

**ANNEXURE A | COMPANY RESOLUTION &  
POWER OF ATTORNEY**



# CK RUMBOLL & VENNOTE / PARTNERS



PROFESSIONELE LANDMETERS ~ ENGINEERING AND MINE SURVEYORS ~ STAD- EN STREEKSBEPLANNERS ~ SECTIE

Datum/Date: 17 May 2022

Verwysing/Reference: BW/12484/NG

## GEREGISTREERDE EIENAAR(S) SE TOESTEMMING – VOLMAG REGISTERED OWNER'S CONSENT – POWER OF ATTORNEY

Hiermee verleen ek / ons: **QUICKSTEP 479 (PTY) LTD (2017/497542/07)**  
Hereby I / we:

die geregistreerde eienaar(s) van eiendom:  
the registered owners of property:

**PORTION 1, 5, 6, 7 and the REMAINDER OF FARM BOETEKA No. 319 BEAUFORT WEST  
REGISTRATION DIVISION as well as the REMAINDER OF FARM LOMBAARDS KRAAL No. 330  
BEAUFORT WEST REGISTRATION DIVISION**

volmag aan Mnre CK RUMBOLL EN VENNOTE om namens my aansoek te doen vir die:  
grant power of attorney to Messers CK RUMBOLL AND PARTNERS to apply on my behalf for the:

- ☐ Hersonerig/Rezoning
- ☐ Verlenging / Extention
- ☐ Onderverdeling / Subdivision
- ☐ Regstelling van grense / Adjustment of boundaries
- ☐ Afwyking /Departure
- ☐ Opheffing Beperkende titel voorwaardes / Removal restrictive title conditions
- ☐ Konsolidasie/ Consolidation
- ☒ Vergunningsgebruik / Consent Use
- ☐ Wysiging van Algemene Plan / Amendment to General Plan
- ☐ Aanpassing van Terreinplan / Amendment of Site Development Plan
- ☒ Servitude registrasie / Servitude registration
- ☐ Bouplan in te dien / loge of building plan
- ☐ Mynpermit / Mine permit
- ☐ Verkryging van bouplanne by munisipaliteit / Obtaining building plans form relevant municipality

van bogenoemde eiendom.  
of said property.

Geteken: .....  
Signed:

.....

Datum / Date: 14/06/2022

### VENNOTE / PARTNERS:

IHJ Rumboll PRL (SA), BSc (Sury), M.I.P.L.S. and AP Steyl PrL (SA), BSc (Sury), M.I.P.L.S.

ADDRESS/ ADRES: [reception@rumboll.co.za](mailto:reception@rumboll.co.za) / PO Box 211 / Rainierstr 16, Malmesbury, 7299  
MALMESBURY (T) 022 482 1845 (F) 022 487 1661 VREDENBURG (T) 022 719 1014





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Document 1 of 2

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**COMPANY RESOLUTION:**

**QUICKSTEP 479 (PTY) LTD (Reg No.2017/497542/07)**

<b>Company name:</b> <i>(hereafter refer to as The Company)</i>	<b>QUICKSTEP 479 (PTY) LTD</b>
<b>Company number:</b>	<b>2017/497542/07</b>
<b>Date:</b>	<b>17 May 2022</b>
<b>Directors of the Company:</b> <i>(Full names and Surnames)</i>	Director 1      Joanie Viviers Russouw
	Director 2      Jan Abraham Viviers
	Director 3
	Director 4
<b>Resolution in terms of</b>	

The Company resolve that:      Name of person      Joanie Viviers Russouw



   ID of person above      8310270179083

in his/her capacity as trustee is granted power of substitution to be The Company's legal representative/agent and to act in the name, place and stead of the company with regard to a **CONSENT USE on PORTION 1, 5, 6, 7 and the REMAINDER OF FARM BOETEKKA No. 319 BEAUFORT WEST REGISTRATION DIVISION as well as the REMAINDER OF FARM LOMBAARDS KRAAL No. 330 BEAUFORT WEST REGISTRATION DIVISION for the purpose of establishing RENEWABLE ENERGY STRUCTURES**. Accordingly, power of attorney is hereby granted to the agent to sign and receive all correspondence in respect of the matter referred to above during the applicable process.

**Signed as a true and correct record:**





<b>Director 1</b>	
<b>(Name &amp; Surname)</b>	Joanie Viviers Russouw
<b>Signature</b>	
<b>Date</b>	14/06/2022
<b>Place</b>	Stellenbosch
<b>Director 2</b>	
<b>(Name &amp; Surname)</b>	Jan Abraham Viviers
<b>Signature</b>	
<b>Date</b>	14/06/2022
<b>Place</b>	Beaufort West
<b>Director 3</b>	
<b>(Name &amp; Surname)</b>	
<b>Signature</b>	
<b>Date</b>	
<b>Place</b>	
<b>Director 4</b>	
<b>(Name &amp; Surname)</b>	
<b>Signature</b>	
<b>Date</b>	
<b>Place</b>	





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## ANNEXURE B | MUNICIPAL APPLICATION FORM





**BEAUFORT-WES(T)  
MUNISIPALITEIT // MUNICIPALITY**

**LAND USE PLANNING APPLICATION FORM**

**(Section 15 of the By-law on Municipal Land Use Planning for Beaufort West Municipality)**

**KINDLY NOTE:** Please complete this form using BLOCK capitals and ticking the appropriate boxes.

**PART A: APPLICANT DETAILS**

First name(s)	NJ				
Surname	DE Kock				
South African Council for Planners (SACPLAN) registration number (if applicable)	A/2995/2021				
Company name (if applicable)	CK RUMBOLL & PARTNERS				
Postal Address	16 RAINIER STREET				
	MALMESBURY			Postal Code	7300
Email	planning2@rumboll.co.za				
Tel	022 482 1845	Fax		Cell	

**PART B: REGISTERED OWNER(S) DETAILS** (If different from applicant)

Registered owner(s)	QUICKSTEP 479 (Pty) Ltd (Reg. No. 2017/497542/07)				
Physical address	1 <sup>st</sup> FLOOR, ALBION SPRING, 183 MAIN ROAD				
	RONDEBOSCH			Postal code	7700
E-mail	kyle.swartz@enertrag.co.za				
Tel	021 207 2181	Fax		Cell	

**PART C: PROPERTY DETAILS** (in accordance with title deed)

Property description [Number(s) of Erf/Erven/Portion/	PTN 1, 5, 6, 7 and the REMAINDER OF FARM BOETEKA NR. 319 & THE REMAINDER OF FARM LOMBARDS KRAAL NR. 330, BEAUFORT WEST REGISTRATION DIVISION
--	--



s) or Farm(s), allotment area.]											
Physical Address	<b>BEAUFORT WEST</b>										
GPS Coordinates	<b>32° 30' 9.023" S 22° 28' 50.194" E</b>				Town/City		<b>BEAUFORT WEST</b>				
Current Zoning	<b>AGRICULTURAL ZONE I</b>			Extent		<b>9710,8776 ha</b>		Are there existing buildings?		<b>Y</b>	<b>N</b>
Applicable Zoning Scheme	<b>BEAUFORT WEST MUNICIPAL STANDARD ZONING SCHEME BY-LAW</b>										
Current Land Use	<b>AGRICULTURE</b>										
Title Deed number and date	<b>T</b>		<b>T49756/2018</b> (Ptn 1, 6, 7 and Remainder of Farm 319) <b>T107596/2004</b> (Ptn 5 of Farm 319 and Remainder of Farm 330)								
Any restrictive conditions?	<b>Y</b>	<b>N</b>	If Yes, list condition(s)								
Are the restrictive conditions in favour of a third party(ies)?	<b>Y</b>	<b>N</b>	If Yes, list the party(ies)								
Is the property encumbered by a bond?	<b>Y</b>	<b>N</b>	If Yes, list bondholder(s)								
Any existing unauthorized buildings and/or land use on the subject property(ies)?					<b>Y</b>	<b>N</b>	If yes, is this application to legalize the building / land use?			<b>Y</b>	<b>N</b>
Are there any pending court case(s) / order(s) relating to the subject property(ies)?					<b>Y</b>	<b>N</b>	Are there any land claim(s) registered on the subject property(ies)?			<b>Y</b>	<b>N</b>

**PART D: PRE-APPLICATION CONSULTATION**

Has there been any pre-application consultation?			<b>Y</b>	<b>N</b>	If Yes, complete the information below and attach the minutes of the pre-application consultation.						
Official's name				Reference Number				Date of consultation			

**PART E: LAND USE PLANNING APPLICATIONS IN TERMS OF SECTION 15 OF THE BY-LAW ON MUNICIPAL LAND USE PLANNING FOR BEAUFORT WEST MUNICIPALITY AND APPLICATION FEES PAYABLE**

Tick	Section	Type of application	Cost
√	2(a)	a rezoning of land;	R
√	2(b)	a permanent departure from the development parameters of the zoning scheme;	R
√	2(c)	a departure granted on a temporary basis to utilise land for a purpose not permitted in terms of the primary rights of the zoning applicable to the land;	R
√	2(d)	a subdivision of land that is not exempted in terms of section 24, including the registration of a servitude or lease agreement;	R
√	2(e)	a consolidation of land that is not exempted in terms of section 24;	R
√	2(f)	a removal, suspension or amendment of restrictive conditions in respect of a land unit;	R
√	2(g)	a permission required in terms of the zoning scheme;	R



✓	2(h)	an amendment, deletion or imposition of conditions in respect of an existing approval;	R
✓	2(i)	an extension of the validity period of an approval;	R
✓	2(j)	an approval of an overlay zone as contemplated in the zoning scheme;	R
✓	2(k)	an amendment or cancellation of an approved subdivision plan or part thereof, including a general plan or diagram;	R
✓	2(l)	a permission required in terms of a condition of approval;	R
✓	2(m)	a determination of a zoning;	R
✓	2(n)	a closure of a public place or part thereof;	R
✓	2(o)	a consent use contemplated in the zoning scheme;	R
✓	2(p)	an occasional use of land;	R
✓	2(q)	to disestablish a home owner's association;	R
✓	2(r)	to rectify a failure by a home owner's association to meet its obligations in respect of the control over or maintenance of services;	R
✓	2(s)	a permission required for the reconstruction of an existing building that constitutes a non-conforming use that is destroyed or damaged to the extent that it is necessary to demolish a substantial part of the building.	R

**TOTAL A:** **R**

**PRESCRIBED NOTICE AND FEES\*\*** (for completion and use by official)

Tick	Notification of application in media	Type of application	Cost
✓	<b>SERVING OF NOTICES</b>	Delivering by hand; registered post; data messages	R
✓	<b>PUBLICATION OF NOTICES</b>	Local Newspaper(s); Provincial Gazette; site notice; Municipality's website	
✓	<b>ADDITIONAL PUBLICATION OF NOTICES</b>	Site notice, public meeting, local radio station, Municipality's website, letters of consent or objection	R
✓	<b>NOTICE OF DECISION</b>	Provincial Gazette	R
✓	<b>INTEGRATED PROCEDURES</b>	T.B.C	R

**TOTAL B:** **R**

**TOTAL APPLICATION FEES\***  
**(TOTAL A + B)** **R**

**\*Application fees that are paid to the Municipality are non-refundable and proof of payment of the application fees must accompany an application.**

**\*\* The applicant is liable for the cost of publishing and serving notice of an application.**

**BANKING DETAILS**

Name:

Bank:

Branch no.:

Account no.:

**Payment reference:**

(if applicable) .....

**PART F: DETAILS OF PROPOSAL**

**Brief description of proposed development / intent of application:**



<b>Renewable energy structures on Portion 1, 5, 6, 7 and the Remainder of Farm Boeteka No. 319 and the Remainder of Lombards Kraal No. 330 Beaufort West Registration Division.</b>											
<b>PART G: ATTACHMENTS AND SUPPORTING INFORMATION AND DOCUMENTATION FOR LAND USE PLANNING APPLICATION [section 15(2)(a) to (s) of the By-Law on Municipal Land Use Planning for Beaufort West Municipality]</b>											
<b>Complete the following checklist and attach all the information and documentation relevant to the proposal. Failure to submit all information and documentation required will result in the application being deemed incomplete. It will not be considered complete until all required information and documentation have been submitted.</b>											
Information and documentation required in terms of section 38(1) of said legislation											
<b>Y</b>	<b>N</b>	Power of attorney / Owner's consent if applicant is not owner				<b>Y</b>	<b>N</b>	Bondholder's consent (if applicable)			
<b>Y</b>	<b>N</b>	Resolution or other proof that applicant is authorised to act on behalf of a juristic person				<b>Y</b>	<b>N</b>	Proof of registered ownership or any other relevant right held in the land concerned			
<b>Y</b>	<b>N</b>	Written motivation				<b>Y</b>	<b>N</b>	S.G. diagram / General plan extract			
<b>Y</b>	<b>N</b>	Locality plan				<b>Y</b>	<b>N</b>	Site development plan or conceptual layout plan			
<b>Y</b>	<b>N</b>	Proposed subdivision plan				<b>Y</b>	<b>N</b>	Proof of agreement or permission for required servitude			
<b>Y</b>	<b>N</b>	Proof of payment of application fees				<b>Y</b>	<b>N</b>	Full copy of the title deed			
<b>Y</b>	<b>N</b>	Conveyancer's certificate				<b>Y</b>	<b>N</b>	Minutes of pre-application consultation meeting (if applicable)			
Supporting information and documentation:											
<b>Y</b>	<b>N</b>	<b>N/A</b>	Consolidation plan			<b>Y</b>	<b>N</b>	<b>N/A</b>	Land use plan / Zoning plan		
<b>Y</b>	<b>N</b>	<b>N/A</b>	Street name and numbering plan			<b>Y</b>	<b>N</b>	<b>N/A</b>	1 : 50 / 1:100 Flood line determination (plan / report)		
<b>Y</b>	<b>N</b>	<b>N/A</b>	Landscaping / Tree plan			<b>Y</b>	<b>N</b>	<b>N/A</b>	Home Owners' Association consent		
<b>Y</b>	<b>N</b>	<b>N/A</b>	Abutting owner's consent			<b>Y</b>	<b>N</b>	<b>N/A</b>	Services Report or indication of all municipal services / registered servitudes		
<b>Y</b>	<b>N</b>	<b>N/A</b>	Copy of Environmental Impact Assessment (EIA) / Heritage Impact Assessment (HIA) / Traffic Impact Assessment (TIA) / Traffic Impact Statement (TIS) / Major Hazard Impact Assessment (MHIA) / Environmental Authorisation (EA) / Record of Decision (ROD)			<b>Y</b>	<b>N</b>	<b>N/A</b>			



			(strikethrough irrelevant)				
Y	N	N/A	Copy of original approval and conditions of approval	Y	N	N/A	Proof of failure of Home owner's association
Y	N	N/A	Proof of lawful use right	Y	N	N/A	Any additional documents or information required as listed in the pre-application consultation form / minutes
Y	N	N/A	Required number of documentation copies	Y	N	N/A	Other (specify)

#### PART H: AUTHORISATION(S) IN TERMS OF OTHER LEGISLATION

Y	N/A	National Heritage Resources Act, 1999 (Act 25 of 1999)	Y	N/A	Specific Environmental Management Act(s) (SEMA) (e.g. Environmental Conservation Act, 1989 (Act 73 of 1989), National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004), National Environmental Integrated Coastal Management Act, 2008 (Act 24 of 2008), National Environmental Management: Waste Act, 2008 (Act 59 of 2008), National Water Act, 1998 (Act 36 of 1998) (strikethrough irrelevant)
Y	N/A	National Environmental Management Act, 1998 (Act 107 of 1998)			
Y	N/A	Subdivision of Agricultural Land Act, 1970 (Act 70 of 1970)			
Y	N/A	Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013)(SPLUMA)			
Y	N/A	Occupational Health and Safety Act, 1993 (Act 85 of 1993): Major Hazard Installations Regulations			
Y	N/A	Land Use Planning Act, 2014 (Act 3 of 2014) (LUPA)	Y	N/A	Other (specify)
Y	N	If required, has application for EIA / HIA / TIA / TIS / MHIA approval been made? If yes, attach documents / plans / proof of submission etc.			
Y	N	If required, do you want to follow an integrated application procedure in terms of section 44(1) of the By-Law on Municipal Land Use Planning for Beaufort West Municipality? If yes, please attach motivation.			

#### SECTION I: DECLARATION

I hereby wish to confirm the following :

1. That the information contained in this application form and accompanying documentation is complete and correct.
2. I'm aware that it is an offense in terms of section 86(1)(e) to supply particulars, information or answers knowing the particulars, information or answers to be false, incorrect or misleading or not believing them to be correct.
3. I am properly authorized to make this application on behalf of the owner and (where applicable) that a copy of the relevant power of attorney or consent are attached hereto.
4. Where an agent is appointed to submit this application on the owner's behalf, it is accepted that correspondence from and notifications by the Municipality in terms of the by-law will be sent only to the agent and that the owner will regularly consult with the agent in this regard.
5. That this submission includes all necessary land use planning applications required to enable the development proposed herein.



6. I confirm that the relevant title deed(s) have been read and that there are no restrictive title deed restrictions, which impact on this application, or alternatively an application for removal/suspension or amendment forms part of this submission.
7. I am aware that development charges to the Municipality in respect of the provision and installation of external engineering services are payable by the applicant as a result of the proposed development.

Applicant's signature: \_\_\_\_\_ Date: 24 April 2024

Full name: **NJ DE KOCK**

Professional capacity: **PROFESSIONAL TOWN PLANNER**

SACPLAN registration number: **A/2995/2021**

#### FOR OFFICE USE ONLY

Date received:

Received by:

Municipal Stamp

#### ANNEXURES

The following Annexures are attached for your information, only if applicable:

**Please do not submit these Annexures with the application form.**

Annexure A: Minimum requirements matrix

Annexure B: Land use planning application submission and protocol

Annexure C: Land use planning application workflow



## ANNEXURE C | TITLE DEED & PROPERTY DIAGRAM



CRAWFORDS  
Dankinstraat 36  
BEAUFORT-WES  
6970  
Docex 1, BEAUFORT-WES

Opgestel deur my,  
**TRANSPORTBESORGER**  
**ANTON GEORG VORSTER**

Fee enforcement		Office fee
Partnership	Amount	
Partnership	R 20 300 000,00	R 215,00
Mortgage capital	R	R 4890,00
Amount	R	
Reason for exemption	Cat	Exempt i.e. 9
	section	Act

Para 1, 2, 4, 5 and 6

VERBIND MORTGAGED	
R 11 000 000,00	
B 000023800 / 2018	REGISTRATEUR/REGISTRAR
29 OCT 2018	

T 000049756 / 2018

## AKTE VAN TRANSPORT

HIERMEE WORD BEKEND GEMAAK

DAT

**JANINE FOUCHÉ**

voor my die REGISTRATEUR VAN AKTES verskyn het te KAAPSTAD, die genoemde  
Komparant synde behoorlik daartoe gemagtig deur 'n Volmag aan hom/haar verleen  
deur

**VIVIERS TRUST**

Registrasienommer IT1844/2005

gedateer 28 Mei 2018

en geteken te BEAUFORT-WES

CRAWFORDS

DATA / CAPTURE  
30 OCT 2018  
PHUMELELA MNAMATA

DATA / VERIFY  
30 OCT 2018  
PENELOPE NGOGOWANA

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EN genoemde Komparant het verklaar dat die gesegde **VIVIERS TRUST** die ondergemelde eiendom op **09 MAART 2018** waarlik en wettiglik verkoop het en dat hy/sy in sy/haar voornoemde hoedanigheid hierby sedeer en transporteer aan en ten gunste van:

**QUICKSTEP 479 PROPRIETARY LIMITED**  
**Registrasienommer 2017/497542/07**

hulle opvolgers in amp of regsverkrygendes in volkome en vrye eiendom:

1. **GEDEELTE 6 (BOETEKA) VAN DIE PLAAS BOETEKA NR 319**  
**In die Munisipaliteit en Afdeling van BEAUFORT-WES**  
**PROVINSIE WES-KAAP**

**GROOT: 2154,5792 (TWEË DUISEND EEN HONDERD VIER EN VYFTIG**  
**KOMMA VYF SEWE NEGE TWEË) Hektaar**

OORSPRONKLIK OORGEDRA kragtens Transportakte Nr T4977/1938 met 'n kaart wat daarop betrekking het en gehou kragtens Transportakte Nr. T61762/2006.

A. **ONDERHEWIG** aan die voorwaarde waarna verwys word in Transportakte Nommer 4977/1938.

B. ....

C. **ONDERHEWIG VERDER** soos genoem in Grondbrief Nr 104/1949 aan die volgende voorwaarde voorgeskryf deur Artikel 9 van die Wet Nr 45 van 1937, soos vervang deur Artikel 3 van die Wet Nr 42 van 1944 en gewysig deur Artikel 4 van die Wet Nr 23 van 1948, naamlik:-

"Geen verdeling van die hiemee toegekende grond of van enige gedeelte daarvan of onverdeelde aandeel daarin, mag bewerkstellig word nie sonder die skriftelike toestemming van die Minister van Lande, verteen op aanbeveling van die landraad op die voorwaardes wat die Minister wenslik ag om op te stel; en hierdie voorwaarde word in elke daaropvolgende oordrag van die hiemee toegekende grond of enige gedeelte daarvan of onverdeelde aandeel daarin, opgeneem."

2. **GEDEELTE 7 (GEDEELTE VAN GEDEELTE 1) VAN DIE PLAAS BOETEKA**  
**NR 319**  
**In die Munisipaliteit en Afdeling van BEAUFORT-WES**  
**PROVINSIE WES-KAAP**

**GROOT: 1070,6650 (EEN DUISEND EN SEWENTIG KOMMA SES SES VYF**  
**NUL) Hektaar**

OORSPRONKLIK OORGEDRA kragtens Transportakte Nr T4072/1944 met Kaart Nr 4919/43 wat daarop betrekking het en gehou kragtens Transportakte nr T61762/2006



- A. **ONDERHEWIG** aan die voorwaardes waarna verwys word in Transportakte nr 4072/1944.

3. **RESTANT GEDEELTE 1 VAN DIE PLAAS BOETEK A NR 319**  
In die Munisipaliteit en Afdeling van BEAUFORT-WES  
PROVINSIE WES-KAAP

**GROOT: 1383,9216 (EEN DUISEND DRIE HONDERD DRIE EN TAGTIG KOMMA NEGE TWEE EEN SES) Hektaar**

**OORSPRONKLIK OORGEDRA** kragtens Transportakte Nr T182/1871 gedateer 17 Februarie 1871 met 'n Kaart wat daarop betrekking het en gehou kragtens Transportakte Nr T61762/2006.

- A. **ONDERHEWIG** aan die voorwaardes waarna verwys word in Transportakte Nr T6169/1908.

- B. **GEREGTIG** op die voordeel van die volgende voorwaarde genoem in Transportakte Nr T1396/1927, naamlik:

"Dat gesegde Pieter Jacobus Muller en sy opvolgers as eienaar van bogemelde restant van Boeteka geregtig sal wees op 'n vrye suiping in die rivier op Boeteka A getranspoteer ten faveure van Stephanus Andries Muller op hierdie dag No. 1395; by die woonhuis gemerk "Homestead" op die kaart van Boeteka A. "Hulle sal ook geregtig wees op 'n vrye toegang of trek vir hulself en hul vee naar die Rivier oor Boeteka A vir hierdie doel. "Sodanig toegang of trek sal in die korste en reguitste rigtinge tussen die bakens L en h op die kaart van Boeteka A moet gebruik word."

