of tools, machinery, and storage facilities to identify and address any maintenance issues promptly. ❖ Keep maintenance records and logbooks to track equipment usage, repairs, and servicing. 		
FINALISING SOLAR PV PANELS AREAS			
33. Finalising solar PV panels areas	<ul style="list-style-type: none"> ❖ Plan construction access routes to minimize disruption to surrounding areas and reduce the risk of soil compaction, erosion, or habitat fragmentation. Use existing roads or pathways whenever possible to minimize new disturbances. ❖ Clear the construction site responsibly, minimizing habitat destruction and soil disturbance. Implement erosion control measures such as silt fences, straw bales, or sediment basins to prevent soil erosion and sedimentation of nearby water bodies. ❖ Ensure compliance with local building codes, zoning regulations, and permitting requirements for solar installations. This may include setbacks, fire safety regulations, and other considerations specific to your location. 	❖ Once-off	❖ Contractor

	<ul style="list-style-type: none"> ❖ Plan the layout of the electrical components, including inverters, wiring, and conduit paths, to minimize energy losses and ensure efficient energy production. ❖ Calculate the spacing between solar panels to avoid shading and optimize the use of available space. Factors such as panel tilt, shading, and maintenance access should be considered when determining panel spacing. ❖ Determine the optimal orientation and tilt angle for the solar panels based on the site's latitude and the desired energy output. Panels should typically face south to maximize sun exposure. ❖ Analyze the solar resource potential of the site, including factors such as solar irradiance, shading from nearby buildings or trees, and the tilt and orientation of the panels. 		
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8. OPERATIONAL PHASE

Although the project owner and contractor have no absolute control over the operational phase of this project, this section of the EMPr briefly provides management principles for the operational phase of the project. Environmental actions, procedures and responsibilities as required during the operational phase are specified. **Table 16** provides the management measures to be implemented during the Operational phase of the Road.

Table 16: Impact and Mitigation Measures in Operational Phase

POTENTIAL ENVIRONMEN	RECOMMENDED MITIGATION MEASURES
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TAL IMPACT (NATURE OF THE IMPACT)	MANAGEMENT AND MITIGATION MEASURES	TIMEFRAMES	RESPONSIBILITIES
SANITATION			
1.Ablution Facilities	<ul style="list-style-type: none"> ❖ The entrances to the toilets will be adequately screened from the public view. ❖ Sanitary hygiene bins will be provided for female staff. ❖ Ensure an adequate supply of soap, water, and hand sanitizer in restroom facilities. ❖ Regularly clean and disinfect restroom facilities to prevent the spread of germs and maintain hygiene standards. ❖ Provide training to workers on sanitation practices, including proper waste disposal, personal hygiene, and food safety. ❖ Raise awareness among workers about the importance of sanitation for their health and the environment, and encourage compliance with sanitation protocols 	❖ Continuously	❖ Operations and maintenance contractor
STORM AND WASTEWATER MANAGEMENT			
2.Storm and wastewater management	<ul style="list-style-type: none"> ❖ Storm water drainage lines must be maintained to divert runoff water around the PV Plant to prevent ponding. ❖ All storm water drainage lines shall contain water flow arrestors to prevent erosive action on the sides of the drainage lines. ❖ The following measures must be implemented, both as erosion prevention and storm water control measures: <ul style="list-style-type: none"> ➤ Straw barriers (replaced when needed) should be installed in drainage paths to reduce velocity, and as a sediment trap during 	❖ On-going	❖ Operations and maintenance contractor

	<p>construction. Suspended solids carried by overland flow would be intercepted. These erosion barriers must be placed at intervals of 25-50 m apart in the drainage paths which would intercept suspended solids from entering the natural drainage paths.</p> <ul style="list-style-type: none"> ➤ Rip-rap should be placed as liners for channel spines. These comprise packed stones with an average diameter of 100 mm, packed in the channels as lining material to control flow velocities and hence erosion. ➤ Earth cut-off channels at boundaries of the facility. These would assist in directing flow away from the site and reduce the possibility of flooding from runoff origination from outside the site. ➤ Provide erosion protection at channel outfalls and positions of high flow concentration. These comprise packed stones with an average diameter of 200 mm, packed in the drainage path to control flow velocities and hence erosion. <ul style="list-style-type: none"> ❖ Road drainage to deflect storm water off the road surface will be required. This can be achieved effectively by constructing drainage deflection humps diagonally across the road surface. The drainage hump will reduce velocity. ❖ Any erosion channels which develop during the operation period must be suitably backfilled, compacted and restored to a proper condition. 		
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HERITAGE RESOURCES

