FINAL BASIC ASSESSMENT REPORT

Basic Assessment for the proposed development of the up to 150 MW Padloper Solar PV Facility 2 (i.e., Padloper PV 2), as well as the proposed development of a 132 kV Overhead Power Line between the Padloper PV 2 and the proposed authorised Ishwati Emoyeni Collector Substation (i.e., Padloper EGI 2), and their associated infrastructure, near Murraysburg in the Western Cape Province



APPENDIX D.13:

Traffic

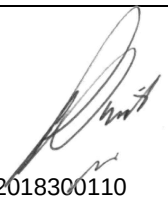
TRANSPORTATION SPECIALIST ASSESSMENT:

Basic Assessment for the Proposed Padloper Solar Photovoltaic Facilities 1 to 4 near Murraysburg, Northern and Western Cape Provinces

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Report prepared for:	*Report prepared by:*
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September 2023

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Document Title:	**Padloper Solar Photovoltaic Facilities 1 to 4** Traffic Study	
Revision Number	D	
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Signature:	 Pr. No: 202202263	Date: 21 September 2023
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Client:	African Clean Energy Development (Pty) Ltd	

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EXECUTIVE SUMMARY

Project Overview

The Project Applicant, Padloper PV (Pty) Ltd (hereinafter referred to as "the Applicant"), is proposing the development of the Padloper Solar Photovoltaic (PV) Cluster comprising 7 solar facilities and their dedicated 7 powerlines (or Electrical Grid Infrastructure (EGIs)), and associated infrastructure. This report specifically addresses 4 of the 7 proposed Padloper solar facilities, i.e., Padloper 1-4 (hereinafter also referred to as PV 1-4 or individually as PV 1, PV 2, PV 3, and PV 4).

PV 1 is located in the Ubuntu Local Municipality, Pixley ka Seme District Municipality, Northern Cape province of South Africa, approximately 28 km north of the town of Murraysburg; while PVs 1-4 are located in the Beaufort West Local Municipality, Central Karoo District Municipality, Western Cape province of South Africa, approximately 21 km north of the town of Murraysburg. The proposed facilities will have a combined maximum generating capacity of 700 MW with each facility having a maximum expected generation capacity as shown below.

PV Facility	Maximum Expected Generation Capacity
Padloper PV 1	250 MW
Padloper PV 2	150 MW
Padloper PV 3	150 MW
Padloper PV 4	150 MW

The overall objective of the proposed solar projects is to generate electricity by means of renewable energy technology capturing solar energy to feed into the national grid via the Eskom Gamma Main Transmission Substation via the proposed authorised Ishwati Emoyeni Collector substation. It is proposed that the Padloper Solar Facilities 1-4 will connect to the proposed authorised Ishwati Emoyeni Collector substation via dedicated 132 kV overhead power lines. These proposed powerlines will form part of the separate relevant Basic Assessment (BA) processes being undertaken for the proposed Padloper Solar Facilities 1-4. Traffic Impact Assessments (TIAs) are not one of the required specialist studies for the EGI project in terms of the DFFE Screening Tool, and therefore the dedicated overhead power lines connecting the proposed Padloper Solar Facilities 1-4 to the proposed authorised Ishwati Emoyeni Collector substation project is not covered in this TIA.

Objective

The main objective of the TIA is to determine the potential traffic impact/s of the proposed development on the existing road network and include these impacts, the assessment of the significance of these impacts, the proposed mitigation measures to reduce the potential negative impacts in the BA process, and identifying and enhancing any positive impacts. The study includes an assessment of potential impacts pertaining to the construction phase, the operation and maintenance phase, as well as the decommissioning phase of the development. The assessment of the potential impacts in these phases considers the transportation of normal and abnormal loads to site, which include *inter alia*; - Solar PV Facility components, construction materials, equipment and the transportation of construction workers.

Key Findings

The development is near national road R63 and provincial roads MR607 and DR2404. It can be accessed from likely points of supply through an existing road network comprising asphalt and gravel roads that are in good and suitable condition, including for the transportation of abnormal loads.

Access to the proposed facilities already exists in the form of farm access points but the vertical alignment and width of the access roads will need to be upgraded to accommodate the proposed adjusted land use.

The construction phase of the proposed Padloper Solar Facilities 1-4 projects (which will extend over 12-18 months for each project) is expected to generate a combined average of 160 daily trips and 49 peak hour trips; the operational phase is expected to generate a combined average of 26 daily trips and 22 peak hour trips; and the decommissioning phase is expected to generate a combined average of 141 daily trips and 46 peak hour trips.

Summary of Impacts

The potential traffic impacts identified in this study are summarised as follows:

- Increased abnormal load traffic such as the transportation of construction plant, transformers, mobile offices etc.;
- Increased normal load traffic such as the transportation of labour and the delivery of construction equipment, materials and renewable energy components;
- Increased potential incidents with pedestrians and livestock; and
- Increased need for road maintenance.

Summary of Mitigation Measures

Several mitigation measures are proposed to accommodate the proposed development and to reduce the risks and impacts on to the surrounding road network. These are summarised as follows:

- Ensure the transportation of abnormal loads is staggered and scheduled for off-peak periods;
- Ensure the delivery of construction plant, equipment, materials and facility components is staggered and scheduled for off-peak periods;
- Group transportation of labour;
- Maintain verges along local roads to provide safe walking space for pedestrians;
- Erection appropriate road signage for alerting motorists to property accesses and designated animal crossing points; and
- Implement appropriate, timely and high-quality maintenance of internal and external gravel roads.

Recommendation

With reference to this report, associated assessment and the findings made within, it is SiVEST's opinion that the proposed Padloper Solar Facilities 1-4 will have a nominal impact on the existing traffic network. The projects are therefore deemed acceptable from a transport perspective, provided the recommendations and mitigations measures in this report are implemented, and hence the Environmental Authorisation (EA) should be granted for the proposed Padloper Solar Facilities 1-4.

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LIST OF ABBREVIATIONS

ACED	Africa Clean Energy Developments
ADT	Average Daily Traffic
AP	Afternoon Peak
BA	Basic Assessment
BESS	Battery Energy Storage System
CSIR	Council for Scientific and Industrial Research
DFFE	Department of Forestry, Fishery and the Environment
DR	District Road
EA	Environmental Authorisation
EC	Eastern Cape
ECDoT	Eastern Cape Department of Transport
ECSA	Engineering Council of South Africa
EGI	Electrical Grid Infrastructure
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
FS	Free State
GIS	Geographic Information Systems
HV	Heavy Vehicle
KZN	KwaZulu-Natal
LV	Light Vehicle
MR	Main Road
MW	Mega Watt
NC	Northern Cape
NCDRPW	Northern Cape Department of Roads and Public Works
NEMA	National Environmental Management Act
NWA	National Water Act
OP	Minor Roads
PV	Photovoltaic
RCAM	Road Classification and Access Management
SAICE	South African Institution of Civil Engineering
SANRAL	South African National Roads Agency Limited
SEF	Solar Energy Facility
SG	Surveyor General
TCS	Traffic Counting System
TIA	Traffic Impact Assessment
TMH	Technical Methods for Highways
TR	Trunk Road
TRH	Technical Recommendation for Highways
UKZN	University of KwaZulu-Natal
WC	Western Cape
WCDTPW	Western Cape Department of Transport and Public Works
WEF	Wind Energy Facility
WM	Weekday Midday

This report serves as the Traffic Impact Assessment (TIA) that was prepared as part of the BA process undertaken for the proposed development of the Padloper Solar Facilities 1 to 4 with a combined generation capacity of up to 700 MW near the town of Murraysburg in the Western Cape and Northern Cape provinces.

1. INTRODUCTION

1.1. Scope, Purpose and Objectives of this Specialist Report

The key objective of the TIA is to determine the potential traffic impacts of the proposed development on the immediate and greater transportation systems and whether it can be accommodated, with or without mitigation, on the existing transportation network.

The study includes a site visit, and an assessment of potential impacts pertaining to the construction, operation and maintenance phase, as well as the decommissioning phase of the development. The assessment of the potential impacts in these phases considers the transportation of normal and abnormal loads to site, which include inter alia solar PV facility components, construction plant and materials, equipment and the transportation of construction workers.

1.2. Details of Specialist

This TIA has been undertaken by Ntuthuko Hlanguza of SiVEST (Pty) Ltd. Mr. Hlanguza is registered with the Engineering Council of South Africa (ECSA) (registration number 202202263) in the field of Civil Engineering. His *Curriculum Vitae* is included in Appendix A of this report. A signed specialist statement of independence is found in Appendix B.

1.3. Terms of Reference

1.3.1. Location

The Proposed Padloper Solar Facilities 1-4 will be developed on four farm portions located approximately 25 km north and north-east of the town of Murraysburg. The farm portion for PV 1 is within the Ubuntu Local Municipality, Pixley ka Seme District Municipality, Northern Cape province while those of PVs 2-4 are within the Beaufort West Local Municipality, Central Karoo District Municipality, Western Cape province.

Table 1-1 gives the affected farm portions while Figure 1-1 shows the locality of the proposed facilities (PI-1, PI-2, PI-3 and PI-4 on the figure and referred to as PV 1, PV 2, PV 3 and PV 4 in this report).

Table 1-1 Affected Farm Portions

No.	Facility	Farm Portion	SG Code	Province
1	PV 1	Portion 7 of Farm Klipplaat No. 109	C06300000000010900007	Northern Cape
2	PV 2	Remainder of Farm Riet Poort No.9	C05200000000000900000	Western Cape
3	PV 3	Portion 1 of Farm Klipplaat No. 109	C06300000000010900001	Western Cape
4	PV 4	Portion 2 of Farm Angora No. 26	C05200000000002600002	Western Cape

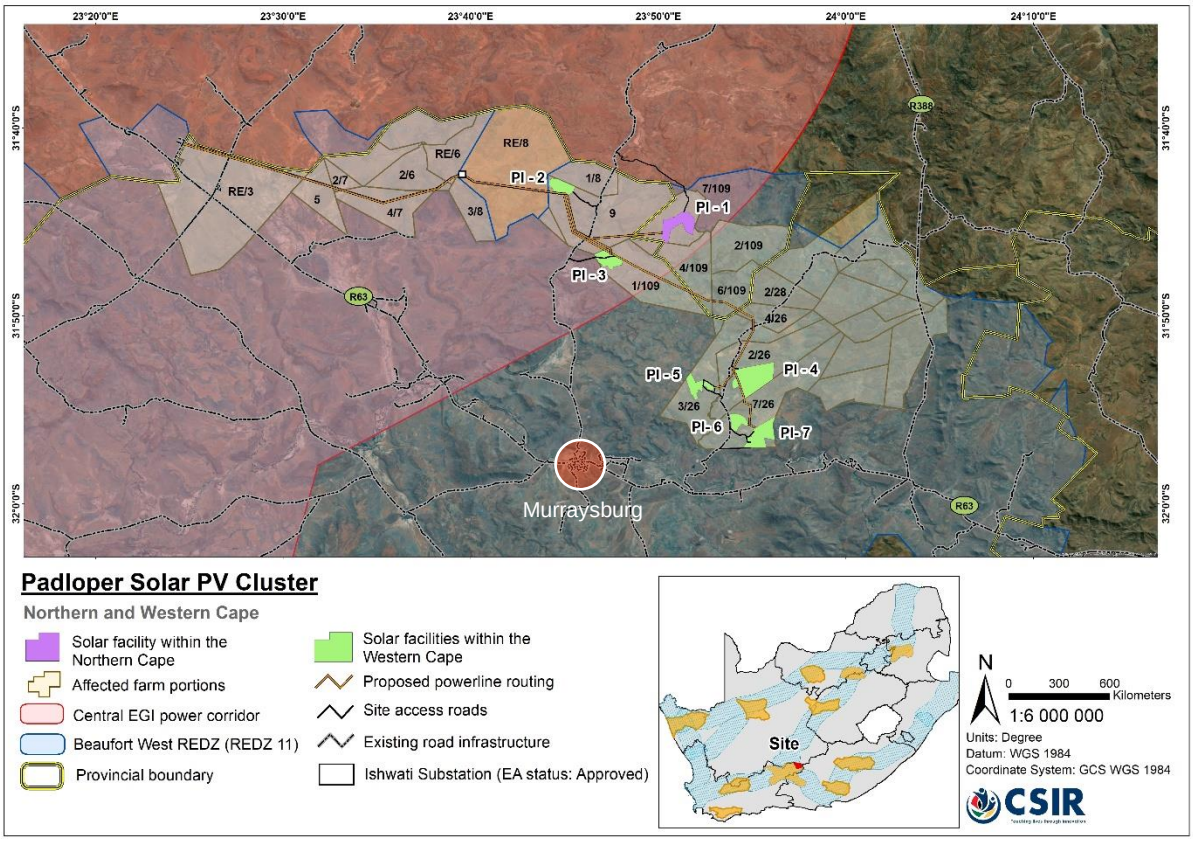


Figure 1-1 Project Locality

1.3.2. Development Components

The proposed facility will comprise the typical components tabulated below. It is noted that many of the tabulated aspects are subject to finalisation during the detail design phase.