- C. **ONDERHEWIG VERDER** aan en **GEREGTIG** op die voordeel van die volgende spesiale voorwaardes genoem in Transportakte Nummer 1396/1972 naamlik:

"Dat al die tuinwater waarop die restant Boeteka getranspoteer onder Transportakte gedateer 3de September 1908, No.6169, groot 4329 morges 466 vierkante roede ten faveure Komparants Prinsipaal geregtig mag wees in twee dele verdeel sal word naamlik, gesegde Stephanus Andries Muller, en sy opvolgers as eienaar van Boeteka A sal geregtig wees op een-helfte daarvan en gesegde Pieter Jacobus Muller en sy opvolgers as eienaar van bogemelde restant sal geregtig wees op die ander helfte. Hierdie water kom uit in die rivier op die lyn tussen gesegde Boeteka A en bogemelde restant by die Baken H op die kaart van Boeteka A."

4. **RESTANT VAN DIE PLAAS BOETEK A NR 319**  
In die Munisipaliteit en Afdeling van BEAUFORT-WES  
PROVINSIE WES-KAAP

**GROOT: 2605,2134 (TWEE DUISEND SES HONDERD EN VYF KOMMA TWEE EEN DRIE VIER) Hektaar**

**OORSPRONKLIK OORGEDRA** kragtens 'n Grondbrief gedateer 1 November 1838 (Beaufort Wes Erfpakte Boekdeel 3 Nr 4) met 'n Kaart wat daarop betrekking het en gehou kragtens Transportakte Nr T61762/2006.

- A. **ONDERHEWIG** aan die voorwaardes waarna verwys word in Transportakte Nr T4977/1938.

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B. ....

- C. **ONDERHEWIG VERDER** soos genoem in Grondbrief Nr. 104/1949 aan die voorwaarde voorgeskryf deur Artikel 9 van Wet Nr 45 van 1937, soos vervang deur Artikel 3 van Wet Nr 42 van 1944 en gewysig deur Artikel 4 van Wet Nr 23 van 1948, naamlik:

"Geen Verdeling van die hiermee toegekende grond of van enige gedeelte daarvan of onverdeelte aandeel daarin, mag bewerkstellig word nie sonder die skriftelike toestemming van die Minister van Lande, verleen op aanbeveling van die landraad op die voorwaardes wat die Minister wenslik ag om te stel; en hierdie voorwaarde word in elke daaropvolgende oordrag van die hiermee toegekende grond of enige gedeelte daarvan of onverdeelte aandeel daarin, opgeneem."

5. **GEDEELTE 5 ('N GEDEELTE VAN GEDEELTE 2) VAN DIE PLAAS LOMBARDS KRAAL NR 330**  
In die Munisipaliteit en Afdeling van BEAUFORT-WES  
PROVINSIE WES-KAAP

**GROOT: 956,3172 (NEGE HONDERD SES EN VYFTIG KOMMA DRIE EEN SEWE TWEE) Hektaar**

**AANVANKLIK** oorgedra kragtens Verdelingstransport Nr. T20974/1953 met Kaart Nr. 5022/53 wat daarop betrekking het en gehou kragtens Transportakte Nr. T43776/2008

- A. **ONDERHEWIG** aan die voorwaardes waarna verwys word in Transportakte Nr T2928/1911.
- B. **ONDERHEWIG VERDER** aan die terme van 'n endossement gedateer 15 Augustus 1968 op gesegde Verdelingstransport Nr. T20974/1953, wat as volg lees:-

"ENDOSSEMENT KRAGTENS ARTIKEL 31(6) VAN WET 47 VAN 1937  
(SOOS GEWYSIG)

"'n Gedeelte van die eiendom hierin vermeld groot 0.311 mge is ontelen deur die Administrateur van die Kaap kragtens Art 130 Ord 15/52 saamgelees met Art 2(3) Ord 3/66. Vide onteieningskennisgewing Nr. RN17/1004d.d. 107065 geliasseer as onteienings caveat 1256/65 planne No. 12 geliasseer hiermee."

- C. **ONDERHEWIG VERDER** aan die terme van 'n endossement gedateer 11 Junie 1986 op gesegde Verdelingstransport Nr. T20974/1953, wat as volg lees:-

"Kragtens Notariële Akte van Serwituut Nr. K502/86 S gedateer 24-10-1985 is

- 1) Die serwituut waarna verwys word in endossement gedateer 30/5/77 t.g.v. Evkom (Nr K469/77S) nou gekanselleer.
- 2) Die binnegemelde eiendom is onderhewig aan die regte en onderhewig aan die reg ten gunste van Evkom om elektrisiteit daaroor te lei, tesame met bykomende regte en onderhewig aan voorwaardes, soos vollediger sal blyk uit die gesegde Akte, afskrif waarvan hieraan geheg is."

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- D. **ONDERHEWIG VERDER** aan die terme van 'n endossement gedateer 20 Junie 1990 op gesegde Verdelingstransport Nr. T20974/1953, wat as volg lees:-

"Kragtens Notariële Akte Nr. K502/90 gedateer 6 Junie 1990 en hede geregistreer is die roete van kraglynserwituut waarna verwys word in endossement ged 11/6/86 nou bepaal.

Spos meer volledig sal blyk uit gesegde Not. Akte."

**DIE PLAAS NR 432**

In die Munisipaliteit en Afdeling van BEAUFORT-WES  
PROVINSIE WES-KAAP

**GROOT: 2577,4276 (TWEË DUISEND VYF HONDERD SEWE EN SEWENTIG  
KOMMA VIER TWEË SEWE SES) Hektaar**

**AANVANKLIK GEREGETREER** en steeds gehou kragtens sertifikaat van verenigde Titel  
Nr. 54166/2008 met Kaart LG Nr. 1610/2008 wat daarop betrekking het.

- I. **WAT BETREF** die figuur A B C D E F G H J K a R op Kaart LG Nr.  
1610/2008:

A. **WAT BETREF** die figuur q e a soos aangedui op Kaart LG Nr. 1608/2008:

1. **ONDERHEWIG** aan die voorwaardes waarna verwys word in  
Transportakte Nr. T9077/1907.

2. **ONDERHEWIG VERDER** aan die serwituutaantekening gedateer 25  
Maart 1963 aangeteken op Transportakte Nr. T3073/1957, welke  
aantekening soos volg lees:-

"Endossement kragtens Artikel 31(6) van Wet Nr. 47 van 1937 (soos  
gewysig)

Gedeeltes van die eiendom hierin vermeld, Paras, 2, 3 en 4 soos  
hieronder uiteengeesit onteien deur die Provinsiale Administrasie van die  
Kaap kragtens Art. 130 van Ord. 15/1952 saamgelees met Artikels 2 en 3  
Ord. 3/1936, vide onteieneienings caveat 83/65, planne in tweevoud  
gelisasseer hiermee.

Van para 4 plus-minus 0,9537 hektaar."

- B. **WAT BETREF** die figuur R A B C D E F G H J K L a op Kaart LG  
Nr. 1610/2008, uitgesluit die figuur q e a op Kaart LG Nr. 1608/2008:

1. **ONDERHEWIG** aan die voorwaardes waarna verwys word in  
Transportakte Nr. T4453/1937.

2. **ONDERHEWIG VERDER** aan die serwituut verwysing gedateer 25 Maart  
1963 aangebring op Transportakte Nr. T3073/1957, naamlik:-

"Endossement kragtens Artikel 31(6) van Wet Nr. 47 van 1937 (soos  
gewysig)

Gedeeltes van die eiendom hierin vermeld, Paras 2, 3 en 4 soos  
hieronder uiteengeesit is onteien deur die Provinsiale Administrasie van die

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Kaap kragtens Art. 130 van Ord. 15/1952 staan, vide onteieningskennisgewing Nr. RN 17/828 — 7-10-10-64 geliasseer as onteienings caveat 83/65, van para 2 ongeveer 14,5798 hektaar, van para 3 ongeveer 18,9175 hektaar, van para 4 ongeveer 0,9537 hektaar."

3. **ONDERHEWIG VERDER** aan die endossement gedateer 27 Mei 1987 aangebring op Transportakte nr. T2375/1982, naamlik:-

"Kragtens Notariële Akte Nr. K963/1992S, is die binnevermelde eiendom onderhewig aan die reg ten gunste van EVKOM om elektrisiteit daaroor te lei, tesame met bykomende regte, en onderhewig aan voorwaardes, soos vollediger sal blyk uit die gesegde akte, afskrif waarvan hieraan geheg is."

(soos nou aangedui deur die lyne b c d en e f g op Kaart LG Nr. 1610/2008)

- II. **WAT BETREF** die figuur Q R a L M N P op Kaart LG Nr. 1610/2008;

**ONDERHEWIG** aan die voorwaardes waarna verwys word in Transportakte Nr. T4691/1921.

- III. **WAT betref** die geheel van die eiendom:

**ONDERHEWIG** aan die volgende voorwaardes opgelê ingevolge Artikel 11 van die Wet op Adverteer langs en Toebou van Paaie (Wet 21 van 1940), soos uiteengesit in Transportakte Nr. T54165/08.

1. geen addisionele toegange tot Grootpad 33 Seksie 5 geskep word sonder die goedkeuring van hierdie kantoor nie.
2. die bepalinge van Artikel 17(1)(a) en (b) van Ordonnansie 19 van 1976 van toepassing bly op alle gedeeltes.
3. geen advertensie tekens vertoon word waar dit sigbaar is vanaf Grootpad 33 Seksie 5 nie.

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Kaap kragtens Art. 130 van Ord. 15/1952 staan, vide onteieningskennisgewing Nr. RN 17/828 — 7-10-10-64 geliasseer as onteienings caveat 83/65, van para 2 ongeveer 14,5798 hektaar, van para 3 ongeveer 18,9175 hektaar, van para 4 ongeveer 0,9537 hektaar."

3. **ONDERHEWIG VERDER** aan die endossement gedateer 27 Mei 1987 aangebring op Transportakte nr. T2375/1982, naamlik:-

"Kragtens Notariële Akte Nr. K963/1992S, is die binnevermelde eiendom onderhewig aan die reg ten gunste van EVKOM om elektrisiteit daaroor te lei, tesame met bykomende regte, en onderhewig aan voorwaardes, soos vollediger sal blyk uit die gesegde akte, afskrif waarvan hieraan geheg is."

(soos nou aangedui deur die lyne b c d en e f g op Kaart LG Nr. 1610/2008)

- II. **WAT BETREF** die figuur Q R a L M N P op Kaart LG Nr. 1610/2008;

**ONDERHEWIG** aan die voorwaardes waarna verwys word in Transportakte Nr. T4691/1921.

- III. **WAT betref** die geheel van die eiendom:

**ONDERHEWIG** aan die volgende voorwaardes opgelê ingevolge Artikel 11 van die Wet op Adverteer langs en Toebou van Paaie (Wet 21 van 1940), soos uiteengesit in Transportakte Nr. T54165/08.

1. geen addisionele toegange tot Grootpad 33 Seksie 5 geskep word sonder die goedkeuring van hierdie kantoor nie.
2. die bepalinge van Artikel 17(1)(a) en (b) van Ordonnansie 19 van 1976 van toepassing bly op alle gedeeltes.
3. geen advertensie tekens vertoon word waar dit sigbaar is vanaf Grootpad 33 Seksie 5 nie.

CRAWFORDS



WESHALWE die Komparant afstand doen van al die regte, titel en belang wat die gesegde **VIVIERS TRUST** voorheen op genoemde eiendom gehad het en gevolglik ook erken dat hy geheel en al van die besit daarvan onthef en nie meer daartoe geregtig is nie, en dat, kragtens hierdie akte, bogenoemde **QUICKSTEP 479 PROPRIETARY LIMITED**, hulle opvolgers in amp of regsverkrygendes tans en voortaan daartoe geregtig is, ooreenkomstig plaaslike gebruik, behoudens die regte van die Staat en erken hy ten slotte dat die koopprys van die eiendom wat hiermee getranspoteer word die bedrag van **R20 300 000.00 (TWINTIG MILJOEN DRIE HONDERD DUISEND RAND)** is.

TEN BEWYSE WAARVAN EK, die genoemde Registrateur van Aktes, tesame met die Komparant hierdie Akte onderteken en dit met die Ampseël bekragtig het.

ALDUS GEDOEN EN VERLY op die kantoor van die REGISTRATEUR VAN AKTES te KAAPSTAD op

29 OCT 2010

In my teenwoordigheid

  
Registrateur van Aktes

  
q.q. Handtekening van komparant



CRAWFORDS  
Donkinstraat 36  
BEAUFORT-WES  
6970  
Docex 1, BEAUFORT-WES

Opgestel deur my,

TRANSPORTBESORGER  
ANTON GEORG VORSTER

## PROKURASIE OM TRANSPORT TE GEE

Ek, die ondergetekende,

**VIVIERS TRUST**

Registrasienommer IT1844/2005

Hierin verteenwoordig deur JAN ABRAHAM VIVIERS in sy hoedanigheid as  
Trustee van die VIVIERS TRUST Registrasienommer IT1844/2005 en behoorlik  
daartoe gemagtig kragtens resoluë van die Trustees en behoorlik daartoe  
gemagtig kragtens Magtigingsbrief uitgereik deur die Meester van die  
Hooggeregshof te Kaapstad op 30 Augustus 2007.

nomineer en stel hiermee:

**JANINE FOUCHE**

aan, met mag van substitusie, om ons wettige gevolmagtigde en verteenwoordiger te  
wees, om vir en namens ons voor die Registrateur van Aktes te KAAPSTAD, te  
verskyn en daar namens ons aan:

**QUICKSTEP 479 PROPRIETARY LIMITED**

Registrasienommer 2017/497542/07

transport te gee van:

1. GEDEELTE 6 (BOETEK) VAN DIE PLAAS BOETEK NR 319  
In die Munisipaliteit en Afdeling van BEAUFORT-WES  
PROVINSIE WES-KAAP

GROOT: 2154,5792 (TWEË DUISEND EËN HONDERD VIER EN VYFTIG  
KOMMA VYF SEWE NEGE TWEË) Hektaar

GEHOU kragtens Transportakte ten gunste van die Verkoper Nr. T61762/2006

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2. GEDEELTE 7(GEDEELTE VAN GEDEELTE 1) VAN DIE PLAAS BOETKA  
NR 319  
In die Munisipaliteit en Afdeling van BEAUFORT-WES  
PROVINSIE WES-KAAP
- GROOT: 1070,6650 (EEN DUISEND EN SEWENTIG KOMMA SES SES VYF  
NUL) Hektaar
- GEHOU kragtens Transportakte ten gunste van die Verkoper Nr. T61762/2006
3. RESTANT GEDEELTE 1 VAN DIE PLAAS BOETKA NR 319  
In die Munisipaliteit en Afdeling van BEAUFORT-WES  
PROVINSIE WES-KAAP
- GROOT: 1383,9216 (EEN DUISEND DRIE HONDERD DRIE EN TAGTIG  
KOMMA NEGE TWEE EEN SES) Hektaar
- GEHOU kragtens Transportakte ten gunste van die Verkoper Nr. T61762/2006
4. RESTANT VAN DIE PLAAS BOETKA NR 319  
In die Munisipaliteit en Afdeling van BEAUFORT-WES  
PROVINSIE WES-KAAP
- GROOT: 2605,2134 (TWEE DUISEND SES HONDERD EN VYF KOMMA TWEE  
EEN DRIE VIER) Hektaar
- GEHOU kragtens Transportakte ten gunste van die Verkoper Nr. T61762/2006 ✓
5. GEDEELTE 5 (IN GEDEELTE VAN GEDEELTE 2) VAN DIE PLAAS LOMBARDS  
KRAAL NR 330  
In die Munisipaliteit en Afdeling van BEAUFORT-WES  
PROVINSIE WES-KAAP
- GROOT: 956,3172 (NEGE HONDERD SES EN VYFTIG KOMMA DRIE EEN  
SEWE TWEE) Hektaar
- GEHOU kragtens Transportakte ten gunste van die Verkoper Nr. T43776/2008 ✓
6. DIE PLAAS NR 432  
In die Munisipaliteit en Afdeling van BEAUFORT-WES  
PROVINSIE WES-KAAP
- GROOT: 2577,4276 (TWEE DUISEND VYF HONDERD SEWE EN SEWENTIG  
KOMMA VIER TWEE SEWE SES) Hektaar  
*Sertifikaat van Verenigde Titel*
- GEHOU kragtens Transportakte ten gunste van die Verkoper Nr. T054166/2008 ✓

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en deur ons kragtens **Privaat Ooreenkoms** aan hulle op **09 MAART 2018**, verkoop vir die bedrag van

**R20 300 000.00 (TWINTIG MILJOEN DRIE HONDERD DUISEND RAND);**


en om in die algemeen alles te doen wat ook al nodig mag wees ten einde aan die voormelde doeleindes uitvoering te gee, net so volledig en doeltreffend as wat ons dit self kon doen as ons persoonlik teenwoordig was en handelend daarin opgetree het; en ons bekragtig, veroorloof en bevestig alles wat ons genoemde prokureur ook al wettiglik kragtens hierdie Volmag doen of laat doen, en belowe en kom ooreen om dit te bekragtig, te veroorloof en te bevestig.

Geteken te BEAUFORT-WES.

op 08 MEI 2018 in die teenwoordigheid van die ondergetekende getuies

As Getuies

1.  \_\_\_\_\_

 \_\_\_\_\_  
J VIVIERS

2.  \_\_\_\_\_





2013-10-19

## **MUNISIPALITEIT VAN BEAUFORT-WES**

### **MAGTING VIR REGISTRASIE VAN OORDRAG VAN ONROERENDE GOED**

Hiermee word gesertifiseer dat alle bedrae verskuldig in verband met die gespesifiseerde eiendom vir munisipale dienstegelede, bobelastings op gelde, eiendomsbelasting en ander munisipale belasting, heffings en aksyns gedurende die twee jaar wat die datum van aansoek voorafgaan ten volle betaal is.

#### **KLARINGCERTIFIKAAT**

Magting word hierby verleen ingevolge Artikel 18(1) van die Wet op Plaaslike Regering, Munisipale Stelsels, 2000 (Wet 32 van 2000) vir die registrasie van die eiendom hierna gedoent: die oordrag van die eiendom hierin beskryf

**MUNISIPALE BESTUURDER** Direkteur: Finansiële Dienste

**DATUM:**

Hierdie serfikaat verstryk (2) maande vanaf datum van uitreiking.

Die uitreikingsdatum is dus

#### **VOLLEDIGE TITELBESKRJVING:**

1. **GEDEELTE 6 (BOETEK) VAN DIE PLAAS BOETEK NR 319**  
In die Munisipaliteit en Afdeling van BEAUFORT-WES  
PROVINSIE WES-KAAP

GROOT: 2154,5792 (TWEË DUISEND EEN HONDERD VIER EN VYFTIG  
KOMMA VYF SEWE NEGE TWEË) Hektaar

GEHOU kragtens Transportakte ten gunste van die Verkoper Nr.  
T61752/2006

2. **GEDEELTE 7 (GEDEELTE VAN GEDEELTE 1) VAN DIE PLAAS  
BOETEK NR 319**  
In die Munisipaliteit en Afdeling van BEAUFORT-WES  
PROVINSIE WES-KAAP

GROOT: 1070,6650 (EEN DUISEND EN SEWENTIG KOMMA SES SES  
VYF NUL) Hektaar

GEHOU kragtens Transportakte ten gunste van die Verkoper Nr.  
T61762/2006



**3. RESTANT GEDEELTE 1 VAN DIE PLAAS BOETEKA NR 319**

In die Munisipaliteit en Afdeling van BEAUFORT-WES  
PROVINSIE WES-KAAP

GROOT: 1383,9216 (EEN DUISEND DRIE HONDERD DRIE EN TAGTIG  
KOMMA NEGE TWEE EEN SES) Hektaar

GEHOU kragtens Transportakte ten gunste van die Verkoper Nr.  
T61762/2006

**4. RESTANT VAN DIE PLAAS BOETEKA NR 319**

In die Munisipaliteit en Afdeling van BEAUFORT-WES  
PROVINSIE WES-KAAP

GROOT: 2605,2134 (TWEE DUISEND SES HONDERD EN VYF KOMMA  
TWEE EEN DRIE VIER) Hektaar

GEHOU kragtens Transportakte ten gunste van die Verkoper Nr.  
T61762/2006

**5. GEDEELTE 5 ('N GEDEELTE VAN GEDEELTE 2) VAN DIE PLAAS  
LOMBARDS KRAAL NR 330**

In die Munisipaliteit en Afdeling van BEAUFORT-WES  
PROVINSIE WES-KAAP

GROOT: 956,3172 (NEGE HONDERD SES EN VYFTIG KOMMA DRIE  
EEN SEWE TWEE) Hektaar

GEHOU kragtens Transportakte ten gunste van die Verkoper Nr.  
T43776/2008

**6. DIE PLAAS NR 432**

In die Munisipaliteit en Afdeling van BEAUFORT-WES  
PROVINSIE WES-KAAP

GROOT: 2577,4276 (TWEE DUISEND VYF HONDERD SEWE EN  
SEWENTIG KOMMA VIER TWEE SEWE SES) Hektaar

GEHOU kragtens Transportakte ten gunste van die Verkoper Nr.  
T054166/2008





**HANDTEKENING VAN AANVRAER:**

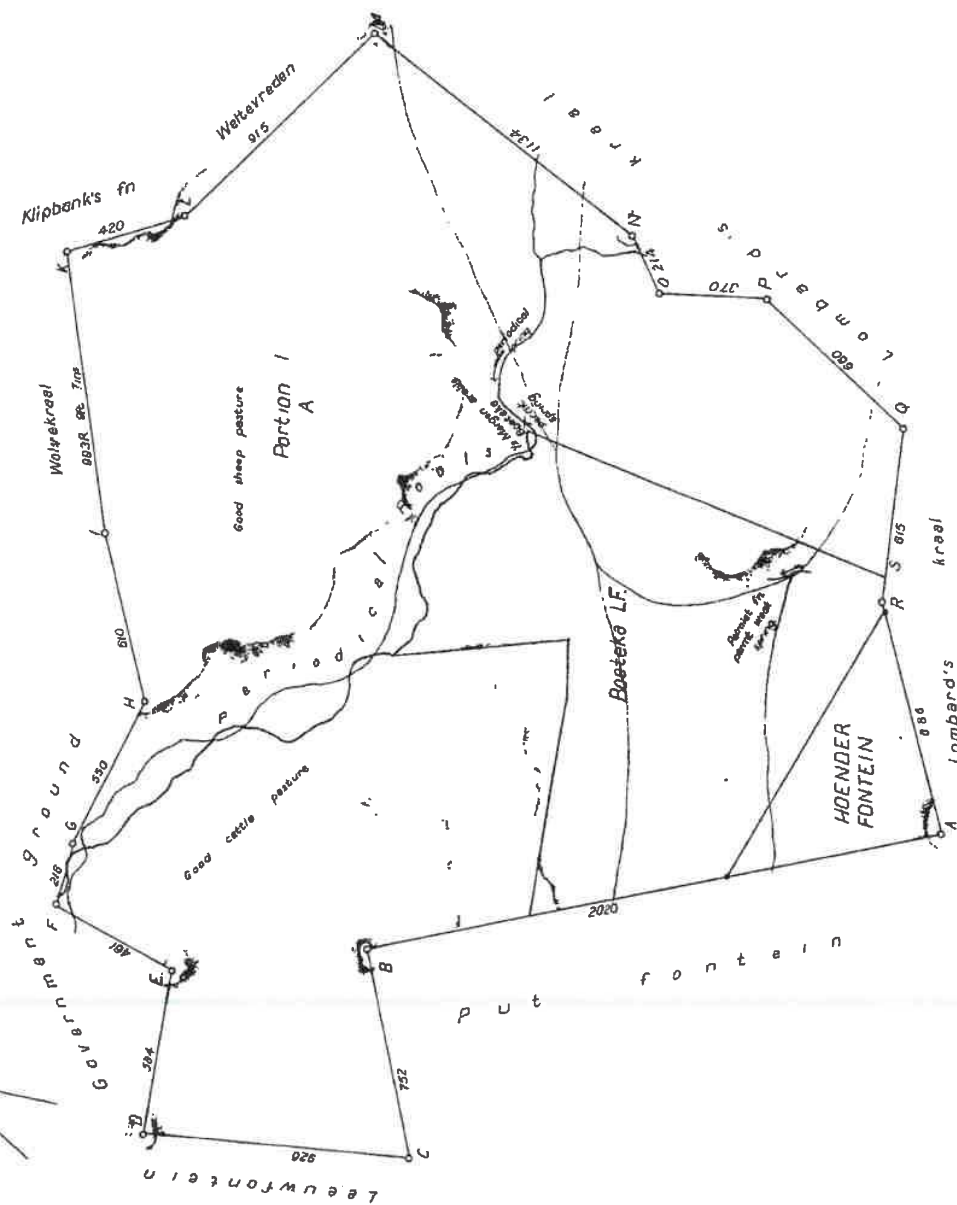
MUNICIPALITY OF INKSTER  
09 OCT 2018  
Revenue Office  
DEALFORTH-WES / WEST



Ek sertifiseer dat die transportgewer se korrekte registrasienommer IT1844/2005 op belastinguitklaringsertifikaat moet lees. Munisipaliteit is reeds dienooreenkomstig in kennis gestel. Passeer asseblief! Baie dankie!

