POFADDER WIND FACILITY 3 (PTY) LTD

POFADDER WIND ENERGY FACILITY 3

Transportation Study

Issue Date: 27th July 2022
Revision No: 2
Project No: 16876
Document No: TS_P3

Date:	27th July 2022	
Document Title:	**Pofadder Wind Energy Facility 3** Transportation Study	
Revision Number:	1	
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Signature:	 Pr. N°: 2018300094	Date: 27th July 2022
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Signature:	 Pr. N°: 2018300110	Date: 27th July 2022
For:	POFADDER WIND FACILITY 3 (PTY) LTD	

Confidentiality Statement

EXECUTIVE SUMMARY

Objective

Pofadder Wind Facility 3 (Pty) Ltd proposes constructing and operating the Pofadder Wind Energy Facility (WEF) 3 and associated grid infrastructure ±35 km south-east of Pofadder in the Northern Cape Province. The proposed facility will have a contracted generating capacity of up 248 MW. The overall objective is to generate electricity through renewable energy technology, capturing wind energy to feed into the national grid.

The proposed Pofadder WEF 3 forms part of a cluster development with two additional developments adjacent to this facility as separate EIA applications: - Pofadder Wind Energy Facility 1 and Pofadder Wind Energy Facility 2. Although this report only focuses on the Pofadder WEF 3, all three developments are considered for this study as they share common boundaries and access points from Road DR2986.

The main objective of the 'Transportation Study' is to determine the impact/s of the proposed development on the immediate and greater area concerning transportation. The assessment will comprise a site assessment and include preliminary transportation-related matters arising during the construction phase, through the operation & maintenance phase, up to and including the decommissioning phase of the development. The assessment of these phases will take into account the transportation of normal and abnormal vehicles, which are made up of, among other things; - WEF components, construction materials, equipment, construction workers and employees.

Key Findings

We don't foresee any major risks concerning the proposed development and therefore include our recommendations in the report to take note of before and during the detailed design and construction stages. It should, however, be noted that several recommendations were highlighted and therefore stated as important.

The development is located in close proximity to an existing road network. Several new access points are proposed along Road DR2986 to accommodate the adjusted land use and obtain the recommended sight distances of 250m between the chosen access positions. Pofadder WEF 3 obtains access through Pofadder WEF 1 and Pofadder WEF 2. Approval and a wayleave application will be required from the Northern Cape Department of Public Works & Roads (NCdr&pw) before work commences.

The construction phase for this development will typically generate the highest number of additional vehicles. However, it will be temporary, and impacts are considered nominal.

Several mitigation measures are proposed to accommodate the development and reduce the impact on the surrounding road network.

Recommendation

Concerning this report, associated assessment and the findings made within, it is SiVEST's opinion that the Pofadder WEF 3 will have a nominal impact on the existing traffic network. The project is therefore deemed acceptable from a transportation perspective, provided the recommendations and mitigation measures in this report are implemented. Hence, Environmental Authorisation (EA) should be granted for the EIA application.

DECLARATION BY SPECIALIST

I, MERCHANDT LE MAITRE, 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 Specialist:

Name of Company: SiVEST SA (PTY) Ltd

Date: 27th July 2022

NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND ENVIRONMENTAL IMPACT REGULATIONS, 2014 (AS AMENDED) - REQUIREMENTS FOR SPECIALIST REPORTS (APPENDIX 6)

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	Section of 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;	Refer to **Section 4** and **Appendix A**
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Refer **above**
c) an indication of the scope of, and the purpose for which, the report was prepared;	Refer to **Section 3**
(cA) an indication of the quality and age of base data used for the specialist report;	Refer to **Section 7.1**
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Refer to **Section 10** Refer to **Section 11**
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Refer to **Section 3**
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Refer to **Section 3**
f) details of an assessment of the specifically 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;	Refer to **Section 12**
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;	Refer to **Figure 11:1**
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Refer to **Section 5**
j) a description of the findings and potential implications of such findings on the impact of the proposed activity, (including identified alternatives on the environment) or activities;	Refer to **Section 7** Refer to **Section 13**
k) any mitigation measures for inclusion in the EMPr;	Refer to **Section 10**
l) any conditions for inclusion in the environmental authorisation;	Refer to **Section 10**
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Refer to **Section 10**
n) a reasoned opinion- i. (as to) 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,	Refer to **Section 13**

management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	**N/A**
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	**N/A**
q) any other information requested by the competent authority.	**N/A**
2) Where a government notice gazetted 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.	**N/A**

POFADDER WIND FACILITY 3 (PTY) LTD

POFADDER WIND ENERGY FACILITY 3

TRANSPORTATION STUDY

CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. INTRODUCTION

SiVEST Civil Engineering Division has been appointed by the Pofadder Wind Facility 3 (Pty) Ltd. (hereafter referred to as "Pofadder 3" or "Pofadder WEF 3") to complete a Transportation Study for the proposed Pofadder WEF 3 and associated grid infrastructure (hereafter refer to as the "proposed facility / facilities"). The facility is situated ±35 km south-east of Pofadder within the Kai !Garib Local Municipality and the Z F Mgcawu District Municipality in the Northern Cape Province.

The proposed facility and associated grid infrastructure between Springbok and Upington will not be located within a Renewable Energy Development Zones (REDZ).

The proposed Pofadder WEF 3 forms part of cluster development with two additional developments adjacent to this facility as separate EIA applications: - Pofadder Wind Energy Facility 1 and Pofadder Wind Energy Facility 2. Although this report only focuses on the Pofadder WEF 3, all three developments are considered for this study as they share common access points from Road DR2986 through Pofadder WEF 1 and Pofadder WEF 2.

2. WIND ENERGY FACILITY COMPONENTS

The WEF will consist of the following:

2.1 WEF Components

At this stage, the proposed Pofadder 3 WEF will comprise up to thirty-one (31) wind turbines with a maximum total energy generation capacity of up to approximately 248 MW. In summary, the proposed Pofadder WEF 3 development will include the following components:

- Up to 31 wind turbines, each with a maximum of 8 MW output per turbine, with a maximum export capacity of approximately 248 MW. This will be subject to allowable limits in terms of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP).
- Each wind turbine will have a maximum hub height and a rotor diameter of up to approximately 200 m;
- Concrete turbine foundations and turbine hardstands;
- Each turbine will have a circular foundation with a diameter of up to 32 m. The turbine foundation will be placed alongside the 45 m wide hardstand, resulting in an area of about 45 m x 32 m that will be permanently disturbed for the foundation. The combined permanent footprint for the turbines will be approximately 4.2 ha.
- Each turbine will have a crane hardstand of approximately 70 m x 45 m. The permanent footprint for turbine crane hardstands will be ±9 ha.
- Each turbine will have a blade hardstand of approximately 80 m x 45 m (3 600 m2). The combined permanent footprint for blade hardstands will be ±10.8 ha.
- One (1) new 33/132 kV on-site substation occupies an area of approximately 1.6 ha.
- The wind turbines will be connected to the proposed on-site substation via medium voltage (33 kV) underground cables, mainly running alongside the access roads. Where burying of cables is not possible due to technical, geological, environmental or topographical constraints, cables will be overhead via 33 kV monopoles.
- The main access road will be between 8 – 12 m wide (to allow vehicles to pass).
- Internal roads with a width of 6 – 8 m will provide access to each wind turbine. Existing farm roads will be upgraded and used wherever possible, although new site roads will be constructed where necessary.

- A 12 m wide corridor may be temporarily impacted during construction and rehabilitated to a 6 m wide corridor after construction. The internal gravel roads will have a 6 – 8 m wide surface and a 12 m wide road clearance during construction. Additional space might be required for cut and fill, side drains and other stormwater control measures, turning areas and vertical and horizontal turning radii to ensure the safe delivery of the turbine components.
- Pofadder WEF 3 will have a total road network of approximately 48 km.
- One (1) construction laydown / staging area of up to approximately 7 ha (to be rehabilitated following construction). It should be noted that no on-site labour camps will be required to house workers overnight as all workers will be accommodated in the nearby towns and transported daily to the site (by bus);
- The gatehouse and security house will occupy an area of up to 0.5 ha.
- One (1) permanent Operation and Maintenance (O&M) building (including offices, warehouses, workshops, canteen, visitors centre and staff lockers) occupying an area of up to 1 ha;
- The temporary establishment of a site camp and concrete batching plant occupying an area of up to 1.6 ha.
- Galvanised palisade fencing to be used at the substations with the maximum height of the fencing to be up to 3.5 m;
- Water will be sourced from either the Local Municipality, supplied from a private contractor and trucked in, from existing boreholes within the application site or from a new borehole if none of these options are available.

2.2 Grid Connection Components

In order to evacuate the energy generated by the WEF's to supplement the national grid, Pofadder Grid (Pty) Ltd is proposing two grid connection alternatives which will be assessed in a separate Integrated Grid Basic Assessment Reports (BAR).

3. OBJECTIVES AND SCOPE OF WORK

The main objective of the 'Transportation Study' is to determine the impact/s of the proposed development on the immediate and greater area concerning transportation. The assessment will comprise a site assessment and include preliminary transportation-related matters arising during the construction phase, through the operation and maintenance phase, up to and including the decommissioning phase of the development. The assessment of these phases will take into account the transportation of normal and abnormal vehicles, which are made up of, among others; - WEF components, construction materials, equipment, construction workers and employees.

The scope of work consisted of the following:

a) A site investigation (completed on the 15th July 2022).

b) Consultations with the relevant authorities and / or stakeholders include collecting traffic data and information.

c) Desktop analysis of traffic data and information from the various authorities and / or stakeholders. The analysis includes the evaluation of the road network's capacity (if required).

d) Evaluate the impact of the proposed development on the existing road network / traffic volumes and populate a suitable 'Impact Rating System'.

e) Determine specific traffic needs during the different phases of implementation.

f) Conclude and propose possible mitigation measures.

g) Identify the position and suitability of the preferred access road alternatives.

h) Confirm the required clearances for the necessary equipment to be transported from the point of delivery to the various sites.

i) Confirm freight and transport requirements during construction, operation and maintenance period.

j) Propose origins and destinations of equipment.

k) Determine Abnormal load requirements (if any).

l) Seasonal impacts do not affect the assessment.

3.1 Legal Requirement & Guidelines

Key legal requirements and guidelines for the proposed facilities are as follows:

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

4. SPECIALIST CREDENTIALS

Merchandt Le Maitre from SiVEST Consulting Engineers compiled this Transportation Study. He has a B Tech (Baccalaureus Technologiae) in Civil Engineering with over 17 years of experience, with 12 years in renewable energy. His extensive experience in the different facets of Civil Engineering means he can advise clients in the renewable energy sector in; geotechnical engineering, topographical studies, stormwater management, water demand, transportation studies, access / layout designs and glint & glare assessments. A full Curriculum Vitae is included in 'Appendix A.'

Table 4.1 Specialist Credentials & Experience

Company	SiVEST (Pty) Ltd
Contact Details	merchandtm@sivest.co.za
Qualifications	B Tech (Baccalaureus Technologiae) in Civil Engineering
Professional Registrations & Memberships	• Pr. Tech Eng – Engineering Council of South Africa • MSAICE – Member of South African Institute of Civil Engineers • SAWEA – South African Wind Energy Association
Expertise to carry out the Transportation Study	• Tooverberg WEF • Umsobomvu PV • Droogfontein 3 PV • Mierdam PV • Dwarsrug PV • Platsjambok West PV

	• Platsjambok East PV • Loeriesfontein 3 PV • Koeris BESS • Koup 1 & 2 WEF • Beaufort West WEF • Lephalale Solar Project

5. ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations are to be noted:

- The analysis is based on the information provided at the time by Pofadder Wind Facility 3 (Pty) Ltd and its representatives.
- Digital Terrain Model: 25 m DEM from NGI (2014) & 2 m DEM from GeoSmart (2016:2919BA, 2919BB, 2919BC & 2919BD)
- Technical Specifications for the Facility are:

Table 5.1 Technical Specification for Pofadder WEF 3

Technical Component	Dimensions
Number of Turbines	Maximum of 31
Capacity	≤ 248 MWac
Hub Height	≤ 200m
Rotor Diameter	≤ 200m
Construction Period (assumed)	± 24 – 30 months (TBC)
Expected Lifespan	20 - 25 years (TBC)
Road Width	Up to 8 m
Length of Internal Roads	±48 km

- Traffic Station Data / Counts and trip generation calculations are for one direction only and do not include return trips unless indicated.
- Peak Hour Trip Generations:
    - Weekday AM peak hour - 07:00 to 08:00
    - Weekday Midday peak hour - 11:00 to 14:00
    - Weekday PM peak hour - 16:00 to 17:00
- Traffic Station Data / Counts and trip generation calculations are for one direction only and do not include return trips unless indicated.
- This assessment is limited to the impact of the development traffic on the network, not the wider impacts known as background traffic. Such impacts can only be addressed in a detailed Traffic Impact Study, which considers actual traffic counts undertaken during peak periods.
- The information provided in this report is an informed estimate. However, construction-related traffic may vary and differ from the information provided during construction phases because of supplier delivery schedule changes.
- Some of the figures provided are indicative as many of the components are still at the design stage and will only be confirmed closer to the construction time.