Table 1-2 Development Components

PV Facilities	
Component	**Description / dimensions**
Height of PV panels	Maximum of ± 4.5m.
MW of each PV Facility	Padloper Solar PV 1: Up to 250 MW Padloper Solar PV 2: Up to 150 MW Padloper Solar PV 3: Up to 150 MW Padloper Solar PV 4: Up to 150 MW
Area of PV Array	Proposed area occupied by PV panel arrays: Padloper Solar PV 1: 429 ha (Total developable area: ± 420 ha) Padloper Solar PV 2: 249 ha (Total developable area: ± 222 ha) Padloper Solar PV 3: 293 ha (Total developable area: ± 233 ha) Padloper Solar PV 4: 747 ha (Total developable area: ± 329 ha) Note that the total developable area referred to above includes all associated infrastructure within the fenced off area of the PV facility.

PV Facilities		
Component	**Description / dimensions**	
Number of inverters required	Preliminary number of 3.5 MW inverters across all the projects: 330	
Area occupied by inverter-transformer stations and on-site substation and height	Inverter-Transformer stations: 0.022 ha each x 165 stations = 3.63 ha for all 7 facilities. The inverter stations will have a height of ± 3 m each (Excluding lightning rods. The lightning rods are expected to extend 10 m high. Each inverter station will have 1 – 2 lightning rods). A facility substation complex at all 4 PV facilities**.** The on-site substation will be approximately 2 ha and will have a height of up to 18 m.	
Capacity of on-site substation	132 kV	
Area occupied by both permanent and construction laydown areas	One temporary laydown area proposed at each PV Facility (ranging from approximately 1 ha to 4 ha). The temporary laydown areas will be rehabilitated after construction and will not be retained for the operational phase.	
Length of internal roads	Preliminary internal roads: ± 36.3 km long x 5 m wide = 18.15 ha for all 7 facilities (Note: This is rough estimate and will be confirmed during the final design phase of the projects prior to commencing construction).	
Width of internal roads	Width: ± 4 – 5 m	
Upgrading of existing access road/s	Existing roads will be used as far as practically achievable.	
	Current width (m): ± 5 m	
	Upgraded width (m): ± 8 m (6m wide road surface with 1m drain either side)	
Internal transmission and/or distribution lines	All on-site medium voltage cabling (22 or 33kV) will be buried to a maximum depth of 1.5 m.	
Site offices There will be 1 site office at each PV Facility which will include a warehouse/workshop and an operational and maintenance (O&M) control centre. The details provided in this section is for one site office.	Number of buildings:	± 1
	Maximum height (m):	Up to 10 m
	Footprint (m²):	300 m²
Guard houses There will be 2 guardhouses facilities at each PV Facility. The details provided in this section is for one guard house.	Maximum height (m):	Up to 3 m
	Footprint (m²):	Guard house and security: ± 6 m x 6 m ± 36 m²
Ablution facilities	Maximum height (m):	Up to 10 m
	Footprint (m²):	Staff lockers: ± 22 m x 11 m ± 242 m²

PV Facilities		
Component	**Description / dimensions**	
2 ablution facilities at each PV Facility, each with the following details.		
Battery storage Each PV Facility will include 1 BESS facility. It is proposed that the BESS will be located at the project substation site and laydown area	Battery technology type:	Lithium-ion technology
	Approx. footprint (ha):	± 5ha
	Maximum height (m):	Up to 10 m
	Capacity:	Padloper PV 5: 150 MW (900 MWh) Padloper PV 6: 100 MW (600 MWh) Padloper PV 7: 150 MW (900 MWh)
Underground low voltage cables or cable trays	Maximum depth (m):	Up to 1.5 m
Construction Period (months):	± 12 - 18 months per project (projects may be constructed in parallel).	

1.3.3. Site Layout

The site layouts of the proposed Padloper Solar Facilities 1-4 are shown in Figure 1-2 and will be further refined during the detailed design phase. It is recommended that the final project layout design takes the findings of this study into account.

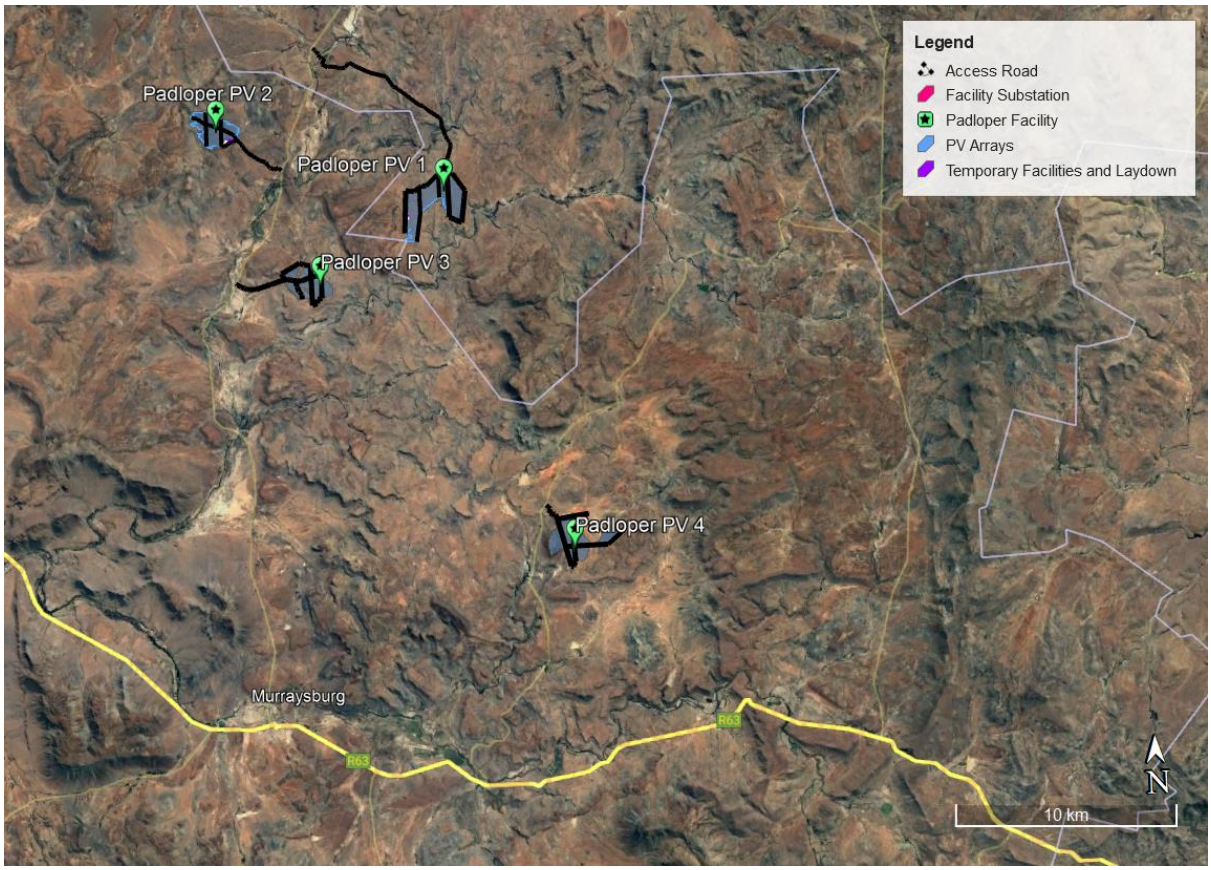


Figure 1-2 Site Layouts of the Proposed Padloper Solar Facilities 1-4.

2. APPROACH AND METHODOLOGY

2.1. Adopted Approach

The approach and methodology followed in undertaking the TIA are outlined below.

a) Desktop Assessment

Available project-related information was reviewed for the study, including master plans, municipal integrated development plans, previous TIAs, the specialist terms of reference and project specific maps and layout drawings.

b) Consultations

Consultations were held in person on 21 October 2022 with the Chief Traffic Inspector of the Beaufort West Local Municipality. Further telephonic/virtual consultations were held with representatives of Western Cape Department of Transport and Public Works (WCDTPW), Northern Cape Department of Roads and Public Works (NCPRPW), and the Eastern Cape Department of Transport (ECDT). The purpose of the consultations was to understand the state and suitability of the transport infrastructure affected by the proposed development, and the requirements of the respective entities for the use of said infrastructure.

c) Site Investigations

A site investigation was conducted in the spring season from 20 to 23 October 2022 wherein the geometric and traffic characteristics of the road network surrounding the proposed development area were assessed, including existing and potential site accesses. A rain event occurred during the site investigation which afforded the rare opportunity of observing the stormwater drainage capacity of the surrounding road network.

d) Route and Trip Projections

The nature, origin and transportation of project-specific components during construction, including plant, materials, equipment and staff were considered, including abnormal load requirements. Routes from ports to site were identified and assessed, and the number of generated normal and abnormal load trips were estimated for the construction, operation and decommissioning phases of the project.

e) Assessment of Impact

The potential traffic impacts of the proposed development were explicitly identified for the construction, operation and decommissioning phases of the proposed project (Padloper Solar Facilities 1-4), assessed and rated using the impact assessment methodology provided by the CSIR (Appendix D). Recommendations were provided to mitigate the identified impacts at all stages of the development, namely the construction phase, operation phase and decommissioning phase (refer to the assessment tables in Section 6.6).

f) Presentation of Findings

The outcomes of the specialist study were collated, synthesised and presented in this report.

2.2. Information Sources

Below is the primary base information utilised for the TIA:

Table 2-1 Base Data

Data / Information	Source	Date	Type	Description
Pixley Ka Seme District Municipality Spatial Development Framework	Pixley Ka Seme District Municipality	2021	Report	Planned spatial development within the project region
Central Karoo District Municipality Spatial Development Framework	Central Karoo District Municipality	2021	Report	Planned spatial development within the project region
Northern Cape Provincial Infrastructure Development Plan	Northern Cape Provincial Government	2019		Planned infrastructure development and maintenance within the project region
Western Cape Provincial Strategic Plan	Western Cape Provincial Government	2019	Report	Planned infrastructure development and maintenance within the project region
Record Traffic Data	Western Cape Department of Transport and Public Works	2021	Statistical	Traffic counts at all major intersections of the proposed developments' surrounding road network
Geographic Information Systems (GIS) shape files	Department of Agriculture, Land Reform and Rural Development	2020-2022	Spatial	Positioning and descriptions of roads to be impacted by the proposed developments

2.3. Assumptions, Knowledge Gaps and Limitations

The following assumptions and limitations are to be noted:

- The analysis is based on the information provided at the time of report preparation by African Clean Energy Developments (Pty) Ltd (ACED) and the CSIR, and their representatives.
- The design horizon for the proposed facilities is assessed to be 20 years.
- The study and its findings are limited to the technical specifications described in Section 1.3 as provided by the client.
- Traffic Data and trip generation calculations are for one direction only.
- This assessment is limited to the impact the development traffic will have on the network and not on the wider traffic known as background traffic. Such impacts can only be addressed in a detailed Traffic Impact Study which considers actual traffic counts undertaken during the peak periods.
- The information provided in this report is an informed estimate. Construction-related traffic may however vary as a result of supplier delivery schedule changes.
- Some of the figures provided are indicative figures as many of the components are still at the design stage and will only be confirmed closer to construction.
- Seasonal impacts do not affect the assessment.
- Cumulative impacts are assessed by adding expected impacts from this proposed development to existing and proposed developments with similar impacts in a 30 km radius. The existing and

proposed developments that were taken into consideration for cumulative impacts are listed in Section 6.4 of this report.

3. TRANSPORTATION ASPECTS

3.1 Ports of Entry

Various renewable energy components and equipment are available within South Africa, particularly at the country's major economic centres of Johannesburg, Durban, Gqeberha and Cape Town. However, due to the scale, logistics and technological requirements of industrial renewable energy developments, it is common to import many renewable energy components.

The recommended port of entry is the Port of Ngqura in the Nelson Mandela Bay Metropolis, 345 km south-east of the proposed facilities. The Port of Ngqura is one of only two ports in South Africa that are not encompassed by a city (the other being the Port of Saldanha), making initial mobility more efficient. Alternative ports of entry are the Port of Cape Town (± 622 km south-west of the proposed facility) and the Port of Saldanha (± 678 km west of the proposed facility).

In respect of air travel, the closest international airports to the proposed facilities are in Gqeberha (± 355 km), Bloemfontein (± 475 km) and Cape Town (± 622 km).

3.2 Abnormal Loads

Abnormal loads are described as loads that, for all practical purposes, cannot be transported on a vehicle without exceeding the limitations described in the National Road Traffic Regulations (2000). These loads are defined and identified in the technical guideline document titled TRH16: Dimensional and Mass Limitations and Other Requirements for Abnormal Load Vehicles.