JANNIE FOUQUE  
TRANSPORTBESORGER





THE FARM --- Boeteka --- No 312  
BEAUFORT-WEST

Rhineland Roads.

The annexed Diagram from A to R represents the Place called Boeteka, situated in the Field Cornetcy of J. G. Moeke Gough and District of Beaufort, contains 12328 Morgens, and is

bounded N.	by	Wetkredon
E.&S.E.	by	Lombard's kraal
S.W.	by	Put fontein
W.	by	Leuwerfontein and Government ground and
N.W.	by	Wolfskraal.

Measured December 1830 by me  
for Leendert Hendrik du Plooy Cornelis Son  
(Sgd.) C. O. Osche.  
Land-Surveyor.

Copied from diagram relating  
to...  
dated...  
for Surveyor-General  
25.1.1967

SHEET CL-3, 3D.  
SHEET CL-6, 5B  
SHEET CL-5, 5B

Per list of  
Sgd. at  
Sgd. at

SCO/JB

CHECKED  
DATE...  
M/L



14. FOLLOWING DECISION, HAVE BEEN MADE FROM THIS DIAG. AM

Survey Records	Section	Sub. as on	Morg.	Sq. Rds.	Deed
		A col. pink	6270	570	1871 - -182
	4292/1924	Hoender Fontein	499	599	1925 - -2386
E40/1938	84/1938	Boeteka LF.	2515.4684		1938 - -4977

Ptn. 1.  
" 3  
" 6



Approved

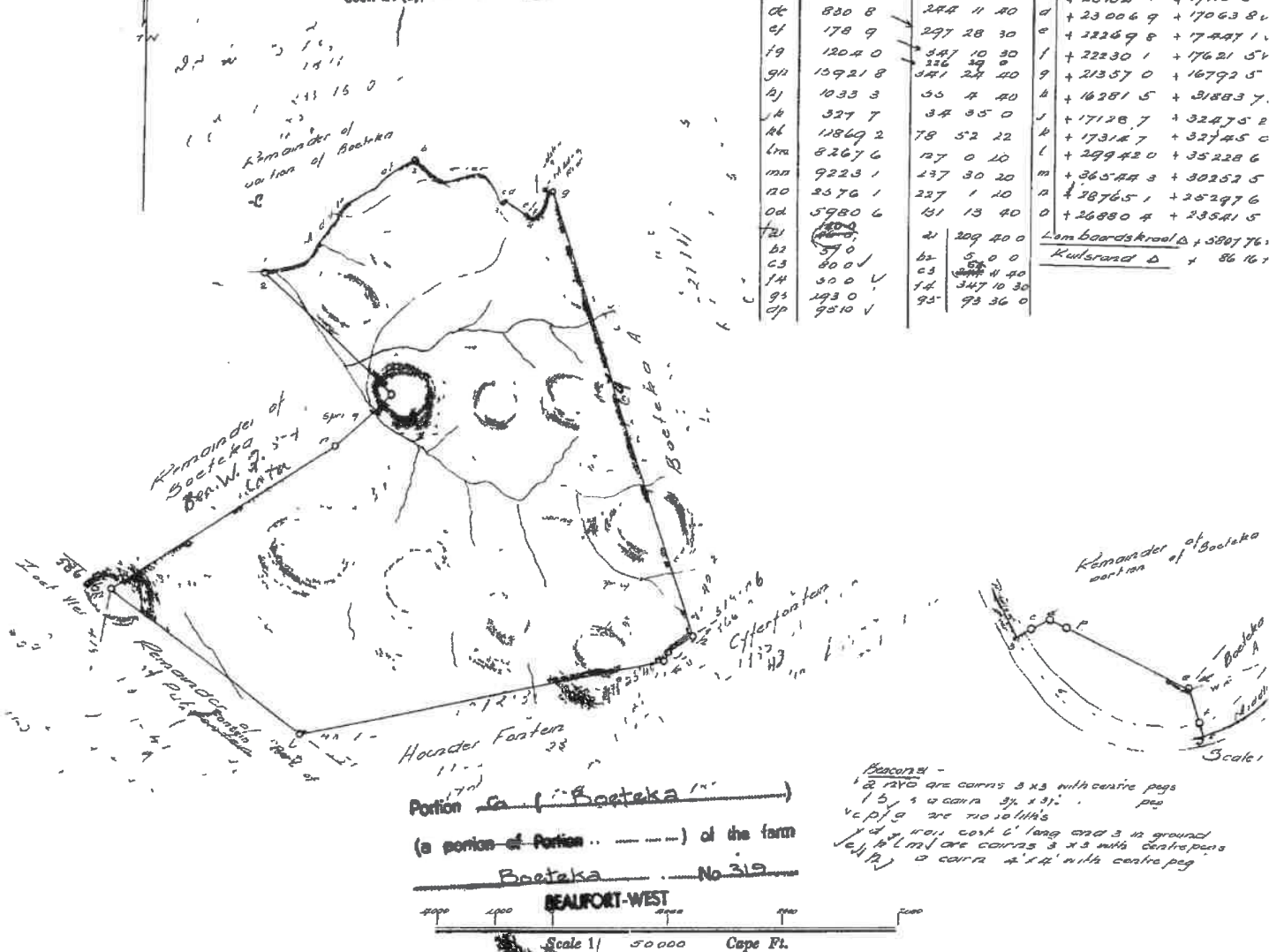
Surveyor-General

24-5-1938

34/1938

**SUBDL DIAGRAM**  
Sect. 24 (a), Act No. 9 of 1927

SIDES	ANGLES OF	SYSTEM Lo.
Cape Feet	DIRECTION	y CO-ORDINATES x
ab 6448 5	233 22 0	2 + 31378 4 + 19399 8
bc 3385 5	193 37 40	3 + 16206 1 + 13753 7
cd 108 0	244 11 40	4 + 23105 1 + 17116 8
de 830 8	297 28 30	5 + 23006 9 + 17063 8
ef 178 9	247 10 30	6 + 22230 1 + 17621 5
fg 1204 0	347 24 40	7 + 21357 0 + 16792 5
gh 1033 3	35 4 40	8 + 16281 5 + 31883 7
h 327 7	34 35 0	9 + 17128 7 + 32475 2
ab 11869 2	78 52 22	10 + 17314 7 + 32745 0
lm 8267 6	127 0 10	11 + 29942 0 + 35228 6
mn 9223 1	237 30 20	12 + 36544 3 + 30252 5
no 2376 1	227 1 10	13 + 28765 1 + 25297 6
od 5980 6	131 13 40	14 + 26880 4 + 23541 5
21 209 40 0		15 + 26880 4 + 23541 5
b2 5 0 0		16 + 26880 4 + 23541 5
c3 80 0 0		17 + 26880 4 + 23541 5
d4 347 10 30		18 + 26880 4 + 23541 5
e5 93 36 0		19 + 26880 4 + 23541 5



Beacons -  
2 1200 are corners 3 x 3 with centre pegs  
1 5 1 4 corner 3 x 3  
v c p / g are no pillars  
y d 1 1001 cost 6' long and 3 12 ground  
e f h l m are corners 3 x 3 with centre pegs  
a b n o corner 4 x 4 with centre peg

The figure 21 middle of River 3 cde + 4 middle of River 5 g h l m n o represents 2515 46 84 Morgen - Square-Feet of land,  
portion of Boeteka which is referred to here  
situate in the Field Cornetcy of DIVISION of Beaufort West  
PROVINCE of CAPE of GOOD HOPE.

Surveyed in Oct 1937

by me

J. J. Joubert

Land Surveyor

This diagram is annexed to Transfer Deed  
No. 4977 dated 19 5 1938 in favour of  
The Govt of the Union of South Africa

Registrar of Deeds.

The original diagram is No. annexed to  
Title Deed No. B.W. 43-4 dated 11 11 1938  
in favour of L.W. du Plooy & Co.

S.G. File No. 8134  
Survey Records No. E

BEACONS ACKNOWLEDGE

CL-5B



EF	6583	1	254	7	30	E	+ 22777	6	+ 25517	8
FG	5251	1	210	18	0	F	+ 16445	6	+ 23717	0
GA	3847		220	53	20	G	+ 13796	3	+ 19183	2
Dd	6138		305	30	10	b	+ 3092	3	+ 15998	8
De	5663	4	348	9	30	e	+ 23917	6	+ 32274	5
Cc	150	✓	34	31	7					
Id	330	✓	348	9	30					

Rec'd Area 1430-6176 Morg.

EF	6583	1	254	7	30	E	+ 22777 6	+ 25517 8
FG	5251	1	210	18	0	F	+ 16445 6	+ 23717 0
GA	3847	7	220	53	20	G	+ 13796 3	+ 19183 2
Bb	613 8		305	30	10	b	+ 3092 3	+ 15998 8
Dd	5665 4		348	9	30	e	+ 23917 6	+ 32274 5
Cc	150	✓	34	31	7			
IId	330	✓	348	9	30			

Rect Area 1430-6176 Morg.

### Description of Beacons

- A Iron pole section against iron corner pole in cairn.  
B Iron pole section under cairn  $2' \times 2'$   
C Cairn  $3' \times 3'$  over iron peg  
D Cairn  $5' \times 5'$   
E F b Wooden corner fencing posts in cairns  
G Cairn  $5' \times 5\frac{1}{2}'$   
H Not beaconed

Portion 7 ( ) of the Village  
(a portion of Portion )

Bostoka **BEAUFORT-WEST**

Scale 1:50000

*The figure*      A B C middle of River d D E F G

represents  
1250.0000 Morgen  
of land being

PORTION 77 (a Portion of Portion 7)

of the farm БОЕТЕКА

*Beaufort West* *Province of Cape of Good Hope.*

Surveyed in July, 1943 by me

**Land Surveyor.**

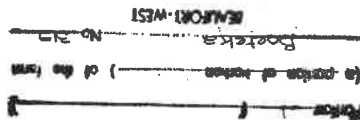
[illegible]



NO. 55/1871.

The numerical data of this diagram are sufficiently consistent.  
(Sgd.) L. Marquard.  
Examiner. y

SIDES	ANGLES
Cape Roads	
AB 2163.76	A 30.51.30
BC 9.00	B 149.15.40
CD 69.23	C 233.16.00
DE 28.83	D 229.43.00
EF 109.22	E 52.31.20
FG 1324.10	F 301.57.00
GH 522.19	G 73.55.30
HK 660.00	H 127.30.10
KL 370.00	K 139.00.00
LM 214.00	L 244.30.00
MN 1134.00	M 150.17.00
NO 915.00	N 99.5.40
OP 430.00	O 206.57.20
QR 993.8	P 98.00.00
RS 610.00	R 174.00.00
ST 550.00	S 221.10.00
TA 216.00	T 168.00.00
Rectilinear Area	6095.480



Not known as Portion 1 of the Farm Boeteka.  
The diagram colored yellow represents 6270 Morgen 770 Sq. Rods of Land being portion of the farm BOETIKA situated in the Gough division of Beaufort

Extending North to Klipbankfontein & Walterredien  
N. West to Wolke Kruel & Groun Land  
East to Lourens Kruel  
South to Remaining portion of Boeteka

being portion of the land transferred to C. D. Moake & D.J.L. Hutting on the 11th July 1865.

Framed from actual survey,

(Sgd.) J.A. Thwaites.

Govt. Surveyor.

July 1870.

Copied from diagram relating to Transfer of 182 dated 17.2.1871 (Vol. A)

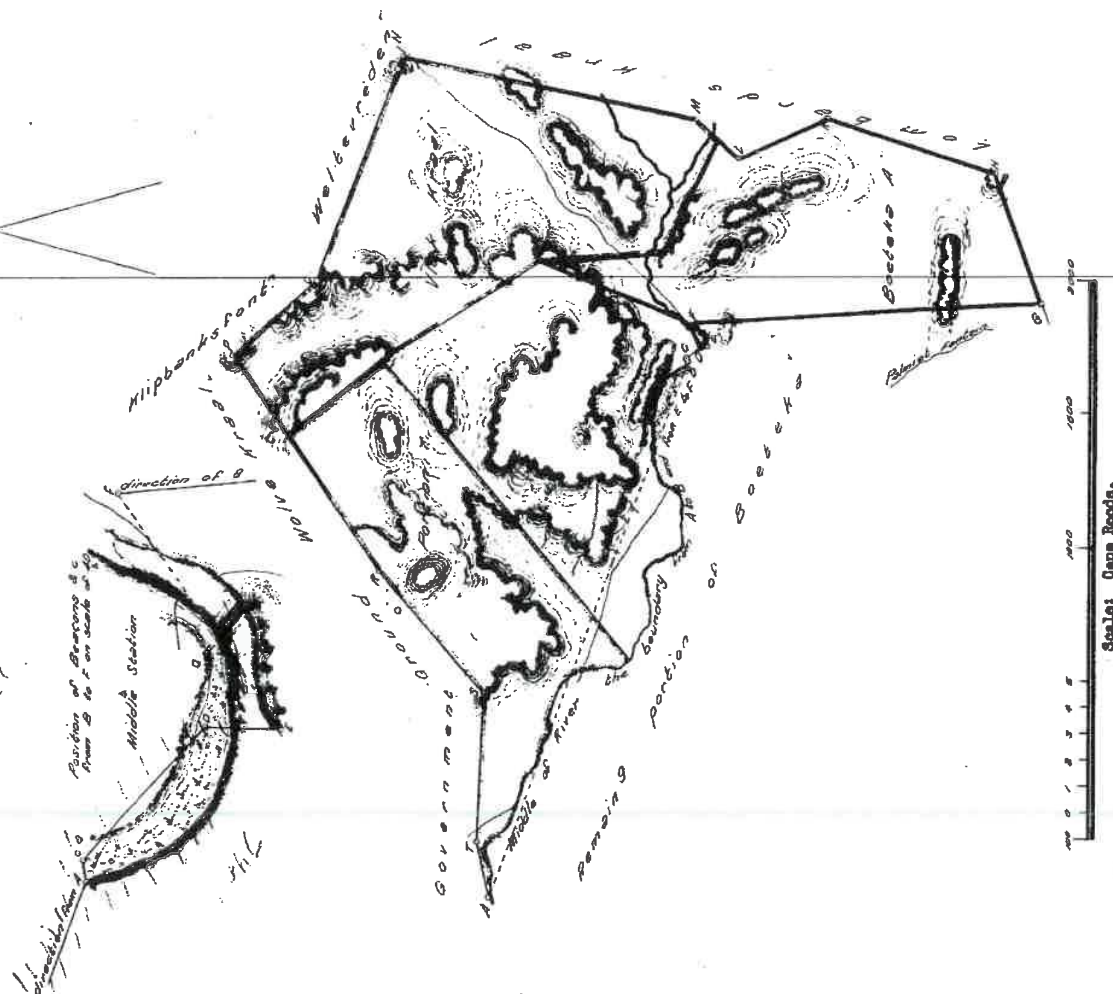
Surveyor-General 15.1.1964

CHECKED 177 DATA CHECKED 1

1982/MP

Sheet 01-3-4-5 & 6, 3D, 58.

C B S





THE FOLLOWING DEDUCTIONS HAVE BEEN MADE FROM THIS DIAGRAM.

Survey Records.	Diag. No.	Subdivision.	Morg.	Ared. Sq. Rds.	Deed.
	549/21	Vlak Kraal	1941	104	20.5.1921-4691
	A2777/26	Boetaka A	1464	30	21.2.1927-1395
E1260/43	4919/43	Portion 7	1250.0000	-	4072-1944

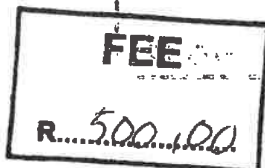
Pm. 2  
 " 5  
 " 7



Nelson Borman en Vennote  
Standard Bank Centre  
2de Vloer  
Oaklaan 304  
Randburg

Opgestel deur my

TRANSPORTBESORGER  
HERTENBERGER R



VAN ENKESSEMENTE KYK BLADSY  
FOR ENDORSEMENTS SEE PAGE

16



T 000107596 / 2004

## TRANSPORTAKTE

HIERBY WORD BEKEND GEMAAK DAT

*Stephanus Cornelius Nell*

voor my verskyn het, REGISTRATEUR VAN AKTES, te KAAPSTAD, hy die  
genoemde komparant synde behoorlik daartoe gemaagt deur in Volmag aan hom  
verleen deur

Die Trustees vir tyd en wyl van MIDAZ TRUST  
Registrasienommer T169/89

DATA / VERIFY

22 NOV 2004

BERGHOFF D

geteken te RANDBURG op 13 SEPTEMBER 2004



BC000070134/2006
GEKANSELLEER CANCELLED
REGISTRATEUR/REGISTRAR
28 AUG 2006

VERBIND MORTGAGED	
VIR FOR R 2 100 000,00	
B000089800/2004	03 NOV 2004
REGISTRATEUR/REGISTRAR	

III	ENDOSSEMENT KRAGTENS ARTIKEL 27 (7) VAN WET 69 VAN 1984	ENDORSEMENT BY VIRTUE OF SECTION 27 (7) OF ACT 69 OF 1984
	BINNEGEMELDE t/mener MAATSKAPPI IS OMSKEP IN 'N BE- SLOTE KORPORASIE-EN STAAN HOU BEKEHD AS	WITHINMENTIONED t/mener COMPANY HAS BEEN CONVERTED INTO A CLOSE CORPORATION AND IS NOW KNOWN AS
Quickstep - 4791 CC		
		NO. 2006/162814/23
BC000070135/2006	REGISTRATEUR/REGISTRAR	

28 AUG 2006

IV	VERBIND MORTGAGED	
	VIR FOR R 3 500 000,00	
B000088148/2006	28 AUG 2006	
REGISTRATEUR/REGISTRAR		REGISTRATEUR/REGISTRAR
		29 OCT 2018

For release see bond

BC00043407/2018

GEKANSELLEER  
CANCELLED

29 OCT 2018

Siem bol. 11 vir verdere eksposisie

6



En genoemde Komparant het verklaar dat sy prinsipaal, op 15 April 2003, waarlik en wettiglik verkoop by Privaat ooreenkoms, en dat hy, in sy voorgenoemde hoedanigheid hierby sedeer en transporteer aan en ten gunste van

**QUICKSTEP 479 (EIENDOMS) BEPERK**  
**Registrasienommer 2003/005861/07**

diese Opvolgers in titel of Regverkrygendes, in volle en vrye eiendom:

1. RESTANT van die plaas LOMBARDS KRAAL NR 330, MUNISIPALITEIT BEAUFORT, WEST, AFDELING VAN BEAUFORT, WEST, PROVINSIE WES KAAP;

GROOT 1242,4928 (EEN DUISEND TWEE HONDERD TWEE EN VEERTIG KOMMA VIER NEGE TWEE AGT) Hektaar

EERS GEREISTREER kragtens Grondbrief gedateer 1 November 1838 (Beaufort West Erfpagte Boekdeel 3 Nr. 3) met 'n vervangingskaart Nr. 5923/56 daaraangeheg, en gehou kragtens Transportakte T17011/1991

- A. ONDERHEWIG aan die voorwaardes waarna verwys word in Transportakte gedateer 7 Maart 1935, No. 1601.

- B. ONDERHEWIG VERDER aan die terme van die endossement gedateer 10 November 1971 op Transportakte Nr 24726/1964 wat as volg lees:

"The following endorsement date 1/12/1965 appears on Deeds Office copy hereof.

Endorsement in terms of Section 31(6) of Act 47 1937 (as amended). A portion of the herein mentioned property measuring +- 1.493 morgen has been expropriated by the Administrator of the Cape in terms of Section 130 Ordinance 15/1952 read with Section 2(3) Ordinance 3/1936. Vide notice of expropriation No R N 17/1003 dated 1/7/1965 filed as exprop. caveat 1255/1965 plans No 14 filed herewith. Deeds Office Cape Town."

- C. ONDERHEWIG VERDER aan die terme van die endossement gedateer 25 April 1988 op Transportakte Nr 24726/1964 wat as volg lees:

"Restant.



Para 2

DIE GROND HIERIN BESKRYWE IS HERNOMMER EN  
THE LAND DESCRIBED HEREIN HAS BEEN RENUM-  
BERED AND MUST IN FUTURE BE DESCRIBED AS:  
Ged. 5 (Ged. 1) (Ged. van Ged. 1) van  
die Ploeg Baetken Nr. 319  
AKTEKANTOOR  
DEEDS REGISTRY  
KAAPSTAD  
CAPE TOWN  
28 AUG 2006 REGISTRATEUR VAN AKTES  
REGISTRAR OF DEEDS

II

Eiendomsbeskrywing in para 4  
GEWYSIG KRAGTENS ART. 4 (1) (b) VAN AMENDED IN TERMS OF SECTION 4 (1)  
WET 47 VAN 1937 OM TE LEES: (b) OF ACT 47 OF 1937 TO READ:  
"gedeelte 9 (Plandfontein)  
(gedeelte van gedeelte 1)  
van die ploeg Lutfontein  
nr. 320  
BC 000078135/2006  
28 AUG 2006 REGISTRATEUR REGISTRAR

GEWYSIG KRAGTENS ART. 4 (1) (b) VAN AMENDED IN TERMS OF SECTION 4 (1)  
WET 47 VAN 1937 OM TE LEES: (b) OF ACT 47 OF 1937 TO READ:  
BC 000078135/2006 REGISTRATEUR REGISTRAR

VOOR VERDERE ENDOSEMENTE SIEH BLADSY 12  
FOR FURTHER ENDORSEMENT SEE PAGE 12



Kragtens Notariële Akte K244/88S, gedateer 30 November 1987:-

Is die binnegemelde eiendom onderhewig aan die reg ten gunste van Eskom om Elektrisiteit daaroor te lei, tesame met bykomende regte, en onderhewig aan voorwaardes soos meer volledig sal blyk uit gesegde Notariële Akte, Aktekantoor Kaapstad."