3.Alteration of the cultural and natural landscape by built elements	<ul style="list-style-type: none"> ❖ Use neutral, earthy-coloured paint on the built elements of the development so as to reduce the visual contrast in the landscape. 	<ul style="list-style-type: none"> ❖ Continually as required 	<ul style="list-style-type: none"> ❖ Operations and maintenance contractor
PROTECTION OF FAUNA AND FLORA			
4.Bird collisions with PV panels and other infrastructure.	<ul style="list-style-type: none"> ❖ Monitor bird fatalities – the monitoring plan must indicate what species are affected and at what time/season these occur and should follow Bird life SA recommendations. ❖ Monitoring must make note of bird species present and absent in terms of Southern African Bird Atlas Project (SABAP2) records for the area. ❖ Preferred habitat and areas of congregation must be noted. 	<ul style="list-style-type: none"> ❖ On-going 	<ul style="list-style-type: none"> ❖ Operations and maintenance contractor
5.Alien invasive species	<ul style="list-style-type: none"> ❖ Removal of the alien and weed species encountered on the property must take place in order to comply with existing legislation National Environmental Management: Biodiversity Act 2004 (Act No 10 of 2004) Alien and Invasive Species Regulations, 2014. ❖ Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used. 	<ul style="list-style-type: none"> ❖ Every 3 months 	<ul style="list-style-type: none"> ❖ Operations and maintenance contractor
6. Wildlife	<ul style="list-style-type: none"> ❖ Rescue wild animals found inside the site and give them to SPCA. ❖ No hunting of wild animals is allowed. ❖ Training and awareness on snakes handling. 	<ul style="list-style-type: none"> ❖ Continually 	<ul style="list-style-type: none"> ❖ Operations and maintenance contractor

SOLID WASTE MANAGEMENT			
7. Pollution of the area with general waste, domestic waste, electronic waste	<ul style="list-style-type: none"> ❖ Implement a waste segregation system to separate different types of waste, such as recyclables, non-recyclables, hazardous waste, and electronic waste. ❖ Provide clearly labeled waste bins and containers for each waste stream and ensure they are conveniently located throughout the plant site. ❖ Designate trained personnel responsible for waste collection, segregation, and disposal. ❖ Establish procedures for the proper handling, storage, and disposal of electronic equipment and components at the end of their lifecycle. ❖ Ensure that e-waste is collected separately from other waste streams and recycled or disposed of in accordance with environmental regulations. ❖ Partner with certified e-waste recyclers or refurbishers to responsibly manage electronic waste and prevent environmental contamination. ❖ Encourage the reuse of materials and equipment where feasible to minimize waste generation and conserve resources. 	❖ Weekly during operational	❖ Operations and maintenance contractor
HAZARDOUS SUBSTANCES MANAGEMENT			
8. Pollution of the environment due to the use of hazardous chemicals/ substances on site.	<ul style="list-style-type: none"> ❖ Identify and properly manage hazardous materials used in plant operations, such as batteries, lubricants, solvents, and chemicals. ❖ Store hazardous waste in designated areas equipped with appropriate containment measures, such as secondary containment systems and spill kits. 	❖ On-going	❖ Operations and maintenance contractor

	<ul style="list-style-type: none"> ❖ Arrange for the safe transportation and disposal of hazardous waste through licensed contractors or facilities in accordance with regulatory requirements. 		
SOCIAL ECONOMIC BENEFITS AND IMPACTS			
9.Job Creation and Economic Growth	<ul style="list-style-type: none"> ❖ Solar plants create employment opportunities during the operational phase, including positions for maintenance technicians, engineers, and administrative staff. ❖ Local businesses may benefit from increased economic activity related to servicing the solar plant, such as supply of goods and services 	❖ Continually	❖ Project Manager
10.Community Investment, Energy Access and Affordability	<ul style="list-style-type: none"> ❖ Community investment initiatives, such as funding local infrastructure projects, education programs, or health services. ❖ These investments can improve the quality of life for residents in nearby communities and foster positive relationships between the plant and the local community. ❖ Solar energy generated by the plant contributes to energy access and affordability, particularly in regions with limited access to electricity or high energy costs. ❖ Reduced reliance on fossil fuels can also mitigate the impact of energy price fluctuations on consumers. ❖ Solar plant operations provide opportunities for workforce development and training in renewable energy technologies. ❖ Training programs can help residents acquire skills and qualifications for employment in the growing renewable energy sector. 	❖ Continually	❖ Project Manager
WATER SUPPLY MANAGEMENT			