A vehicle (or combination of load and vehicle) can exceed stipulated limitations and hence be deemed an abnormal load as a result of one or more of the following:

- Dimension Abnormality
  - Length
    - Single vehicle - 12.5 m
    - Articulated vehicle - 18.5 m
    - Combination vehicle - 22.0 m
  - Width
    - General vehicles - 2.5 m
    - Goods vehicles - 2.6 m
    - Construction vehicles - 3.5 m
    - Agricultural vehicles - 4.5 m
  - Height
    - All vehicles - 4.3 m
  - Front Overhang
    - Vehicle front-end ≤ 1.7 m: 60% of wheelbase or 6.2 m less half of wheelbase
    - Vehicle front-end > 1.7 m: 60% of wheelbase or 5.8 m less half of wheelbase

        - Semi-trailer - 1.8 m
    - Rear Overhang
        - All goods vehicles - 60% of wheelbase
    - Front Load Projection
        - All vehicles - 300 mm
    - Rear Load Projections
        - All vehicles - 1.8 m
    - Wheelbase
        - Bus-trains - 15.0 m
        - Semi-trailers - 10.0 m
        - All other vehicles - 8.5 m
    - Turning Radius
        - Bus-trains - 17.5 m
        - Twin-steer vehicles - 17.5 m
        - All other vehicles - 13.1 m
    - Stability
        - Height/wheel track ratio: 2.0
        - Load width/wheel track ratio: 1.8
    - Ground Clearance
        - All vehicles: - 150 mm

- Mass Abnormality
    - Loads on Tyres
    - Manufacturer's Ratings
    - Carrying Capacity of Roads
    - Carrying Capacity of Bridges and Culverts
    - Drawing Vehicle Limitations (Power to Mass Ratio)
    - Mass loads on Drive Axles (Traction Ratio)
    - Mass loads on Steering Axles (Steering Ratio)

In the development of solar energy facilities, abnormal loads can arise from the transportation of construction plant such as graders, compactors and cranes; and site facilities such as prefabricated offices.

Examples of such abnormal loads are depicted below.

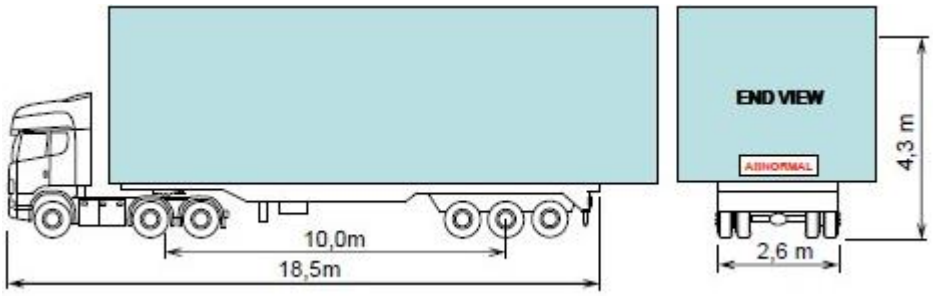


Figure 3-1 Abnormal Load Example: Prefabricated Offices

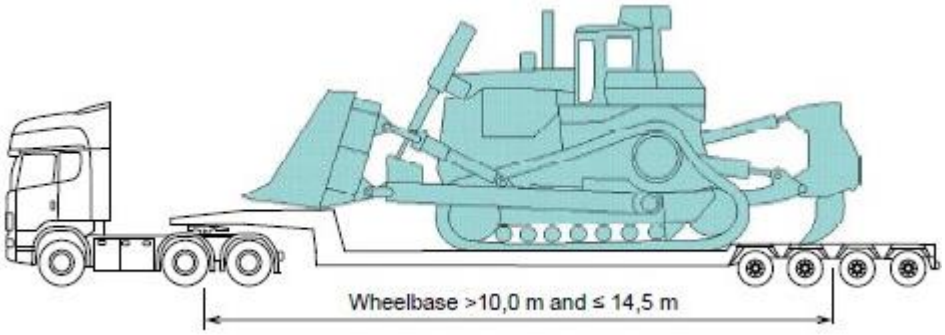


Figure 3-2 Abnormal Load Example: Construction Plant

Prior to transporting abnormal loads, approval must be obtained in the form of a permit from all the national and provincial departments of transport associated with the transportation route. The permit application includes route clearances from local, provincial and national road and transport authorities, as well as from national utilities such as Telkom, Eskom and Transnet.

The suitability of routes for abnormal loads is considered in this report. Nonetheless, it is recommended that an Abnormal Load Study be undertaken once the (i) detail design, (ii) construction programme, and (iii) logistics schedule are available. The suitability of routes to the proposed facility for abnormal loads is considered below.

3.3 Long Haulage Routes

Solar energy components and construction equipment are assumed to come from the Nelson Mandela Bay Metropolis (Port of Ngqura and Gqeberha) and from Cape Town. The city of Bloemfontein in the Free State Province is considered as an alternative trip origin for the supply of construction plant, materials, and equipment. Staff and labour are expected to come from the town of Beaufort West and its surrounding areas. It is assumed that general construction material can be obtained locally.

Error! Reference source not found. presents the expected/assumed trip origins for long haulage transportation of equipment, materials, and workers to site. The trip destination for all trips is the site of the proposed facilities some 21 km outside the town of Murraysburg. The long haulage routes are further depicted in Figure 3-3 and discussed thereafter.

Table 3-1 Long Haulage Routes

TRIP ORIGIN	ROUTE DETAILS			
	Load	**Distance**	**Province**	**Abnormal Load Capability**
Ngqura (Route 1 - Preferred route)	Components, plant, equipment	± 345 km	EC, WC	Good
Cape Town (Route 2)	Components, plant, equipment	± 622 km	WC	Good
Bloemfontein (Route 3)	Plant, equipment, material	± 475 km	FS, NC, WC	Good

EC: Eastern Cape, WC: Western Cape, FS: Free State, NC: Northern Cape

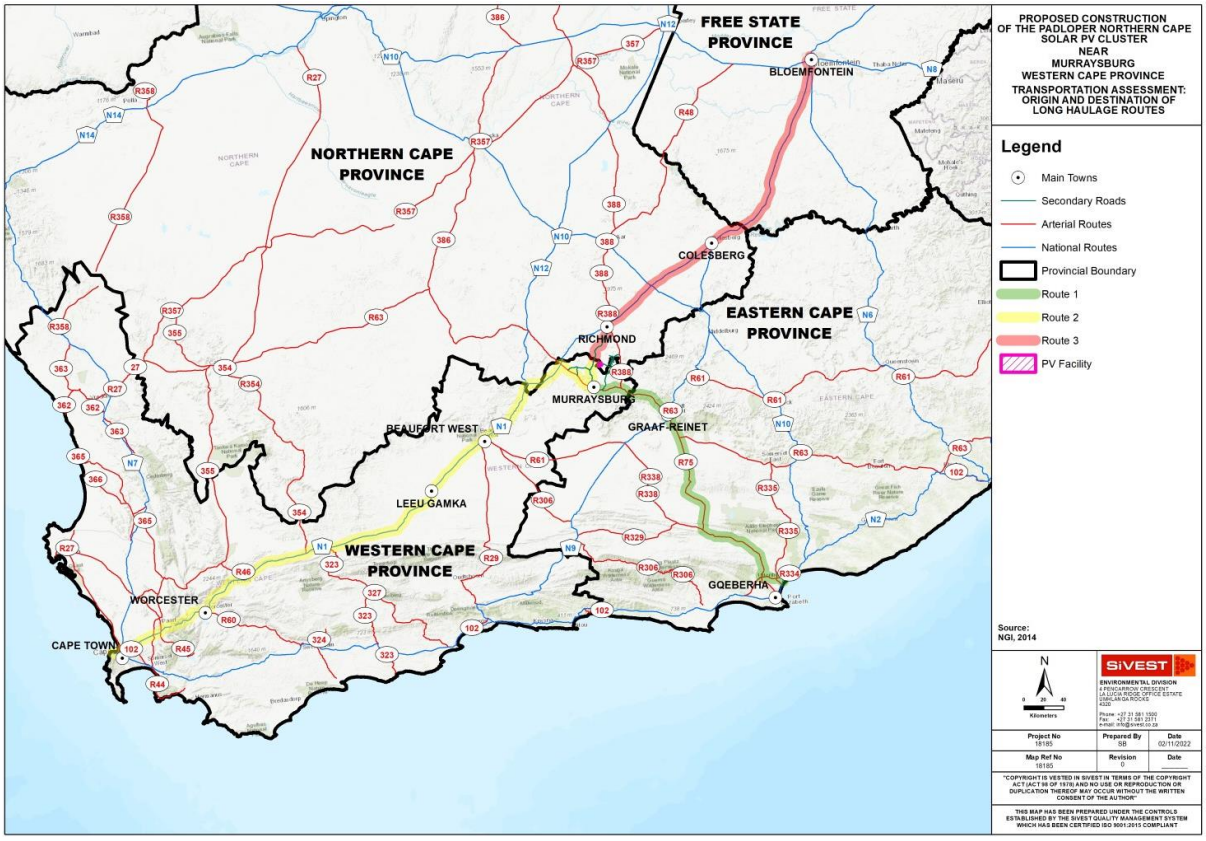


Figure 3-3 Long Haulage Routes investigated for the proposed transportation of equipment and materials to the Padloper Solar Facilities 1-4.

Route 1: Port of Ngqura to the Proposed Padloper PV Facilities (Preferred)

This route consists of regularly maintained national and provincial asphalt roads that are in good condition and are approximately 9 m wide. Resurfacing and widening are currently being undertaken by SANRAL within the first 85 km of the route, with approximately four stop-and-go control points. The route features one notable mountain pass, namely Van Ryneveld's Pass on the R63 approximately 270 km into the journey. The pass is 2.1 km long and has an altitude variance of 40m. Despite some twisty sections along the pass, the route is considered suitable for the transportation of the anticipated abnormal loads.

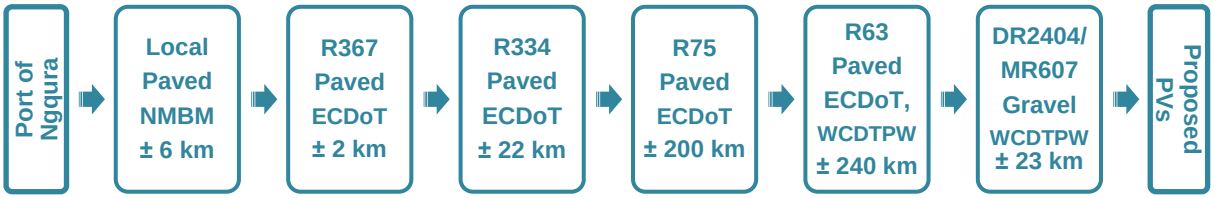


Figure 3-4 Route 1

Route 2: Cape Town to the Proposed Padloper PV Facilities

This route includes the N1, which is the country's longest national road traversing diagonally across South Africa between Cape Town in the southwest corner of the country and Beitbridge in the north-east. The route is well maintained and in good condition and is suitable for the anticipated abnormal loads.

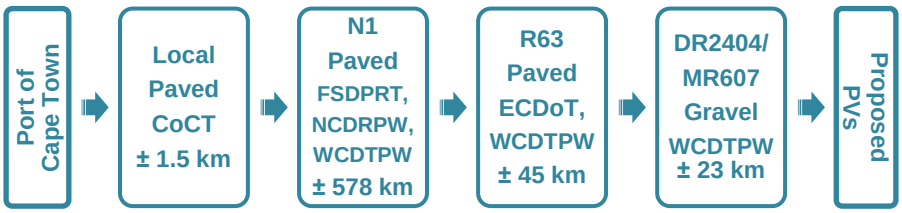


Figure 3-5 Route 2

Route 3: Bloemfontein to the proposed Padloper PV Facilities

This route follows the N1 for all but 50 km of the distance. The route is well maintained and in good condition and is suitable for the anticipated abnormal loads.

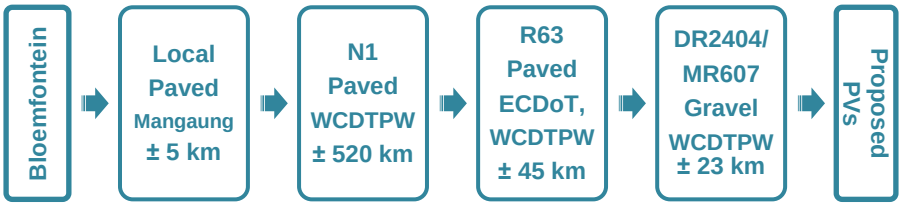


Figure 3-6 Route 3

3.4 External Transportation Network

Figure 3-7 shows the external road network in the immediate vicinity of the proposed Padloper PV Facilities 1-4, including existing and/or proposed site access roads.