- D. ONDERHEWIG VERDER aan die terme van die endossement gedateer 6 Desember 1990 op Transportakte Nr 24726/1964 wat as volg lees:

"Restant.

Kragtens Notariële Akte Nr K985/90S is die kraglynroetes ten gunste van Eskom voorbehou in K244/1988S nou omskryf, soos meer volledig sal blyk uit gesegde Notariële Akte. Aktekantoor Kaapstad."

2.

GEDEELTE 5 (gedeelte van Gedeelte 1) van die plaas BOETEKA NR 319, AFDELING VAN BEAUFORT WEST, MUNISIPALITEIT BEAUFORT WEST, PROVINSIE WES KAAP;

GROOT 1254,0056 (EEN DUISEND TWEE HONDERD VIER EN VYFTIG KOMMA NUL NUL VYF SES) Hektaar

EERS OORGEDRA KRAGTENS Transportakte Nr 1395/1927 met 'n kaart daaraan geheg en nou gehou kragtens Transportakte T17011/1991

ONDERHEWIG AAN:

- (1) aan sodanige voorwaardes waarna verwys word in Transportakte Nr 6169 gedateer 3 September 1908.

- (2) ONDERHEWIG AAN en GEREKTIG op die voordele van die volgende spesiale voorwaarde vervat in gemelde Transportakte Nr 1395/1927, nl:-

"(a) Dat Pieter Jacobus Muller en sy opvolgers as eienaar van die restant van die bogemelde plaas BOETEKA, groot volgens restant 2685 morge, 436 vierkante roede, hierdie dag aan hom te worden getranspoteer geregtig sal wees op 'n vrye suiping in die rivier by die woonhuis "homestead" op die kaart van Boeteka A. Hulle is ook geregtig op 'n vrye toegang of trak naar die rivier vir hulself en hul vee oor gesegde Boeteka A vir hierdie doel. Sodanige toegang of trek naar die rivier sal in die kortste en reguitste rigtinge tussen die bākens L en H op die kaart van Boeteka A moet gebruik word.

*Handwritten note:*  
- Muller  
soos  
per  
endossement



BC 408 / 2018 (5)

GEKANSLEER  
CANCELLED

REGISTRATEUR/REGISTRAR

29 OCT 2018

VERBIND MORTGAGED

VIR FOR R 2'500 000.00

B 000025099 / 2013

2013-09-06

REGISTRATEUR/REGISTRAR

For money  
see bond

Para 6

GETRANSPORTEER AAN TRANSFERRED TO

JP Scheepers Familie Trust

RESIDANT/REMAINDER

T 000025460 / 2014

23 MAY 2014

REGISTRATEUR/REGISTRAR

VIR ENDOSSEMENTE KYK BLADSY 13  
FOR ENDORSEMENTS SEE PAGE 13

Para 7+8...

GETRANSPORTEER AAN TRANSFERRED TO

D.J. Malen

RESIDANT/REMAINDER

T 000025461 / 2014

23 MAY 2014

REGISTRATEUR/REGISTRAR

VIR ENDOSSEMENTE KYK BLADSY 13  
FOR ENDORSEMENTS SEE PAGE 13



- (b). Dat al. die tuinwater, waarop die restant van Boeteka soos getranspoteer is onder transportakte gedateer 3de September 1908 No 6169, groot 4329 morge, 466 vierkante roede, geregig mag wees, word in twee dele verdeel, naamlik:- gesegde Stephanus Andries Muller, en sy opvolgers as eienaar van gesegde BOETEKA A sal geregig wees op een helfte en PIETER JACOBUS MULLER eienaar van die restant van Boeteka hierdie dag aan hom worden getranspoteer; sal geregig wees op die ander helfte. Hierdie water kom uit in die rivier op die lyn tussen gesegde Boeteka A en die gesegde restant by die baken H op die kaart van BOETEKA A."

3. GEDEELTE 3 (Hoender Fontein) van die plaas BOETEKA NR 319, AFDELING VAN BEAUFORT WEST, MUNISIPALITEIT BEAUFORT WEST, PROVINSIE WES KAAP;

GROOT 428,2646 (VIER HONDERD AGT EN TWINTIG KOMMA TWEE SES VIER SES) Hektaar

EERS OORGEDRA KRAGTENS Transportakte Nr 2386/1925 met 'n kaart daaraan geheg en gehou kragtens Transportakte T17011/1991.

ONDERHEWIG aan die voorwaardes waarna verwys word in Transportakte No 256, gedateer 27 Januarie 1891.

4. (RESTANT VAN GEDEELTE 9 (Gedeelte van Gedeelte 1 Elandsfontein) VAN DIE PLAAS PUTFONTEIN Nr 320, AFDELING VAN BEAUFORT WEST, MUNISIPALITEIT BEAUFORT WEST, PROVINSIE WES KAAP;

GROOT 436,8350 (VIER HONDERD SES EN DERTIG KOMMA AGT DRIE VYF NUL) Hektaar

EERS OORGEDRA KRAGTENS Transportakte Nr 16117/1956 met kaart Nr 4593/56 daarby aangeheg en gehou kragtens Transportakte T17011/1991

ONDERHEWIG aan die voorwaardes waarna verwys word in Transportakte No 257, gedateer 19 Januarie 1912.

*Differensie per eksposiment bl. 11*



Para 314

GETRANSPORTEER AAN		TRANSFERRED TO	
JP. Schremer Familie Trust			
RESIDANT/REMAINDER			
T000025462/2014			
23 MAY 2014		REGISTRAR/REGISTRAR	

Para Ged. 14 - 277,5206 Hg.

GETRANSPORTEER AAN		TRANSFERRED TO	
D.J. Malan			
RESIDANT/REMAINDER			
T000027822/2016		678/7891 Hg	
18 MAY 2016		REGISTRAR/REGISTRAR	

Para - Remainder

GETRANSPORTEER AAN		TRANSFERRED TO	
Noblesfontein Trust			
RESIDANT/REMAINDER			
49756/2013			
18 MAY 2016		REGISTRAR/REGISTRAR	



5.

RESTANT VAN GEDEELTE 2 (CYFERFONTEIN) VAN DIE PLAAS  
LOMBARDS KRAAL NR 330, MUNISIPALITEIT BEAUFORT WEST,  
AFDELING VAN BEAUFORT WEST, PROVINSIE WES KAAP;

GROOT 956,3097 (NEGE HONDERD SES EN VYFTIG KOMMA DRIE  
NUL NEGE SEWE) Hektaar

EERS OORGEDRA KRAGTTENS Transportakte Nr 1600/1935 met 'n  
kaart Nr 5024/1953 daaraan geheg en nou gehou kragtens Transportakte  
T17011/1991.

A.

ONDERHEWIG aan die voorwaardes waarna verwys word in  
Transportakte gedateer 29 April 1911, Nr 2928.

B.

ONDERHEWIG VERDER aan die terme van die endossement gedateer 1  
Desember 1965 op gemelde Transportakte Nr 20975/1953 wat as volg  
lees:

"'n gedeelte van die eiendom hierin vermeld groot + - 1,758 morges is  
ontien deur die Administrateur van die Kaap kragtens Artikel 130 Ord.  
15/1952 saangelees met Artikel 2(3) Ord. 3/36. Vide  
onteieningskennisgewing No RN17/1003 gedateer 1/7/1965 geliasseer as  
onteienings caveat. Ex 1255/65 planne in tweevoud geliasseer hiermee.  
Aktekantoor Kaapstad."

C.

ONDERHEWIG VERDER aan die terme van die endossement gedateer  
25 April 1988 op gemelde Transportakte Nr 20975/1953 wat as volg lees:

"Kragtens Notariële Akte K244/88S gedateer 30 November 1987:-

Is die binnegemelde eiendom onderhewig aan die reg ten gunste van  
Eskom om elektrisiteit daarvoor te lei, tesame met bykomende regte, en  
onderhewig aan voorwaardes, soos vollediger sal blyk uit gesegde  
Notariële Akte. Aktekantoor Kaapstad."

D.

ONDERHEWIG VERDER aan die terme van die endossement gedateer 6  
Desember 1990 op gemelde Transportakte Nr 20975/1953 wat as volg  
lees:

"Kragtens Notariële Akte Nr K985/90S is die kraglynroetes ten gunste van  
Eskom voorbehou in K244/88S nou omskryf, soos meer volledig sal blyk  
uit gesegde Notariële Akte. Aktekantoor Kaapstad."



GEDEELTE 6 (n Gedeelte van Gedeelte 2) VAN DIE PLAAS LOMBARDS  
KRAAL NR 330, MUNISIPALITEIT BEAUFORT WEST, AFDELING VAN  
BEAUFORT WEST, PROVINSIE WES KAAP;

GROOT 956,3139 (NEGE HONDERD SES EN VYFTIG KOMMA DRIE  
EEN DRIE NEGE) Heklaar;

EERS OORGEDRA KRAGTENS Verdelingstransportakte Nr. 20973/1953  
met kaart Nr 5023/53 daaraan geheg en nou gehou kragtens  
Transportakte T17011/1991.

- A. ONDERHEWIG aan die voorwaardes genoem in Transportakte Nr 2928  
gedateer 29 April 1911.
- B. ONDERHEWIG VERDER aan die onteining, verwysing waarna op 30  
November 1965 endosseer is op Transportakte Nr 20973 gedateer 24  
Desember 1953, naamlik:-

"Endossement kragtens Artikel 31(6) van Wet Nr 47 van 1937 (soos  
gewysig).

"n Gedeelte van die eiendom hierin vermeld + - 0.561 morg is onteien  
deur die Administrateur van die Kaap kragtens Artikel 130 Ordonnansie 15  
van 1952 saamgelees met Artikel 2(3) van Ordonnansie 3 van 1936 vide  
Onteiningskennisgewing Nr RN/17/1002 gedateer 1 Julie 1965  
geliasseer as onteinings caveat 1254/65 planne geliasseer hiermee."

- C. ONDERHEWIG VERDER aan die terme van die endossement gedateer  
25 April 1988 op gemelde Transportakte Nr T12063/1976 wat as volg  
lees:

"Kragtens Notariële Akte K244/88S gedateer 30 November 1987:-

Is die binnegemelde eiendom onderhewig aan die reg ten gunste van  
Eskom om elektrisiteit daaroor te lei, tesame met bykomende regte, en  
onderhewig aan voorwaardes soos vollediger sal blyk uit gesegde  
Notariële Akte. Aktekantoor Kaapstad."

- D. ONDERHEWIG VERDER aan die terme van die endossement gedateer 6  
Desember 1990 op gemelde Transportakte Nr T12063 wat as volg lees:
- 



"Kragtens Notariële Akte Nr K985/90S is die kraglynroetes ten gunste van Eskom voorbehou in K244/1988S nou omskryf, soos meer volledige sal blyk uit gesegde Notariële Akte. Aktekantoor Kaapstad."

GEDEELTE 7 VAN DIE PLAAS LOMBARDS KRAAL 330,  
MUNISIPALITEIT BEAUFORT WEST IN DIE AFDELING VAN  
BEAUFORT WEST, PROVINSIE WES KAAP;

GROOT 1434,5170 (EEN DUISEND VIER HONDERD VIER EN DERTIG  
KOMMA VYF EEN SEWE NUL) Hektaar

AANVANKLIK GETRANSPORTEER kragtens Transportakte Nr  
T17078/1956 met kaart Nr 5922/1956 wat daarop betrekking het en gehou  
kragtens Transportakte Nr T8814/1992.

A. ONDERHEWIG aan die voorwaardes waarna verwys word in  
Transportakte Nr T1601/1935.

B. ONDERHEWIG VERDER aan die endossement gedateer 30 November  
1965 op Transportakte Nr 7184/1965, naamlik:

"ENDOSSEMENT KRAGTENS ARTIKEL 31(6) VAN WET NR 47 VAN  
1937 (soos gewysig).

'n Gedeelte van die eiendom hierinvermeld groot + 4.526 morg is onteien  
deur die Administrateur van Kaap kragtens Art. 130 Ord. 15/195  
saamgelees met Art. 2(3) Ord. 3/1936

Vide onteieningskennisgewing Nr RN 17/829 dd 16/7/65 geliasseer as  
onteienings caveat 1246/65 planne in tweevoud geliasseer hiermee."

C. ONDERHEWIG VERDER aan die minerale voorbehoud ten gunste van  
Marthinus Christoffel van der Westhuizen, gebore 24 Januarie 1904, van  
die regte op alle minerale en metale, edel of onedel, uitsluitende goud,  
silwer en edelgesteentes in, op of onder die eiendom ten opsigte waarvan  
'n Sertifikaat van Minerale Regte Nr K904/1974 RM op die 31ste  
Desember 1974 geregistreer is.

GEDEELTE 8 VAN DIE PLAAS LOMBARDS KRAAL NR 330,  
MUNISIPALITEIT BEAUFORT WEST IN DIE AFDELING BEAUFORT  
WEST, PROVINSIE WES KAAP;



GROOT 192,0271 (EEN HONDERD TWEE EN NEGENTIG KOMMA NUL  
TWEE SEWE EEN) Hektaar

AANVANKLIK GETRANSPORTEER kragtens Transportakte Nr  
T29890/1971 met kaart Nr 4781/70 wat daarop betrekking het en gehou  
kragtens Transportakte T8814/1992

- A. ONDERHEWIG aan die voorwaardes waarna verwys word in  
Transportakte Nr T1601/1935.
- B. ONDERHEWIG VERDER aan die minerale voorbehoud ten gunste van  
Marthinus Christoffel van der Westhuizen, gebore 24 Januarie 1904, van  
die regte op alle minerale en metale, edel of onedel, uitsluitende goud,  
silwer en edelgesteentes in, op of onder die eiendom ten opsigte waarvan  
'n Sertifikaat van Minerale Regte Nr K904/1974 RM op die 31ste  
Desember 1974 geregistreer is.

WESHALWE die komparant afstand doen van al die regte en titel wat die  
genoemde

TRANSPORTGEWERS

voorheen op genoemde eiendom gehad het en gevolglik ook erken dat die  
genoemde

TRANSPORTGEWERS

geheel en al van die besit daarvan onthef en nie meer daartoe geregtig is nie en  
dat, kragtens hierdie akte, bogenoemde

TRANSPORTNEMER





diese opvolgers-in-titel of regverkrygendes tans en voortaan daartoe geregtig is, ooreenkomstig plaaslike gebruik, behoudens die regte van die Staat en ten slotte erken hy dat die koopsom ten bedrae van R2 898 322,00 (Twee Miljoen Agt Honderd Agt en Negentig Duisend Drie Honderd Twee en Twintig Rand) behoorlik betaal of verseker is.

TEN BEWYSE WAARVAN ek, genoemde Registrateur, tesame met die Komparant hierdie Akte onderteken en dit met die ampseël bekragtig het.

EN VERLY in die kantoor van die Registrateur van Aktes te

2004

q.q.

In my teenwoordigheid

REGISTRATEUR VAN AKTES

1

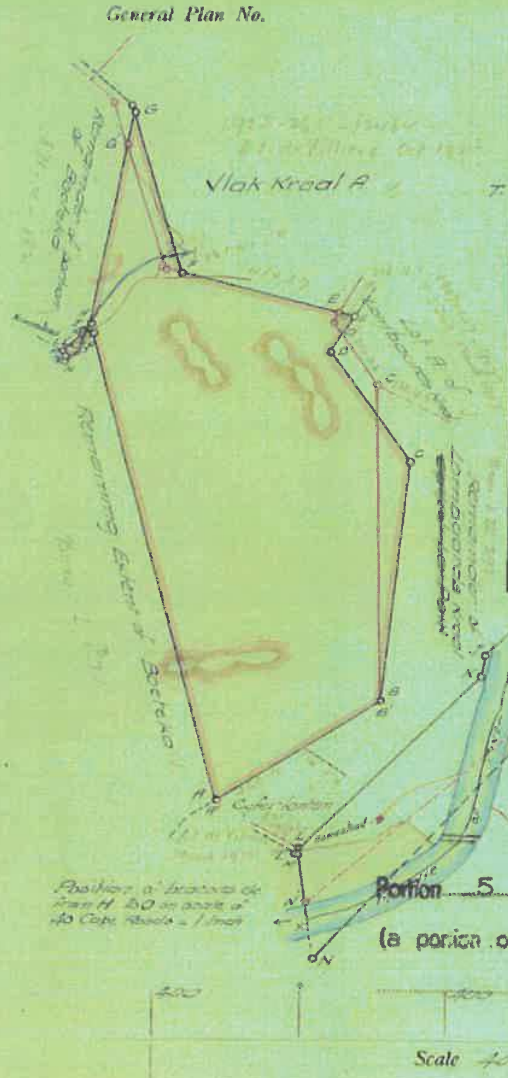


No. 12777, 1926.

Approved

General Plan No.

Surveyor General  
20.9.1926



Data for Transfer			Survey Data	
Angles			ANGLES	SIDES
A	73	25	AB	578.35
B	127	30	BC	870.34
C	139	0	CD	210.29
D	144	43	DE	31.73
E	74	19	EF	454.37
F	238	18	FG	354.87
G	29	4	GH	500.14
H	718	42	HI	29.16
I	150	7	IJ	5.83
J	210	12	JK	08.03
K	75	8	KL	4.91
L	229	43	LN	100.31
M	52	31	NO	326.68
N	301	57	OA	
Sides			CO-ORDINATES	
AB	578.35		A	+2582.69
BC	870.34		B	+3070.96
CD	210.29		C	+3744.26
DE	31.73		D	+3789.92
EF	454.37		E	+3631.08
FG	354.87		F	+3620.81
GH	500.14		G	+3525.30
HI	29.16		H	+3360.43
IJ	5.83		I	+3251.40
JK	08.03		J	+3246.11
KL	4.91		K	+3273.56
LN	100.31		L	+3258.84
NO	326.68		N	+3260.91
OA			O	+3260.91

Real Area = 1392 Morgen 285 Sq. Rds.  
Cur'd Area = 1393 Morgen 0 Sq. Rds.  
L. Ang = 248° 31' 0"

The above figure *ABCEDEFGHIJKLMNOP* represents 1404 Morgen, 30 Square Roads, Square Feet of land, situated in the Division of Beaufort West being portion Boeteka A of that part of the farm Boeteka transferred to W. J. Parker on 17<sup>th</sup> Febry 1871

Bounded as indicated above

Surveyed and beaconed by me according to regulations

*J. J. de la Harpe*  
Government Land Surveyor.  
June 1926

This Diagram belongs to the transfer deed issued this day, in favour of *S. Q. Muller*

21/2/1927 1395

Registrar of Deeds.

S.



A 2777 - 1926.

A. I. de Villiers,  
Government Land Surveyor.

Prince Albert, C.P.

Stuyvesant  
200 Kip Street, Saskatoon  
20th July 1926.

1.

Report on the Survey of "Boetika A" District  
in the Division of Beaufort West.

In doing the survey of Boetika A the following  
beacons of the farm Boetika were pointed out to me  
by the owner of Boetika and by the owners of the  
adjoining farms.

Note sketch  
in pencil  
on next sheet  
A.I.D.V.

A' a cairn of stones 3' 6" in height by 3' 6" in diameter

B & D' corner fence posts.

C' a cairn of stones 3' in height by 3' in diameter

E' a flat stone 18" in width by 4", planted firmly in the ground  
and projecting 2' above the ground.

F' and the beacons at the extremity of the line F' G'  
produced are cairns of stones 4' in diameter by 5' in height.

J' a stone planted firmly in the ground and projecting  
2' above the ground.

L' a stone planted firmly in the ground and projecting  
18" above the ground.

N' a stamp of a corner post planted firmly in the  
ground and projecting 18" above the ground.

O' a slab of stone planted firmly in the ground and  
projecting 6 feet above the ground.







Meter	HOEKE	Y	Stelsel Lo 23° X	
	Konstante	±	0,00	+3 500 000,00
AB	32 858,39	358 06 09	A	+ 43 362,08
			B	+ 42 274,02
CD	9 827,18	5 04 56	C	+ 41 232,78
			D	+ 42 103,33
	(50) Lombardskraal	▲		+ 41 538,17
	(42) Kuilsrand	▲		+ 39 736,71
				+ 96 722,07
				+ 129 562,44
				+ 95 538,00
				+ 105 326,54
				+ 93 127,25
				+ 105 053,59

089-89

Goedgekeur

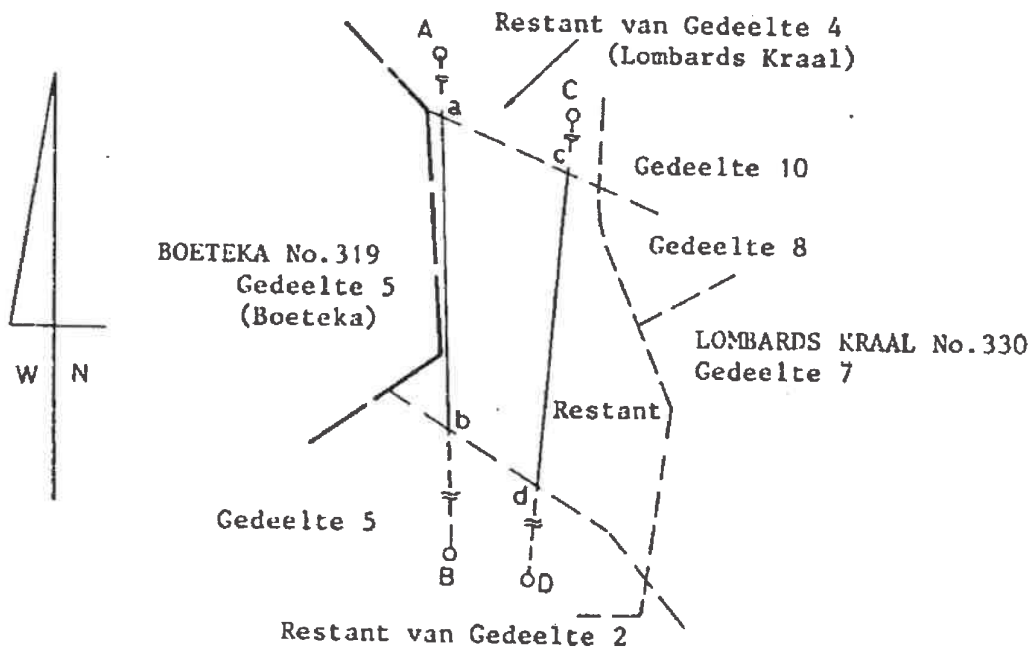
*Ambr*  
nms. Landmeter-  
generaal  
1989-11-14

### Bakenbeskrywing

A,B ... 20mm Ysterpen en klipstapel in basis van kragtoring.