6. PROJECT DESCRIPTION

6.1 Locality

Pofadder WEF 3 and associated infrastructure is located ±35 km south-east of Pofadder in the Northern Cape Province. The facility is ±22 km from Road R358 regional road (P0736) on Road P2986 and 29 km from the N14 Freeway between Springbok and Upington in the Kai !Garib Local Municipality and the Z F Mgcawu District Municipality as indicated in **Figure 6:1**.

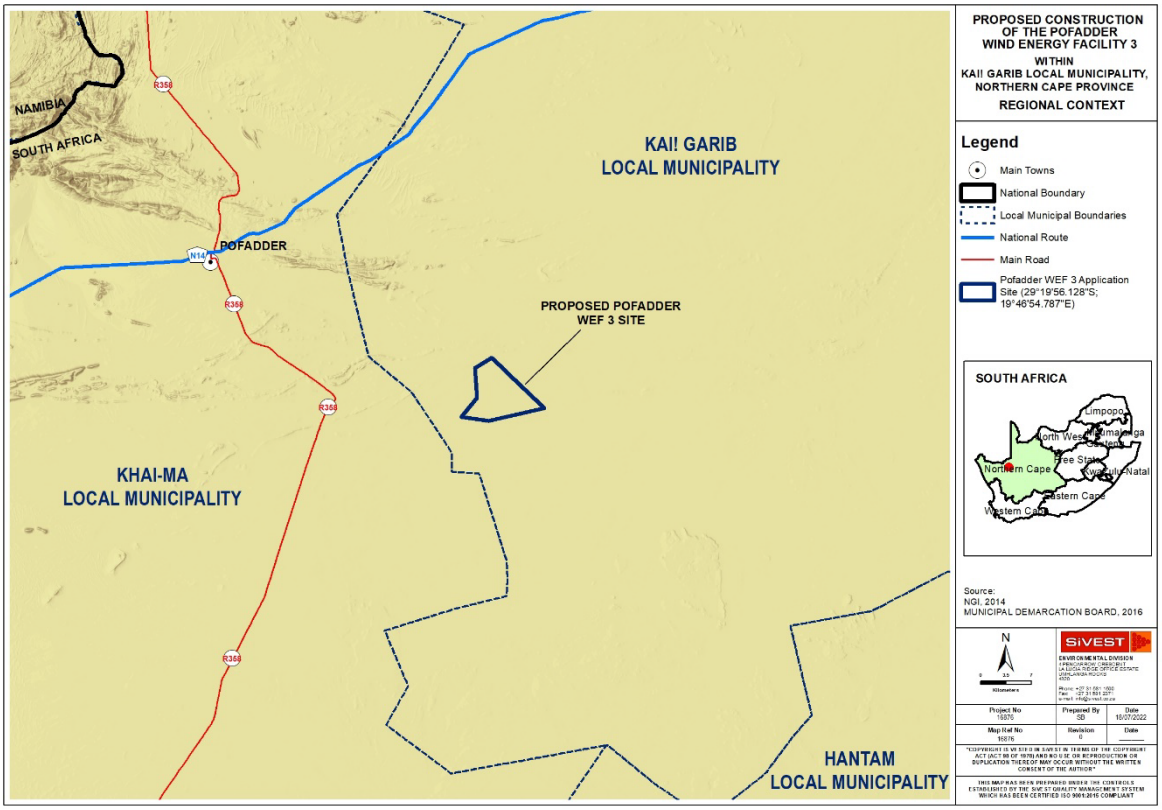


Figure 6.1 Pofadder WEF 3 - Regional Context

The closest urban nodes to the Pofadder WEF are:

Table 6.1 Distance to Urban Nodes

Urban Nodes	Distance	Estimated Travel Time
Pofadder	±51 km	40min
Kakamas	±183 km	1hr 55min
Brandvlei	±196 km	2hr 12min
Kenhardt	±153 km	1hr 54min
Kliprand	±191 km	2hr 15min

** Distance and Travel times according to Google Maps*

The WEF will be located on the following properties (Refer to **Figure 6:2**):

- Remaining Extent of the Farm Ganna-Poort No. 202

- Remaining Extent of the Farm Lovedale No. 201
- Portion 3 of the Farm Sand-Gat No. 150

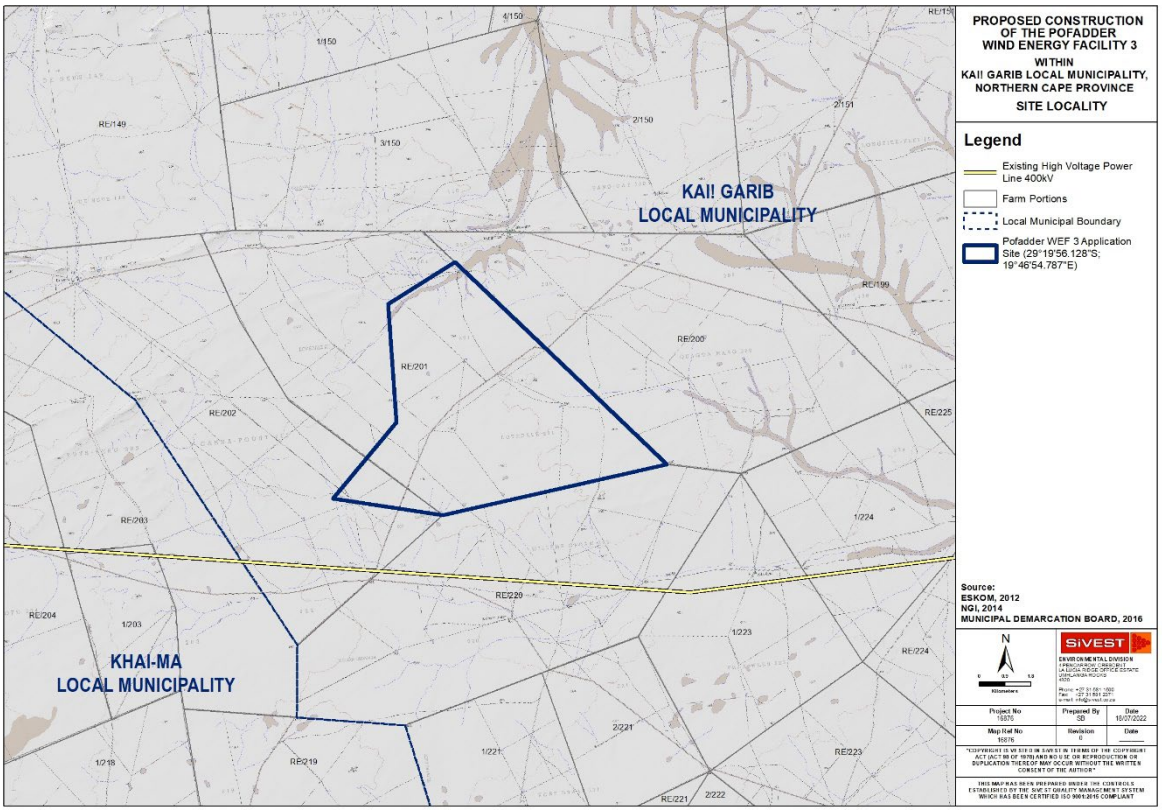


Figure 6.2 Pofadder WEF 3 - Site Locality

7. TRANSPORTATION

Road DR2986 bisects the Pofadder WEF 1 development with existing and new access positions linking the proposed development to the surrounding road network. An internal road network will then provide access to Pofadder WEF 3 through Pofadder WEF 2. The future development and adjusted land use will require access upgrades and / or new access positions to accommodate the proposed development.

Road DR2986 is a District Road and falls under the jurisdiction of the Northern Cape Department of Roads & Public Works (NCdr&pw).

The site, respective access points and internal layouts will be discussed in more detail in the sections below. It should be noted that this report only focuses on Pofadder WEF 3 development; however, all three developments will be considered and analysed as a combined assessment as they share common access points from Road DR2986.

7.1 Existing Road Network

The existing road network surrounding the proposed development is well established and provides a high degree of mobility and access. The mobility roads join the major centres and towns with each other, while access roads provide access roads to serve smaller nodes and individual properties.

The Northern Cape is the largest province in South Africa, covering 31% of the country's surface area in a semi-desert climate. However, the Northern Cape only has 2.2% of the country's population, resulting in the province with a low population density and low vehicle ownership. The existing road

networks are predominantly mobility roads; in most cases, the arterials and collector roads are gravel roads. The gravel roads are generally in a fair to good condition as the low rainfall in the semi-desert climate requires less maintenance. This development is located ±51 km from the N14 Freeway through Pofadder; ±50 km of this section is a gravel surface.

Roads which impact this development have been summarised in **Table 7.1** below and indicated in **Figure 6.2** above.

Table 7.1 Existing Road Network

Route	Surface	RCAM Class	Section	Jurisdiction
N014	Asphalt	R1	Springbok - Kakamas	SANRAL
MR0736 (R358)	Gravel	R4	Pofadder - Bitterfontein	NCdr&pw
DR2986	Gravel	R4	Bakerville - Kenhardt	NCdr&pw

7.2 Existing Traffic Conditions

Existing traffic data for Road N007 and N014 was obtained from the SANRAL and indicate the highest vehicles per hour (vph) rates for routes surrounding the development. The figures noted in the tables below are well below the capacity of a typical two-lane two-roads of 2500 vph.

Table 7.2 Traffic Counts on N014 Freeway

Route	Site ID	Distance (Km)	Location	Traffic Stream (TS) to		Lanes	Light Vehicles	Heavy Vehicles (ADTT)	Total Vehicles (ADT)	Highest Vol (Time of Day)	
				TS1	TS2					TS1	TS2
N014 (01)	205	2.50	Springbok	Pofadder	Springbok	2	1510	170	1680	176 (18:00)	162 (18:00)
N014 (02)	19322	160.30	Pofadder	Pofadder	Springbok	2	885	166	1051	80 (18:00)	77 (07:00)
N014 (02)	19321	120.00	Upington & Pofadder	Upington	Pofadder	2	676	143	818	59 (14:00)	55 (16:00)

Table 7.3 Traffic Counts on N007 Freeway

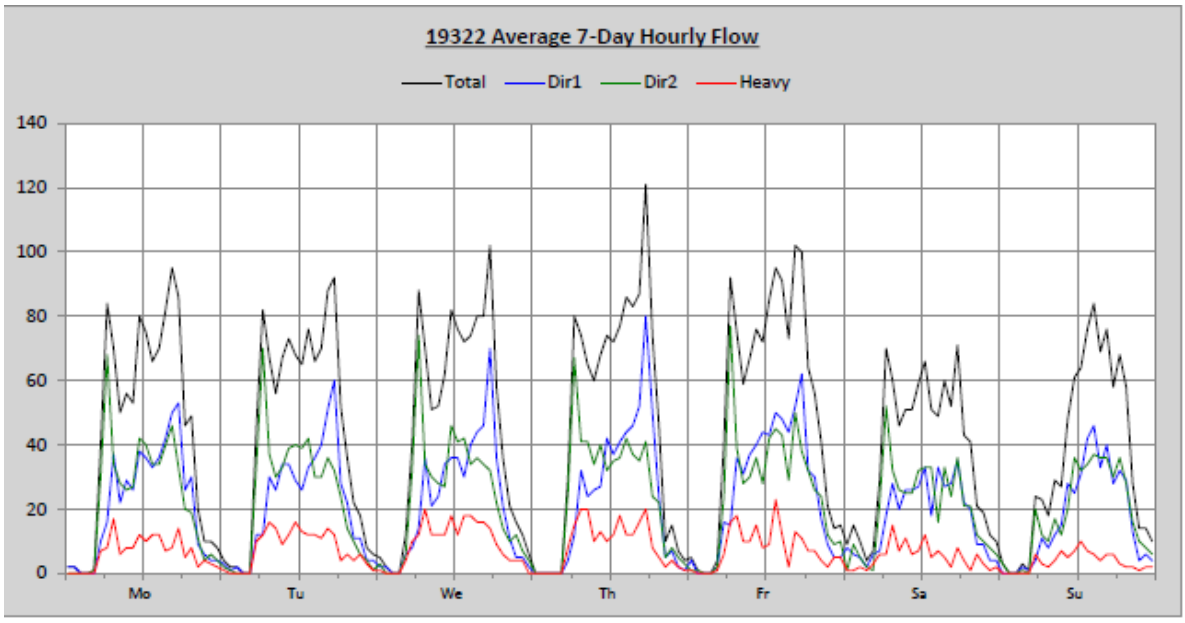
Route (Section)	Site ID	Distance (Km)	Location	Traffic Stream (TS) to		Lanes	Light Vehicles	Heavy Vehicles (ADTT)	Total Vehicles (ADT)	Highest Vol (Time of Day)	
				TS1	TS2					TS1	TS2
N007 (07)	209	101.00	Sprinbok	Springbok	Cape Town	2	857	275	1132	101 (12:00)	130 (12:00)
N007 (06)	18010	4.70	WC Border	WC Border	Cape Town	2	522	249	771	55 (17:00)	50 (17:00)
N007 (06)	18009	3.70	WC Border	T/O Pofadder	Bitterfontein	2	559	255	814	60 (17:00)	51 (17:00)
N007 (05)	18008	79.40	Nuwerus & Bitterfontein	Bitterfontein	Nuwerus	2	638	260	898	58 (17:00)	55 (17:00)
N007 (05)	18008	8.00	Vanrhynsdorp & Nuwerus	Springbok	Vanrhynsdorp	2	759	276	1035	120 (14:00)	147 (14:00)
N007 (04)	208	64.20	Clanwilliam & Vanrhynsdorp	Vanrhynsdorp	Clanwilliam	2	989	414	1403	92 (16:00)	82 (15:00)
N007 (04)	18079	21.40	Clanwilliam & R363	Vanrhynsdorp	Clanwilliam	2	1614	726	2340	144 (17:00)	153 (13:00)
N007 (03)	5015	76.00	Citrusdal & Clanwilliam	Clanwilliam	Citrusdal	2	2640	793	3433	410 (17:00)	523 (14:00)