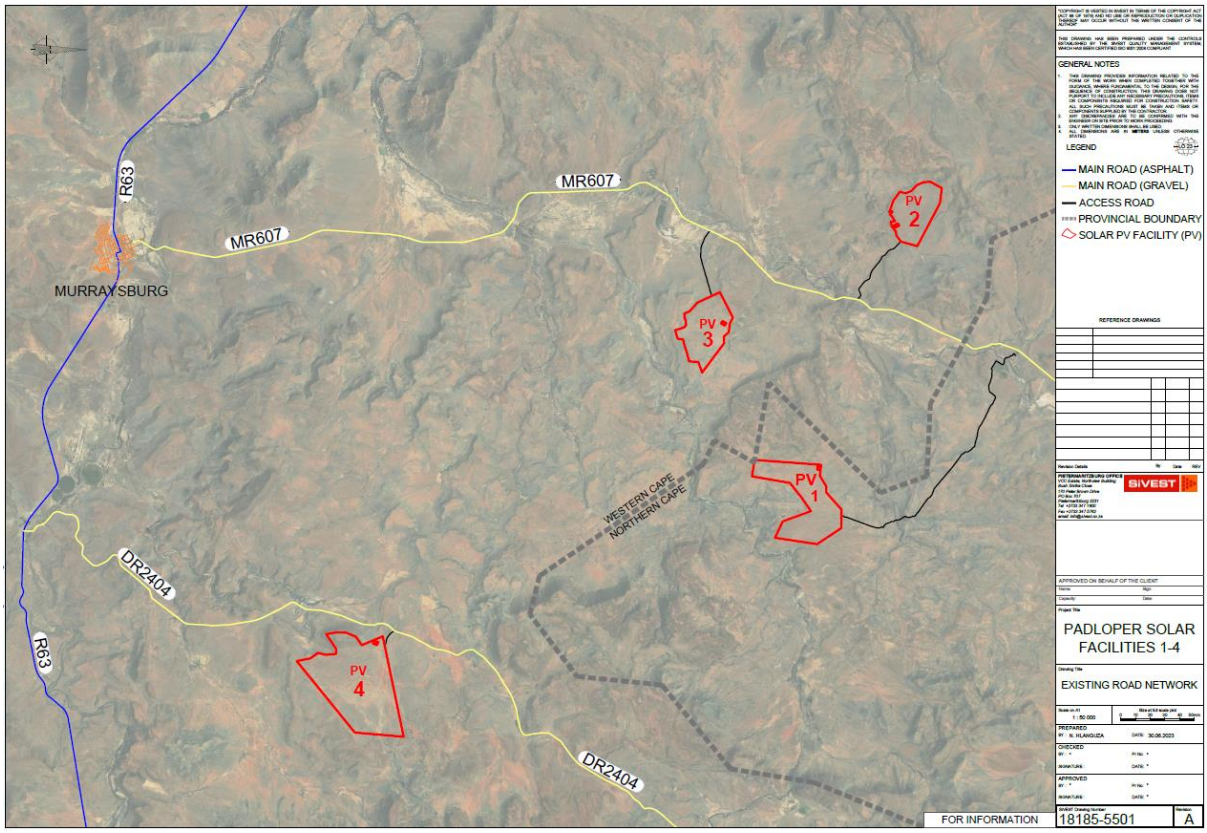


Figure 3-7 External Road Network assessed with the proposed PV 1-4 Facilities.

3.4.1 Existing Roads

The proposed facility can be accessed using public roads R63, MR607 and DR2404. All intersections in this road network are non-signalised.

Road ***R63*** is an asphalt trunk road spanning three provinces (Eastern Cape, Western Cape and Northern Cape) which is maintained by SANRAL. It carries the RCAM classification R2 and is lightly trafficked in the vicinity of the proposed Padloper Solar Cluster. The road is in good condition and is suitable for the requirements of the proposed developments. Road R63 provides access to MR607 and DR2404.

Road ***MR607*** is a gravel main road which runs between Murraysburg in the Western Cape and Richmond in the Northern Cape. It is overseen by the respective provincial road authorities and carries the RCAM classification of R4. The road features two narrow river bridges with a clear width of approximately 3.8 m. At the time of the site inspection, at one of the bridges the appropriate warning signage was installed on one side of the bridge only. It is recommended that traffic be controlled at these bridges during construction, and that adequate signage be erected. Ponding was also witnessed after a rain event at approximately KM 10, suggesting poor drainage at some point along the road. The presence of water generally accelerates the deterioration of the road, which will be exacerbated under the expected heavy vehicles during construction. It is recommended that the road authority conduct road maintenance prior to the commencement of the projects. It is further recommended that the developer conduct a conditional assessment of all public gravel roads prior to construction and implement an ongoing assessment and maintenance programme for addressing construction-related defects. Road MR607 provides access to PV 1, PV 2 and PV 3.

Road ***DR2404*** is a gravel divisional road within the Western Cape with an RCAM classification of R4. The road begins at its intersection with the R63 approximately 10 km east of Murraysburg. The intersection has sight distances of approximately 320 m and 1800 m, which are sufficient for the developments' anticipated construction traffic. DR2404 is approximately 6 m wide for most of the assessed length, with a few sections that are approximately 4 m wide and may require widening. Moderate corrugation and oversized aggregate were observed on some sections of the road surface. Construction traffic is advised to travel at a slow speed on DR2404 due to the 6 m width, to allow timely sighting and safe passing of opposing traffic. It is also recommended that the road be bladed before construction to smoothen out the corrugations and rocky surface. This will assist with safer transportation of PV panels and construction material, as well as reduce road degradation. Road DR2404 provides access to PV 4.

Images of some of the existing roads are depicted below.



Image 3-1 Typical condition of the R63.



Image 3-2 Start of MR607 in Murraysburg.



Image 3-3 Typical condition of MR607.



Image 3-4 Narrow bridge on MR607.



Image 3-5 Ponding on MR607.



Image 3-6 DR2404 (ahead) intersecting with R63, approx. 10 km east of Murraysburg.



Image 3-7 Typical condition of DR2404.



Image 3-8 DR2404, oversized stone on road surface.

Table 3-2 summarises the details of the existing road network in the vicinity of the proposed Padloper Solar Facilities 1-4. Reference is also made to Figure 3-7 above.

Table 3-2 Existing Road Network

Road	RCAM Class	Surface	Average Width	Road Reserve	Authority	Condition
R63	R2	Asphalt	8 m	30	SANRAL	Excellent
MR607	R4	Gravel	7.4 m	30	WCDTPW, NCDRPW	Good
DR2404	R4	Gravel	6 m	20	WCDTPW	Good

SANRAL: South African National Roads Agency Limited
WCDTPW: Western Cape Department of Transport and Public Works
NCDRPW: Northern Cape Department of Roads and Public Works

3.4.2 Public Transportation

Formalised public transportation around the Murraysburg area is very limited. Most commuting by non-vehicle owners around farm areas is in the form of hiking or privately arranged group travel.

3.4.3 Non-Motorised Transportation

Commuting by foot is common in Murraysburg and surrounding areas. However, the proposed facilities are approximately 25 km from the closest residential areas, making walking to the facility unlikely. Notwithstanding the above, the surrounding road network features sufficiently wide and clear verges for safe commuting by foot, and the road widths are sufficient to accommodate cyclists.

3.5 Site Access

The proposed Padloper Solar Facilities 1-4 have 4 existing accesses which were assessed. Access roads were on average 4.5 m wide while access gates were approximately 5 m wide. The existing access points were found to be suitable for the proposed development in terms of location but require minor upgrades to achieve the required functionality.

The nature of the proposed development requires that the following access design standards be satisfied.

Table 3-3 Access Design Considerations

Design Element	Minimum	Recommended	PV 1	PV 2	PV 3	PV 4
Sight Distance	200 m	300 m	✓	✓	✓	✓
Turning Radii	14 m	20 m	×	×	×	×
Access Width Clearance	6 m	10 m	×	×	×	×
Access Height Clearance	4.7 m	No Obstruction	✓	✓	✓	✓

Sight Distance

All the existing accesses provide the required site distance of 200 m from all approach directions.

Turning Radii

Accesses to the proposed Padloper Solar Facilities 1-4 do not satisfy the minimum turning radii requirement. There is however sufficient space within the verges of these intersections to accommodate any hanging from abnormal vehicles or to facilitate minor temporary works that may be required for construction traffic. The current turning radii are sufficient for typical heavy vehicles. Permanent upgrades for this purpose are not envisaged.

Access Width Clearance

All the existing accesses feature an access gate which constricts the width to an average of 4.5 m at that point, resulting in the access not satisfying the required width clearance. Wider access gates would therefore be required.

Access Height Clearance

No overhead obstacles are present at the four access points.

The existing accesses to the proposed facilities are depicted in selected images below.



Image 3-9 Access to PV 1 to the right, off the MR607.



Image 3-10 Access to PV 2 off MR607.



Image 3-11 Access to PV 3 off MR607.



Image 3-12 Access tp PV 4 off DR2404.

The NCDRPW and WCDTPW require access designs to be undertaken by an ECSA registered engineer and submitted for approval. The departments make available standard details for accesses which must be considered in the design. The expected traffic during the construction and operational and maintenance (O&M) phases, the available sight distances including photographs, and the affected stormwater structures are to be included in the application.

3.6 Internal Transportation Network

All of the proposed sites contain internal gravel roads with a width of 4 - 5 m. These existing roads are to be used and incorporated into the final internal road layout as far as possible.

Internal road networks consisting of 5 m wide gravel roads in a traditional grid pattern formation are proposed. The network layouts ought to provide efficient access to all elements of the facilities and effective accommodation of the anticipated internal traffic.

The geometrics of the roads must be designed to accommodate all normal and abnormal vehicles anticipated within the facility. The internal roads must further consider the facilities' stormwater management plan to reduce the risks of possible erosion.

It is recommended that all internal access roads be constructed according to *TRH20 – Unsealed Roads: Design Construction and Maintenance.* This assessment assumes that the *in-situ* material below the topsoil is of 'G7' quality and can be used as a suitable road subgrade material, followed by an imported 'Gravel Wearing Course' material. A suitable geotechnical study will however be required at predesign stage to better understand the design limitations on the development followed by a preliminary design to 'value' Engineer the project.

4. BASELINE TRAFFIC CONDITIONS

4.1 General Description

The prescribed study area for direct traffic impact due to a proposed development includes accesses to the site and external roads in the immediate vicinity of the site, generally limited to Class 4 and 5 roads up to their first intersections with higher order roads, within a maximum distance of 1.5 km from all site accesses.

4.2 Existing Traffic Conditions

The Western Cape Provincial Government makes use of a Traffic Counting System (TCS) and serves the Western Cape Provincial Network since 1999. The system includes Trunk (TR), Main (MR) and Divisional (DR) roads and at the present time only those Minor (OP) roads that intersect with the aforementioned roads.

The most recent record traffic data for the road network around Murraysburg was produced in 2021. TMH 16 provides that traffic counts up to two years old may be used in traffic assessments provided that no significant developments have occurred during this period. Having confirmed this to be the case with the Beaufort West Local Municipality, the record data was deemed appropriate for this study and was used to establish the baseline traffic conditions for the R63, MR607 and DR2404. Should more recent data be desirable later in the design phase, a traffic count undertaken in accordance with TMH 14 is recommended.

The baseline traffic conditions are given in Table 4-1 below.

Table 4-1 Existing Traffic Conditions

Road	Position	Morning 07:00-08:00			Weekday Midday 09:00-15:00			Afternoon 16:00-17:00		
		LV	HV	T	LV	HV	T	LV	HV	T
R63	Intxn with DR2404	22	4	26	76	17	93	38	13	51
MR607	At KM 0.0	18	1	19	20	7	27	13	1	14
DR2404	Intxn with R63	2	0	2	1	2	3	3	0	3

Intxn: Intersection; LV: Light vehicle; HV: Heavy vehicle; T: Total vehicles

5. ISSUES, RISKS AND IMPACTS

5.1 Identification of Potential Impacts/Risks

The potential impacts of the proposed Padloper Solar Facilities 1-4 on the surrounding road network are given below for the various stages of development.

Construction Phase

- Increase in abnormal load traffic;
- Increase in normal load traffic due to the delivery of construction plant, equipment, materials, and solar PV facility components, and the transportation of labour;
- Increase in incidents with pedestrians and livestock; and
- Increased need for road maintenance.

Operation and Maintenance Phase

- Increase in abnormal load traffic;
- Increase in normal load traffic due to the transportation of staff, the delivery of replacement parts, repairs, and cleaning of panels; and
- Increased need for road maintenance.

Decommissioning Phase

- Increase in abnormal load traffic;
- Increase in normal load traffic due to the delivery and removal of construction plant, equipment, materials, and solar PV facility components, and the transportation of labour;
- Increase in incidents with pedestrians and livestock; and
- Increased need for road maintenance.

6. TRAFFIC IMPACT ASSESSMENT

The traffic impact of the proposed Padloper Solar Facilities 1-4 varies across the different stages of development (i.e., pre-construction, construction, operations and maintenance, and decommissioning). Primarily the nature of the impact across all stages will be an increase in normal load traffic, abnormal load traffic, pedestrian traffic, as well as the need for regular road maintenance.

6.1 Traffic Impact: Construction Phase

The construction phase will generate the highest number of trips for the proposed facilities. Construction will typically involve earthworks, access roads, foundations, trenching, on-site buildings, electrical cables, transformers, switch gears, substations, battery energy storage systems (BESS) and pylons. The traffic impact on the surrounding road network will result from the delivery of the associated plant, materials, equipment and abnormal loads, as well as the commuting of construction labour to and from the site.

Expected traffic volumes are estimated using trip generation rates derived from SiVEST's experience and our research of previous solar energy facilities. Traffic generation is influenced by the scope of work as outlined in the preceding paragraph, the typical programming of the works, and the assumed

construction duration. Table 6-1 below provides the traffic generated by each facility during the construction phase. The morning and afternoon peak traffic generally corresponds to the transportation of labour while the weekday midday traffic corresponds to the transportation of plant, equipment and materials.