C,D ... 25mm Ysterpen en klipstapel by middelpunt tussen twee hout kraglynpale, 7,6 meter van mekaar.

Die omvang en wydte van die Serwitute is 23,5 meters aan albei kante van die lyn ab en 15,5 meters aan albei kante van die lyn cd.



Skaal:- 1 : 100 000

Die lyne ab en cd

stel voor die hartlyne van Serwitute van Elektriese Kragleidings oor

Restant van die plaas  
LOMBARDS KRAAL No. 330

geleë in die Administratiewe Distrik Beaufort West Provinsie KAAP DIE GOFIE HOOP  
Opgemeet in Julie 1988 deur my

*A.W. Reynolds*  
A.W. Reynolds  
Landmeter

Hierdie kaart is geheg aan	Die oorspronklike Kaart is	Lêer BFT.W.MF
Akte van Serwituut No.	No. 5923/1956	M.S. No. E1652/89
gedateer t.g.v.	Transport/Grondbrief	Komp. No.
EVKOM	No. Bf.WQ 3.3	CL-6(4590)
Registrateur van Aktes		Alg. Plan



**CANCELLED**  
 Reminder of  
 This diagram  
 Vide Diagram. 5923/1956 (Bf. N.O. 3-3)  
 F. E. 810459  
 Farm 330  
 (Inda.) P. A. J. V. A. H. A.  
 FOR SURVEYOR-GENERAL  
 3.12.1956  
 330/6, 330/7

**THE FARM Lombard's Kraal... No. 330**

25A FORI-WEST

The annexed Diagram from A. to P. represents the Place called Lombard's kraal situated in the Field Cornetcy of J.G. Mooké Gough and District of Beaufort, contains 14013 Morgens and is

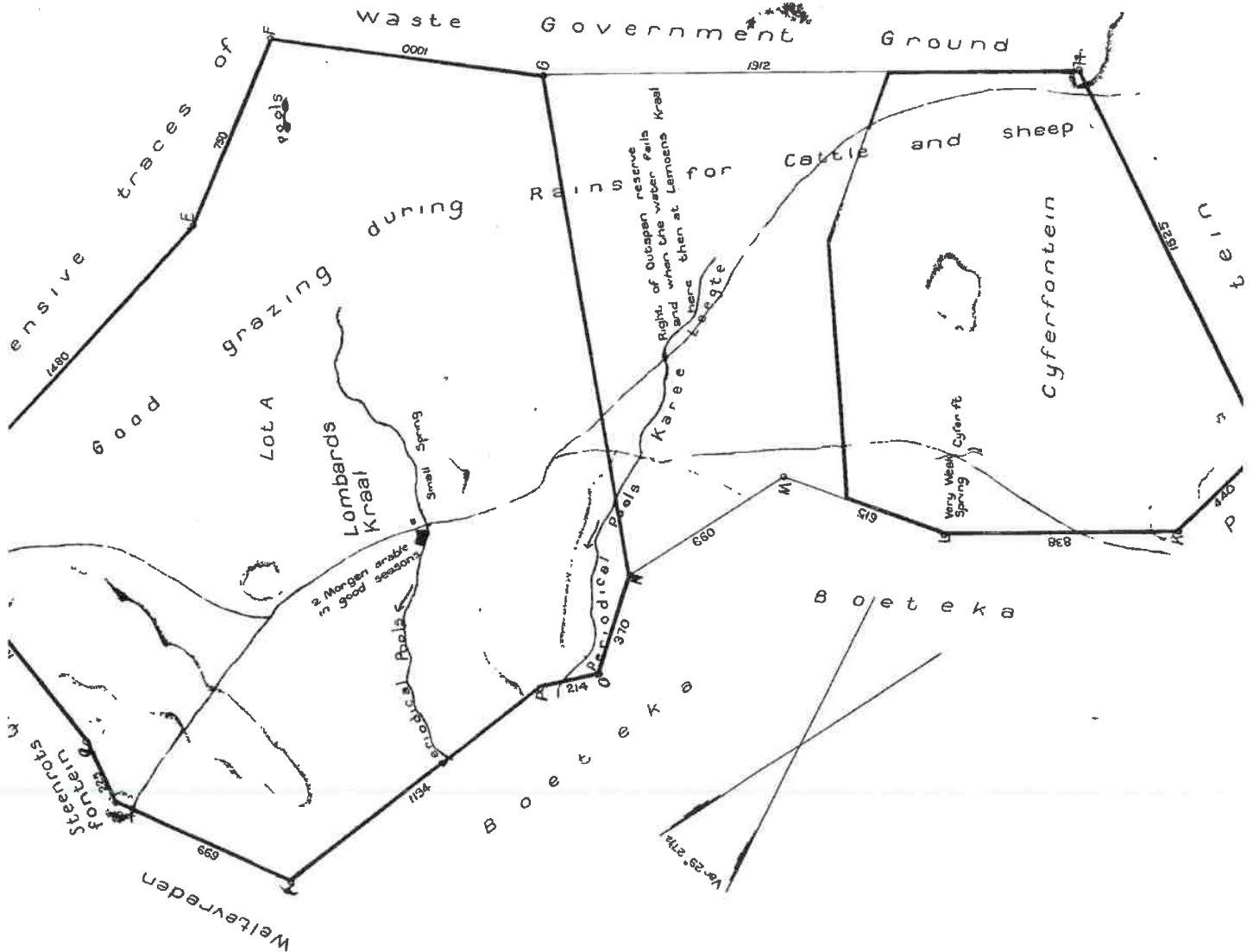
bounded N. by Steenrots fontein  
 N.N.E. " Quagga fontein  
 E. " extensive tracts of waste Government ground  
 S. " Putfontein  
 W. " Bosteka  
 and N.W. " Weltevreden

Measured December, 1830 by me, for Fredrik Simon Mooké  
 (Sgd.) G.G. Oobse, N

Repted from diagram relating  
 to Title Bf. N.O. 3-3  
 dated 1.11.1838  
 for Surveyor-General

Sheet 01-6

For list of  
 deductions see  
 back of diagram





THE FOLLOWING DEDUCTIONS HAVE BEEN MADE FROM THIS DIAGRAM.

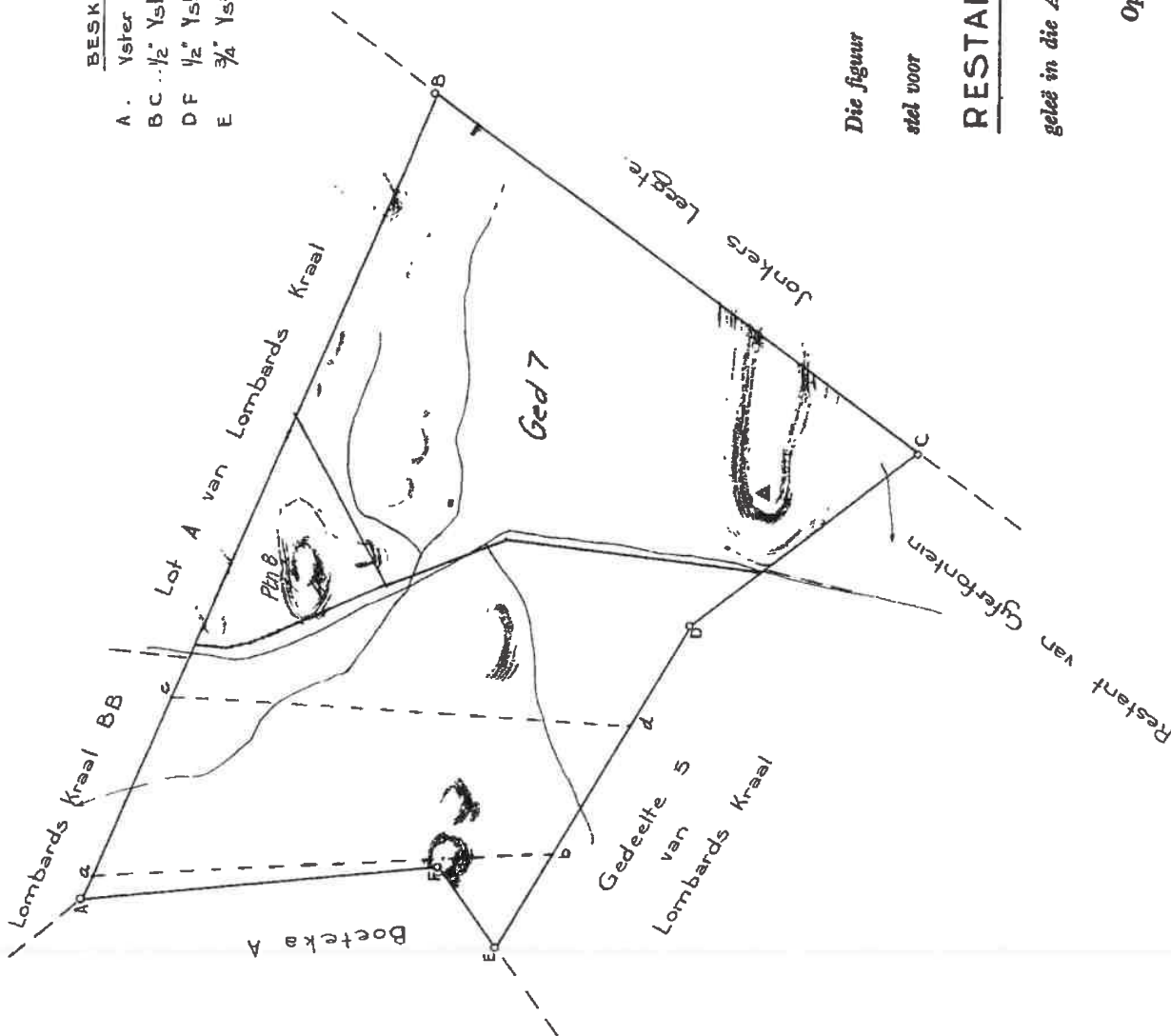
	Curvey Records.	Diag. No.	Subdivision	Area.		Deed.
				Morgen	Sq. Rds.	
Pm 1			<del>Lot A</del>	8047	400	1907-137-9077
" 2		A787/26	Cyferfontein	3317		1935-31-1600 ✓



DE	1140	3	121	0035	D	+300575	+375793	✓	W.S. Solihly
EF	2855	6	235	0440	E	+396455	+318358	✓	
FA	10453	4	175	5229	F	+373041	+302051	✓	Landmeter-Generaal.
					Kultstrand	A	+262062	+358662	22.8 1956

# BESKRYWING VAN BAKENS

- A. Yster hoekpaal in klipstapel ✓
- BC  $\frac{1}{2}$ " Ysterpen teenaan yster hoekpaal in klipstapel. ✓
- DF  $\frac{1}{2}$ " Ysterpen teenaan hout hoekpaal in klipstapel ✓
- E  $\frac{3}{4}$ " Ysterpen teenaan hout hoekpaal in klipstapel. ✓



Rem of THE LOMBARDS KRAAL Nr 330 ...

in ...

Skaal 1:50000

Die figuur ABCDEF

stel voor 3349 5968 Morg. grond, synde

## RESTANT van die plaas LOMBARDS KRAAL

geleë in die Afdeling Beaufort-Wes Provinsie Kaap die Goeie Hoop

Opgeneem in

Junie 1956

deur my

W. S. Solihly

Landmeter.

Hierdie kaart is

Die oorspronklike kaart se  
wat hierop vervolg word is  
Nr 330/1956

Leër No.

1184-79

15 0 17 2

1 0 3 156



The following deductions have been made:

Survey Records	Diag. No.	Sub-division	Area	Tras. No.
1242, 4928				
E/289/56	5922/56	Ged. 7	1674.7967	
E/214/70	4781/70	Portion 8	192.0271	
				17078/1956
				2989/71

SERVITUDES/LFASEHOLD AREAS				
SURVEY RECORD	DIAGRAM NO.	DESCRIPTION	DEED	INITIALED
E/652/89	8089/89	The lines ab and cd represents the centre lines of E.P.L. servitudes 47m and 31m wide resp		



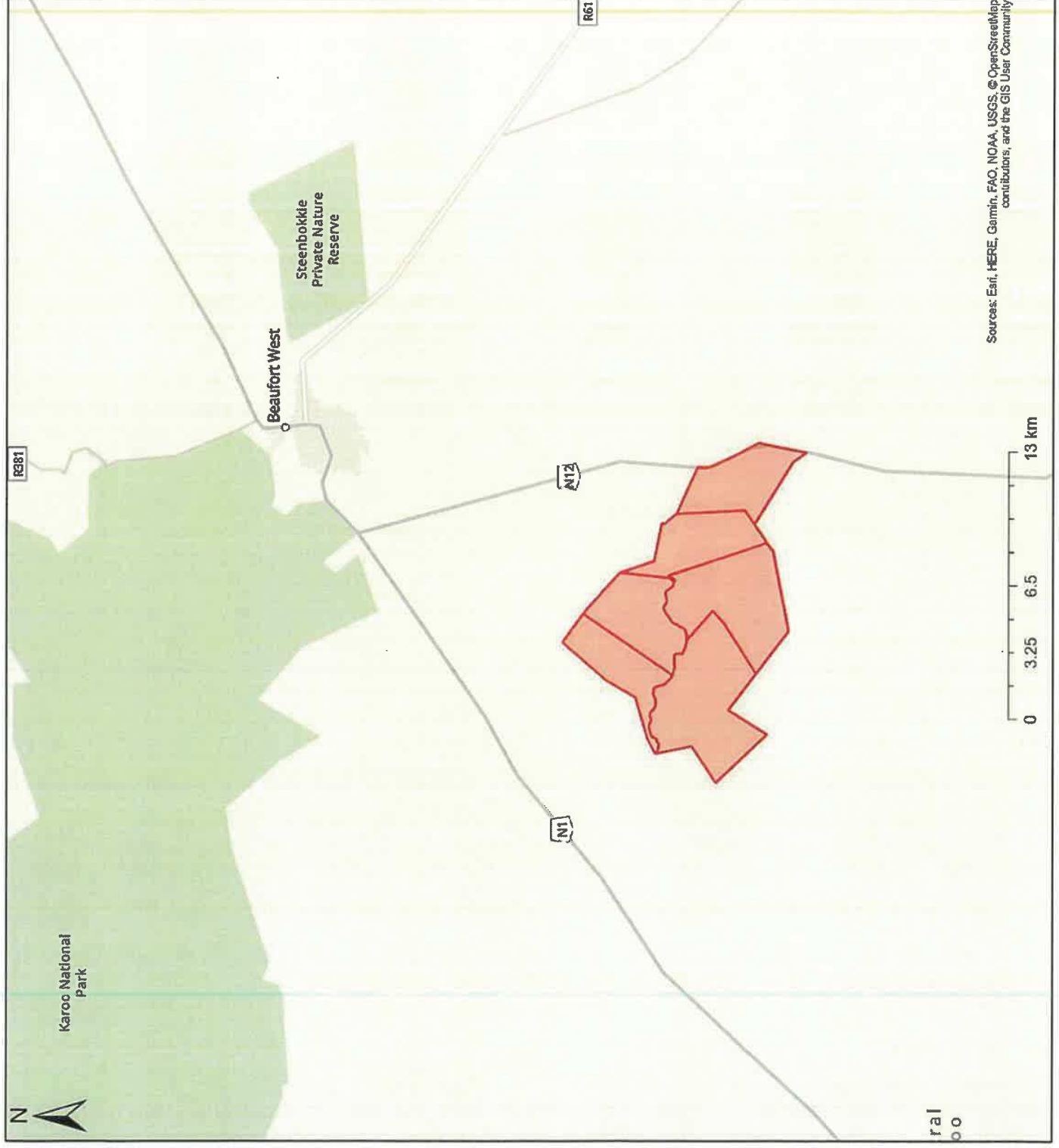
## ANNEXURE D | LOCALITY MAP





# Locality: Jessa Cluster, Beaufort West

## Legend



Map Center: Lon: 22°30'31.4"E  
Lat: 32°27'6.1"S

Scale: 1:300 000

Date created: June 17, 2022



Western Cape  
Government

FOR YOU

Agriculture



## ANNEXURE E | SITE DEVELOPMENT PLAN

\_\_\_\_\_

\_\_\_\_\_



**Jessa M Wind Energy Facility Site Development Plan**

**Jessa M Indicative Turbines and Boundary Points Coordinates**

WTG ID	X Coordinate	Y Coordinate	Point	X Coordinate	Y Coordinate
01	-32.549762°	22.463025°	A	-32.535368°	22.480278°
02	-32.543677°	22.474300°	B	-32.549467°	22.454188°
03	-32.540320°	22.480570°	C	-32.563706°	22.476198°
04	-32.548824°	22.473819°	D	-32.556797°	22.518042°
05	-32.554026°	22.469399°	E	-32.571307°	22.568538°
06	-32.558857°	22.480427°	F	-32.550472°	22.573513°
07	-32.554395°	22.480247°	G	-32.523883°	22.561111°
08	-32.548422°	22.485698°	H	-32.514712°	22.536849°
09	-32.539162°	22.493095°			
10	-32.552662°	22.489506°			
11	-32.557365°	22.489168°			
12	-32.555592°	22.49448°			
13	-32.550173°	22.497004°			
14	-32.544267°	22.498365°			
15	-32.553815°	22.510026°			
16	-32.538879°	22.505453°			
17	-32.542058°	22.517134°			
18	-32.549670°	22.570904°			
19	-32.545431°	22.52836°			
20	-32.537011°	22.52022°			
21	-32.540797°	22.529635°			
22	-32.525564°	22.54946°			
23	-32.534270°	22.549244°			
24	-32.540160°	22.550005°			
25	-32.544788°	22.550670°			
26	-32.550696°	22.549509°			
27	-32.548030°	22.558340°			
28	-32.553433°	22.559765°			
29	-32.558831°	22.560114°			

WTG ID	X Coordinate	Y Coordinate	Point	X Coordinate	Y Coordinate
01	-32.549762°	22.463025°	A	-32.535368°	22.480278°
02	-32.543677°	22.474300°	B	-32.549467°	22.454188°
03	-32.540320°	22.480570°	C	-32.563706°	22.476198°
04	-32.548824°	22.473819°	D	-32.556797°	22.518042°
05	-32.554026°	22.469399°	E	-32.571307°	22.568538°
06	-32.558857°	22.480427°	F	-32.550472°	22.573513°
07	-32.554395°	22.480247°	G	-32.523835°	22.561111°
08	-32.548422°	22.485698°	H	-32.544712°	22.536849°

WTG ID	X Coordinate	Y Coordinate
01	-32.549762°	22.463025°
02	-32.53677°	22.474300°
03	-32.540320°	22.480570°
04	-32.548824°	22.473819°
05	-32.554026°	22.469399°
06	-32.558857°	22.480427°
07	-32.554395°	22.480247°
08	-32.548422°	22.485698°
09	-32.539162°	22.483095°
10	-32.525622°	22.489506°
11	-32.557365°	22.489168°
12	-32.555592°	22.495448°
13	-32.550173°	22.497004°
14	-32.542627°	22.498365°
15	-32.553815°	22.510026°
16	-32.538879°	22.505453°
17	-32.542058°	22.517134°
18	-32.54670°	22.520904°
19	-32.545431°	22.523836°
20	-32.537011°	22.527022°
21	-32.540797°	22.529635°
22	-32.525564°	22.549446°
23	-32.534270°	22.549244°
24	-32.540160°	22.550005°
25	-32.544788°	22.550670°
26	-32.550696°	22.549909°
27	-32.548030°	22.558340°
28	-32.553433°	22.559765°
29	-32.558831°	22.560114°

◎ Indicative Turbine Location  
 Wind Energy Facility

Proposed Internal Road and Cable Network

### Farm Portions

Wind Energy Facility

### Farm Portions

**Legend**

- ⊙ Indicative Turbine Location
- Proposed Internal Road and Cable Network
- Wind Energy Facility
- Farm Portions

**Contact Information:**  
(e) [info@enertrag.co.za](mailto:info@enertrag.co.za)  
(t) +27 21 207 2181

Project Name  
Jessa M Wind

## General Information

Revision: None  
Date: N/A

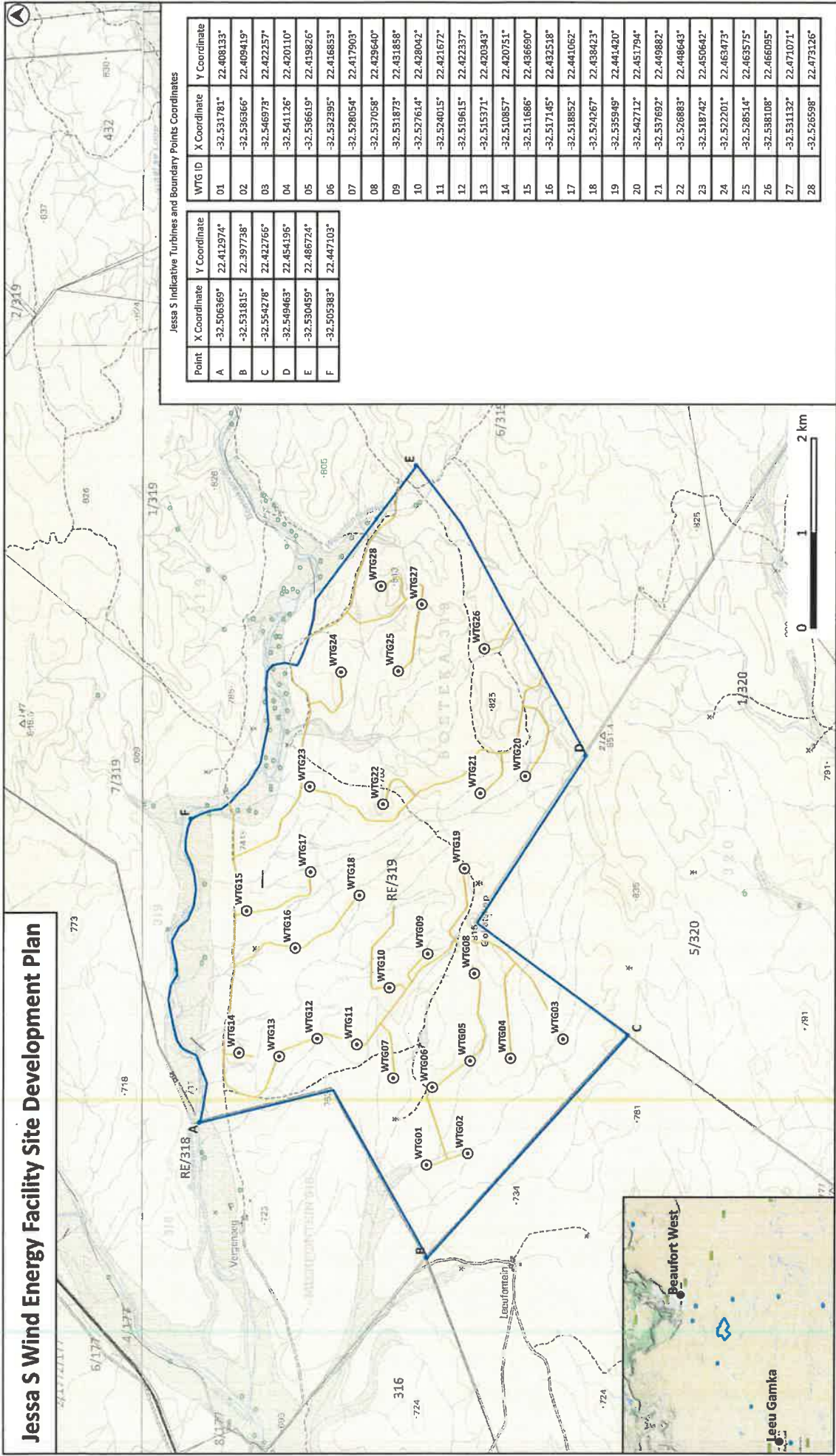
Purpose	
Reasoning	

**Drawing Name**  
**Jessa M SDP Map**

Drawing Size

## General Information





Jessa S Indicative Turbines and Boundary Points Coordinates

Point	X Coordinate	Y Coordinate	WTG ID	X Coordinate	Y Coordinate
A	-32.506369°	22.412974°	01	-32.531781°	22.408133°
B	-32.531815°	22.397738°	02	-32.536366°	22.409419°
C	-32.554278°	22.422766°	03	-32.546979°	22.422257°
D	-32.549463°	22.454196°	04	-32.541126°	22.420110°
E	-32.530459°	22.486724°	05	-32.536619°	22.419826°
F	-32.505383°	22.447103°	06	-32.532395°	22.416853°
			07	-32.528054°	22.417903°
			08	-32.537058°	22.429640°
			09	-32.531873°	22.431858°
			10	-32.527614°	22.428042°
			11	-32.524015°	22.421672°
			12	-32.519615°	22.422337°
			13	-32.515371°	22.420343°
			14	-32.510857°	22.420751°
			15	-32.511686°	22.436690°
			16	-32.517145°	22.432518°
			17	-32.518852°	22.441062°
			18	-32.524267°	22.438423°
			19	-32.535949°	22.441420°
			20	-32.542712°	22.451794°
			21	-32.537692°	22.449882°
			22	-32.526883°	22.448643°
			23	-32.518742°	22.450642°
			24	-32.522201°	22.463473°
			25	-32.528514°	22.463575°
			26	-32.538108°	22.466095°
			27	-32.531132°	22.471071°
			28	-32.526598°	22.472126°