Route (Section)	Site ID	Distance (Km)	Location	Traffic Stream (TS) to		Lanes	Light Vehicles	Heavy Vehicles (ADTT)	Total Vehicles (ADT)	Highest Vol (Time of Day)	
				TS1	TS2					TS1	TS2
N007 (03)	18078	60.20	Poterville & Eendekuil	Citrusdal	Piketberg	2	2859	791	3650	269 (17:00)	292 (16:00)
N007 (03)	18077	42.20	Piketberg & Poterville	Citrusdal	Piketberg	2	2602	742	3344	241 (17:00)	265 (17:00)
N007 (03)	18078	30.40	Mooreesburg & Piketberg	Springbok	Cape Town	2	3473	947	4420	538 (17:00)	607 (15:00)

The closest counting station to the proposed development, where the most significant impact will occur, is Molino (Station No. 19322) to the west of Pofadder. Additional information on the station is included below in **Table 7.4**.

Table 7.4 Traffic Data Summary – Station No. 19322

	Light Vehicles	Heavy Vehicles	Total Vehicles	Directional Split (East : West)
N01401E Km 160.30 Station No: Temporary Date: 2019/08/11 – 2019/08/22				
Morning 7:00-8:00	76	12	88	16.5 : 83.5
Afternoon 16:00-17:00	88	14	102	68.5 : 31.5
Average Annual Daily Trips	885	166	1051	48.4 : 51.6
Station Count Chart				



Based on the table above, it can be concluded that the existing peak traffic on this section of road is in the morning (AM) and afternoon (PM). Therefore, it is recommended that the transportation of labour and the delivery of material and abnormal loads be completed in the off-peak periods.

7.3 Additional Traffic Generation

The construction / BOP phase will typically generate the highest number of trips for the proposed facility. Construction will typically involve access roads, foundations, Wind Turbine Generators (WTG), electrical cables / transformers / switch gears / substations / BESS installations and the delivery of these materials / equipment / abnormal loads on the public road network.

It is assumed that no staff or labour will reside on the construction site, other than security, and therefore all will reside in the town Pofadder or nearby hostels.

7.3.1 Construction Phase

Calculations and experience from previous WEF developments confirm the construction phase will generate the greatest additional traffic to the surrounding road network. The impact will be on the surrounding road network, increasing dust generation, noise, and road maintenance.

Referring to **Table 7.5** below, the civil construction period for WEF developments with steel towers (hybrid towers in brackets) typically takes place between 2 – 16 months on a development of this size. This development of ±5 100 ha will generate a maximum of ±84 (103) additional vehicle trips per day on the surrounding road network (external). Of these vehicle trips, ±74 (86) vehicle trips will occur at the peak of the construction phase transporting staff and labour. Typically, these trips will be in the morning between 6:00 – 7:00 and the afternoons between 17:00 – 18:00. These trips will occur before and after the 'morning' & 'afternoon' peak periods, respectively.

The deliver of construction material and abnormal loads will equate to ±11 (15) vehicle trips and will occur during the 'weekday midday' period. The abnormal loads, however, only account for three (2) trips per day of the construction phase and is elaborated further in **Section 7.3.1.1** below. Assuming a 9 hr workday, the ±11 (15) vehicles during the 'weekday midday' period will equate to ±2 (2) vehicle trips / hour.

The resultant impact of this development on the surrounding road network during the construction period for both steel and hybrid tower methods are seen as minimal.

The specific traffic needs for this phase of the development.

- Reduction in vehicle speed
- Reduction in dust generation
- Adequate law enforcement
- Appropriate, timely and high-quality maintenance of roads
- Implementation of pedestrian safety initiatives
- Regular maintenance of farm fences and access cattle grids
- Continuous engagement with the Northern Cape Department of Public Works & Roads (NCdr&pw).

Table 7.5 Typical Trip Generation Sheet for 31 WTG's

		Month																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Construction Phase																									
1	**Balance of Plant Construction**																								
1.1	Civil Balance of Plant																								
1.1.1	- Site Establishment	1																		1				1	
1.1.2	- Transport - Skilled		19	21	22	22	22	22	22	21	19	18	16	14	12	10	8	7	6	4	3	3	2	2	
1.1.3	- Transport - Semi Skilled			12	12	13	13	13	13	13	12	12	11	10	8	7	6	5	4	3	3	2	2	1	
1.1.4	- Transport - Unskilled			3	3	3	4	4	4	4	4	4	4	4	4	4	3	3	3						
1.1.5	- Construction - Foundation (External)		2	2	2	2	2	3	3	3	3	3	3	3	3	2	2	2	2						
1.1.6	- Construction - Foundation (Local)		39	42	46	48	50	51	52	51	50	48	46	42	39	35	31	28	24						
1.1.7	- Construction - Road & Platform (External)		6	6	7	7	7	7	7	7	7	7	7	6	6	5	5	4	4						
1.1.8	- Construction - Road & Platform (Local)		6	7	7	7	8	8	8	8	8	7	7	7	6	6	5	4	4						
1.2	Electrical Balance of Plant																								
1.2.1	- Site Establishment			1																1				1	
1.2.2	- Transport - Skilled				12	13	14	14	14	14	14	13	12	11	10	9	8	7	5	4	4	3	2	2	
1.2.3	- Transport - Semi Skilled				10	11	11	11	11	11	11	11	10	9	8	7	6	5	4	4	3	2	2	2	
1.2.4	- Transport - Unskilled				2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1			
1.2.5	- Construction - MV Collector																								
1.2.6	- Construction - Substation					1	1	1	1	1	1	1	1	1	1	1	1	1	1						
1.2.7	- Construction - HV Transmission																								
2	**Wind Turbine Generator Assembly (Steel Towers)**																								
2.1	Delivery - Bolt Cage			1																					
2.2	Delivery - WTG															3	3	3	3	3	3				
2.3	Site Establishment														1										1
2.4	Install / Assemble / Erect																								
2..4.1	- Transport - Skilled															18	20	21	22	22	22	22	21	20	18
2..4.2	- Transport - Semi Skilled																	21	22	22	22	22	22	21	
2..4.3	- Transport - Unskilled																	3	4	4	4	4	4	3	
	TOTAL	**1**	**72**	**95**	**123**	**129**	**134**	**136**	**137**	**135**	**131**	**126**	**119**	**109**	**100**	**109**	**100**	**116**	**110**	**70**	**65**	**59**	**55**	**53**	**19**

2	**Wind Turbine Generator Assembly (Hybrid Towers)**																								
2.1	Construction - Foundation (External)										4	4	4	4	4	4	4	4							
2.2	Construction - Foundation (Local)										1	5	6	7	7	7	7	6	5						
2.2.1	- Transport - Skilled										5	6	6	6	6	6	6	6	5						
2.2.2	- Transport - Semi Skilled										2	2	2	2	2	2	2	2	2						
2.2.3	- Transport - Unskilled										1	1	1	1	1	1	1	1	1						
2.3	Delivery - WTG																2	2	2	2	2				
2.4	Site Establishment													1											1
2.5	Install / Assemble / Erect																								
2.5.1	- Transport - Skilled														17	19	21	22	22	22	22	22	21	19	17
2.5.2	- Transport - Semi Skilled																22	22	22	22	22				
2.5.3	- Transport - Unskilled																4	4	4	4	4				
	TOTAL	**1**	**72**	**94**	**123**	**129**	**134**	**136**	**137**	**135**	**144**	**144**	**138**	**130**	**136**	**127**	**146**	**137**	**122**	**69**	**64**	**33**	**29**	**28**	**18**

7.3.1.1 *Abnormal Loads*

Abnormal loads are described as loads that, for all practical purposes, cannot be transported on a vehicle or vehicle without exceeding the limitations described in the 'National Road Traffic Regulations (2000)'.

These vehicles exceed the limitations as a result of one of the following.

- Dimension Abnormality
    - Length
    - Width
    - Height
    - Overhangs
    - Load Projections
    - Wheelbase
- Mass Abnormality

The delivery of WTG's in South Africa is primarily from two ports, Port of Saldanha and Ngqura. Both ports are uniquely positioned to accommodate the unique project cargo / abnormal loads of WTG's and are the only ports in South Africa that are not city-locked. The distance between the proposed facility and each port is indicated in **Table 7.6** below.

Table 7.6 Pofadder WEF – Port Distances

Port	Distance
Port of Saldanha	731 km
Port of Ngqura	1165 km

For this development, the transportation of abnormal loads for WTG's from their origin (ports) to the proposed facility has been assumed primarily from the Port of Saldanha. Examples of the transportation methods for the Steel Tower Sections (**Figure 7.**1), Hybrid Concrete Tower Sections (**Figure 7.2**) Nacelle (**Figure 7.3),** Rotor Hub (**Figure 7.4**), and Rotor Blade (**Figure 7.5**) is included below. The transportation of abnormal loads for electrical transformers is assumed to be from Gauteng.

Figure 7.1 Example of Steel Tower Sections Transport (Nooteboom)

Figure 7.2 Example of Hybrid Tower Sections (Nordex)

Figure 7.3 Example of Nacelle Transport *(Recharge News)*

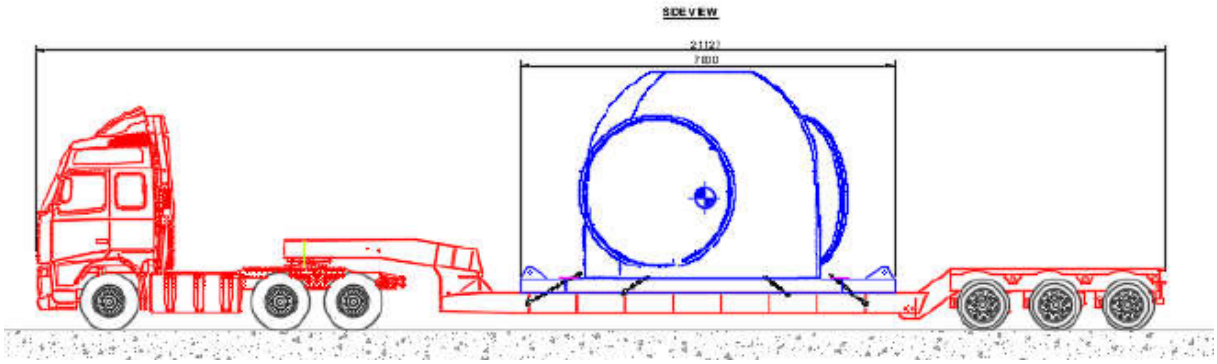


Figure 7.4 Example of Hub

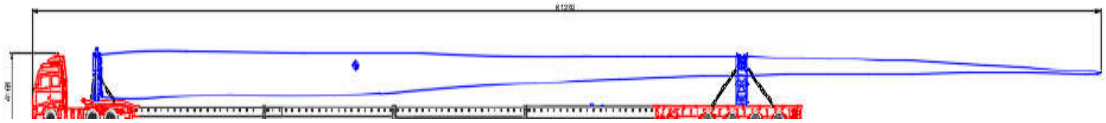


Figure 7.5 Example of Rotor Blades

The Geometric clearance requirements associated with these abnormal loads transporting the equipment types are shown in **Table 7.7**. However, it should be noted that the figures above and table below are indicative as many of the components are still at a design stage and will only be confirmed closer to the construction.