Table 6-1 Generated Trips: Construction Phase

Facility	Capacity (MW)	R63			MR607			DR2404		
		MP	WM	AP	MP	WM	AP	MP	WM	AP
PV 1	250	16	33	16	16	33	16	0	0	0
PV 2	150	11	26	11	11	26	11	0	0	0
PV 3	150	11	26	11	11	26	11	0	0	0
PV 4	150	11	26	11	0	0	0	11	26	11

MP: Morning Peak (07h00-08h00), WM: Weekday Midday (09h00-15h00); AP: Afternoon Peak (16h00-17h00)

In terms of TMH 16, developments that generate less than 50 peak hour trips are not required to undertake a detailed TIA. Each of the three proposed facilities are estimated to generate less than 50 peak hour trips. The traffic impact during this phase is hence seen as nominal.

The proposed mitigation measures for the traffic impacts of this phase of the development are:

- Stagger the construction of the various PV Facilities rather than constructing them simultaneously;
- Group transportation of construction labour;
- Off-peak scheduling of plant, material and equipment deliveries;
- Reduction in vehicle speed at and approaching the development access;
- Maintenance of farm fences;
- Erection of appropriate road signage informing motorists of property accesses and designated animal road crossings;
- Maintenance of road verges to provide safe walking space for pedestrians for the duration of the construction period;
- Appropriate, timely and high-quality maintenance of internal and external gravel roads; and
- Continuous engagement with the NCDRPW and WCDTPW.

6.2 Traffic Impact: Operation and Maintenance Phase

The Padloper Solar Facilities 1-4 are assessed to have a life span of 20 years, which can be increased if financially viable. The traffic impact during this phase will result from employees commuting to and from the development site, municipal services, maintenance and cleaning of panels, and the occasional delivery of replacement components to site. The staff compliment for the O&M phase of the proposed facilities is derived based on similar existing facilities, which then informs the calculation of generated peak hour trips. The occasional maintenance-related trips are deemed negligible. The overall traffic impact for this phase is found to be nominal.

Table 6-2 below shows the traffic generated by each facility during the O&M phase.

Table 6-2 Generated Trips: Operational and Maintenance Phase

Facility	Capacity (MW)	R63			MR607			DR2404		
		MP	WM	AP	MP	WM	AP	MP	WM	AP
PV 1	250	7	1	7	7	1	7	0	0	0
PV 2	150	5	1	5	5	1	5	0	0	0
PV 3	150	5	1	5	5	1	5	0	0	0
PV 4	150	5	1	5	0	0	0	5	1	5

MP: Morning Peak (07h00-08h00), WM: Weekday Midday (09h00-15h00); AP: Afternoon Peak (16h00-17h00)

The proposed mitigation measures for the traffic impacts of this phase of the development are:

- Group transportation of facility staff;
- Off-peak scheduling of maintenance-related traffic;
- Appropriate, timely and high-quality maintenance of internal gravel roads; and
- Continuous engagement with the NCDRPW and WCDTPW.

6.3 Traffic Impact: Decommissioning Phase

The decommissioning of the proposed facility will generate slightly less trips than the construction phase. It is assumed that the material removed will be transported to Gqeberha for recycling or disposal.

Table 6-3 below shows the traffic generated by each facility during the decommissioning phase.

Table 6-3 Generated Trips: Decommissioning Phase

Facility	Capacity (MW)	R63			MR607			DR2404		
		MP	WM	AP	MP	WM	AP	MP	WM	AP
PV 1	250	13	24	13	13	24	13	0	0	0
PV 2	150	11	21	11	11	21	11	0	0	0
PV 3	150	11	21	11	11	21	11	0	0	0
PV 4	150	11	21	11	0	0	0	11	21	11

MP: Morning Peak (07h00-08h00), WM: Weekday Midday (09h00-15h00); AP: Afternoon Peak (16h00-17h00)

The proposed mitigation measures for the traffic impacts of this phase of the development are:

- Group transportation of staff and labour;
- Off-peak scheduling of plant, material and equipment haulage;
- Reduction in vehicle speed at and approaching the development access;
- Maintenance of farm fences;
- Erection of appropriate road signage informing motorists of property accesses and designated animal road crossings;
- Maintenance of road verges to provide safe walking space for pedestrians for the duration of the decommissioning period;
- Appropriate, timely and high-quality maintenance of gravel roads; and
- Continuous engagement with the NCDRPW and WCDTPW.

6.4 Traffic Impact: Cumulative

The cumulative impact assessment considers the combined effect of the proposed facilities included in this study as well as all other pending developments within a 30 km radius of the proposed Padloper Solar Facilities 5-7. The impacts identified previously are amplified under these conditions. However, when the various developments coordinate their efforts of implementing the mitigation measures suggested previously, the cumulative traffic impacts can be significantly reduced.

The renewable energy developments (REDs) considered in the cumulative assessment are shown in **Error! Reference source not found.** and Figure 6-1:

Table 6-4 Renewable Energy Developments Within a 30 km Radius

Project Title	Applicant	DFFE Ref	Technology	MW	EIA Process
Proposed Padloper Solar PV Cluster (Western Cape)	African Clean Energy Developments (Pty) Ltd		Solar PV	450	Scoping and EIA
Proposed Padloper Solar PV Cluster (Northern Cape)	African Clean Energy Developments (Pty) Ltd		Solar PV	250	Scoping and EIA
Proposed Umsinde Emoyeni Wind Energy Facility phase 2 and its associated electrical grid connection phase 2	Emoyeni Wind Farm Project Proprietary Limited	14/12/16/3/3/2/687	Wind	147	Scoping and EIA
Proposed Umsinde Emoyeni Wind Energy Facility phase 1 and its associated electrical grid connection phase 1	Emoyeni Wind Farm Project Proprietary Limited	14/12/16/3/3/2/686	Wind	147	Scoping and EIA
Proposed Ishwati Emoyeni Wind Energy Facility and supporting Eskom Transmission and Distribution Grid Connection Infrastructure	Special Energy Project (Pty) and Eskom Holdings SOC Limited	14/12/16/3/3/2/410	Wind	115	Scoping and EIA
Proposed Ishwati Emoyeni Wind Energy Facility and supporting Eskom Transmission and Distribution Grid Connection Infrastructure	Special Energy Project (Pty) and Eskom Holdings SOC Limited	14/12/16/3/3/2/411	Wind		Scoping and EIA
Proposed Ishwati Emoyeni Wind Energy Facility and Supporting Eskom Transmission And Distribution Grid Connection Infrastructure	Special Energy Project Pty Ltd	12/12/20/2351	Wind	280	Scoping and EIA
The construction of the 140MW Ishwati Emoyeni Wind Energy Facility and its associated infrastructure	Special Energy Project Pty Ltd	12/12/20/2351/AM2	Wind		Amendment
The Proposed Development of the Mainstream Wind and Solar Energy Facility at Victoria West	South Africa Mainstream Renewable Power Developments (Pty) Ltd	12/12/20/1788/AM1	Wind & Solar PV		Amendment
Proposed Development of the Mainstream Wind and Solar Energy Facility at Victoria West	South Africa Mainstream Renewable Power Developments (Pty) Ltd	12/12/20/1788	Wind & Solar PV	700	Scoping and EIA
Proposed new 132kV grid connection and associated infrastructure for the authorised Emoyeni Wind Energy facilities	Eskom Holdings SOC Limited		Power line		

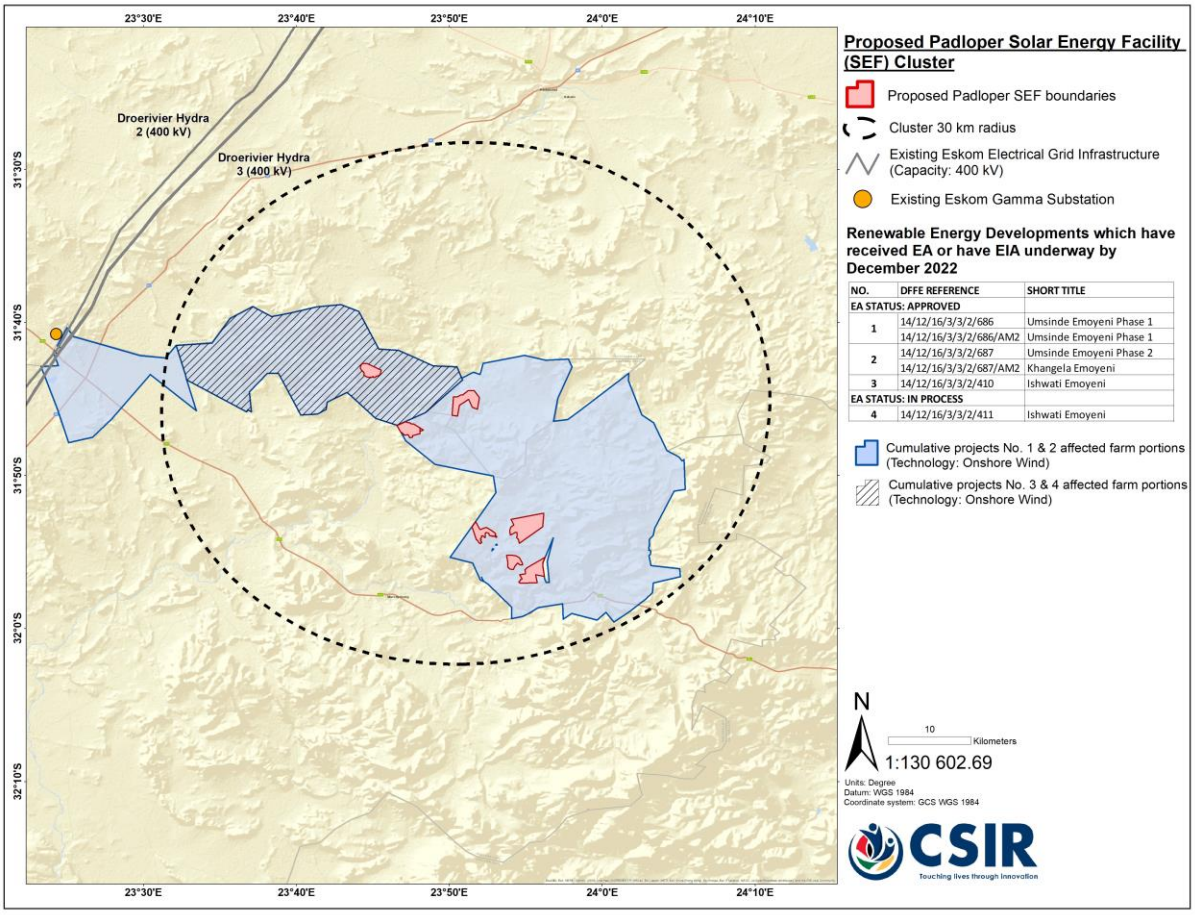


Figure 6-1 Renewable Energy Developments Within a 30 km Radius

6.5 No-Go alternative

The No-Go alternative is the option of not undertaking the proposed Padloper Solar Facilities 1-4. This alternative would result in no traffic impacts on the immediate or broader transport network. It would however mean forgoing the various benefits that the proposed facility offers, such as the creation of jobs, the boosting of the local economy, and primarily the sustainable generation of renewable energy. These benefits are considered to outweigh the avoidance of the traffic impacts associated with the proposed development, especially considering the effective mitigation measures that have been proposed. The No-Go alternative is therefore not preferred.

6.6 Impact Tables

The assessment of the impacts discussed above are presented in tabular format in accordance with the impact assessment methodology described in Appendix D. The assessment is conducted for the three development phases (construction, operation, decommissioning) as well as the cumulative impacts. Tables are presented separately for each of the 4 proposed facilities.

Padloper PV Facility 1 Impact Table

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
CONSTRUCTION PHASE						
Increased abnormal load traffic	*Status*	*Negative*	*Moderate*	• Ensure abnormal vehicles travel to and from the proposed development in the 'off peak' periods and stagger delivery. • Adequate enforcement of traffic laws and Abnormal Load Permit conditions.	*Low*	*High*
	Spatial Extent	*Regional*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Increased normal load traffic (plant, equipment, materials, components, labour)	*Status*	*Negative*	*Low*	• Stagger delivery of plant, equipment, materials and SEF components. • Construction of an on-site concrete batching plant to reduce trips. • Ensure staff transport is undertaken in the 'off peak' periods and by bus or minibus.	*Low*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*High*				
	Irreplaceability	*Low*				
Increased incidents with pedestrians and livestock	*Status*	*Negative*	*Moderate*	• Maintenance of farm fences; • Erection of appropriate road signage informing motorists of property accesses and designated animal road crossings; • Maintenance of road verges to provide safe walking space for pedestrians for the duration of the decommissioning period.	*Low*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Severe*				
	Probability	*Unlikely*				
	Reversibility	*High*				
	Irreplaceability	*High*				
Increased need for road maintenance	*Status*	*Negative*	*Low*	• Reduction in the speed of the vehicles • Construction of gravel roads in terms of TRH20. • Avoid excessive use of gravel roads in wet weather. • Implement a road maintenance program under the auspices of the respective transport department.	*Low*	*Medium*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				