11. water supply management	<ul style="list-style-type: none"> ❖ The Manager must take all practical measures to minimise water use on site and will immediately attend to any wastage. This will include but not limited to: <ul style="list-style-type: none"> ➤ Monitoring of pressure pipes for leaks. ➤ Closing taps when not in use. ➤ Efficient use of water for washing of solar panels. 	❖ Continually	❖ Operations and maintenance contractor
VISUAL IMPACTS			
12. Visual intrusion on the views of sensitive visual receptors	<ul style="list-style-type: none"> ❖ Maintain rehabilitated surfaces until a self-sustaining stand of vegetation is established and visually adapted to the undisturbed surrounding vegetation. ❖ No new disturbance should be created during operations without approval by the Environmental Officer. ❖ Restoration of disturbed land should commence as soon after disturbance as possible. ❖ Dust and noxious weed control should be part of maintenance activities. ❖ Road maintenance activities should avoid damaging or disturbing vegetation. ❖ Painted features should be maintained and repainted when colour fades or paint flakes. ❖ Use appropriately coloured materials for structures to blend in with the backdrop of the project where this is technically feasible and the colour or paint will not have a deleterious effect on the functionality of the structures. 	❖ On-going	❖ Operations and maintenance contractor

13. Night lighting impacts	<ul style="list-style-type: none"> ❖ The lighting of the facility should not exceed, in number of lights and brightness, the minimum required for safety and security. ❖ Low-pressure sodium light sources should be used to reduce light pollution. ❖ Use shielded and directional lighting fixtures to minimize light spillage beyond the site boundaries. 	❖ Continually	❖ Operations and maintenance contractor
FIRE PREVENTION			
14. Fire	<ul style="list-style-type: none"> ❖ A designated smoking area within the site area must be provided, a fireproof sand filled container for extinguishing cigarettes. Smoking shall otherwise be prohibited across the site and in the works areas. ❖ Employees must be aware of the procedure to be followed in the event of a fire. ❖ Fire drills must be conducted every six months or as otherwise required by the OHSA. ❖ Adequate fire protection measures and firefighting equipment must be available at each work area and the camp site area to deal with the type and nature of fire that may arise. ❖ The Contractor shall prepare a Fire Prevention and Fire Emergency Method Statement. The Method Statement should include, but not limited to the following: <ul style="list-style-type: none"> ➤ Fire Fighting training for designated site staff. ➤ Sources of fire risk ➤ Measures to comply with any requirements of local authority fire departments. ❖ Construct firebreaks around the site area before fire seasons 	❖ On-going	❖ Operations and maintenance contractor

HEALTH			
15. Spreading of diseases	<ul style="list-style-type: none"> ❖ There should be an emergency plan to deal with an outbreak e.g. Covid 19. ❖ Train the staff regularly on the containments of disease outbreak and how to prevent further spread. ❖ Provide comprehensive training to staff on proper hygiene and sanitation. ❖ Provision of condoms in the site 	❖ On-going	❖ Project manager

8.1. GENERAL OPERATIONS OF THE SOLAR PLANT

8.1.1. Components of Solar Plant

A solar power plant consists of several key components that work together to generate electricity from sunlight. Here are some of the main components:

- **Solar Panels (PV)**

Solar panels are the primary components that convert sunlight into electricity through the photovoltaic effect. They are made up of interconnected solar cells, usually made of silicon, that generate direct current (DC) electricity when exposed to sunlight.

- **Mounting Structures**

Mounting structures provide support for the solar panels and secure them in place. They can be installed on rooftops, ground-mounted structures, or solar tracking systems to optimize sunlight exposure throughout the day.

- **Inverters**

Inverters are essential components that convert the DC electricity produced by the solar panels into alternating current (AC) electricity, which is used in homes, businesses, and the electrical grid. Inverters also perform functions such as voltage regulation, power management, and grid synchronization.

- **Racking and Mounting Systems**

Racking and mounting systems are used to securely attach solar panels to rooftops or ground-mounted structures. They provide structural support, ensure proper alignment and orientation of the panels, and allow for easy installation and maintenance.

- **Electrical Wiring and Connectors**

Electrical wiring and connectors are used to interconnect solar panels, inverters, and other electrical components in the solar power system. They transmit electricity from the solar panels to the inverters and distribute power to the electrical load or grid connection point.

- **Monitoring and Control Systems**

Monitoring and control systems monitor the performance, efficiency, and output of the solar power plant in real-time. They collect data on energy production, system status, and environmental conditions, allowing operators to optimize performance, diagnose issues, and ensure the reliable operation of the system.

- **Transformers and Switchgear**

Transformers and switchgear are used to step up or step down the voltage of the electricity generated by the solar power plant and to connect it to the electrical grid. They also provide protection, isolation, and control functions to ensure the safe and reliable operation of the electrical system.