Table 7.7 Abnormal Load Dimensions

Description of Load	No. per WTG	Typical Dimensions (m)		
		Length	Width	Height
Tower Sections	8	<31	<4.5	<4.5
Nacelle	1	7	<4	3.8
Drive Train	1	6.6	3.5	3.3
Rotor Blades	3	95	4.4	3.9
Rotor Hub	1	4.8	4.4	4.0

Table 7.8 Abnormal Load Trips

Proposed WTG Delivery Schedule	Month (Period)			Origin
	1-14	15-20	21-24	
Tower Sections	0	3 (2)	0	Saldanha
Nacelle				Saldanha
Drive Train				Saldanha
Rotor Blades				Saldanha
Rotor Hub				Saldanha
Trips/Day for period	**0**	**3 (2)**	**0**	

* *Please note the values above are estimates based on data currently available*

Before any Abnormal Load conveying equipment is delivered to the facility, approval must be obtained through a permit from the Department of Transport (DoT). The permit application will be completed by specialists in the transportation of Abnormal loads and will conform to 'The Road Traffic Act, 1996 (Act No 93 of 1996)'. The application includes route clearances from Telkom and Eskom, after which the application is submitted to DoT. They, in turn, consult with the SANRAL and each Local Municipality and Provincial Authority travelling through before issuing a permit.

7.3.1.2 *Permitting for Abnormal Loads– General Rules*

The limits recommended in *TRH 11 - Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads* are intended to serve as a guide to the Permit Issuing Authorities. It must be noted that each Administration has the right to refuse a permit application or modify the conditions under which a permit is granted. It is understood that:

- A permit is issued at the sole discretion of the Issuing Authority. The permit may be refused because of the condition of the road, the culverts and bridges, the nature of other traffic on the road, and abnormally heavy traffic during specific periods or for any other reason.
- A permit can be withdrawn if the vehicle is found unsuitable to be operated upon inspection.
- During specific periods, such as school holidays or long weekends, an embargo may be placed on the issuing of permits. Embargo lists are compiled annually and are obtainable from the Issuing Authorities.

7.3.1.3 *Proposed Normal & Abnormal Load Routes*

The transportation of Normal & Abnormal goods has been indicated in **Figure 7.6** below and will be primarily from the Port of Saldanha / Cape Town and Gauteng.

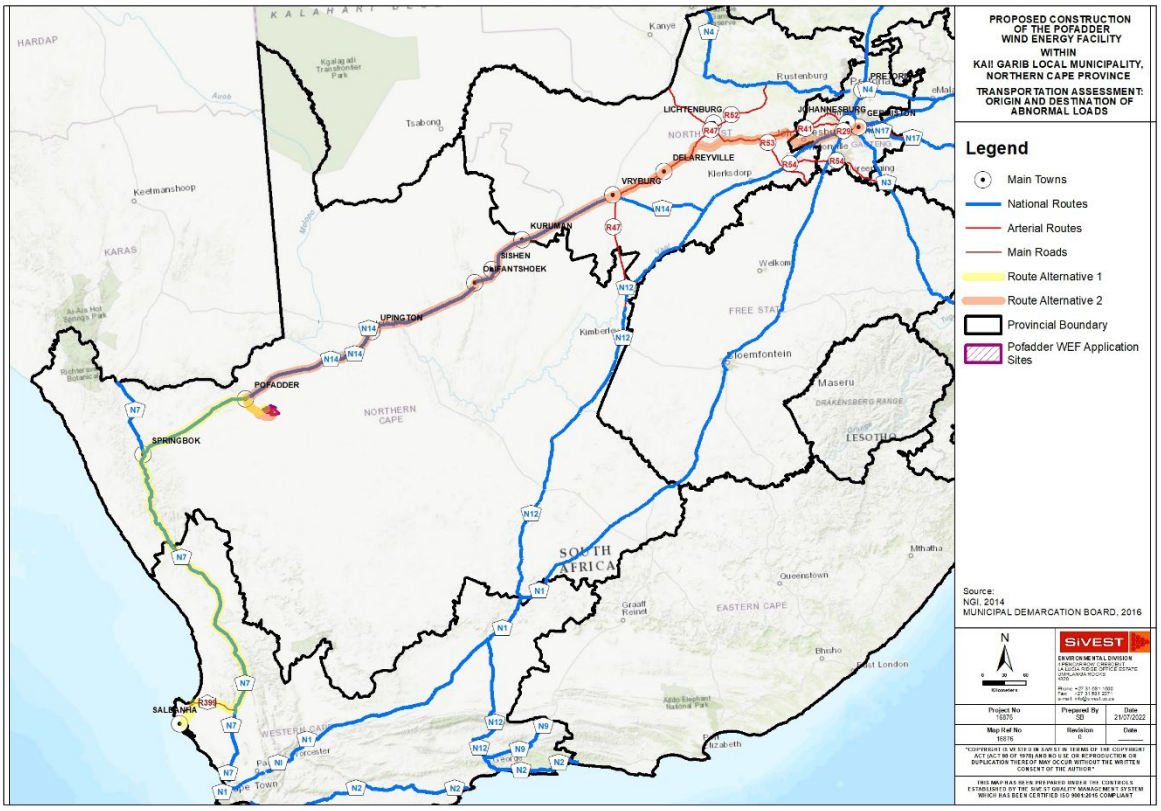


Figure 7.6 Normal & Abnormal Load Transport Route

An approved Abnormal Load route exists between the Port of Saldanha and the Springbok REDZ. The Pofadder WEF is, however, located ±48 km east of the Springbok REDZ. Therefore, the abnormal load route following the N7 Freeway north and N14 Freeway east will extend past Aggeneys towards Pofadder and ultimately south on Road MR0736 (R358).

The approved abnormal load route leaves the Port of Saldanha on the R45 towards Moorreesburg via the R311. Leaving Moorreesburg will continue north on the N7 Freeway towards Springbok. Before the town of Springbok, take the Kokerboom Rd / N14 / R355 ramp east, and then after crossing over the freeway, turn north towards the N14 Freeway / Voortrekker St intersection. At the intersection, continue east on the N14 Freeway towards Pofadder.

Several routes through Pofadder from the N14 Freeway to Road MR0736 exist. The direct route through Pofadder on Voortrekker Rd can be used for a majority of the additional trips generated by the development. Abnormal Loads and, more specifically, the transportation of rotor blades will require more detailed analysis in this section. Based on our desktop assessments, rotor blades will be able to negate the intersection of Voortrekker & Springbok Rd, taking into account the existing memorial. Alternative routes have been indicated below in **Figure 7.7** with their possible shortcomings.

- Alternative A via Buitekant Street – An abnormal rotor blade load could have difficulty negotiating the intersection of the N14 and Buitekant St.
- Alternative B via Nuwe Street – An abnormal rotor blade load could have difficulty negotiating the intersection of the N14 and Nuwe St.

- Alternative C via old Springbok / Upington road – This road is currently decommissioned and will require additional approvals and possible road upgrades.

We recommend completing a more comprehensive route analysis before construction to understand better the works required and the potential risks.

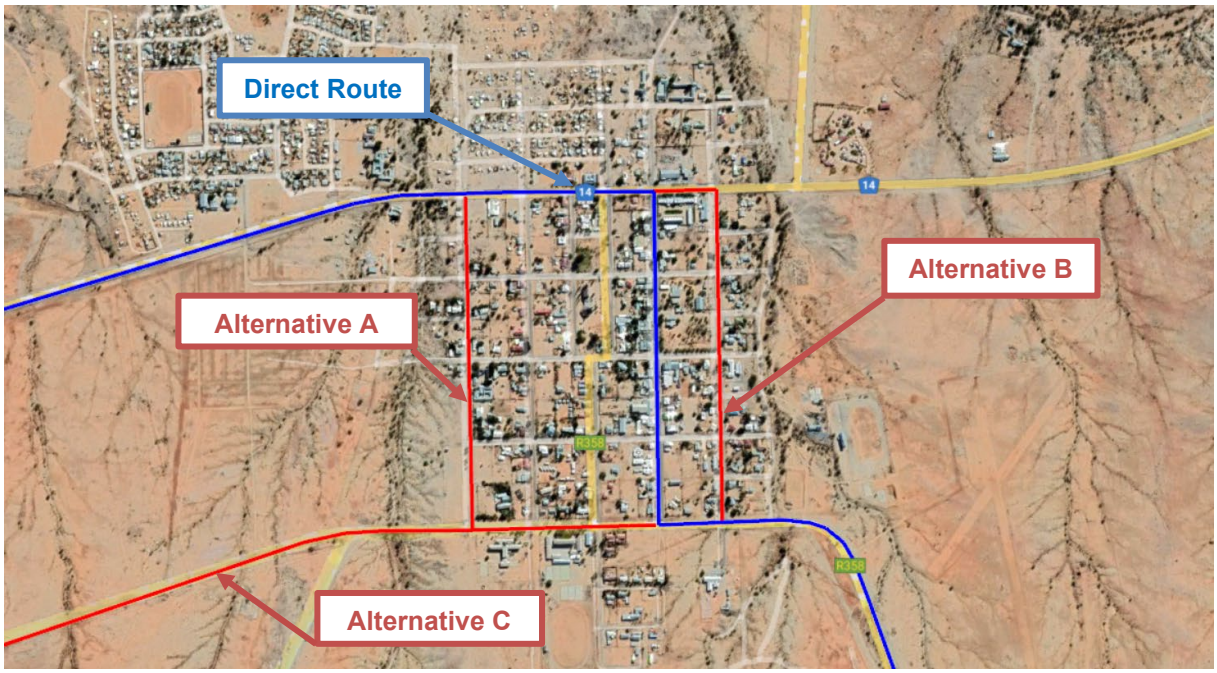


Figure 7.7 Pofadder Route Diversion

7.3.2 Operation & Maintenance Phase (O&M)

The Pofadder WEF 3 has been designed with a 20 – 25 year lifespan and could increase if financially viable. The O&M during the 20 – 25 year period will typically be in the form of a small general maintenance team during the O&M period. Any maintenance required, including a new transformer or switch gear, will be classified as an abnormal load, and the traffic generated by this will be negligible in the greater scheme of the development. The most significant contributor of traffic in this phase will therefore only comprise employees commuting to and from the site.

We assume a maximum number of ±50 employees will be employed during the project's 20 – 25 year life span. Therefore, the assumption is that the employees will commute together; hence, a total of ±25 additional trips will be added to the existing road network during the morning and afternoon. In addition to the staff, commuting will be the collection of waste and sanitation. These are assumed to generate an additional ±2 vehicles / week onto the existing road network; therefore, the sum of this phase will have a low to negligible impact.

The specific traffic needs for this phase of the development.

- Reduction in vehicle speed.
- Reduction in dust generated.
- Adequate law enforcement.
- Appropriate, timely and high-quality maintenance of gravel roads.
- Implementation of pedestrian safety initiatives.

- Regular maintenance of farm fences and access cattle grids; and
- Continuous engagement with the Northern Cape Department of Public Works & Roads (NCdr&pw).

7.3.3 Decommissioning Phase

Decommissioning the Pofadder WEF 3 will generate fewer trips than the construction phase. It is estimated that the decommissioning phase will generate an additional ±10 vehicles / day over a period of 12 – 14 months. The material removed will be transported back to Gauteng or the Western Cape for recycling. The impact of this phase will therefore be low.

The specific traffic needs for this phase of the development.

- Reduction in vehicle speed.
- Reduction in dust generated.
- Adequate law enforcement.
- Appropriate, timely and high-quality maintenance of gravel roads.
- Implementation of pedestrian safety initiatives.
- Regular maintenance of farm fences and access cattle grids; and
- Continuous engagement with the Northern Cape Department of Public Works & Roads (NCdr&pw).

7.4 External Access

The Pofadder WEF 3 forms part of two other developments, Pofadder WEF 1 and Pofadder WEF 2. All three developments share common access points from Road DR2986 in Pofadder WEF 1. Pofadder WEF 3 obtains access through Pofadder WEF 1 and Pofadder WEF 2. The development located on the Remaining Extent of Farm Ganna-Poort No. 202, Remaining Extent of Farm Lovedale No. 201 and Portion 3 of the Farm Sand-Gat No. 150 has existing farm access points from Road DR2986 with new access points proposed on Road DR2986.

These new access points are as follows:

Table 7.9 Pofadder WEF 3 - Proposed Access Positions

Access No.	Road No.	Position	Access Status	Location	
Access 1	DR2986	Km 153.99	New Gravel	29°17'13.40" S	19°37'48.95" E
Access 2	DR2986	Km 148.11	New Gravel	29°16'42.93" S	19°41'23.36" E
Access 3	DR2986	Km 146.82	New Gravel	29°16'40.92" S	19°42' 7.43" E
Access 4	DR2986	Km 142.80	New Gravel	29°16'40.81" S	19°44'37.86" E

The provincial road DR2986 is maintained under the auspices of the NCdr&pw and classified as a Class R4 in terms of the RCAM Classification – Collector Road with an average road reserve width of 42 m (in some cases 22 m) and a gravel road surface of 8.0 m wide and a 1 m wide gravel shoulder on both sides. The road has a design speed of 80 km/h.

The proposed access points are located along Road DR2986, with images of each point included below. The minimum required sight distance applicable to a road at 80 km/h is 250 m. Hence, the current sight distance of >350 m eastern and western approaches are achieved at all the proposed access locations.