OPERATIONAL PHASE						
Increased abnormal load traffic	*Status* *Spatial Extent* *Duration* *Consequence* *Probability* *Reversibility* *Irreplaceability*	*Negative* *Regional* *Long Term* *Moderate* *Unlikely* *Moderate* *Low*	*Low*	• The increase in traffic for this phase of the development is negligible and will not have a significant impact. No mitigation measures are proposed.	*Low*	*High*
Increased normal load traffic (staff, replacement parts, repairs, cleaning)	*Status* *Spatial Extent* *Duration* *Consequence* *Probability* *Reversibility* *Irreplaceability*	*Negative* *Local* *Long Term* *Slight* *Very likely* *Moderate* *Low*	*Very low*	• The increase in traffic for this phase of the development is negligible and will not have a significant impact. No mitigation measures are proposed.	*Very low*	*High*
Increased need for road maintenance	*Status* *Spatial Extent* *Duration* *Consequence* *Probability* *Reversibility* *Irreplaceability*	*Negative* *Local* *Long Term* *Moderate* *Very likely* *Moderate* *Low*	*Low*	• Reduction in the speed of the vehicles • Implement a road maintenance program under the auspices of the respective transport department.	*Low*	*Medium*
DECOMMISSIONING PHASE						
Increased abnormal load traffic	*Status* *Spatial Extent* *Duration* *Consequence* *Probability* *Reversibility* *Irreplaceability*	*Negative* *Regional* *Short Term* *Moderate* *Likely* *Moderate* *Low*	*Moderate*	• Ensure abnormal vehicles travel to and from the proposed development in the 'off peak' periods and stagger delivery. • Adequate enforcement of traffic laws and Abnormal Load Permit conditions.	*Low*	*High*
Increased normal load traffic (plant, equipment, materials, components, labour)	*Status* *Spatial Extent* *Duration* *Consequence* *Probability* *Reversibility* *Irreplaceability*	*Negative* *Local* *Short Term* *Moderate* *Very likely* *High* *Low*	*Low*	• Stagger delivery and removal of plant, equipment, material and SEF components. • Ensure staff transport is undertaken in the 'off peak' periods and by bus or minibus.	*Low*	*High*

Increased incidents with pedestrians and livestock	*Status*	*Negative*	*Moderate*	• Maintenance of farm fences; • Erection of appropriate road signage informing motorists of property accesses and designated animal road crossings; • Maintenance of road verges to provide safe walking space for pedestrians for the duration of the decommissioning period.	*Low*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Severe*				
	Probability	*Unlikely*				
	Reversibility	*High*				
	Irreplaceability	*High*				
Increased need for road maintenance	*Status*	*Negative*	*Low*	• Reduction in the speed of the vehicles • Avoid excessive use of gravel roads in wet weather. • Implement a road maintenance program under the auspices of the respective transport department.	*Low*	*Medium*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				

Padloper PV Facility 2 Impact Table

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
CONSTRUCTION PHASE						
Increased abnormal load traffic	*Status*	*Negative*	*Moderate*	• Ensure abnormal vehicles travel to and from the proposed development in the 'off peak' periods and stagger delivery. • Adequate enforcement of traffic laws and Abnormal Load Permit conditions.	*Low*	*High*
	Spatial Extent	*Regional*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Increased normal load traffic (plant, equipment, materials, components, labour)	*Status*	*Negative*	*Low*	• Stagger delivery of plant, equipment, materials and SEF components. • Construction of an on-site concrete batching plant to reduce trips. • Ensure staff transport is undertaken in the 'off peak' periods and by bus or minibus.	*Low*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*High*				
	Irreplaceability	*Low*				
Increased incidents with pedestrians and livestock	*Status*	*Negative*	*Moderate*	• Maintenance of farm fences; • Erection of appropriate road signage informing motorists of property accesses and designated animal road crossings; • Maintenance of road verges to provide safe walking space for pedestrians for the duration of the decommissioning period.	*Low*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Severe*				
	Probability	*Unlikely*				
	Reversibility	*High*				
	Irreplaceability	*High*				
Increased need for road maintenance	*Status*	*Negative*	*Low*	• Reduction in the speed of the vehicles • Construction of gravel roads in terms of TRH20. • Avoid excessive use of gravel roads in wet weather. • Implement a road maintenance program under the auspices of the respective transport department.	*Low*	*Medium*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				

OPERATIONAL PHASE						
Increased abnormal load traffic	*Status* *Spatial Extent* *Duration* *Consequence* *Probability* *Reversibility* *Irreplaceability*	*Negative* *Regional* *Long Term* *Moderate* *Unlikely* *Moderate* *Low*	*Low*	• The increase in traffic for this phase of the development is negligible and will not have a significant impact. No mitigation measures are proposed.	*Low*	*High*
Increased normal load traffic (staff, replacement parts, repairs, cleaning)	*Status* *Spatial Extent* *Duration* *Consequence* *Probability* *Reversibility* *Irreplaceability*	*Negative* *Local* *Long Term* *Slight* *Very likely* *Moderate* *Low*	*Very low*	• The increase in traffic for this phase of the development is negligible and will not have a significant impact. No mitigation measures are proposed.	*Very low*	*High*
Increased need for road maintenance	*Status* *Spatial Extent* *Duration* *Consequence* *Probability* *Reversibility* *Irreplaceability*	*Negative* *Local* *Long Term* *Moderate* *Very likely* *Moderate* *Low*	*Low*	• Reduction in the speed of the vehicles • Implement a road maintenance program under the auspices of the respective transport department.	*Low*	*Medium*
DECOMMISSIONING PHASE						
Increased abnormal load traffic	*Status* *Spatial Extent* *Duration* *Consequence* *Probability* *Reversibility* *Irreplaceability*	*Negative* *Regional* *Short Term* *Moderate* *Likely* *Moderate* *Low*	*Moderate*	• Ensure abnormal vehicles travel to and from the proposed development in the ‘off peak’ periods and stagger delivery. • Adequate enforcement of traffic laws and Abnormal Load Permit conditions.	*Low*	*High*
Increased normal load traffic (plant, equipment, materials, components, labour)	*Status* *Spatial Extent* *Duration* *Consequence* *Probability* *Reversibility* *Irreplaceability*	*Negative* *Local* *Short Term* *Moderate* *Very likely* *High* *Low*	*Low*	• Stagger delivery and removal of plant, equipment, material and SEF components. • Ensure staff transport is undertaken in the ‘off peak’ periods and by bus or minibus.	*Low*	*High*

Increased incidents with pedestrians and livestock	*Status*	*Negative*	*Moderate*	• Maintenance of farm fences; • Erection of appropriate road signage informing motorists of property accesses and designated animal road crossings; • Maintenance of road verges to provide safe walking space for pedestrians for the duration of the decommissioning period.	*Low*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Severe*				
	Probability	*Unlikely*				
	Reversibility	*High*				
	Irreplaceability	*High*				
Increased need for road maintenance	*Status*	*Negative*	*Low*	• Reduction in the speed of the vehicles • Avoid excessive use of gravel roads in wet weather. • Implement a road maintenance program under the auspices of the respective transport department.	*Low*	*Medium*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				

Padloper PV Facility 3 Impact Table

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
CONSTRUCTION PHASE						
Increased abnormal load traffic	*Status*	*Negative*	*Moderate*	• Ensure abnormal vehicles travel to and from the proposed development in the 'off peak' periods and stagger delivery. • Adequate enforcement of traffic laws and Abnormal Load Permit conditions.	*Low*	*High*
	Spatial Extent	*Regional*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Increased normal load traffic (plant, equipment, materials, components, labour)	*Status*	*Negative*	*Low*	• Stagger delivery of plant, equipment, materials and SEF components. • Construction of an on-site concrete batching plant to reduce trips. • Ensure staff transport is undertaken in the 'off peak' periods and by bus or minibus.	*Low*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*High*				
	Irreplaceability	*Low*				
Increased incidents with pedestrians and livestock	*Status*	*Negative*	*Moderate*	• Maintenance of farm fences; • Erection of appropriate road signage informing motorists of property accesses and designated animal road crossings; • Maintenance of road verges to provide safe walking space for pedestrians for the duration of the decommissioning period.	*Low*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Severe*				
	Probability	*Unlikely*				
	Reversibility	*High*				
	Irreplaceability	*High*				
Increased need for road maintenance	*Status*	*Negative*	*Low*	• Reduction in the speed of the vehicles • Construction of gravel roads in terms of TRH20. • Avoid excessive use of gravel roads in wet weather. • Implement a road maintenance program under the auspices of the respective transport department.	*Low*	*Medium*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				

OPERATIONAL PHASE						
Increased abnormal load traffic	*Status*	*Negative*	*Low*	• The increase in traffic for this phase of the development is negligible and will not have a significant impact. No mitigation measures are proposed.	*Low*	*High*
	Spatial Extent	*Regional*				
	Duration	*Long Term*				
	Consequence	*Moderate*				
	Probability	*Unlikely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Increased normal load traffic (staff, replacement parts, repairs, cleaning)	*Status*	*Negative*	*Very low*	• The increase in traffic for this phase of the development is negligible and will not have a significant impact. No mitigation measures are proposed.	*Very low*	*High*
	Spatial Extent	*Local*				
	Duration	*Long Term*				
	Consequence	*Slight*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Increased need for road maintenance	*Status*	*Negative*	*Low*	• Reduction in the speed of the vehicles • Implement a road maintenance program under the auspices of the respective transport department.	*Low*	*Medium*
	Spatial Extent	*Local*				
	Duration	*Long Term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
DECOMMISSIONING PHASE						
Increased abnormal load traffic	*Status*	*Negative*	*Moderate*	• Ensure abnormal vehicles travel to and from the proposed development in the 'off peak' periods and stagger delivery. • Adequate enforcement of traffic laws and Abnormal Load Permit conditions.	*Low*	*High*
	Spatial Extent	*Regional*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Increased normal load traffic (plant, equipment, materials, components, labour)	*Status*	*Negative*	*Low*	• Stagger delivery and removal of plant, equipment, material and SEF components. • Ensure staff transport is undertaken in the 'off peak' periods and by bus or minibus.	*Low*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*High*				
	Irreplaceability	*Low*				

Increased incidents with pedestrians and livestock	*Status*	*Negative*	*Moderate*	• Maintenance of farm fences; • Erection of appropriate road signage informing motorists of property accesses and designated animal road crossings; • Maintenance of road verges to provide safe walking space for pedestrians for the duration of the decommissioning period.	*Low*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Severe*				
	Probability	*Unlikely*				
	Reversibility	*High*				
	Irreplaceability	*High*				
Increased need for road maintenance	*Status*	*Negative*	*Low*	• Reduction in the speed of the vehicles • Avoid excessive use of gravel roads in wet weather. • Implement a road maintenance program under the auspices of the respective transport department.	*Low*	*Medium*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				

Padloper PV Facility 4 Impact Table

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
CONSTRUCTION PHASE						
Increased abnormal load traffic	*Status*	*Negative*	*Moderate*	• Ensure abnormal vehicles travel to and from the proposed development in the 'off peak' periods and stagger delivery. • Adequate enforcement of traffic laws and Abnormal Load Permit conditions.	*Low*	*High*
	Spatial Extent	*Regional*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Increased normal load traffic (plant, equipment, materials, components, labour)	*Status*	*Negative*	*Low*	• Stagger delivery of plant, equipment, materials and SEF components. • Construction of an on-site concrete batching plant to reduce trips. • Ensure staff transport is undertaken in the 'off peak' periods and by bus or minibus.	*Low*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*High*				
	Irreplaceability	*Low*				
Increased incidents with pedestrians and livestock	*Status*	*Negative*	*Moderate*	• Maintenance of farm fences; • Erection of appropriate road signage informing motorists of property accesses and designated animal road crossings; • Maintenance of road verges to provide safe walking space for pedestrians for the duration of the decommissioning period.	*Low*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Severe*				
	Probability	*Unlikely*				
	Reversibility	*High*				
	Irreplaceability	*High*				
Increased need for road maintenance	*Status*	*Negative*	*Low*	• Reduction in the speed of the vehicles • Construction of gravel roads in terms of TRH20. • Avoid excessive use of gravel roads in wet weather. • Implement a road maintenance program under the auspices of the respective transport department.	*Low*	*Medium*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				

OPERATIONAL PHASE						
Increased abnormal load traffic	*Status* *Spatial Extent* *Duration* *Consequence* *Probability* *Reversibility* *Irreplaceability*	*Negative* *Regional* *Long Term* *Moderate* *Unlikely* *Moderate* *Low*	*Low*	• The increase in traffic for this phase of the development is negligible and will not have a significant impact. No mitigation measures are proposed.	*Low*	*High*
Increased normal load traffic (staff, replacement parts, repairs, cleaning)	*Status* *Spatial Extent* *Duration* *Consequence* *Probability* *Reversibility* *Irreplaceability*	*Negative* *Local* *Long Term* *Slight* *Very likely* *Moderate* *Low*	*Very low*	• The increase in traffic for this phase of the development is negligible and will not have a significant impact. No mitigation measures are proposed.	*Very low*	*High*
Increased need for road maintenance	*Status* *Spatial Extent* *Duration* *Consequence* *Probability* *Reversibility* *Irreplaceability*	*Negative* *Local* *Long Term* *Moderate* *Very likely* *Moderate* *Low*	*Low*	• Reduction in the speed of the vehicles • Implement a road maintenance program under the auspices of the respective transport department.	*Low*	*Medium*
DECOMMISSIONING PHASE						
Increased abnormal load traffic	*Status* *Spatial Extent* *Duration* *Consequence* *Probability* *Reversibility* *Irreplaceability*	*Negative* *Regional* *Short Term* *Moderate* *Likely* *Moderate* *Low*	*Moderate*	• Ensure abnormal vehicles travel to and from the proposed development in the 'off peak' periods and stagger delivery. • Adequate enforcement of traffic laws and Abnormal Load Permit conditions.	*Low*	*High*
Increased normal load traffic (plant, equipment, materials, components, labour)	*Status* *Spatial Extent* *Duration* *Consequence* *Probability* *Reversibility* *Irreplaceability*	*Negative* *Local* *Short Term* *Moderate* *Very likely* *High* *Low*	*Low*	• Stagger delivery and removal of plant, equipment, material and SEF components. • Ensure staff transport is undertaken in the 'off peak' periods and by bus or minibus.	*Low*	*High*