- **Balance of System (BOS) Components**

Balance of system (BOS) components include various auxiliary systems and equipment required for the operation of the solar power plant, such as combiner boxes, surge protectors, disconnect switches, grounding systems, and meteorological stations.

- **Energy Storage Systems**

Energy storage systems, such as batteries, are optional components that store excess electricity generated by the solar power plant for use during periods of low sunlight or high energy demand. They improve energy resilience, grid stability, and the integration of renewable energy sources into the electrical grid.

8.1.2. Solar Process for Electricity Generation

When sunlight strikes the solar panels, photons (light particles) from the sunlight interact with the silicon atoms in the PV cells, causing the release of electrons. This process creates an electric field across the layers of the PV cell, generating direct current (DC) electricity.

The DC electricity produced by the solar panels is collected and transferred to an inverter, which converts it into alternating current (AC) electricity. AC electricity is the standard form of electrical power used in homes, businesses, and the electrical grid. The converted AC electricity can be used to power electrical appliances, lighting, heating, and other devices in homes, businesses, or utilities. Excess electricity generated by the solar panels can be fed back into the electrical grid through a process called net metering, allowing users to receive credit or compensation for the surplus energy produced.

In some cases, solar energy systems may incorporate energy storage solutions such as batteries to store excess electricity generated during the day for use during periods of low sunlight or at night. Energy storage systems enable greater energy independence and resilience, particularly in off-grid or grid-tied systems with intermittent power supply.

Solar power systems can be connected to the electrical grid, allowing users to draw electricity from the grid when solar energy production is insufficient (e.g., at night or

during cloudy weather) and export excess electricity to the grid when production exceeds demand.

Grid-connected solar systems provide flexibility and stability to the electrical grid, reducing reliance on fossil fuels and contributing to decarbonization efforts.

9. IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT PROGRAMME

The construction contractor must ensure that environmental management during pre-construction, construction and operation phases is carried out. A suitable qualified Environmental Officer will be responsible for ensuring compliance to the EMPr. The Environmental Control Officer on site will conduct regular site visits to ensure the success of the EMPr.

The Environmental Control Officer will:

- ❖ Know the contents and implications of the environmental report and monitor the implementation of the findings using the EMPr.
- ❖ Act as a guide, advisor and consultant to the contractor and client on environment issues during construction. This will be achieved by continuous auditing of the project, identification of problem areas and provisioning of action plans to avoid costly stoppages and /or environmental damage.
- ❖ Compile regular site inspection reports for the inclusion in the EMPr as an addendum if necessary.
- ❖ Ensure that a 'hotline' exists for reporting incidents and resolving any problems rapidly.
- ❖ And upgrade the EMPr as necessary and inform the relevant parties of the changes.

9.1. ENVIRONMENTAL AUDITS AND MONITORING

The construction contractor will submit reports on implementation of the environmental plan as described by the project proponent and authorities. An environmental audit will be conducted prior to the development and construction activities. This environmental audit will ensure that:

- Mitigation measures are implemented as prescribed in the Environmental Management Programme;
- The relevant authorities are kept informed about progress with the project and that they are given assurance that the project is implemented and managed as prescribed in the EMPr.
- Periodic inspections and/or audits are performed.
- Compliance to the conditions of the EMPr is adhered to and a report compiled.
- Reviews of conformance against policies and procedures stated in this document are performed. Supervisors in all work areas will conduct performance and compliance reviews, using the EMPr as guideline to ensure compliance.
- And inspections will occur on a monthly basis (or as required).

9.2. RECORD KEEPING

Documents to be maintained by the designated representative/ site agent are to include:

- Training records.
- Inspection records.
- Records of non-conformance and corrective action.
- Records of all complaints, concerns or issues and corrective action.
- Environmental Management Programme.
- All incidents reports.

All records will be kept for up to a year after the completion of the project or in accordance with other legal requirements as they apply.

9.3. EMPr UPDATES

The EMPr will be subject to on-going review throughout the course of the project to ensure its continued suitability, adequacy and effectiveness. This review may include but will not be limited to monitoring and measuring information, performance data, assessment and audit results and other relevant information and data.

10. SUMMARY OF RECOMMENDATIONS AND CONCLUSION

The proposed development will have minimal environmental impacts which are manageable through good engineering practices and following all environmental recommendations prescribed. Although all foreseeable actions and potential mitigations or management actions are contained in this document, the EMPr should be considered as a day-to-day management document. The EMPr thus sets out the environmental standards that are required to minimise the negative impacts and maximize the positive benefits of the local communities. An EMPr is a “live document”, and its continuous review and correct management will definitely result to the successful construction of the proposed development.

The contractor is to be made aware of the potential cost and timing implications needed to fulfill the implementation of the EMPr, thus adequately costing for these.