Upgrades to the proposed access will be required, and approval will need to be obtained from the NCdr&pw.

Figure 7.8 Existing Road DR2986 @ Km 153.99 – West Approaching

Figure 7.9 Existing Road DR2986 @ Km 153.99 – Proposed Access (South Approaching)

Figure 7.10 Existing Road DR2986 @ Km 153.99 – West Approaching

Figure 7.11 Existing Road DR2986 @ Km 148.11 – East Approaching

Figure 7.12 Existing Road DR2986 @ Km 148.11 – Proposed Access (South Approaching)

Figure 7.13 Existing Road DR2986 @ Km 148.11 – Proposed Access (North Approaching)

Figure 7.14 Existing Road DR2986 @ Km 148.11 – West Approaching

Figure 7.15 Existing Road DR2986 @ Km 146.82 – West Approaching

Figure 7.16 Existing Road DR2986 @ Km 146.82 – Proposed Access (North Approaching)

Figure 7.17 Existing Road DR2986 @ Km 146.82 – East Approaching

Figure 7.18 Existing Road DR2986 @ Km 142.80 – East Approaching

Figure 7.19 Existing Road DR2986 @ Km 142.80 – Proposed Access (North Approaching)

Figure 7.20 Existing Road DR2986 @ Km 142.80 – Proposed Access (South Approaching)

Figure 7.21 Existing Road DR2986 @ Km 142.80 – West Approaching

7.5 External Road Upgrades

Most of the additional traffic generated from the Pofadder WEF and associated grid infrastructure can be accommodated on the existing road network and include both normal and abnormal vehicles with minor modifications.

Road MR0736 and DR2986 are in reasonably good condition, with minor areas requiring upgrading or remedial action. The majority of both roads require remedial action in the form of light blading and reshaping of side drains, and mitre drains.

In almost all cases, the vertical alignment of the sag curves through minor drainage lines will result in problem areas for Abnormal Loads. Abnormal Loads require a minimum vertical curve of 400 m with an arc length of 30 m. Some drainage lines have eroded the wearing course and base course of the gravel roads, and therefore we recommend these drainage lines be upgraded with suitable-sized culverts or concrete causeways. Refer **Figure 7.22** and **Figure 7.23** below.

Figure 7.22 Typical erosion in drainage lines on External Roads

Figure 7.23 Typical drainage line requiring upgrades on External Roads

7.6 Design Considerations

Based on our recent discussions with the NCdr&pw, new Land Use applications must be sent to their departments for approval with the proposed new / upgraded access position. As part of the application, the expected traffic during construction and the O&M phase, available sight distances including photographs and the affected stormwater structures are to be included. The OEM's and the NCdr&pw minimum requirements will need to be considered during the design stage.

The access points from Road DR2986 fall within the jurisdiction of NCdr&pw; their standard access requirement is based on TRH 17, TRH 4 and TRH 26. An example of the Western Cape Department of Transport and Public Works – Typical Farm Access Detail is included in **Figure 7.24** and stormwater drainage in **Figure 7.25** below.

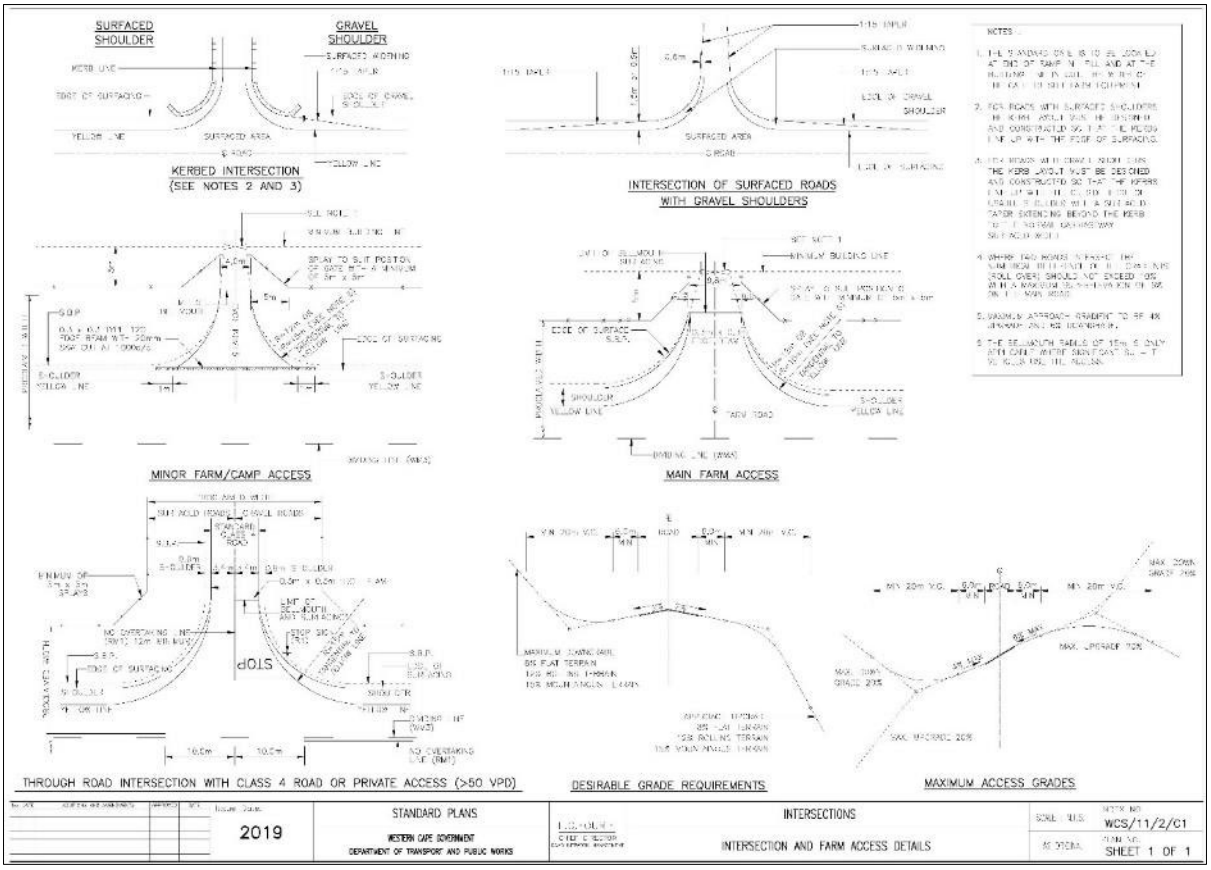


Figure 7.24 Typical Intersection and Farm Access Detail

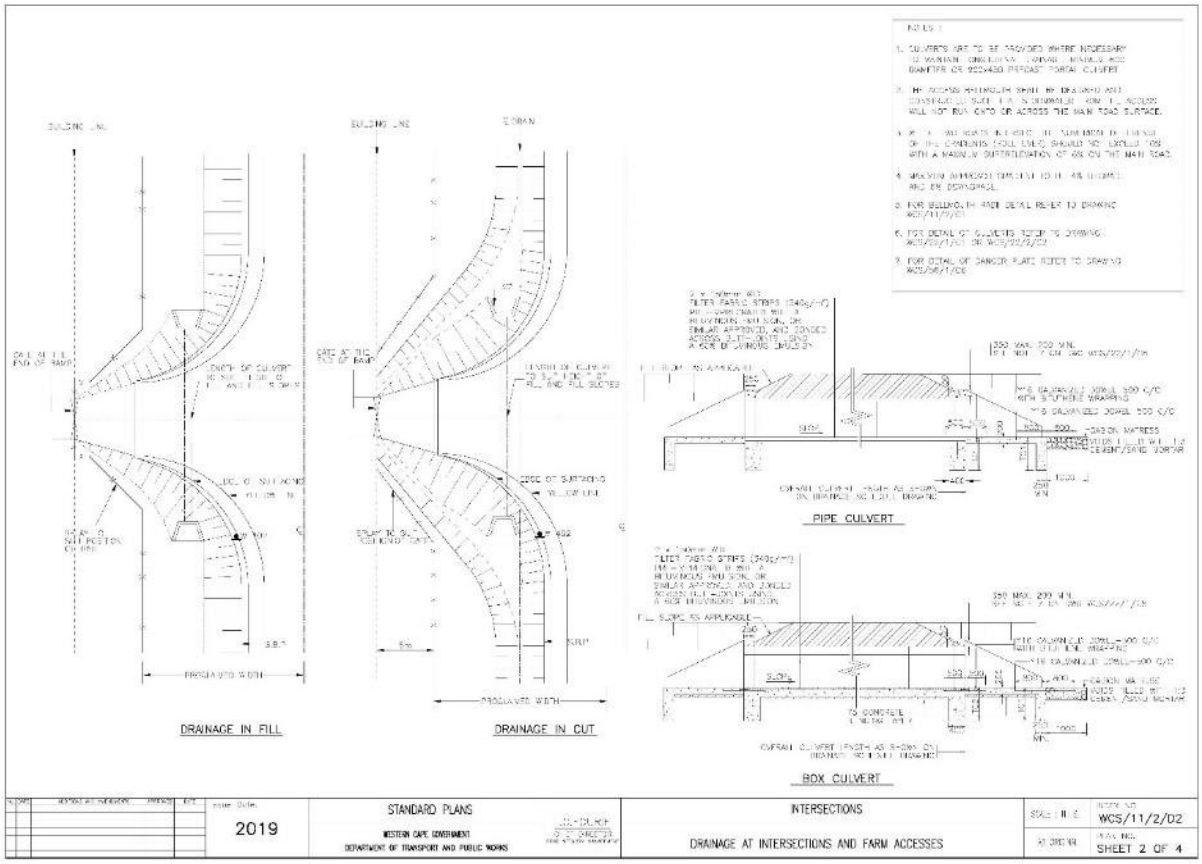


Figure 7.25 Typical Drainage at Farm Access / Intersections

Typical cross-sections for gravel roads have been indicated in **Figure 7.26** below and need to take into account the minimum requirements from OEM's.

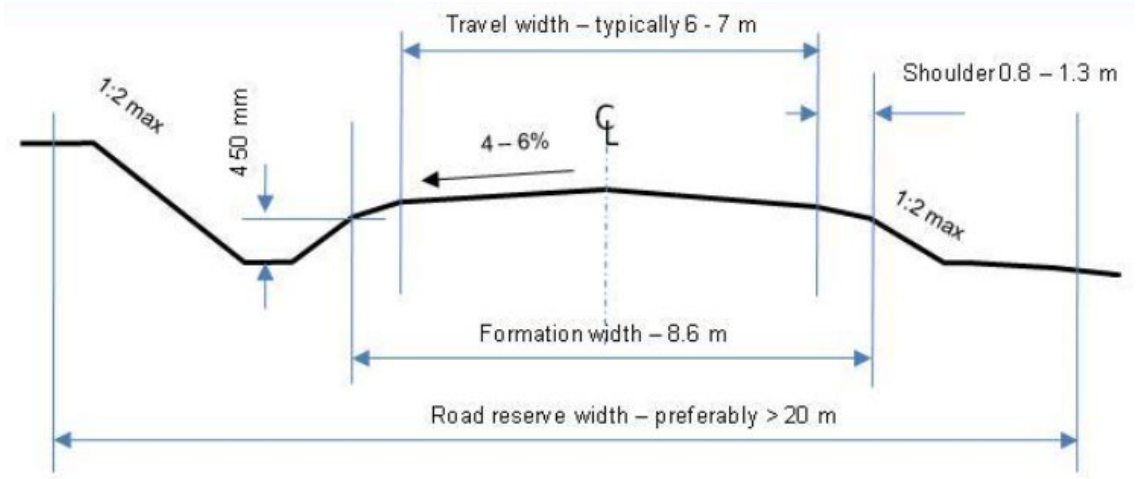


Figure 7.26 Typical Provincial Gravel Road Cross Section

The location and angles of intersections should preferably meet at 90° or nearly at right angles. Angles between 60° and 120° produce only a small reduction in visibility for drivers of passenger vehicles. However, for trucks, the range between 60° and 75° should be avoided because the driver entering the intersection from a minor road to his left would find his view obstructed. The maximum deviations have therefore been included below in **Figure 7.27**.

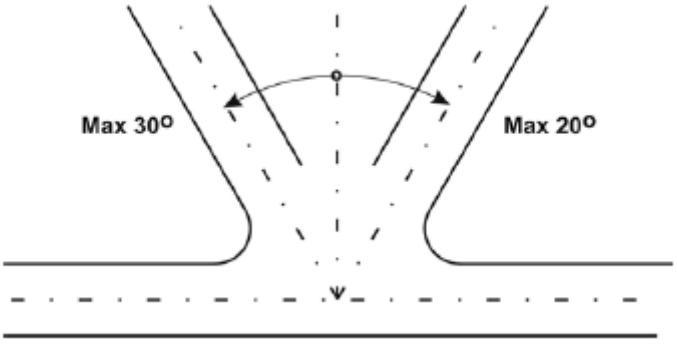


Figure 7.27 Angle of intersection deviation

The specific design considerations for this development are:

- Reduction in vehicle speed.
- Adequate law enforcement.
- Implementation of pedestrian safety initiatives.
- Regular maintenance of farm fences and access cattle grids.
- Adequate road signage as per the latest South African Road Traffic Sign Manual (SARTSM) edition.
- Possible use of approved dust suppressant techniques.
- Appropriate, timely and high-quality maintenance of existing gravel roads in terms of TRH20.
- Design and construction of new gravel roads in terms of TRH20.
- Continuous engagement with OEM and Abnormal Load specialists; and
- Constant engagement with the Northern Cape Department of Public Works & Roads (NCdr&pw).