Increased incidents with pedestrians and livestock	*Status*	*Negative*	*Moderate*	• Maintenance of farm fences; • Erection of appropriate road signage informing motorists of property accesses and designated animal road crossings; • Maintenance of road verges to provide safe walking space for pedestrians for the duration of the decommissioning period.	*Low*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Severe*				
	Probability	*Unlikely*				
	Reversibility	*High*				
	Irreplaceability	*High*				
Increased need for road maintenance	*Status*	*Negative*	*Low*	• Reduction in the speed of the vehicles • Avoid excessive use of gravel roads in wet weather. • Implement a road maintenance program under the auspices of the respective transport department.	*Low*	*Medium*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				

Padloper PV Facility 1 Cumulative Impact Table

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
CONSTRUCTION PHASE						
Increased abnormal load traffic	*Status*	*Negative*	*Moderate*	• Stagger the construction of the various proposed Padloper developments as far as possible. • Ensure abnormal vehicles travel to and from the proposed Padloper developments in the 'off peak' periods and stagger delivery. • Coordinate abnormal load trips across all Padloper developments. • Adequate enforcement of traffic laws and Abnormal Load Permit conditions.	*Low*	*High*
	Spatial Extent	*Regional*				
	Duration	*Short Term*				
	Consequence	*Substantial*				
	Probability	*Likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Increased normal load traffic (plant, equipment, materials, components, labour)	*Status*	*Negative*	*Moderate*	• Combined transportation of labour across multiple Padloper developments • Stagger delivery of plant, equipment, material and Padloper SEF components • Construction of an "on-site" concrete batching plant for use by multiple Padloper developments to reduce trips.	*Low*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Substantial*				
	Probability	*Very likely*				
	Reversibility	*High*				
	Irreplaceability	*Low*				
Increased incidents with pedestrians and livestock	*Status*	*Negative*	*High*	• Maintenance of farm fences; • Erection of appropriate road signage informing motorists of property accesses and designated animal road crossings; • Maintenance of road verges to provide safe walking space for pedestrians for the duration of the decommissioning period.	*Moderate*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Severe*				
	Probability	*Likely*				
	Reversibility	*High*				
	Irreplaceability	*High*				
Increased need for road maintenance	*Status*	*Negative*	*Moderate*	• Reduction in the speed of the vehicles. • Construction of gravel roads in terms of TRH20. • Coordinate implementation of a road maintenance program with multiple Padloper developments. • Avoid excessive use of gravel roads in wet weather. • Coordinated Implementation of a road maintenance program under the auspices of the respective transport department.	*Low*	*Medium*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				

OPERATIONAL PHASE						
Increased abnormal load traffic	*Status*	*Negative*	*Low*	• Coordinated delivery of replacement abnormal load components for the Padloper developments	*Low*	*High*
	Spatial Extent	*Regional*				
	Duration	*Long Term*				
	Consequence	*Moderate*				
	Probability	*Likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Increased normal load traffic (staff, replacement parts, repairs, cleaning)	*Status*	*Negative*	*Low*	• Coordinate maintenance and repair programmes among multiple Padloper facilities	*Low*	*High*
	Spatial Extent	*Local*				
	Duration	*Long Term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Increased need for road maintenance	*Status*	*Negative*	*Low*	• Reduction in the speed of the vehicles at all Padloper facilities • Coordinated Implementation of a road maintenance program under the auspices of the respective transport department.	*Low*	*Medium*
	Spatial Extent	*Local*				
	Duration	*Long Term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
DECOMMISSIONING PHASE						
Increased abnormal load traffic	*Status*	*Negative*	*Moderate*	• Ensure abnormal vehicles travel to and from the proposed Padloper developments in the 'off peak' periods and stagger delivery. • Coordinate abnormal load trips across all Padloper developments. • Adequate enforcement of traffic laws and Abnormal Load Permit conditions.	*Low*	*High*
	Spatial Extent	*Regional*				
	Duration	*Short Term*				
	Consequence	*Substantial*				
	Probability	*Likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Increased normal load traffic (plant, equipment, materials, components, labour)	*Status*	*Negative*	*Moderate*	• Combined transportation of labour across multiple Padloper developments • Stagger delivery and removal of plant, equipment, material and Padloper SEF components	*Low*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Substantial*				
	Probability	*Very likely*				
	Reversibility	*High*				
	Irreplaceability	*Low*				

Increased incidents with pedestrians and livestock	*Status*	*Negative*	*High*	• Maintenance of farm fences; • Erection of appropriate road signage informing motorists of property accesses and designated animal road crossings; • Maintenance of road verges to provide safe walking space for pedestrians for the duration of the decommissioning period.	*Moderate*	*High*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Severe*				
	Probability	*Likely*				
	Reversibility	*High*				
	Irreplaceability	*High*				
Increased need for road maintenance	*Status*	*Negative*	*Moderate*	• Reduction in the speed of the vehicles • Coordinate implementation of a road maintenance program with multiple Padloper developments. • Avoid excessive use of gravel roads in wet weather. • Coordinated Implementation of a road maintenance program under the auspices of the respective transport department.	*Low*	*Medium*
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*Substantial*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				

7. IMPACT ASSESSMENT SUMMARY

The TIA found that the greatest impact of the proposed developments on the existing road network will be realised during the construction phase. The nature of the impact is in the form of increased abnormal load traffic, increased normal load traffic, potential incidents with pedestrians and livestock, and an increased need for road maintenance. Similar impacts will result during the operational and decommissioning phases of the projects, albeit to a far lesser extent. Table 7-1 presents the overall significance of the traffic impact of the proposed projects for each development phase after the mitigation measures are implemented.

Table 7-1 Overall Impact Significance (Post Mitigation)

Phase	**Overall Impact Significance**
Construction	Low
Operational	Low
Decommissioning	Low
Nature of Impact	**Overall Impact Significance**
Cumulative - Construction	Low
Cumulative - Operational	Low
Cumulative - Decommissioning	Low

8. LEGISLATIVE AND PERMIT REQUIREMENTS

Key legal requirements for studies of this nature in relation to the proposed developments are as follows:

- Government Notice 509 (GN509), as published in Government Gazette 40229 of 2016 with reference to the National Water Act, 1998 (Act No. 36 of 1998)
- National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended (NEMA)
- National Water Act, 1998 (Act No. 36 of 1998) (NWA)
- Road Safety Act (Act No. 93 of 1996)
- National Road Traffic Regulations, 2000.

Key guidelines for studies of this nature in relation to the proposed developments are as follows:

- TMH 15: South African Engineering Service Contribution Manual for Municipal Road Infrastructure
- TMH 16 Vol 1: South African Traffic Impact and Site Traffic Assessment Manual
- TMH 16 Vol 2: South African Traffic Impact and Site Traffic Assessment Standards and Requirements Manual
- TMH 17: South African Trip Data Manual
- TRH 11: Dimensional and Mass Limitations and Other Requirements for Abnormal Load Vehicles
- TRH 26: South African Road Classification and Access Management Manual

The transportation-related permits and approvals required for the proposed projects are as follows:

- Access design approvals
- Abnormal load permits, (Section 81 of the National Road Traffic Act No. 93 of 1996 and National Road Traffic Regulations, 2000),
- Port permit (Guidelines for Agreements, Licenses and Permits in terms of the National Ports Act No. 12 of 2005), and
- Authorisation from Road Authorities to modify the road reserve to accommodate turning movements of abnormal loads at intersections.

9. FINAL SPECIALIST STATEMENT AND AUTHORISATION RECOMMENDATION

9.1. Statement and Reasoned Opinion

The TIA found that the highest traffic impact of the proposed development would occur during the construction phases, which are temporary in nature and whose impacts can be effectively mitigated. The existing site accesses were found to be sufficient for the proposed facility but may require some upgrades. No fatal flaws were identified in the proposed Padloper Solar Facilities 1-4 in respect of transportation and traffic aspects. No environmentally sensitive areas are required and therefore no areas are to be avoided from a transportation perspective.

With reference to this report, associated assessment and the findings made within, it is SiVEST's opinion that the proposed Padloper Solar Facilities 1-4 have a nominal impact on the existing traffic network. The proposed Padloper Solar Facilities 1-4 are therefore deemed acceptable from a transport perspective, provided the recommendations and mitigation measures in this report are implemented, and hence the Environmental Authorisation (EA) should be granted for the BA application.

9.2. EA Condition Recommendations

The environmental authorisation is recommended without conditions.

10. INPUTS TO BE INCLUDED IN THE ENVIROMMENTAL MANANGEMENT PROGRAMME

Inputs to be included in the environmental management programme relating to this study are given in Table 10-1 below.

Table 10-1 Environmental Management Programme Inputs

Impact	Mitigation/ Management Outcomes	Mitigation/Management Actions (these apply to the Project footprint area and the access roads on site)	Monitoring		
			Methodology	Frequency	Responsibility
A. PLANNING AND DESIGN PHASE (PRE-CONSTRUCTION PHASE)					
B. CONSTRUCTION PHASE					
Increased abnormal load traffic	Reduce significance of abnormal load traffic	Schedule abnormal load traffic in off-peak periods.	Logistics planning and scheduling	Monthly	Implementing Agent
		Stagger delivery of abnormal loads.	Programming of construction activities	Monthly	Implementing Agent
		Adhere to traffic laws and permit conditions relating to the transportation of abnormal loads.	Training and monitoring	Monthly	Implementing Agent
Increased normal load traffic	Reduce normal load traffic	Stagger delivery of plant, equipment, materials and components	Programming of construction activities	Monthly	Implementing Agent
		Construct an on-site concrete batching plant	Construction	Once-off	Implementing Agent
		Transport staff in off-peak periods and by bus or minibus	Logistics planning and scheduling	Monthly	Implementing Agent
Increased incidents with pedestrians and livestock	Avoid incidents with pedestrians and livestock	Maintenance of farm fences	Fence construction and repair	Monthly	Property owners
		Erect road signage informing motorists of property accesses and designated animal road crossings	Signpost construction	Once-off	Implementing Agent
		Maintain road verges along local and access roads to provide safe walking space for pedestrians.	Bush clearing and grass cutting	Bi-monthly	Implementing Agent

Increased need for road maintenance	Reduce/address deterioration of local roads	Reduce speed of vehicles in the vicinity of construction	Erection of construction warning signs; training and evaluation of drivers and operators	Monthly	Implementing Agent
		Construct gravel access and internal roads according to TRH20	Road construction	Once-off	Implementing Agent
		Avoid use of gravel roads in wet weather	Programming of construction activities	During rain	Implementing Agent
		Implement a road maintenance programme under the auspices of the respective transport department.	Programming and road construction	Quarterly	Implementing Agent
C. OPERATIONAL PHASE					
Increased abnormal load traffic	Reduce significance of abnormal load traffic	Schedule abnormal load traffic in off-peak periods.	Logistics planning and scheduling	As required	Implementing Agent
		Adhere to traffic laws and permit conditions relating to the transportation of abnormal loads.	Training and monitoring	As required	Implementing Agent
Increased need for road maintenance	Reduce/address deterioration of local roads	Reduce speed of vehicles in the vicinity of construction	Erection of construction warning signs; training and evaluation of drivers and operators	Monthly	Implementing Agent
		Implement a road maintenance programme under the auspices of the respective transport department.	Programming and road construction	Quarterly	Implementing Agent
D. DECOMMISSIONING PHASE					
Increased abnormal load traffic	Reduce significance of abnormal load traffic	Schedule abnormal load traffic in off-peak periods.	Logistics planning and scheduling	Monthly	Implementing Agent
		Stagger delivery of abnormal loads.	Programming of construction activities	Monthly	Implementing Agent
		Adhere to traffic laws and permit conditions relating to the transportation of abnormal loads.	Training and monitoring	Monthly	Implementing Agent

Increased normal load traffic	Reduce normal load traffic	Stagger delivery/removal of plant, equipment, materials and components.	Programming of construction activities	Monthly	Implementing Agent
		Transport staff in off-peak periods and by bus or minibus.	Logistics planning and scheduling	Monthly	Implementing Agent
Increased incidents with pedestrians and livestock	Avoid incidents with pedestrians and livestock	Maintenance of farm fences	Fence construction and repair	Monthly	Property owners
		Erect road signage informing motorists of property accesses and designated animal road crossings	Signpost construction	Once-off	Implementing Agent
		Maintain road verges along local and access roads to provide safe walking space for pedestrians.	Bush clearing and grass cutting	Bi-monthly	Implementing Agent
Increased need for road maintenance	Reduce/address deterioration of local roads	Reduce speed of vehicles in the vicinity of construction.	Erection of construction warning signs; training and evaluation of drivers and operators	Monthly	Implementing Agent
		Avoid use of gravel roads in wet weather.	Programming of construction activities	During rain	Implementing Agent
		Implement a road maintenance programme under the auspices of the respective transport department.	Programming and road construction	Quarterly	Implementing Agent

11. REFERENCES

KZN Transport – Concrete Causeway Details (1996).
South African National Roads Agency Limited – Drainage Manual (5th Edition).
American Association of State Highway Transportation Officials - Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT ≤ 400) (2001).
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Technical Recommendations for Highways (TRH17) – Geometric Design of Rural Roads (1988).
Technical Recommendations for Highways (DRAFT-TRH20) – Unsealed Roads: Design, Construction and Maintenance (2013).
Technical Recommendations for Highways (TRH26) – South African Road Classification and Access Management Manual (2012).
Western Cape Government Department Transport and Public Works – Road Network Information System.
Western Cape Government Department Transport and Public Works – Gravel Roads Manual 2001.