Legend

Indicative Turbine Location

Proposed Internal Road and Cable Network

Wind Energy Facility

Farm Portions

Created by: Thembinkosi Mduba  
Date: 12.05.2022

Checked by: Natalia Damba  
Date: 12.05.2022

Revision: None  
Date: N/A

Purpose  
Rezoning Application

Scale  
1:40 000

Contact Information:  
(e) info@enertrag.co.za  
(t) +27 21 207 2181  
ENERTRAG South Africa  
Suite 104 | Albion Springs | 183 Main Road

Project Name  
Jessa S Wind Energy Facility

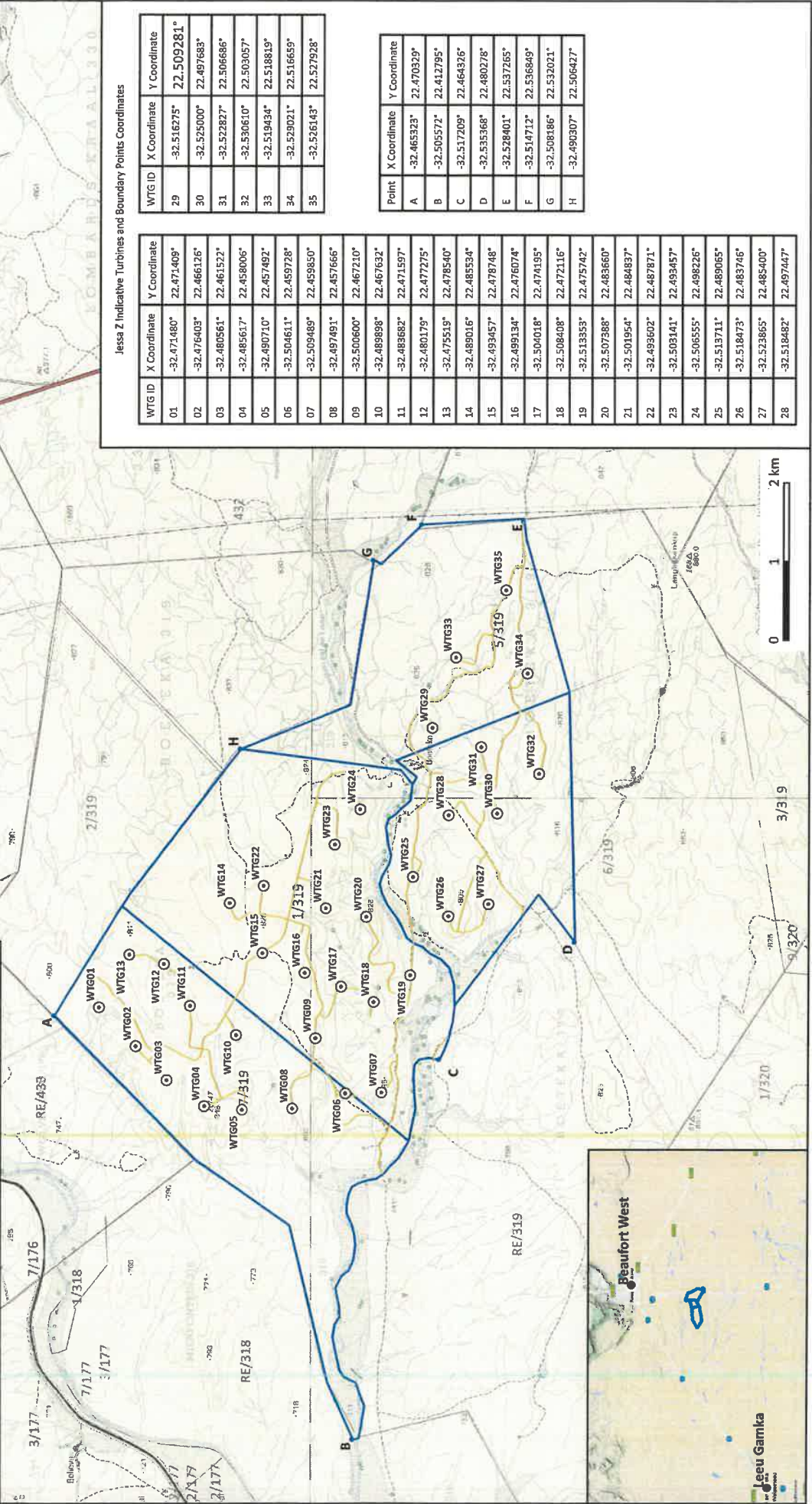
Drawing Name  
Jessa S SDP Map

Drawing Size  
A4

General Information



# Jessa Z Wind Energy Facility Site Development Plan



Jessa Z Indicative Turbines and Boundary Points Coordinates

WTG ID	X Coordinate	Y Coordinate
01	-32.471480°	22.471409°
02	-32.476403°	22.466126°
03	-32.480561°	22.461522°
04	-32.485617°	22.458006°
05	-32.490710°	22.457492°
06	-32.504611°	22.459728°
07	-32.509489°	22.459850°
08	-32.497491°	22.457666°
09	-32.500600°	22.467210°
10	-32.489898°	22.467632°
11	-32.483682°	22.471597°
12	-32.480179°	22.477275°
13	-32.475519°	22.478540°
14	-32.489016°	22.485534°
15	-32.493457°	22.478748°
16	-32.499134°	22.476074°
17	-32.504018°	22.474195°
18	-32.508408°	22.477116°
19	-32.513353°	22.475742°
20	-32.507388°	22.483660°
21	-32.501954°	22.484837°
22	-32.493602°	22.487871°
23	-32.503141°	22.493457°
24	-32.506555°	22.498226°
25	-32.513711°	22.489065°
26	-32.518473°	22.483746°
27	-32.523865°	22.485400°
28	-32.518482°	22.497447°

Point	X Coordinate	Y Coordinate
A	-32.465323°	22.470329°
B	-32.505572°	22.412795°
C	-32.517209°	22.464326°
D	-32.535368°	22.480278°
E	-32.528401°	22.537265°
F	-32.514712°	22.536849°
G	-32.508186°	22.532021°
H	-32.490307°	22.506427°

Legend

Indicative Turbine Location

Proposed Internal Road and Cable Network

Wind Energy Facility

Farm Portions

Created by: Thembinkosi Mduba  
Date: 12.05.2022

Checked by: Natalia Damba  
Date: 12.05.2022

Revision: None  
Date: N/A

Purpose  
Rezoning Application

Scale  
1:50 000

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Project Name  
Jessa Z Wind Energy Facility

Drawing Name  
Jessa Z SDP Map

Drawing Size  
A4

General Information



## **ANNEXURE F |** TRAFFIC IMPACT ASSESSMENT



# **ENERTRAG**

## **JESSA WIND ENERGY FACILITIES**

### **TRAFFIC IMPACT ASSESSMENT**



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Basic Assessment Report (Rev 0) – 15<sup>th</sup> February 2022



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### **Document Control**

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<i>Rev 0</i>	<i>15<sup>th</sup> Feb 2022</i>	<i>Issued to Client for use</i>	<i>Athol Schwarz</i>

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# 1 EXECUTIVE SUMMARY

---

*ENERTRAG South Africa (Pty) Ltd (hereafter referred to as 'ESA') proposes developing three Wind Farms and associated Grid Connection southwest of Beaufort West within the Central Karoo District Municipality of the Western Cape Province. The proposed wind farms are the Jessa M Wind Farm, the Jessa S Wind Farm and the Jessa Z Wind Farm, collectively referred to as the Jessa Wind Farm Cluster.*

*A combined Traffic Impact Assessment for the Jessa Wind Farm Cluster hereafter referred to as the 'proposed development', is provided as part of the Environmental Impact Assessment process. This Traffic Impact Assessment is based on the latest available information for each of the Wind Farms, within the cluster will consist of up to a maximum of 35 wind turbine generator units per wind farm, with a maximum generating capacity in the order of 220 MW, which will be finalised once the turbine supplier has been appointed.*

*In line with the relevant guidelines, Mr A. Schwarz undertook a Traffic Impact Assessment to establish the proposed development's impact on the existing road network for the construction, operation, and decommissioning phases of the projects. A site visit was conducted during September 2021*

*Numerous renewable energy projects are earmarked for development in the adjacent area to the proposed Jessa Wind Farm Cluster. The proposed road network used to commute personnel and transportation of equipment and material, including abnormal loads, to the proposed developments are well-established.*

*Traffic generation estimates used in this assessment are based on information provided by ESA and the experience of similar projects. The worst-case scenario for the cumulative impact has been adopted, which assumes all three Jessa Wind Farms and a Wind Farm (hereafter referred to as 'Wind Farm X') are constructed simultaneously over a period of two years. The most significant increase in traffic will result from the daily commuting of personnel to and from the proposed development. The projected increase in cumulative traffic on the TR03305 exceeds 50 vehicles per hour, the threshold stipulated in the South African Traffic Impact and Site Traffic Assessment Manual (2012).*

*There will be a notable increase in traffic volumes on the road network during the construction phase of the proposed developments and less conspicuous during the operational phase. This report has assessed the cumulative impact of the additional traffic on the surrounding road network and found that the level of servers on these roads is acceptable (LOS B). The increase in traffic volumes will lead to more significant wear and tear, especially during the construction phase of the proposed developments, but will not have an undue detrimental impact on the structural integrity of the roads within the study area. Due to budgetary constraints within various spheres of government, only minor maintenance is undertaken on the road network. To this end, it is strongly suggested that the developer contributes towards the ongoing maintenance of the road network associated with the various phases of the proposed developments.*

*With the approval of the relevant road authorities, the developer will have to provide a new entrance to the Jessa Wind Farm Cluster from the TR03305. The roads designer shall determine the best position for this entrance, taking into account all the relevant geometric constraints and safety aspects, including sighting and stopping distances.*



*It should be noted that it is not possible to determine the expected traffic volumes generated during the decommissioning phase. It can be assumed that these volumes will be lower than during the construction phase as much of the infrastructure will be retained by the landowners. As part of the decommissioning process, a separate traffic impact assessment should be undertaken since many of the characteristics related to the traffic impact assessment, i.e. access routes, road geometry, traffic volumes, etc., would have changed over the operational life of the development.*

*A range of management and mitigation strategies are identified for implementation during the construction and operation phases of the development to minimise traffic impacts, reduce community disruption and the risk of traffic incidents.*

*Thus, from a traffic and transportation perspective, there are no constraints or notable impacts that would jeopardise the implementation of this development.*

## 2 PROJECT SPECIFICATIONS

*A synopsis of the project specification for Jessa Wind Farm Cluster, as supplied by ESA, is provided in Table 1.*

*Table 1 - Synopsis of Project Specifications*

<b>Project Components Description</b>	<b>Specifications</b>	<b>Estimated Combined Footprint (ha)</b>
<i>Project</i>	<i>Jessa Wind Farm Cluster – consisting of Jessa M Wind Farm, the Jessa S Wind Farm and the Jessa Z Wind Farm</i>	
<i>Location</i>	<i>The proposed development is approximately 15 km southwest of Beaufort West within the Central Karoo District Municipality in the Western Cape Province.</i>	
<i>Land Use</i>	<i>Land use of the proposed development and surrounding properties comprises low-density livestock farming (grazing).</i>	
<i>Number of turbines</i>	<i>The number of WTG for each WEF is as follows</i> <ul style="list-style-type: none"> <li><i>Jessa M WEF = up to 29 ;</i></li> <li><i>Jessa S WEF = up to 28 and</i></li> <li><i>Jessa Z WEF = up to 35</i></li> </ul>	
<i>Capacity of the facility</i>	<i>The maximum export capacity (MW) for each WEF is as follows:</i> <ul style="list-style-type: none"> <li><i>Jessa M WEF: 220MW</i></li> <li><i>Jessa Z WEF: 220MW</i></li> <li><i>Jessa S WEF: 203.5MW</i></li> </ul>	
<i>Turbine hub height</i>	<i>The expected hub height will be in the order of 200m for all three WEFs</i>	
<i>Turbine rotor diameter</i>	<i>The rotor diameter for all three WEFs is up to 200m</i>	
<i>Tower-type</i>	<i>Steel or concrete towers (or hybrid) can be utilised at the site. Alternatively, the towers can be of a hybrid nature, comprising concrete towers with top steel sections</i>	
<i>Foundation</i>	<i>Approximately 25m diameter x 3m deep. However, these dimensions may be larger as required by the geotechnical conditions, which are still to be confirmed</i>	
<i>Hard stand/s</i>	<i>Comprising blade storage area, rotor hub laydown area as well as other turbine materials/component laydown areas and crane pad for primary and assistance crane (as required).</i>	<i>60 ha</i>
<i>Operations and Maintenance (O&amp;M) building footprint:</i>	<i>Each WEF will include O&amp;M buildings, to be located in close proximity to each project onsite substation. The total combined area of the buildings will not exceed 5000m<sup>2</sup>.</i>	<i>0.5 ha</i>
<i>Construction camp laydown</i>	<i>Each WEF will include a construction camp with alternative locations for each project. Typical area: 100m x 50m = 5000m<sup>2</sup>. The camps will use portable toilets and septic tanks during the</i>	



<b>Project Components Description</b>	<b>Specifications</b>	<b>Estimated Combined Footprint (ha)</b>
	construction phase.	
Cables	The medium voltage collector system will comprise cables that run underground, except where a technical assessment suggests that overhead lines are required.	
Temporary laydown or staging area	Each WEF will include a laydown area. Approximately 22000m <sup>2</sup> . Laydown area could increase to 30000m <sup>2</sup> for concrete towers, should they be required. Possible concrete batching plant at each WEF.	
Cement batching plant (temporary)	A temporary cement batching plant will be placed on site during the construction phase Course and fine aggregate will be stored in separate storage areas whilst the cement will be contained in a silo	
On-site substation	Each WEF will have an onsite substation of 33/132kV, including a transformer. Palisade fencing of 3m height will be placed around the substation complex encompassing the onsite buildings, as per Eskom's specifications.	3 ha
Masts (if applicable)	The overall project site has existing MET masts.	
Boreholes and storage tanks (if applicable)	The use of onsite boreholes, as far as technically possible, if water quality standards are met. To be decided upon with the landowner. Storage tanks Other water source alternatives will be considered, including water supply from the local Municipality or bulk water supplier in the region Temporary water containment tanks (i.e., Jojo tanks) may be used during the construction phase for water supply, whilst permanent tanks may be placed above the O&M buildings	
BESS	It is proposed that Lithium Battery Technologies (such as Lithium-Ion Phosphate and Lithium Nickel Manganese Cobalt oxides) or Vanadium Redox flow technologies will be considered as the preferred battery technology. The specific technology will however be determined when the contractor is appointed. The systems will have capacities of up to 200MW/800MWh.	10 ha
Procurement and employment (construction phase)	The construction phase of each of the WEF will take approximately 24 months to complete. Each WEF is likely to create employment opportunities for approximately 250 individuals. These employment opportunities will be temporary and will use local labour where possible. Employment opportunities generated during the construction phase will include low skilled, semi-skilled, and skilled options.	
Procurement and employment (operational phase)	The operational phase of each WEF will be in the order of 25 years The operation phase will create up to 40 full-time employment positions which will include low-skilled, semi-skilled and skilled personnel. Employees that can be sourced from the local municipal area include the less skilled and semi-skilled personnel (such as safety and security staff and certain maintenance crew). Highly skilled personnel may need to be recruited from outside the local area where these resources are not available within the area.	
Operation and Maintenance	Full time security, maintenance, and control room staff. All turbines will be operational except under circumstances of mechanical breakdown, inclement weather conditions, curtailment requirements or maintenance activities. Wind turbines to be subject to periodic maintenance and inspection. Areas that were disturbed during the construction phase to be utilised should a laydown area be required during operation.	



### 3 ABBREVIATIONS

The following abbreviations apply to this document.

Table 2 - List of Abbreviations

Abbreviation	Meaning
AADT	Average Annual Daily Traffic
ADT	Average Daily Traffic
BESS	Battery Energy Storage System
DEA	Department of Environmental Affairs
EIA	Environmental Impact Assessment
EPCM	Engineering, Procurement, Construction and Management
ESA	ENERTRAG South Africa (Pty) Ltd
IAP	Interested and Affected Parties
km/h	Kilometre per hour
LOS	Level of Service
MW	Megawatt
NEMA	National Environmental Management Act
O&M	Operation and Maintenance
PDP	Professional Driving Permit
RCAM	Road Classification Assit Management system
RNIS	Road Network Information System
SANRAL	South African National Roads Agency SOC Ltd
TMP	Traffic Management Plan
vph	Vehicle per hour
v/km	Vehicle per kilometre
WEF	Wind Energy Facility
WTG	Wind Turbine Generator

### 4 GLOSSARY

The following definitions apply to these words.

Table 3 - Definitions

Word/Phrase	Definitions
Average Annual Daily Traffic	An Average Annual Daily Traffic is the total traffic volume (in both directions) generated in a year, including school and public holidays and weekends, divided by the number of days in the year.
Average Daily Traffic	An Average Daily Traffic is the total traffic (in both directions) generated in a twenty-four-hour period on a typical working weekday.
Diurnal	Diurnal means happening or active during the daytime.
Follower density	Follower density is defined as the number of vehicles per kilometre per lane
Level of Service	The level of service in this document is based on the follower density and expressed as LOS A to LOS F.
Peak Traffic	traffic at the time it is most busy.
Traffic Volume	Traffic Volume is the number of vehicles passing a specific point in a given time, expressed in vehicles per hour.
Trip	A Trip is defined as a single (one-directional) movement of vehicles, with either the destination or the origin at the proposed development.



## 5 INTRODUCTION

### 5.1 TERMS OF REFERENCE

ESA appointed Mr A. Schwarz, to provide a Traffic Impact Assessment (TIA) for the proposed development within the Central Karoo Municipality District of the Western Cape. The properties on which the Jessa Wind Farm Cluster is to be developed, together with the adjacent properties, are shown in Figure 1.

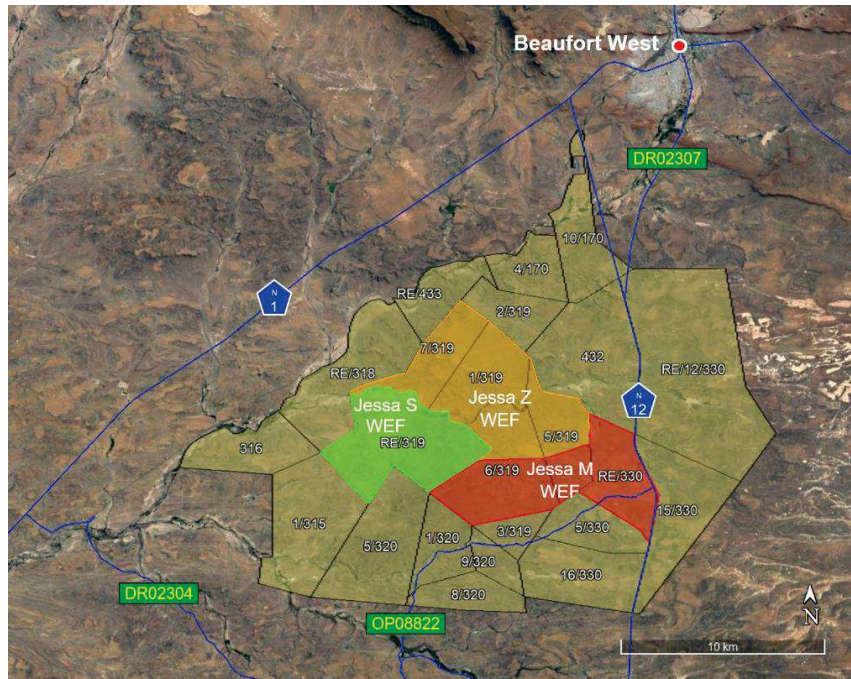


Figure 1 - Jessa Wind Farm Project

This Traffic Impact Assessment forms an integral part of the supporting documentation required for the Environmental Impact Assessment application to the Department of Forestry, Fisheries and the Environment (DFFE).

### 5.2 SCOPE AND OBJECTIVES

#### 5.2.1 Scope

ESA propose developing three wind energy facilities, as shown in Figure 1. Each of the proposed developments shall consist of a number Wind Turbine Generator units, which will be selected from the current potential turbine locations identified.

The scope of this report includes, inter alia:

- Identify the potential road network that could be affected by the proposed development;
- Determine a traffic baseline against which the potential traffic impacts are to be measured;
- Identify potential impacts and cumulative impacts that may occur during the construction, operational and decommissioning phases of the proposed development;
- Determine mitigation and/or management measures which could be implemented, to, as far as possible, reduce the effect of negative impacts; and
- Incorporate and address all issues and concerns raised by Interested and Affected Parties (if and when applicable).