However, we should note that the figures indicated above are indicative as many of the components are still at the design stage and will only be confirmed closer to the construction time.

8. INTERNAL LAYOUTS

The layout of the internal infrastructure is such that the environmental impact is kept to a minimum. Therefore proposed access positions have been kept to a minimum and all temporary and permanent buildings and infrastructure are lcoated close to the access point. Refer to **Figure 8:1** for the layout and access points.

All internal access roads should be designed to have a minimal impact on the environment and thus are, in most cases, parallel to the contours to keep drainage line crossings to a minimum. Using roads perpendicular to the contours for long sections should be avoided, as the risk of possible erosion is increased. Existing gravel roads should be considered in order to reduce the environmental impact.

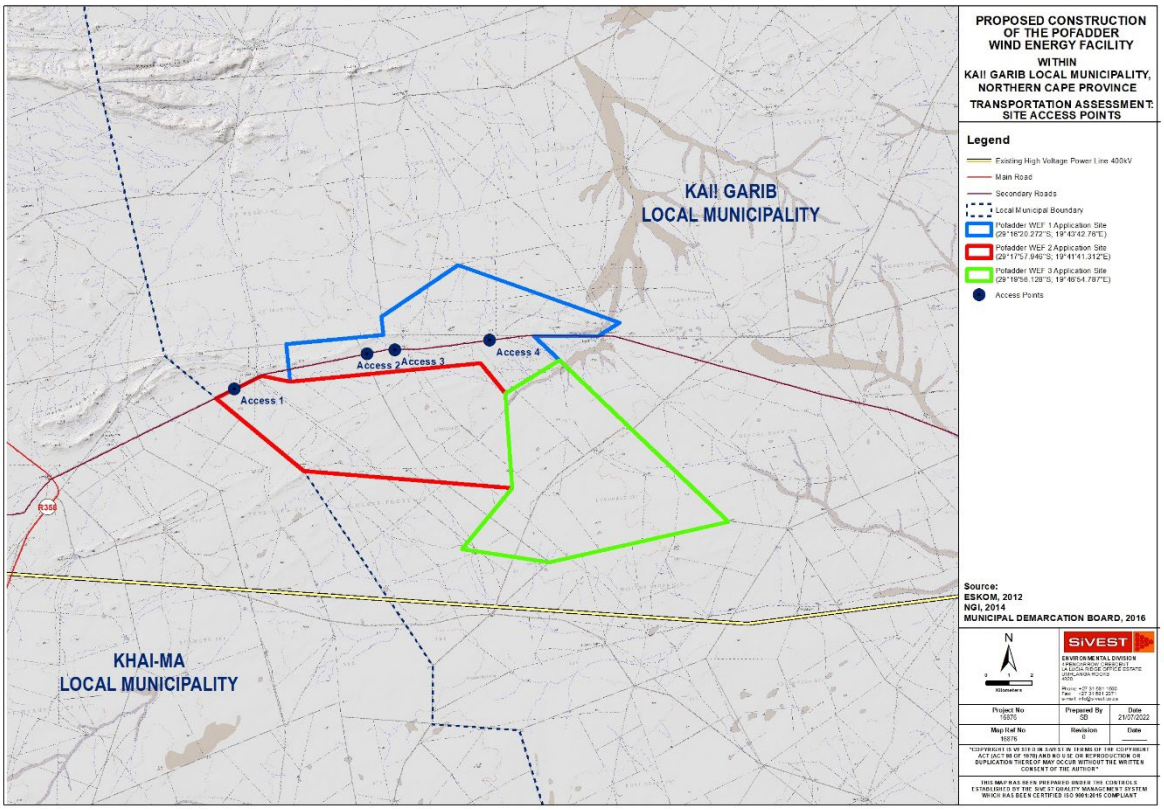


Figure 8.1 Pofadder WEF 3 - Internal Layouts showing access point

An internal network of minimum 6 m wide gravel roads will connect all the WTG and ancillary equipment to each other. The roads will have a horizontal and vertical alignment to accommodate vehicles and more specifically abnormal vehicles intended to use these roads for the delivery of the WTG equipment. A typical intersection and horizontal alignment would consist of radii and clearances similar to the requirements in **Figure 8.2**. We note that the larger WTG's are planned for these facilities and will need to be simulated once additional information becomes available.

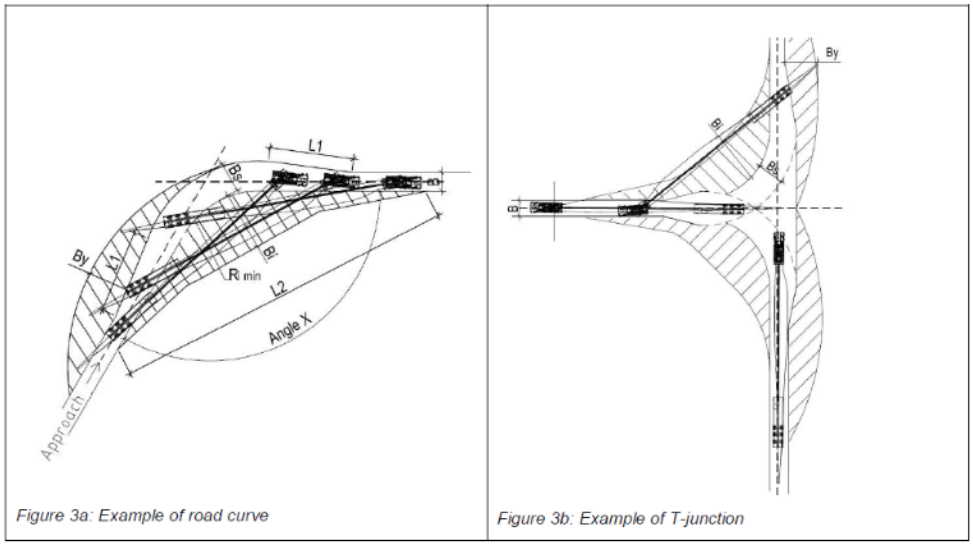


Figure 3a: Example of road curve

Figure 3b: Example of T-junction

The hatched areas on the figure are areas that the Employer shall clear of obstacles and level to allow overhang.

Angle X	$R_{i\,min}$	B_y	B_s	B_i	L_1	L_2
160°	14 m	4 m	4,5 m	3 m	10 m	35 m
120°	28 m	6 m	5 m	5 m	12 m	40 m
90°	38 m	7 m	7 m	6 m	18 m	52 m

Figure 8.2 Typical Horizontal Design Standards for a 101 m Rotor Diameter

We recommend that all internal access roads take the WEF stormwater management plan into account, where possible and applicable, to reduce potential erosion risks.

In addition, we recommend that all internal access roads are constructed according to *TRH20 – Unsealed Roads: Design Construction and Maintenance.* For this assessment, we have assumed 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 understand better the design limitations on the development, followed by a preliminary design to 'value' Engineer the project.

9. GRID CONNECTION

The proposed grid connection infrastructure to evacuate the power from Pofadder WEF 3 will be completed in a separate Integrated Grid Basic Assessment Reports (BAR).

10. IMPACT RATING ASSESSMENT

The 'Impact Rating System' takes into account the nature, scale and duration of the effects on the environment whether such effects are positive (beneficial) or negative (detrimental). Each issue / impact is also assessed according to the project stages:

- Planning
- Construction
- Operation
- Decommissioning

A rating points-based system is applied to the potential environmental impacts and includes objective evaluations of the impact mitigation. These impacts can be found in **Table 10.1** below.

In summary, all impacts were classified as 'Medium to Low' with a large majority of the impacts changing to 'Low' after implementing suitable mitigation measures. This rating applies to all alternatives considered.

10.1 Rating System Used to Classify Impacts

The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the possible mitigation of the impact. Impacts have been consolidated into one (1) rating. In assessing the significance of each issue the following criteria (including an allocated point system) are used:

Table 10.1 Rating of Impacts Criteria

ENVIRONMENTAL PARAMETER		
A brief description of the environmental aspect likely to be affected by the proposed activity (e.g. Surface Water).		
ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE		
Include a brief description of the impact of the environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted by a particular action or activity (e.g., an oil spill in surface water).		
EXTENT (E)		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site
2	Local/district	Will affect the local area or district
3	Province/region	Will affect the entire province or region
4	International and National	Will affect the entire country
PROBABILITY (P)		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	The impact will certainly occur (With greater than a 75% chance of occurrence).
REVERSIBILITY (R)		
This describes the degree to which an impact on an environmental parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with the implementation of minor mitigation measures
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.

4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES (L)		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resources.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in a significant loss of resources.
4	Complete loss of resources	The impact results in a complete loss of all resources.
DURATION (D)		
This describes the duration of the impacts on the environmental parameter. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through a natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a period that the impact can be considered transient (Indefinite).
INTENSITY / MAGNITUDE (I / M)		
Describes the severity of an impact (i.e. whether the impact can alter the functionality or quality of a system permanently or temporarily).		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but the system / component continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	The impact affects the continued viability of the system/component, and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.

4	Very high	The impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation are often impossible. If possible rehabilitation and remediation are often unfeasible due to the extremely high costs of rehabilitation and remediation.

SIGNIFICANCE (S)

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the environmental parameter. The calculation of the significance of an impact uses the following formula:

Significance = (Extent + probability + reversibility + irreplaceability + duration) x magnitude/intensity.

The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.

Points	Impact Significance Rating	Description
5 to 23	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
5 to 23	Positive Low impact	The anticipated impact will have minor positive effects.
24 to 42	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
24 to 42	Positive Medium impact	The anticipated impact will have moderately positive effects.
43 to 61	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
43 to 61	Positive High impact	The anticipated impact will have significant positive effects.
62 to 80	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
62 to 80	Positive Very high impact	The anticipated impact will have highly significant positive effects.

Table 10.2 Pofadder WEF 3 & Grid Connection – Impact Rating Table

POFADDER WEF 3																					
ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Construction Phase																					
Additional Traffic Generation	Increase in Traffic	2	4	1	2	1	3	30	-	Medium	• Ensure staff transport is done in the 'off peak' periods and by bus, if possible • Stagger material, component, and abnormal loads delivery. •Construction of an on-site batching plant and tower construction to reduce trips.	2	4	1	2	1	2	20	-	Low
	Increase of Incidents with pedestrians and livestock	2	3	2	4	1	2	24	-	Medium	• Upgrade of existing / new access points. • Reduction in the speed of vehicles. • Adequate enforcement of the law. • Implementation of pedestrian safety initiatives. • Regular maintenance of farm fences & access cattle grids. • Construction of an on-site batching plant and tower construction to reduce trips.	2	3	2	4	1	1	12	-	Low
	Increase in dust from gravel roads	2	3	2	2	1	2	20	-	Low	• Upgrade of existing / new access point. • Reduction in the speed of the vehicles. • Construction of gravel roads in terms of TRH20. • Implement a road maintenance program under the auspices of the respective transport department. • Possible use of approved dust suppressant techniques. • Construction of an on-site batching plant and tower construction to reduce trips.	2	3	2	2	1	2	20	-	Low
	Increase in Road Maintenance	2	3	2	2	2	2	22	-	Low	• Implement a road maintenance program under the auspices of the respective transport department. • Construction of an on-site batching plant to reduce trips.	2	3	2	2	1	2	20	-	Low
Abnormal Loads	Additional Abnormal Loads	3	3	1	2	1	1	10	-	Low	• Ensure abnormal vehicles travel to and from the proposed development in the 'off peak' periods or stagger delivery. • Adequate enforcement of the law.	3	2	1	2	1	1	9	-	Low