APPENDIX A – SPECIALIST'S EXPERTISE

CURRICULUM VITAE

Name	Ntuthuko Hlanguza
Profession	Professional Civil Engineer
Name of Firm	SiVEST SA (Pty) Ltd
Present Appointment	Senior Civil Engineer SiVEST Civil Engineering Division
Years with Firm	8 years
Nationality	South African

Education

- Maritzburg College (2004): Grade 12 with Distinction

Professional Qualifications

- BSc.Eng (Civil) - University of KwaZulu-Natal (2014)
- Post Graduate Certificate in Energy Efficiency and Sustainability – University of Cape Town (2020)
- Professional Engineer (ECSA) – Registration No. 202202263

Membership in Professional Societies

- Engineering Council of South Africa (ECSA) – Pr Eng (Reg No. 202202263)
- South African Institution of Civil Engineering (SAICE)

Employment Record

Feb 2015 – current	SiVEST SA (Pty) Ltd – Civil Engineer
Dec 2013 – Jan 2014	Naidu Consulting, Durban – Student Engineer

Experience Overview

Ntuthuko is a Professional Civil Engineer with key experience in roads and transportation, water, sanitation, earthworks and construction monitoring. His achievements include SI instructor to junior students at UKZN and chairperson of UKZN's student chapter of the South African Institution for Civil Engineering (SAICE-UKZN).

Fields of Specialisation

- Engineering Feasibility Studies
- Road Geometrics and Pavement Design
- Stormwater Management
- Water Supply and Reticulation
- Sewer Reticulation
- Bulk Earthworks
- Construction Monitoring and Administration

Project Experience (by Sector)

RENEWABLE ENERGY

- Transportation Studies for Proposed Solar and Wind Energy Facilities
    - Lesaka Solar PV Cluster
    - Karee WEF
    - Mierdam Solar PV
    - Patatskloof WEF
    - Platsjambok Solar PV
- Glint & Glare Assessments for Proposed Solar and Wind Energy Facilities
    - Beaufort West Solar PV
- Stormwater Management Plans for Proposed Solar and Wind Energy Facilities
    - Leeubosch Solar PV

ROADS AND STORMWATER

- Traffic Planning, Design and Contract Administration of Urban Roads (Class 3-5 roads)
- Traffic Planning, Design and Contract Administration of Internal Roads, Access Roads and Intersections of Large-Scale Residential Developments
- Design and Construction Monitoring of Bulk Stormwater Infrastructure
- Planning and Design of Storm Attenuation Features
- Undertaking of Flood Risk Assessments and Stormwater Management Plans

WATER AND SANITATION

- Feasibility Studies, Planning and Design of Community Water Supply Schemes
- Feasibility Studies, Planning and Design of Bulk Water Transfer Schemes
- Design of Water and Sanitation Services for Education Facilities
- Design of Water and Sanitation Services for Provincial Hospitals
- Design of Water and Sanitation Services for Residential, Commercial and Industrial Developments

APPENDIX B - SPECIALIST STATEMENT OF INDEPENDENCE

I, Ntuthuko Hlanguza, declare that –

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

Signature of the Specialist: 

Name of Company: SiVEST SA (Pty) Ltd

Date: 21 September 2023

APPENDIX C: SITE SENSITIVITY VERIFICATION

As at September 2023, there are no sensitivity layers on the Screening Tool for Traffic features.

APPENDIX D: IMPACT ASSESSMENT METHODOLOGY

The impact assessment includes:

- *the nature, significance and consequences of the impact and risk;*
- *the extent and duration of the impact and risk;*
- *the probability of the impact and risk occurring;*
- *the degree to which impacts and risks can be mitigated;*
- *the degree to which the impacts and risks can be reversed; and*
- *the degree to which the impacts and risks can cause loss of irreplaceable resources.*

As per the DEFFT Guideline 5: Assessment of Alternatives and Impacts, the following methodology is applied to the prediction and assessment of impacts and risks. Potential impacts and risks have been rated in terms of the direct, indirect and cumulative:

- *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 impacts 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.*

The impact assessment methodology includes the following aspects:

- *Nature of impact/risk - The type of effect that a proposed activity will have on the environment.*

- *Status - Whether the impact/risk on the overall environment will be:*
    - *Positive - environment overall will benefit from the impact/risk;*
    - *Negative - environment overall will be adversely affected by the impact/risk; or*
    - *Neutral - environment overall not be affected.*

- *Spatial extent – The size of the area that will be affected by the impact/risk:*
    - *Site specific;*
    - *Local (<10 km from site);*
    - *Regional (<100 km of site);*
    - *National; or*
    - *International (e.g. Greenhouse Gas emissions or migrant birds).*

- *Duration – The timeframe during which the impact/risk will be experienced:*
    - *Very short term (instantaneous);*
    - *Short term (less than 1 year);*
    - *Medium term (1 to 10 years);*
    - *Long term (the impact will cease after the operational life of the activity (i.e. the impact or risk will occur for the project duration)); or*
    - *Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient (i.e. the impact will occur beyond the project decommissioning)).*

- *Consequence – The anticipated consequence of the risk/impact:*
    - *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).*

- *Reversibility of the Impacts - the extent to which the impacts/risks are reversible assuming that the project has reached the end of its life cycle (decommissioning phase):*
  - *High reversibility of impacts (impact is highly reversible at end of project life i.e. this is the most favourable assessment for the environment);*
  - *Moderate reversibility of impacts;*
  - *Low reversibility of impacts; or*
  - *Impacts are non-reversible (impact is permanent, i.e. this is the least favourable assessment for the environment).*

- *Irreplaceability of Receiving Environment/Resource Loss caused by impacts/risks – the degree to which the impact causes irreplaceable loss of resources assuming that the project has reached the end of its life cycle (decommissioning phase):*
  - *High irreplaceability of resources (project will destroy unique resources that cannot be replaced, i.e. this is the least favourable assessment for the environment);*
  - *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).*

Using the criteria above, the impacts have been further assessed in terms of the following:

- *Probability – The probability of the impact/risk occurring:*
  - *Extremely unlikely (little to no chance of occurring);*
  - *Very unlikely (<30% chance of occurring);*
  - *Unlikely (30-50% chance of occurring)*
  - *Likely (51 – 90% chance of occurring); or*
  - *Very Likely (>90% chance of occurring regardless of prevention measures).*

To determine the significance of the identified impact/risk, the consequence is multiplied by probability (qualitatively as shown in Figure 1).

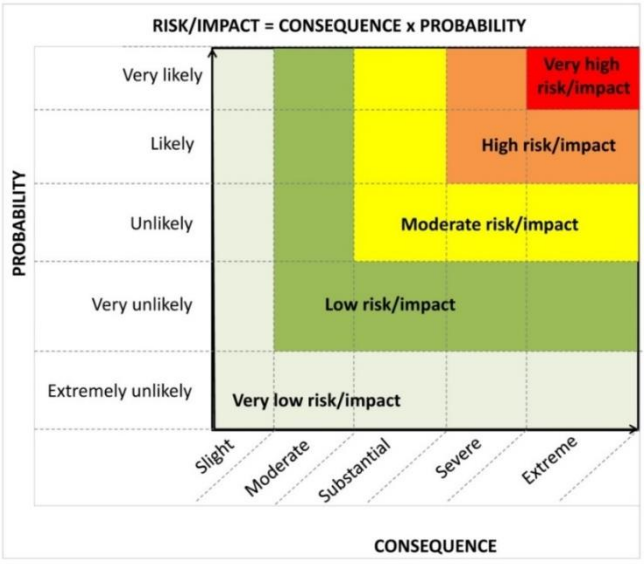


Figure 1. Guide to assessing risk/impact significance as a result of consequence and probability.

- *Significance – Will the impact cause a notable alteration of the environment?*

- *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);*
- *Moderate (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);*
- *High (the risk/impact 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); and*
- *Very high (the risk/impact will result in very 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 authorised unless major changes to the engineering design are carried out to reduce the significance rating)).*

With the implementation of mitigation measures, the residual impacts/risks are ranked as follows in terms of significance:

- *Very low = 5;*
- *Low = 4;*
- *Moderate = 3;*
- *High = 2; and*
- *Very high = 1.*

Confidence – The degree of confidence in predictions based on available information and specialist knowledge:

- *Low;*
- *Medium; or*
- *High.*

APPENDIX E: COMPLIANCE WITH THE APPENDIX 6 OF THE 2014 EIA REGULATIONS (AS AMENDED)

Requirements of Appendix 6 (Specialist Reports) of Government Notice R326 (Environmental Impact Assessment (EIA) Regulations of 2014, as amended)	***Section where this has been addressed in the Specialist Report***
1. (1) A specialist report prepared in terms of these Regulations must contain - *a) details of -* *i. the specialist who prepared the report; and* *ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;*	*Section 1.2 and Appendix A*
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	*Appendix B*
c) an indication of the scope of, and the purpose for which, the report was prepared;	*Section 1.1*
(cA) an indication of the quality and age of base data used for the specialist report;	*Section 2.2*
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	*Section 6*
d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	*Section 2.1*
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	*Section 2.1*
f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	*Section 6.6*
g) an identification of any areas to be avoided, including buffers;	*N/A*
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	*N/A*
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	*Section 2.3*
j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	*Section 6*
k) any mitigation measures for inclusion in the EMPr;	*Section 6.6*
l) any conditions for inclusion in the environmental authorisation;	*Section 9.2*
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	
n) a reasoned opinion- *i. whether the proposed activity, activities or portions thereof should be authorised;* *(iA) regarding the acceptability of the proposed activity or activities; and* *ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;*	*Section 9.1*
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	*Section 2.1*
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	*N/A*

Requirements of Appendix 6 (Specialist Reports) of Government Notice R326 (Environmental Impact Assessment (EIA) Regulations of 2014, as amended)	***Section where this has been addressed in the Specialist Report***
q) any other information requested by the competent authority.	*N/A*
(2) Where a government notice by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	*No Site Sensitivities*

forestry, fisheries
& the environment

Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001, Environment House, 473 Steve Biko Road, Pretoria, 0002 Tel: +27 12 399 9000, Fax: +27 86 625 1042

SPECIALIST DECLARATION FORM – AUGUST 2023

Specialist Declaration form for assessments undertaken for application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

REPORT TITLE

Basic Assessment for the proposed development of the Padloper Solar PV Facility 2 and associated infrastructure (i.e., Padloper PV 2), near Murraysburg in the Western Cape Province

Kindly note the following:

1. This form must always be used for assessment that are in support of applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting, where this Department is the Competent Authority.
2. This form is current as of August 2023. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.dffe.gov.za/documents/forms.
3. An electronic copy of the signed declaration form must be appended to all Draft and Final Reports submitted to the department for consideration.
4. The specialist must be aware of and comply with *'the Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the act, when applying for environmental authorisation - GN 320/2020)'*, where applicable.

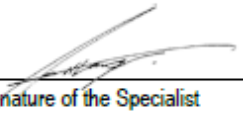
1. SPECIALIST INFORMATION

Title of Specialist Assessment	Traffic Impact Assessment
Specialist Company Name	SiVEST SA (Pty) Ltd
Specialist Name	Ntuthuko Hlanguza
Specialist Identity Number	[redacted]
Specialist Qualifications:	BSc. Eng (Civil)
Professional affiliation/registration:	Pr Eng (Pr No. 202202263)
Physical address:	[redacted]
Postal address:	
Postal address	
Telephone	
Cell phone	
E-mail	

2. DECLARATION BY THE SPECIALIST

I, Ntuthuko Hlanguza, declare that –

- I act as the independent specialist in this application;
- I am aware of the procedures and requirements for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act (NEMA), 1998, as amended, when applying for environmental authorisation which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols") and in Government Notice No. 1150 of 30 October 2020.
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing –
  - any decision to be taken with respect to the application by the competent authority; and;
  - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 48 and is punishable in terms of section 24F of the NEMA Act.



Signature of the Specialist

SiVEST SA (Pty) Ltd

Name of Company:

04 Sep 2023

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

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

Signature of the Specialist

SiVEST (Pty) Ltd

Name of Company

04 Sep 2023

Date

.

Signature of the Commissioner of Oaths

.

Date

Jacqueline Chantel Jackson
COMMISSIONER OF OATHS
Signature: JCJacks
Divisional Controller
Ref. 9/1/8/2 (R/O) KZN PMB - 08/02/2019
Date: 04/09/2023 Place: PMB
Business Address: VCC Estate, 170 Peter Brown Drive, PMB