### 5.2.2 Objectives

*This report aims to determine the potential traffic impact the proposed development will have on the existing road network.*

## 5.3 LEGISLATION AND PERMIT REQUIREMENTS

*The overarching environmental legislation for managing the environment in South Africa is the National Environmental Management Act, 1998 (Act 107 of 1998 "NEMA"). Its preamble states that sustainable development requires the integration of social, economic and environmental factors in the planning, implementation and evaluation of environmental decisions to ensure that the development serves present and future generations.*

*The DFFE Screening Tool and Report that was generated for the site (as per Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended) concluded that based on the selected classification of activity along with the environmental sensitivities of the proposed development footprint, a traffic impact assessment is identified for inclusion in the assessment report.*

### 5.3.1 Roads

*The relevant legislation associated with the road (infrastructure), transportation and traffic include, inter alia:*

- *National Water Act (Act 36 of 1998), with regards to all crossings of watercourses;*
- *National Road Traffic Act (Act 93 of 1996);*
- *Advertising on Road and Ribbon Development Act (Act 21 of 1940):*
  - *Regulates the display of advertisements outside some urban regions at places visible from public roads, and the depositing or leaving of disused machinery or refuse and the erection, construction or laying of structures and other things near certain public roads, and the access to certain land from such roads;*
  - *Section 9: Prohibition of the erection of structures near-certain roads;*
  - *Section 9A: Prohibition of the erection of structures or construction of other things near intersections of certain roads;*
  - *Section 10: Restriction of access to land through a fence, etc., along certain roads.*
- *Roads Ordinance Number 19 of 1976:*
  - *Consolidate and amend the law relating to public roads and public paths and to provide for matters incidental thereto;*
  - *Section 13: Erection of gates across public roads and public paths;*
  - *Section 17: Erection of structures on or near public roads;*
  - *Section 18: Access to and exit from certain public roads and public paths.*

### 5.3.2 Vehicle Dimensions

*Regulations 221 to 230 of the National Road Traffic Act relates to vehicle dimensions, the most salient points are summarised below.*

*Regulation 221: Defines the legislation requirements regarding the overall length of vehicles, and is summarised as follows:*

- *a rigid vehicle shall not exceed 12.5 m;*
- *articulated motor vehicle and semi-trailers shall not exceed 18.5 m;*



- other combinations of motor vehicles (including interlinks, multiple trailers, etc.) shall not exceed 22.0 m;

*Regulation 223: Defines the legislation requirements regarding the overall width of vehicles with a gross mass of 12 000 kilograms or more, shall not exceed 2.6 m.*

*Regulation 224: Define the legislative requirements regarding the overall height of a vehicle and transported load, which shall not exceed 4.3 m.*

*Regulation 225: Defines the legislation requirements regarding the maximum turning radius and wheelbase, which shall not exceed 13.1 m or 10.0 m (for a semi-trailer), respectively.*

### **5.3.3 Vehicle Loads**

*Regulations 231 to 249 of the National Road Traffic Act relates to vehicles loads. The most salient points are summarised below.*

*Regulation 240: Defines the legislation requirements regarding the mass load carrying capacity on roads. The most relevant points are summarised below:*

- *The mass load of a wheel fitted to a steering axle shall not exceed 3 850 kg, and others shall not exceed 4 000 kg;*
- *The mass load of an axle fitted with two wheels, which is the steering axle, shall not exceed 7 700 kg, others shall not exceed 8 000 kg;*
- *The mass load of an axle fitted with four wheels shall not exceed 9 000 kg;*
- *The mass load of an axle unit, which consists of two axles, each of which are fitted with two wheels, acting as a steering axle unit shall not exceed 15 400 kg, and other axle units shall not exceed 16 000 kg;*
- *The mass load of an axle unit, which consists of two axles, each of which are fitted with four wheels, shall not exceed 18 000 kg;*
- *The mass load of an axle unit, which consists of three or more axles, each of which are fitted with two wheels, acting as a steering axle unit shall not exceed 23 100 kg, and other axle units shall not exceed 24 000 kg;*
- *The mass load of an axle unit, which consists of three or more axles, each of which are fitted with four wheels, shall not exceed 24 000 kg;*
- *The axle mass load of an axle unit consists of two axles, one of which is a drive axle with four wheels and the other is an axle with two wheels, the sum of the two axles shall not exceed 18 200 kg.*

*Regulation 241: Defines the legislation requirements regarding the mass load-carrying capacity of bridges.*

### **5.3.4 Abnormal Loads**

*The National Road Traffic Act (Act 93 of 1996) and the National Road Traffic Regulations (2000) prescribe certain limitations on vehicle dimensions and axle and vehicle masses that a vehicle using a public road must comply with. Where the prescribed limits are exceeded, these loads are classified as abnormal loads. Provision for such abnormal vehicles and loads are made in Section 81 of the National Road Traffic, as substituted by Section 23 of the National Road Traffic Amendment Act (Act 64 of 2008).*

*The requirements and procedures for transporting abnormal loads are contained in the following two documents:*

- *“TRH 11 - Dimensional and Mass Limitations and Other Requirements for Abnormal Load Vehicles”; and*



- “Administrative Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads”.

#### **5.4 METHODOLOGY**

*The South African Traffic Impact and Site Traffic Assessment Standards (2014), and the Manual for Traffic Impact Studies (1995), form the basis for this traffic impact assessment.*

*The methodology adopted in the compilation of this report includes, inter alia:*

- *Identify the road network which will be used by vehicles associated with the proposed development and other developments in the area;*
- *Establish the number of vehicle trips generated during the construction, operation and decommissioning of the proposed development;*
- *Determine the mode of transport, vehicle type and size for each trip or category of trip generated during the construction, operational and decommissioning of the proposed development;*
- *Establish peak-hour vehicle trip rate generated during the construction, operation and decommissioning of the proposed development;*
- *Identify and assess the significance and severity of development-related traffic on the existing road network. Where possible comparing the existing traffic volumes on the roads with the traffic generated by the proposed development;*
- *Propose practical measures to mitigate the impacts of development-related traffic on the existing road network.*

#### **5.5 ASSUMPTIONS**

*The compiling of this report is based on the following assumptions:*

- *ESA propose developing three separate Wind Farms in the Central Karoo Municipality District of the Western Cape. The cumulative impact shall assume that all three Wind Farms are constructed, operated and decommissioned simultaneously, together with any other projects in the area with valid Environmental Authorisation;*
- *A project duration of 24 months is expected and used to calculate traffic volumes.*
- *A workforce complement for each Wind Farm during the peak construction phase is assumed to be in the order of 250 individuals, comprising of approximately 90% low-skilled and semi-skilled individuals and 10% highly skilled individuals.*
- *A workforce complement for each Wind Farm during the operational phase is assumed to be in the order of 40 individuals, comprising approximately 80% low-skilled and semi-skilled individuals and 20% highly skilled individuals.*
- *No accommodation is to be provided on the proposed development;*
- *The construction staff is drawn from the entire area, not just one specific town. The distribution of personnel is based on the working population within a defined radius of the proposed development, as delineated in the document.*
- *Although most of the WTG components are imported into South Africa via one of the South African ports, some of the WTG components could be fabricated and transported to the proposed development from other centres within South Africa;*
- *The majority of the transportation will be via the N1, as the Meiringspoort Pass on the N12 to the South poses significant challenges for heavily loaded*



vehicles and is not a predominant traffic corridor from the larger commercial centres in South Africa;

- Construction equipment and materials (other than aggregates) for this development will be transported to site from various centres within South Africa;
- The supply of raw material for the manufacture of concrete and road construction, as a worst-case scenario, will be sourced from commercial sources outside the development area;
- A single batching plant will be provided for each of the developments. This is based on the assumption that each of the three developments will be a separate entity, each constructed by different contractors. However, it is more probable that a single contractor will be appointed for all three Wind Farms. In which case, a single batching plant might be provided for all WTG foundations;
- A single access point shall be provided from the TR03305 for the Jessa Wind Farm Cluster. However, the final position of this point is still to be finalised.

## **5.6 LIMITATIONS**

*This report excludes:*

- Transport Management Plan for the proposed development;
- Site Development Plan of the infrastructure within the site boundary that does not affect the public road network;
- The geometric details of intersections and entrances onto the site from the public road network, as this will be finalised during the detailed design phase, which will require approval from the relevant roads' authorities;
- Assessment of risks and impacts associated with loading or off-loading of the vehicles at the site or associated facilities are not addressed since these will be addressed in the Standard Operating Procedures developed by the Engineering, Procurement, Construction and Management (EPCM) contractor for the construction and decommissioning of the development;
- Finalisation of the transportation route for the WTG components as this will be the responsibility of the logistics company appointed once the preferred turbine generator has been selected.

## **5.7 SOURCE OF INFORMATION**

*Information used in compiling this report was drawn from the following sources:*

- Manual for Traffic Impact Studies, Department of Transport, RR 93/635, 1995;
- TMH 16, Volume 1 - South African Traffic Impact and Site Traffic Assessment Manual, COTO 2012;
- TMH 16, Volume 2 - South African Traffic Impact and Site Traffic Assessment Standards and Requirements Manual, COTO 2014;
- TMH 17 - The South African Trip Data Manual, COTO 2012;
- TRH 4 - Structural Design of Flexible Pavement for Interurban and Rural Roads, 1996;
- TRH 26 - South African Road Classification and Access Management Manual, 2012;
- All information relating to the roads within the Western Cape were obtained from the Western Cape Government Road Network Information System ([https://rnis.westerncape.gov.za/rnis/rnis\\_web\\_reports.main.null](https://rnis.westerncape.gov.za/rnis/rnis_web_reports.main.null));
- All information relating to traffic volumes on the roads within the Western Cape where obtained from the Western Cape Government Road Network Information System ([https://rnis.westerncape.gov.za/rnis/rnis\\_web\\_reports.main.null](https://rnis.westerncape.gov.za/rnis/rnis_web_reports.main.null));



- The number of households was obtained from the Department of Statistics South Africa ([http://www.statssa.gov.za/?page\\_id=964](http://www.statssa.gov.za/?page_id=964));
- Information regarding mountain passes was obtained from Mountain Passes of South Africa (<https://mountainpassessouthafrica.co.za/>);
- Distance and estimated travelling times were obtained using Google Maps;
- Satellite imagery of the site available on Google Earth was also used for evaluation;
- The author took most of the photographs used in this report during the site visit.

## 6 DESCRIPTION OF THE AFFECTED ENVIRONMENT

### 6.1 ROAD NETWORK

The existing road network adjacent to the proposed development is well established. Consisting of a combination of national roads and first, second and third-order roads, it provides the proposed development accessibility to local towns and the major commercial centres within South Africa.

The road network immediately adjacent to the proposed development, which could be used to access the proposed development, are shown in Figure 2.



Figure 2 - Road Network

Not all of these roads will be utilised to access the proposed development. The most relevant roads to the proposed development used in this report are N1, N12, DR02307 and MR00372. The other roads, i.e. DR02304 and OP08822, have not been included in the transportation routes for reasons delineated below.

#### 6.1.1 National Roads - N1 (NR00107)

The N1 is a Principal Arterial providing high mobility between provinces, regions and towns, and falls under the jurisdiction of the South African National Road



Agency. The N1 starts at the M6 (western Boulevard) in Cape Town and ends at Beit Bridge Border Post at the Zimbabwe border, passing through or bypassing many towns on route. The N1 and N12 merge approximately seven kilometres west of Beaufort West before splitting again at Three Sisters.

The N1 is a Class 1 road, generally consisting of a single paved carriageway, with one lane in each direction and paved shoulders, as shown in Figure 3. Climbing lanes are provided along various sections of the road, and turning lanes are provided at major intersections. In many cases, the shoulder is wide enough to allow yellow-line driving. The road is in good condition with a speed limit of 120 km/h.



Figure 3 - N1 (West of TR03305)

#### **6.1.2 Trunk Road - N12 (TR03305)**

The N1 is a Primary Arterial providing high mobility between provinces, regions and towns, and falls under the jurisdiction of the South African National Road Agency. The N12 starts at the N2/N9 (Kraaibosch Interchange) approximately 5 km south of George and ends at eMalahleni, passing through or bypassing many towns on-route. The N1 and N12 merge approximately seven kilometres west of Beaufort West, before splitting again at Three Sisters.

This Class 2 road generally consists of a single paved carriageway, with one lane in each direction and a combination of paved and gravel shoulders, as shown in Figure 4. The road is in good condition with a speed limit of 120 km/h.

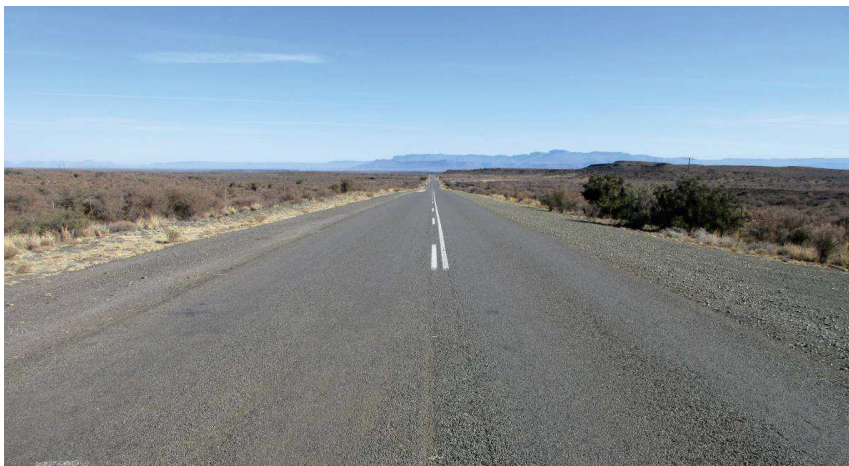


Figure 4 - N12 (South of NR001)



Approximately 110 km south of the N1/N12 intersection is the “Droëkloof” pass, and a further 20 km is the “Meiringspoort” pass. The “Meiringspoort” pass is in superb condition and offers typically gentle poort gradients, but the 63 bends, corners, and curves require a high concentration level. It's easy to become mesmerised by the mind-boggling scenery. Hence, drivers need to remain focused and understand that the lack of safety shoulders and the large volume of heavy trucks means a certain level of danger is always present.

### 6.1.3 Divisional Roads

#### **DR02304**

The DR02307 is an Access Collector providing access between towns and other roads. The DR02304, is 97.09 km long, and starts at the NR001/7 (N1), as shown in Figure 5.



Figure 5 - DR02304 at NR001/7

At approximately 4 km, there is a level crossing, where the road crosses over the Trans-Karoo railway. Along this road there are a significant number of low level drifts, which are impassable during heavy downpours.

At 26.64 km, there is an at grade junction to the left with OP08822, at 38.85 km, the road crosses the TR03305, as shown in Figure 6, and ends at the Provincial boulder into the Eastern Cape.

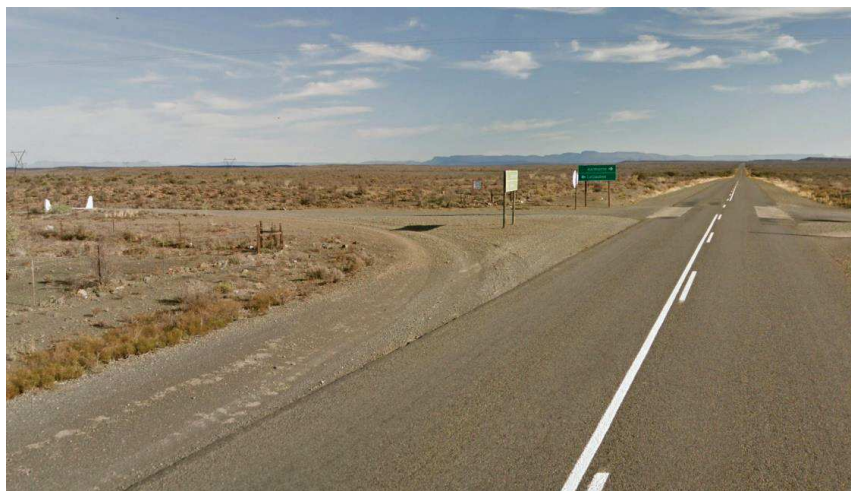


Figure 6 - DR02304 at TR03305



*The maintenance and management of this portion of the road falls under the jurisdiction of the Western Cape Provincial Roads Department.*

*According to the Western Cape Road Information System, this road is designed to be a Functional Class 4, with an RCAM classification of R4c. The gravel road is 6 m wide, situated in a 20 m wide servitude.*

*Due to the intrinsic dangers along this road, including the level crossing and the low-level drifts, this road is considered a high risk and as such this road has not been considered a feasible access route to the proposed developments. Users of this road should be cautioned against using it to access the proposed developments.*

#### **DR02307**

*The DR02307 is an Access Collector providing access between towns and other roads. The road is paved with gravel shoulders and is 18.2 km long. It starts at the TR03305 (N12), as shown in Figure 7, and ends in Beaufort West.*



*Figure 7 - DR02307 at TR03305*

*The maintenance and management of the first 10.0 km of this road falls under the jurisdiction of the Western Cape Provincial Roads Department, and the balance of the road falls under the jurisdiction of the Beaufort West Municipality.*

*According to the Western Cape Road Information System, this road is designed to be a Functional Class 4, with an RCAM classification of R4c. The road is situated in a 20 m wide servitude, with an 8.5 m wide gravel surface.*

### **6.1.4 Main Roads**

#### **MR00372**

*The MR00372 is a Residential Access Collector providing access between towns and other roads. This is a gravel road that connects Prince Albert to the TR03305, and is 55.3 km long.*

*The maintenance and management of this road falls under the jurisdiction of the Western Cape Provincial Roads Department.*

*According to the Western Cape Road Information System, this road is designed to be a Functional Class 3, with an RCAM classification of R4a. The road is situated in a 20 m wide servitude, with a 7 m wide gravel surface.*



The road is assumed to provide access to the proposed development from Prince Albert.

### **6.1.5 Minor Roads**

#### **OP08822**

The OP08822 is a Local Access Collector providing access between other roads. The road is 17.68 km long. It starts at the TR03305 (N12), as shown in Figure 8, and ends the junction with DR02304. It is clear from the image provided that this road is not accessible from the TR03305 and does not appear to have been used in many years.



Figure 8 - OP08822 on TR03305

The maintenance and management of this road falls under the jurisdiction of the Western Cape Provincial Roads Department.

According to the Western Cape Road Information System, this road is designed to be a Functional Class 5. The gravel road is 6 m wide, situated in a 20 m wide servitude.

According to correspondence received from Mr Andrew Raath (Control Engineering Technician, Road Planning: Proclamation and Road Use, Transport and Public Works, WESTERN CAPE GOVERNMENT), there could be closed gate/s along a proclaimed Minor Road (in this case 8822), as long as these gates are not locked for the public to use. The gates are often closed (but not locked) to keep the farmer's stock in a particular area and or prevent them from escaping as such. One would normally drive up to the gate, open it, drive through, stop on the other side of said gate, and close the gate again. Similar on their return trip.

If the developer intends using this as an access road, the developer will have to engage with the interested and affected land owners in this area, regarding the development of this road.

### **6.2 SITE ACCESS**

All three proposed developments are envisaged to be constructed to the west of TR03305 (N12), as shown in Figure 9.



There are only two existing access points to the proposed development from the TR03305.

- The one is the entrance to OP08822, as shown in Figure 8. The sighting distance to the north is reasonable. However, the same can not be said for the sighting distance to the south.
- The other existing entrance to the proposed development from the TR03305 is at chainage 62.6 km. It appears that this is an Eskom servitude for a current power line. The entrance is located on a curve which compromises the sighting distances in both directions. It is not recommended that this access point be considered as possible access to the proposed developments.

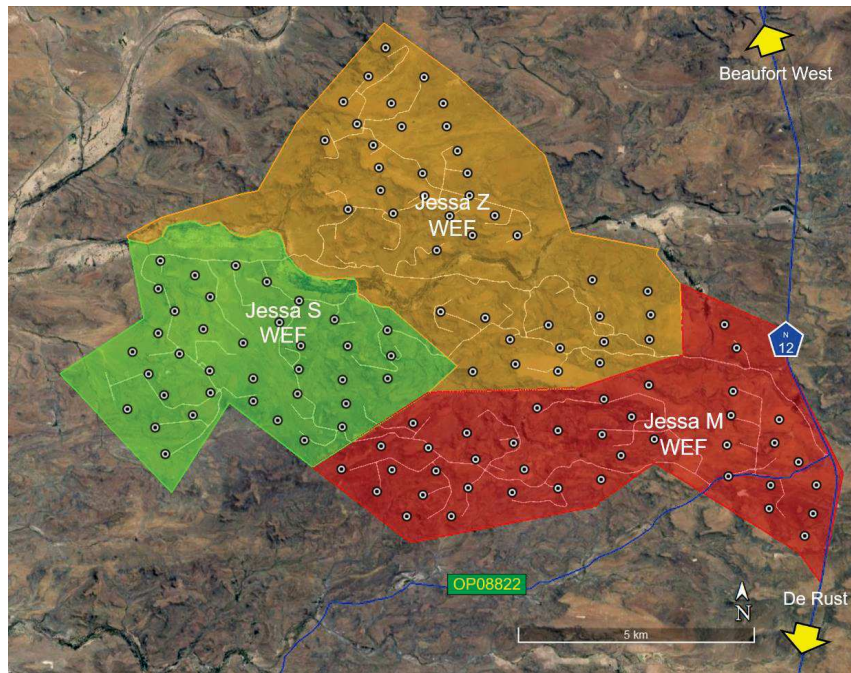


Figure 9 - Potential WTG Layout

The proposed internal road network and the access points onto the public road OP08822 for the three proposed developments are shown in Figure 9. However, since access on the OP08822 was not possible the propose access points on to the proposed development could not be visually assessed.

## 6.3 TRANSPORTATION ROUTES

### 6.3.1 Commuter Routes

The towns in this part of the country are few and far apart. The closest town to the proposed development is Beaufort West, approximately 30 km on surfaced roads. All the other towns in the area are more than 75 km away.

The distance to the surrounding towns and the estimated travelling time, together with the “working age” population in the adjacent towns, are shown in table 5.

Table 4 - Surrounding Towns

Town	Travel Distance*	Estimated Travel Time**	Population
Beaufort West (via N1)	± 26.4 km	17 min	21 608
Beaufort West (via DR)	± 22.7 km	19 min	
De Rust & Klaarstroom	± 120 km	1 hour 16 min	2 554
Leeu Gamka (via N1)	± 88 km	51 min	1 679



Leeu Gamka (via DR)	± 85.8 km	1 hour 10 min	4 452
Prince Albert (via N1)	± 143 km	1 hour 49min	
Prince Albert (via N12)	± 120 km	1 hour 37 min	

\* Distance from the Access Point on N12 to the main intersection in the Town

\*\* Obtained from Garmin Software

In light of the current economic situation in the country and REIPPPP requirements, it is assumed that the workforce will be drawn from surrounding communities. The proportions are based on a 'working-age' population, which have been modified by a 'weighted factor'. The 'weighted factor' is calculated based on the distance travelled to the proposed development from the relevant towns. The expected proportion of the workforce from the surrounding communities is depicted in Table 5.