POFADDER WEF 3																						
ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Internal Access Roads	Increase in dust from gravel roads	1	4	1	1	1	2	16	-	Low	• Enforce a maximum speed limit on the development. • Appropriate, timely and high-quality maintenance required in terms of TRH20. • Possible use of approved dust suppressant techniques.	1	3	1	1	1	2	14	-	Low
	New / Larger Access points	1	4	1	2	1	1	9	-	Low	• Adequate road signage according to the SARTSM. • Approval from the respective roads department.	1	4	1	2	1	1	9	-	Low
Operational Phase																						
Additional Traffic Generation	Increase in Traffic	2	1	1	2	3	1	9	-	Low	• The increase in traffic for this phase of the development is negligible and will not have a significant impact.	2	1	1	2	3	1	9	-	Low
	Increase of Incidents with pedestrians and livestock	2	1	1	2	3	1	9	-	Low	• The increase in traffic for this phase of the development is negligible and will not have a significant impact.	2	1	1	2	3	1	9	-	Low
	Increase in dust from gravel roads	2	1	1	2	3	1	9	-	Low	• The increase in traffic for this phase of the development is negligible and will not have a significant impact.	2	1	1	2	3	1	9	-	Low
	Increase in Road Maintenance	2	1	1	2	3	1	9	-	Low	• The increase in traffic for this phase of the development is negligible and will not have a significant impact.	2	1	1	2	3	1	9	-	Low
Abnormal Loads	Additional Abnormal Loads	3	1	1	2	3	1	10	-	Low	• The increase in traffic for this phase of the development is negligible and will not have a significant impact.	3	1	1	2	3	1	10	-	Low
Internal Access Roads	New / Larger Access points	1	1	1	2	3	1	8	-	Low	• Adequate road signage according to the SARTSM. • Approval from the respective roads department.	1	1	1	2	3	1	8	-	Low

POFADDER WEF 3																					
ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Decommissioning Phase																					
Additional Traffic Generation	Increase in Traffic	2	4	1	2	1	3	30	-	Medium	• Ensure staff transport is done in the 'off peak' periods and by bus. • Stagger material, component, and abnormal loads removal. •Construction of an on-site sorter and pressing machine to reduce trips.	2	4	1	2	1	2	20	-	Low
	Increase of Incidents with pedestrians and livestock	2	3	2	4	1	2	24	-	Medium	• Reduction in the speed of vehicles. • Adequate enforcement of the law. • Implementation of pedestrian safety initiatives • Regular maintenance of farm fences & access cattle grids.	2	3	2	4	1	1	12	-	Low
	Increase in dust from gravel roads	2	3	2	2	1	2	20	-	Low	• Reduction in the speed of the vehicles. • Appropriate, timely and high-quality maintenance required in terms of TRH20. • Possible use of approved dust suppressant techniques. • Implement a road maintenance program under the auspices of the respective transport department. •Construction of an on-site sorter and pressing machine to reduce trips.	2	3	2	2	1	2	20	-	Low
	Increase in Road Maintenance	2	3	2	2	2	2	22	-	Low	• Implement a road maintenance program under the auspices of the respective transport department.	2	3	2	2	1	2	20	-	Low
Abnormal Loads	Additional Abnormal Loads	3	2	1	2	1	1	9	-	Low	• Ensure abnormal vehicles travel to and from the proposed development in the 'off peak' periods or stagger delivery. • Adequate enforcement of the law.	3	2	1	2	1	1	9	-	Low
Internal Access Roads	Increase in dust from gravel roads	1	4	1	1	1	1	8	-	Low	• Enforce a maximum speed limit on the development.• Appropriate, timely and high-quality maintenance required in terms of TRH20.• Possible use of approved dust suppressant techniques.	1	3	1	1	1	2	14	-	Low
	New / Larger Access points	1	4	1	2	1	1	9	-	Low	• Adequate road signage according to the SARTSM. • Approval from the respective roads department.	1	4	1	2	1	1	9	-	Low

POFADDER WEF 3																					
ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION									
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S	
Cumulative																					
Additional Traffic Generation	Increase in Traffic	2	4	1	2	1	4	40	-	Medium	• Ensure a large portion of vehicles travelling to and from the proposed development travels in the 'off peak' periods or by bus. • Construction of an on-site batching plant and tower construction to reduce trips. • Coordination between all developers in the area.	2	4	1	2	1	3	30	-	Medium
	Increase of Incidents with pedestrians and livestock	2	3	2	4	1	3	36	-	Medium	• Reduction in the speed of vehicles. • Adequate enforcement of the law. • Implementation of pedestrian safety initiatives. • Regular maintenance of farm fences, and access cattle grids. • Construction of an on-site batching plant and tower construction to reduce trips. • Coordination between all developers in the area.	2	3	2	4	1	2	24	-	Medium
	Increase in dust from gravel roads	2	3	2	2	1	4	40	-	Medium	• Reduction in the speed of the vehicles. • Construction of gravel roads in terms of TRH20. • Implement a road maintenance program under the auspices of the respective transport department. • Possible use of approved dust suppressant techniques. • Construction of an on-site batching plant and tower construction to reduce trips. • Coordination between all developers in the area.	2	3	2	2	1	2	20	-	Low
	Increase in Road Maintenance	2	3	2	2	2	2	22	-	Low	• Implement a road maintenance program under the auspices of the respective transport department. • Construction of an on-site batching plant and tower construction to reduce trips. • Coordination between all developers in the area.	2	3	2	2	2	2	22	-	Low

POFADDER WEF 3																						
ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Abnormal Loads	Additional Abnormal Loads	3	3	1	2	1	4	40	-	Medium	• Ensure abnormal vehicles travel to and from the proposed development in the 'off peak' periods. • Adequate enforcement of the law. • Coordination between all developers in the area.	3	2	1	2	1	2	18	-	Low
Internal Access Roads	Increase in dust from gravel roads	1	4	1	1	1	3	24	-	Medium	• Enforce a maximum speed limit on the development. • Appropriate, timely and high-quality maintenance required in terms of TRH20. • Possible use of approved dust suppressant techniques.	1	3	1	1	1	2	14	-	Low
	New / Larger Access points	1	4	1	2	1	2	18	-	Low	• Adequate road signage according to the SARTSM. • Approval from the respective roads department.	1	4	1	2	1	1	9	-	Low

11. CUMULATIVE IMPACT ASSESSMENT

SiVEST undertook every effort to obtain the information (including specialist studies, BA / EIA / Scoping and EMPr Reports) for the surrounding developments within 35 km of the proposed WEF and associated grid infrastructure; however, many of the documents are not currently publicly available. To this extent, the information obtained from the surroundings and planned renewable energy developments were considered part of the cumulative impact assessment. Six (6) renewable energy projects were identified within a 35 km radius of the proposed development, as shown in **Table 11:1** below. The renewable energy developments considered as part of this Transportation Study are as follows:

Table 11.1 Proposed Renewable Energy developments within a 35 km radius.

Applicant	Project	Technology	Capacity	Status of Application / Development
South African Mainstream Renewable Power Developments (Pty) Ltd	Korana 1 WEF (Pty) Ltd	Wind	Unknown	Approved
South African Mainstream Renewable Power Developments (Pty) Ltd	Poortjies & Namies South WEF	Wind	Unknown	EIA Process underway
South African Mainstream Renewable Power Developments (Pty) Ltd	Poortjies WEF	Wind	Unknown	EIA Process underway
Paulputs WEF (RF) (Pty) Ltd	Paulputs WEF	Solar	300 MW	Approved
Unknown	Scuitklip 92 SEF	Solar	Unknown	Unknown
Juwi Renewable Energies (Pty) Ltd	Paulputs PV2 North and East	Solar	100 MW	Approved

The information obtained for other planned renewable energy developments in the surroundings is indicated in **Figure 11:1** below.

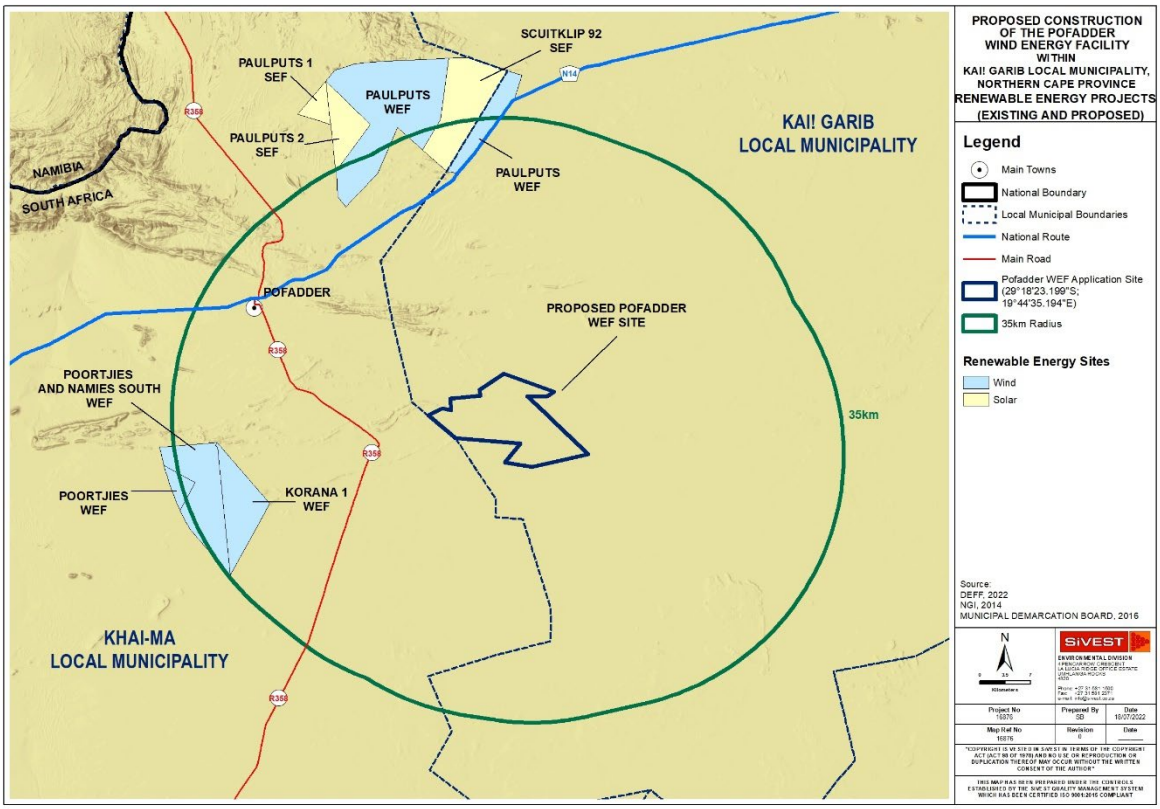


Figure 11.1 Proposed Renewable Energy Developments within a 35 km radius

Based on the above, this Transportation Study has considered the cumulative impacts, which were further assessed in **Section 10** above.

12. COMPARATIVE ASSESSMENT OF ALTERNATIVES

No alternative options were provided.

13. CONCLUSIONS AND IMPACT STATEMENT

The main objective of the 'Transportation Study' is to determine the impact/s the proposed Pofadder WEF 3 development and associated grid infrastructure will have on the immediate and greater area concerning transportation. The proposed development is located in a rural part of the Northern Cape Province, with the existing road network providing access to the development. Several other renewable energy developments have already been completed or are in the process of being completed in the immediate area.

The construction phase for this development will typically generate the highest number of additional vehicles. For steel towers, an additional ±84 trips / hour will occur in the morning and afternoon outside of the peak period, while for hybrid towers ±103 trips / hour will occur. For construction material and abnormal loads ±2 trips / hour will occur during the midday peak for both steel towers and hybrid towers. The impact will, however, be temporary and is considered to be nominal if adequately mitigated. During the operation phase, it is expected that the facility will accommodate ±50 employees and generate an additional ±20 trips / day in the morning and afternoon peak period. This impact is considered to be nominal.

- In conclusion.
    - The Pofadder WEF 3 consists of one EIA application, while the Grid connection infrastructure will be undertaken as a separate Basic Assessment application.
    - All proposed access points from Road DR2986 has sufficient sight distance of >350 m and are not located within and / or near any drainage lines.
    - Access upgrades are required at the chosen access points.
    - Access for Pofadder WEF 3 will be obtained through Pofadder WEF 1 and Pofadder WEF 2.
    - All external road upgrades require approval and a wayleave application from the Northern Cape Department of Public Works & Roads (NCdr&pw) before work commences.
    - Mitigation measures to be included in the construction phase:
        - Ensure staff transport is done in the 'Off Peak' period and by bus to reduce impact in the peak periods.
        - Stagger material, component, and abnormal loads deliveries.
        - Adequate road signage on all external roads carrying development traffic according to the South African Road Traffic Sign Manual (SARTSM).
        - Reduction in the speed of vehicles.
        - Adequate enforcement of the law.
        - Implementation of pedestrian safety initiatives.
        - Regular maintenance of farm fences & access cattle grids.
        - Construction of gravel roads in terms of Technical Recommendations for Highways (TRH20).
        - Implement a road maintenance program under the auspices of the respective transport department; and
        - Possible use of approved dust suppressant techniques.
    - A more comprehensive route analysis be completed before construction to get a better understanding of the works required and the potential risks.
    - The 'No Go' alternative would result in no transportation impacts.
    - No fatal flaws or preferences were identified for any proposed site alternatives, construction laydown areas, substation locations or Power line routes.
    - No environmentally sensitive areas have been identified; therefore, no areas are to be avoided from a Transportation perspective.

- Impact Statement;
    - Concerning this report, associated assessment and the findings made within, it is SiVEST's opinion that the Pofadder WEF 3 and associated grid infrastructure will have a nominal impact on the existing traffic network. The project is therefore deemed acceptable from a transport perspective, provided the recommendations and mitigation measures in this report are implemented. Hence, Environmental Authorisation (EA) should be granted for the EIA application.

14. REFERENCES

Bernard Radowitz (2020) *Recharge News - Available at: https://www.rechargenews.com/wind*

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)*

Nooteboom Trailers – ***www.nooteboom.com***

Technical Recommendations for Highways (TRH4) – *Structural Design of Flexible Pavements for Interurban and Rural Roads (1998)*

Technical Recommendations for Highways (TRH11) – *Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads (7th Edition - 2000)*

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)*

APPENDIX A: SPECIALIST CURRICULUM VITAE

M 03/2022

CURRICULUM VITAE

Merchandt Le Maitre

Name	Merchandt Le Maitre
Profession	Civil Engineer
Name of Firm	SiVEST SA (Pty) Ltd
Present Appointment	Divisional Manager: Civil Engineering Division
Years with Firm	17 Years
Date of Birth	25 September 1982, Johannesburg, South Africa
ID Number	820925 5037 086
Nationality	South African

Education

- University of Johannesburg (2006)
- University of South Africa (2016)

Professional Qualifications

- N Dip: Civil Engineering
- B Tech: Civil Engineering (Water)
- Pr.Tech.Eng. (Reg. No. 2018300094)

Membership in Professional Societies

- Engineering Council of South Africa (ECSA) – Pr Tech Eng; (Reg N° 2018300094)
- South African Institute of Civil Engineers (SAICE)
- South African Wind Energy Associations (SAWEA)

Employment Record

Nov 2020 – present	SiVEST SA (PTY) LTD: Divisional Manager
May 2004 – Oct 2020	SiVEST SA (PTY) LTD: Senior Civil Engineering Technician
Jan 2004 – April 2004	Con Roux Zambia - Junior Foreman
Dec 2002 – Dec 2003	Neda Engineering - Vacation Work

Language Proficiency

LANGUAGE	SPEAK	READ	WRITE
English	Fluent	Fluent	Fluent
Afrikaans	Fluent	Fluent	Fluent

Years of Working Experience: 17

M 03/2022

CURRICULUM VITAE

Merchandt Le Maitre

Countries of Work Experience

- South Africa
- Swaziland
- Zambia
- Kenya
- Namibia

Fields of Expertise

- Bulk Services Studies
- Feasibility Studies
- Service Reports
- Infrastructure Design
- Contract Documentation & Procurement
- Contract Administration
- Procurement and Construction Monitoring

Overview

Merchandt joined SiVEST as a student Civil Engineering Technician in 2004 to which he received a company bursary to complete his studies and join the company permanently thereafter. Since joining permanently he has been actively involved in numerous township projects and associated infrastructure projects.

A summary of the experience in each field is indicated below:

Roads & Stormwater
Design, Implement & Contract Administration:
- Provincial Road Intersections (Class 2 Roads)
- Municipal Roads (Class 3-5 Roads)
- Residential & Industrial Township services
- Bulk Stormwater Infrastructure

Hydrology
- Attenuation Reports
- Flood Inundation Assessments / Floodline Reports
- Stormwater Management Reports
- Stormwater Assessments / Investigations
- Roof Gutter & Down Pipe Design / Assessments / Reports

Water & Sanitation
Design, Implement & Contract Administration:
- Water supply lines including Bulk Water
- Water pump stations
- Sanitation networks including Outfall Sewers
- Sewer pump stations
- Farm Irrigation Network

Renewable Energy
- Transportation Impact Assessments
- Water Demand Assessments
- Glint & Glare Assessments
- Stormwater Management Reports

- Preliminary Engineering Reports & Designs

Projects Experience (by Sector)

TOWNSHIP SERVICES

- Tijger Valley Extension 10, 20, 21, 22, 23, 27, 38-44, 72, 105-113, 19, 62, 103, 104, 34, 35, 36, 123 etc. - Design, Procurement, Contract Administration and Monitoring.
- Derdepoort Extension 181- Design, Procurement, Contract Administration and Monitoring.
- Project Springbok, Sasolburg - Design, Procurement, Contract Administration and Monitoring.
- Arcadia Extension 11 - Design, Procurement, Contract Administration and Monitoring.
- Lakeside Erf 181- Design, Procurement, Contract Administration and Monitoring.
- Longmeadow Extension 10, 11 & 12 - Design, Procurement, Contract Administration and Monitoring.
- Bushwillow Estate - Design, Procurement, Contract Administration and Monitoring.
- Forum Homini – Draughting Monitoring of Dam Spillway construction & sewer reticulation.
- Longmeadow Extension 7, 8, 9, 10, 11, 12 – Township services and design of earth retaining wall.
- Lakeside Erf 181 – Design and supervision of Township Services including Attenuation facilities.
- Mbabane Kingdom Hall – Bulk earthworks and road Design, Procurement, Contract Administration and Monitoring.
- Kungwini Bulk Water – Draughting and supervision of a Steel Bulk Water Supply Pipe.
- Mooikloof Booster Station – Design and supervision of a water booster pump facility..
- PTN 2 of 148 Athol – Compiling and analysis Stormwater Assessment.
- Mooibosch Development – Compiling of Services reports and Floodline Determination.
- Hazeldean Extension 39 – Design and supervision of Township Services.
- Hazeldean Retirement – Design of Township Services.
- Kungwini Collector Sewer – Design of Collector Sewer.
- Maroeladal Extension 9 – Design and compilation of Services Report.
- Hazeldean Oukraal – Design of Township Services
- Hazeldean Business Park – Design and compilation of Services Reports.
- Erf 181 Derdepoort – Design and compilation of Services Reports and preliminary design of Provincial Intersection.
- Erf 92 Edenburg – Floodline Determination and design and compilation of the Services reports.
- Longmeadow Extension 12 Stormwater – Design of Stormwater Reticulation.
- Astral Foods - Design, Procurement, Contract Administration and Monitoring of civil services.
- Eastgate Solar Roof – Glint & Glare Assessment
- Cotton Gin Mpumalanga – Design & Procure all services

ROADS & INTERSECTION DESIGN

- D631 Intersection – Design, Wayleave Approval, Procurement, Contract Administration and Monitoring.
- D36 Intersection & Road Widening - Design, Wayleave Approval, Procurement.
- K34 Intersection – Design, Wayleave Approval, Procurement, Contract Administration and Monitoring.
- K101 Intersection – Design, Wayleave Approval.
- Justice Mahomed, University, Walton Jameson Rd Intersection – Design, Wayleave Approval.
- Cedar Road West – Design, Wayleave Approval, Procurement, Contract Administration and Monitoring.
- Brikor – Design of New Intersection.
- New Zealand Embassy – Design of Intersection.
- East Point Game - Design, Wayleave Approval, Procurement, Contract Administration and Monitoring.

HYDROLOGY AND STORMWATER

- Hazeldean Floodline - Data collection, Flood determination and compilation.

- Gautrain Railway Stormwater Management – Design and compile stormwater management and attenuation facilities.
- Stormwater Modelling for Project Springbok – Attenuation of hazardous material in stormwater system.
- Sappi Ngodwana Floodline – Data collection, Flood determination and compilation. This floodline included cognisance of the Ngodwana dam.
- Irene Mall Stormwater Management - Accommodation of the Post Development stormwater flow through an existing township / suburb.
- Loftus Park Stormwater Management – Accommodation of the Post Development stormwater flow through an existing township / suburb.
- Pienaars River Floodline Modelling – Modelling of the river through two future Class 1 & 3 road bridge structures.
- Renewable Energy Stormwater Management – A number of Management Plans for the Renewable Energy sector has been completed.
- Longmeadow Extension 10 (Pick & Pay) – Design and compilation of Stormwater Management report.
- Erf 4173 Peter Place – Floodline Determination.
- Irene Mall Township – Design of Township Services and Stormwater Management.
- Mitsubishi McCarthy Midrand – Design and compilation of Stormwater Management report.
- Isago @ N12 – Floodline Determination.
- Innoland – Floodline Determination.
- Lot 204 Edenburg – Floodline Determination
- Erf 90 Douglasdale – Floodline Determination.
- PTN 35 Houtkoppen – Floodline Determination.
- Erf 4173 Peter Place – Floodline Determination.
- Hyde Close Floodline – Floodline Determination.
- Chartwell Floodline – Floodline Determination
- Hyundai East Rand – Roof Gutter & Down Pipe design
- Oilifants River – Floodline Determination

WATER TRANSFER / RETICULATION AND SANITATION COLLECTORS / OUTFALLS

- Bojanala Platinum District Municipality – Water & Sanitation Bulk Master Planning.
- Hazeldean Development – Bulk Water Supply & Collector Sewer Design, Procurement, Contract Administration and Monitoring.
- Mamba Kingdom – Bulk Water Analysis.
- Lesedi Local Municipality Bulk Water - Design, Wayleave Approval, Procurement, Contract Administration and Monitoring.
- NEF Tomato Paste Project – Design of Farm Irrigation Network

RENEWABLE ENERGY

- Dyansons Klip 5 – Stormwater Management Report
- De Aar Solar – Stormwater Management Report
- Droogfontein Solar – Stormwater Management Report
- Mierdam Solar – Stormwater Management Report
- Prieska– Stormwater Management Report
- Hoekplaas – Stormwater Management Report
- Noupoort WEF – Stormwater Management Report
- Copperton PV – Stormwater Management Report
- Klipgats PV – Stormwater Management Report
- Tooverberg Wind Energy Facility – Transportation Impact Assessment & Water Demand Assessment
- Umsobomvu Solar Energy - Transportation Impact Assessment
- Prieska Solar Energy - Transportation Impact Assessment Amendment
- Droogfontein Solar Energy - Transportation Impact Assessment Amendment

- Loeriesfontein Solar Energy - Transportation Impact Assessment Amendment
- Koeris WEF - Transportation Impact Assessment Amendment
- East Gate Shopping Centre - Glint & Glare Assessment
- Oya Energy - Glint & Glare Assessment
- Yemaya – Glint & Glare Assessment
- Beaufort West WEF – Preliminary Engineering Design
- Heuweltjies WEF – Transportation Study
- Kraaltjies WEF – Transportation Study
- Koup 1 & 2 – Transportation Study
- Grootegeluk Solar Project – Transportation Study
- Renewstable Swakopmund – Glint & Glare Assessment
- Several projects are Confidential as they are not yet in the public domain and hence have not been included in the list above.

OTHER

- Project Springbok – Design of Services and Railway Siding.
- Phalaborwa Mining Company – Preliminary Design of Bulk Water feed and Railway Line.
- Kansanshi Copper Mine, Zambia – Junior Site Foreman.
- Final QC for Sasol Secunda.
- NDT testing – MMC Nelspruit, Global Forest Products Sabie.
- Boiler inspections and preliminary design – MMC Nelspruit, Global Forest Products, TSB Malelane.

Computer Skills

- AutoCAD Civil 3D
- AutoCAD Storm and Sanitary Analysis
- Microsoft Office
- Microsoft Project
- TechnoCAD
    - Surfmate
    - Roadmate
    - Pipemate
    - Watermate
- AutoTURN (Vehicle Turning Simulation Software)
- RiverCAD
- HecRAS
    - 1D Flood Modelling
    - 2D Flood Modelling

APPENDIX B: SPECIALIST DECLARATION

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

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)

PROJECT TITLE

PROPOSED POFFADER WIND ENERGY FARM 3 IN THE NORTHERN CAPE PROVINCE

Kindly note the following:

1. This form must always be used for 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 01 September 2018. 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.environment.gov.za/documents/forms.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	SIVEST SA (PTY) LTD			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	2	Percentage Procurement recognition	100%
Specialist name:	MERCHANDT LE MAITRE			
Specialist Qualifications:	B TECH – CIVIL ENGINEER			
Professional affiliation/registration:	ECSA (PR TECH ENG No: 2018300094)			
Physical address:	LOFTUS PARK, BUILDING A, 5TH FLOOR, 416 KIRKNESS STR, ARCADIA, PRETORIA			
Postal address:	PO BOX 2921, RIVONIA			
Postal code:	2128	Cell:	072 435 8497	
Telephone:	011 798 0600	Fax:	011 803 7272	
E-mail:	MERCHANDTM@SIVEST.CO.ZA			

2. DECLARATION BY THE SPECIALIST

I, MERCHANDT LE MAITRE, 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

SIVEST SA (PTY) LTD

Name of Company:

12TH JULY 2022

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, MERCHANDT LE MAITRE, 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 SA(PTY) LTD

Name of Company

11TH JULY 2022

Date

Signature of the Commissioner of Oaths

Date

SiVEST Civil Engineering Division

Loftus Park, Building A, 5th Floor
416 Kirkness Street, Arcadia, Pretoria.
P O Box 2921, Johannesburg. 2000
Gauteng. South Africa

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Email: merchandtm@sivest.co.za