Table 5 - Proportion

Town	Proportion (%)
Beaufort West	± 92%
De Rust & Klaarstroom	± 2%
Leeu Gamka	± 2%
Prince Albert	± 4%

There are two routes to the proposed development from Beaufort West, one is via the N1, and the other is via DR02307. It is more likely that the DR02307 will be used by light vehicles, while the larger vehicles will use the N1. Thus, for this report's purpose, it has been assumed that 58% of the traffic commuting to the proposed development will use the DR02307, and the remaining 42% will use the N1.

The workforce commuting to the proposed development from De Rust and Klaarstroom will be via the TR03305 (N12).

There are two routes to the proposed development from Leeu Gamka, the longer but quickest is via the N1, while the shorter route is via the DR02304. The route via the N1 is surfaced, while the route via the DR02304 is a gravel road that passes over a level crossing and through many drifts. Thus, from a safety aspect, the route via the DR02304 has not been considered a viable commuting route to the proposed development, due to the potential risks.

There are various routes to the proposed development from Prince Albert, the longest one is via the N1, and the shorter route is via MR00372. For this report, the shorter route has been selected as the most viable option.

Thus, personnel commuting to and from the proposed development from Beaufort West and Leeu Gamka will be on the TR03305 to the North, while personnel from De Rust, Klaarstroom and Prince Albert will commute on the TR03305 to the South.

### 6.3.2 Freight Routes

#### Container Terminals

Transnet Port Terminals is a division of Transnet SOC Limited, South Africa's state-owned freight transport company, which owns and operates the terminal at several Ports in South African. Operations are divided into the major market sectors: containers, bulk, breakbulk, and automotive, organised into three geographical regions – Eastern Cape, Western Cape, and Kwa-Zulu Natal.



The port of entry into South Africa for all import WTG components is limited to Ngqura (located close to Gqeberha) or Saldanha Terminals. The possible routes from these terminals to the proposed developments are shown in Figure 10.

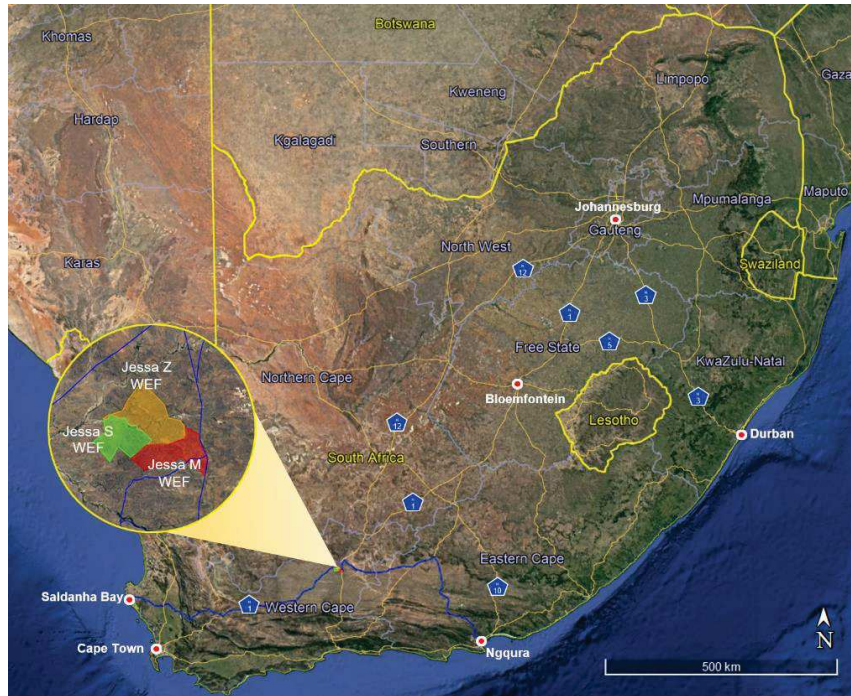


Figure 10 - Terminals

The potential transportation routes from the various Port Terminals in South Africa, with the capability to import wind turbine components, to the proposed development, are detailed in Table 6.

Table 6 - Distance - Port Terminals

Container Terminals	Distance
Ngqura	473 km
Saldanha	531 km

The closest terminal to the proposed developments is the Ngqura Port Terminal (close to Gqeberha) based on the information provided above.

However, the length and weight of the various WTG components will only be available once the turbine supplier has been appointed. There is a strong possibility that the length of the blades for the WTG units could exceed 95 m.

Each of the proposed transportation routes has challenges that the logistics company appointed will need to address. In some cases, the challenges can be easily overcome, and for others, alternative routes will have to be considered.

The geometric design and gradient of the Meiringspoort Pass on the TR03305 (N12) could pose constraints that would inhibit the use of this road for transportation of the WTG components to the proposed development with the current transportation equipment available in South Africa.

### Commercial Centres

The most likely transportation routes for domestically supplied and manufactured components from the major commercial centres to the proposed developments are either Cape Town or Johannesburg (or any supplier along these routes), as shown in Figure 11.



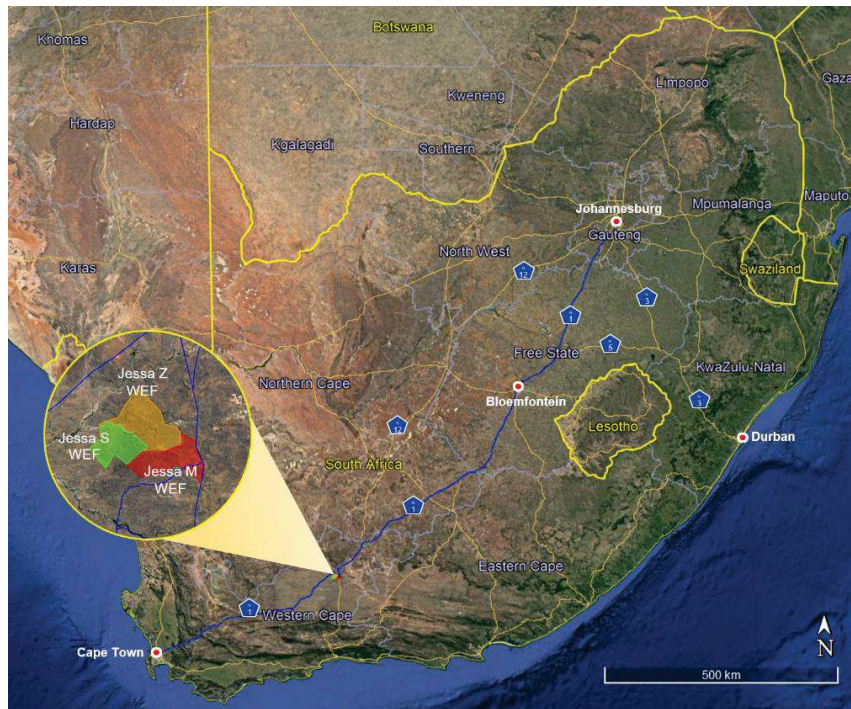


Figure 11 - Commercial Centres

The distances from the proposed developments to the major commercial centres in South Africa are shown in Table 7.

Table 7 - Distance - Major Commercial Centres

Commercial Centres	Distance
Cape Town	471 km
Johannesburg	969 km

The closest major commercial centre to the proposed developments is located in the Cape Town area. However, some components will have to be transported from the Johannesburg area.

#### Route Distribution

The envisaged distribution of the freight routes on the public road network adjacent to the proposed development is provided in Table 8.

Table 8 - Route Distribution

Commercial Centres	Distribution (%)
Cape Town (via N1)	± 35%
Johannesburg (via N1)	± 55%
Johannesburg (via DR02307)	± 5%
Garden Route (N12)	± 5%

## 6.4 RENEWABLE DEVELOPMENTS

All renewable energy developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed developments, as provided by the South African Renewable Energy EIA Application Database (REEA), are listed in Table 9.



Table 9 - Proposed Developments

No	EIA Reference No	Classification	Status of application
1	12/12/20/1784	Wind	Approved
2	12/12/20/2133/AM5	Solar PV	Approved
3	12/12/20/2286/AM4	Solar PV	Approved
4	14/12/16/3/3/2/772	Solar PV	Approved
5	14/12/16/3/3/2/773	Solar PV	Approved
6	14/12/16/3/3/2/774	Solar PV	Approved

The relation of the renewable energy developments listed in Table 7 to the proposed ESA developments is depicted in Figure 12.

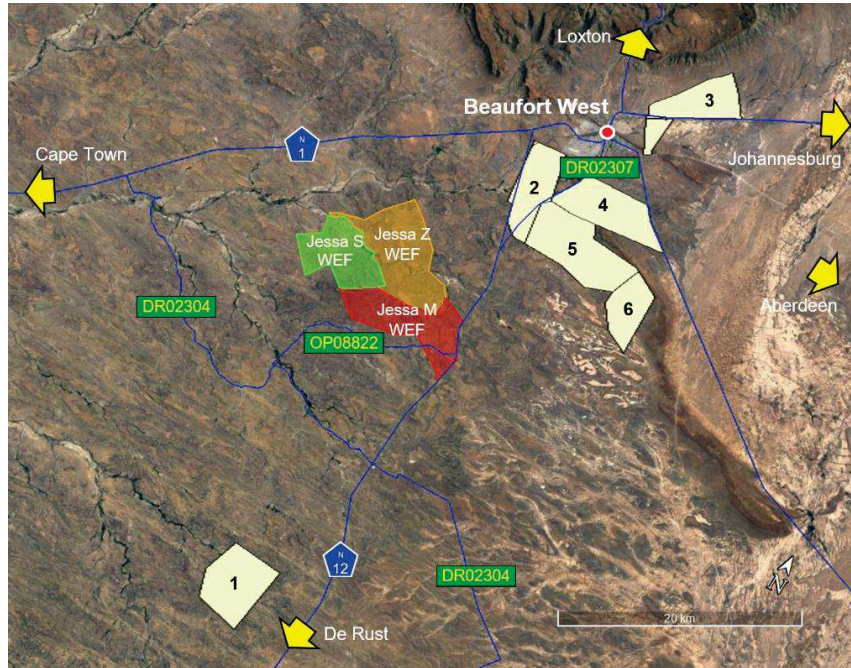


Figure 12 - Proposed Renewable Energy Facilities

The author was unable to obtain the name and details of the other proposed developments. Since development 12/12/20/1784 is of significant importance to the cumulative effect, this development will be referred to as 'Wind Farm X'. However, based on information provided by SLR Consulting, it is unlikely that this development will be reach financial closure.

## 7 TRAFFIC VOLUMES

The South African Trip Data Manual (TMH 17), as provided by COTO, does not make provision for expected trip generation for the construction, operation and decommissioning phases of a wind farm. Thus, the traffic trip generation for the construction, operation and decommissioning phrases used in this document is based on data obtained for similar projects. The estimated traffic generation detailed below represents a worst-case scenario.

### 7.1 STATUS QUO

The current traffic volumes on the road network are based on information extracted from the Western Cape Road Information System. The data is obtained from counting stations and strip charts



### 7.1.1 Counting Stations

*The Western Cape Road Information System provides counting stations at various intersections on the roads network adjacent to the proposed developments, these are shown in Figure 13.*

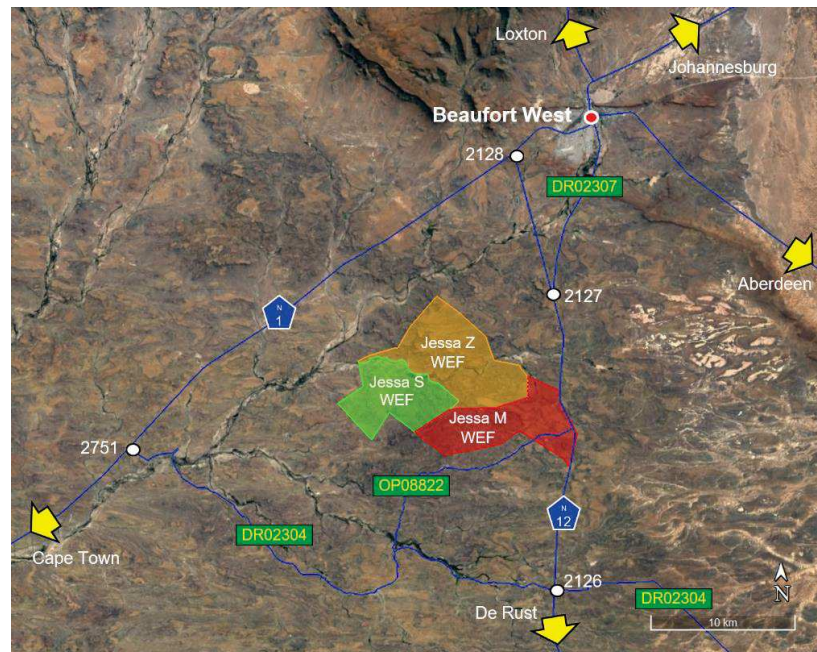
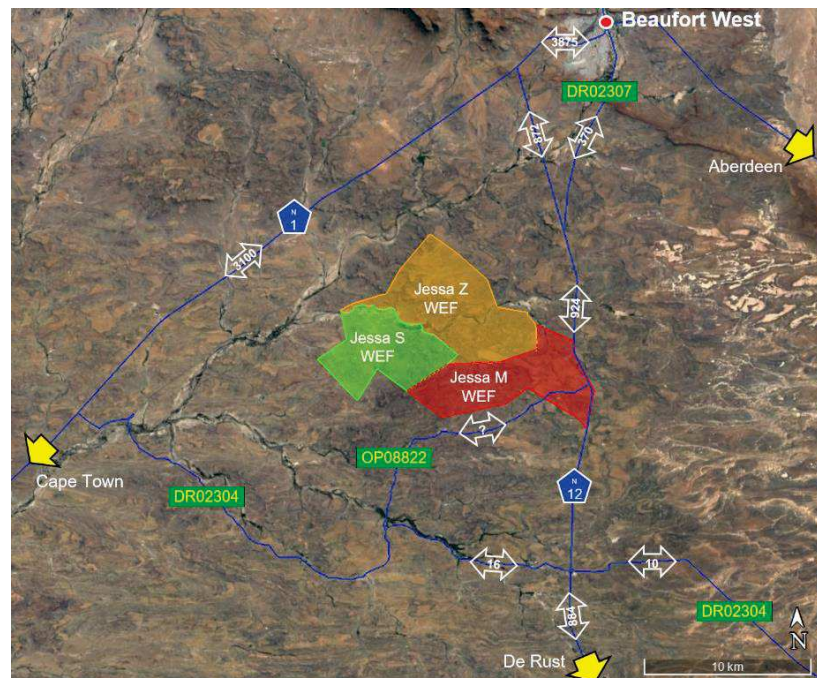


Figure 13 - Counting Station

### 7.1.2 Baseline Traffic Volumes

The baseline traffic volumes for the road network adjacent to the proposed developments are based on the AADT values obtained from the various counting stations. The values used are the average values between intersections, which have been adjusted by a growth factor relevant to the road. The adjusted AADT values used in this assessment are provided in Figure 14.



*Figure 14 - Baseline AADT*



## 7.2 ROAD NETWORK

The road network has been comprehensively delineated in section 6.1 above. The N1 and the TR03305 have been subdivided into shorter lengths for modelling and analysis purposes, as shown in Figure 15. Intersections indicated by yellow stars form the boundaries of the subdivisions. This Figure is the primary reference for the balance of this report.

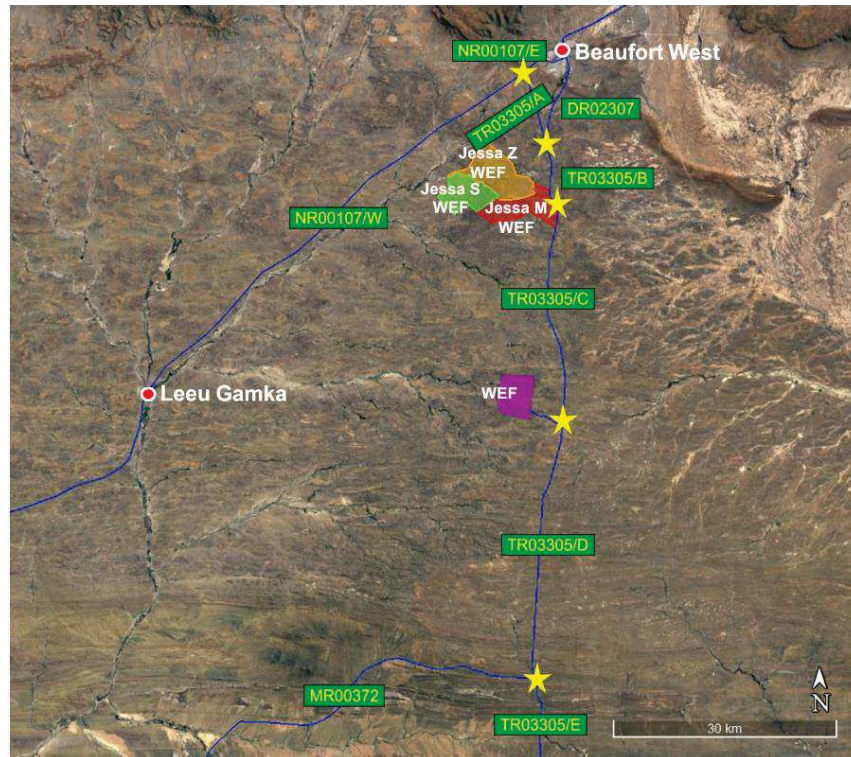


Figure 15 - Road Network - Subdivisions

## 7.3 CONSTRUCTION PHASE

The construction phase of the development will generate the most significant increase in traffic volumes on the local road network. Construction traffic will include vehicles transporting equipment, material and personnel. The trips will include the delivery of abnormal and oversized components such as rotor blades, tower sections, transformers and generators.

A construction period of 24 months is anticipated for this development. The construction activities and duration will vary according to the construction schedule.

The two most significant activities, that impact traffic volumes during the construction phase, are:

- The commuting of personnel, to and from the proposed development; and
- The delivery of equipment and material to the proposed development.

The simultaneous occurrence of these two activities is improbable.

The commuting of personnel to and from the proposed development are two different activities, one occurring at the beginning of the working day (constituting the morning peak) and the other occurring at the end of the working day (constituting the afternoon peak). These activities contribute to Peak Traffic. Traffic movement statistics have shown a noticeable difference between morning and afternoon traffic peaks. Although the same number of trips are generated during



these peaks, the morning peak is more concentrated, and the afternoon peak is spread over a longer period. Thus, for analysis purposes, the morning traffic shall be adopted for both morning and afternoon peaks to demonstrate a worst-case scenario.

The delivery of equipment and materials to the proposed developments is envisaged to occur during normal working hours throughout the day. No night deliveries are anticipated and are strongly discouraged. Given the distance from the origin of the material and components and the development, it is assumed that most deliveries will only start arriving at the proposed development an hour or two after work on site commences and will stop an hour or two before work on site concludes for the day. These activities contribute to Diurnal Traffic.

The envisaged timeframes for these activities, as adopted in this document, are:

- Morning Peak Traffic - between 6:30 to 7:30;
- Diurnal Traffic - between 7:30 to 16:30;
- Afternoon Peak Traffic - between 16:30 to 17:30.

### 7.3.1 Peak Traffic

It has been estimated that a total workforce complement of approximately 250 individuals will be required during the peak construction for each of the proposed developments, a total of 750 individuals for the cluster. Since no accommodation is provided on-site, the personnel will have to be accommodated in the surrounding towns and commute to the proposed development. As identified in section 6.3.1, all the personnel on the proposed development will be drawn from surrounding towns.

Based on the project specification for each of the proposed developments, the anticipated breakdown of the site personnel is as follows:

- Senior Staff, consisting of Construction managers, supervisors and other key staff, constitute 10% of the site personnel, equating to approximately 25 persons. It is assumed that senior staff will reside within the community and will commute to the site in pairs, using light vehicles. A fleet of 14 vehicles is envisaged.
- Workforce, consisting of semi-skilled and unskilled workers, will constitute 90% of the site personnel, equating to 225 persons. It is assumed that the workforce will reside within the community and will commute to the site using mini-buses and buses. A fleet of mini-buses and various sizes of buses are envisaged, equating to approximately 7 vehicles.

It is assumed that the transport vehicles will remain on-site during the workday.

The maximum traffic volumes on the road network during the Peak Traffic of the proposed development is depicted in Table 10.

Table 10 - Construction Phase - Peak Traffic

Road	Number of Vehicles
NR00107/W	6.00 vph
NR00107/E	24.00 vph
TR03305/A	30.00 vph
TR03305/B	51.00 vph
TR03305/C	12.00 vph
TR03305/D	12.00 vph
TR03305/E	6.00 vph
MR00372	6.00 vph



Road	Number of Vehicles
DR02307	21.00 vph
JESSA WEF	63.00 vph

Based on the information provided above, the maximum number of vehicles during the Peak Traffic is on the TR03305/B, which is in the order of 51 vph. However, the maximum number of vehicles on the main access to the proposed development will be in the order of 63 vph.

### 7.3.2 Diurnal Traffic

The construction phase of the proposed development consists of several activities, and some occur sequentially while others occur concurrently. Thus, not all the traffic volumes estimated in this document for the various activities are cumulative.

The construction phase activities, which will increase the traffic volumes include, *inter alia*:

- Site establishment: the initial activity of the development, the increase in traffic volumes resulting from this activity is not cumulative;
- Delivery of material and equipment to site: the traffic volumes resulting from these activities are cumulative and include the delivery of;
  - gravel for the construction of the roads, terraces, battery storage facility and substation platforms;
  - raw material (i.e. cement, sand, stone) for batching of concrete;
  - construction material (i.e. scaffolding, formwork, reinforcing steel, brick, roof sheeting, fencing, etc.);
  - construction vehicles and equipment (i.e. earthmoving equipment, batching plant, etc.)
  - substation components (i.e. steel gantries, transformers, switchgear, cables, circuit breakers, surge arresters, lightning conductor masts, etc.)
  - components for the battery storage facility (i.e. containers and equipment such as batteries, inverters, transformers, HVAC equipment, switchgear, etc.)
- Delivery of the WTG components are cumulative (i.e. tower sections, blades, nacelle, gearbox, generator, nose cone, hub, etc.). Due to the physical characteristics of most of these components, they will be transported as abnormal loads.

The diurnal traffic volumes for the proposed developments are based on the cumulative volumes generated by the following activities.

The various freight transportation routes to the proposed development have been addressed in Section 6.3.2 above, see Table 8.

The traffic volumes generated for each proposed development by the various construction activities are delineated below.

The information provided in this document is an informed estimate. Construction-related traffic may vary and be different from the information provided in this report due to the availability of contractors' resources and schedules.

#### Construction Equipment and Materials

Once the site has been established, the delivery of construction equipment and materials will commence. Equipment, such as tools, machinery, scaffolding, formwork, etc., will be delivered to the proposed developments at the



commencement of the construction and will be gradually removed from the proposed developments as construction draws to an end. Materials, such as reinforcing steel, brick, roof sheeting, fencing, transformers, switchgear, cables, etc., will be delivered to the proposed development as an ongoing activity. These deliveries will start increasing during the early stages of the construction phase, ramping up to maximum deliveries, before tapering off again close to the end of the construction phase

Various types of vehicles will be used to deliver the construction equipment and materials to the site. The increase in traffic volume for this activity is conservatively estimated to be in the order of eight return trips per day, which equates to approximately 2 vph.

Due to the size of the vehicles delivering the construction equipment and material, the most likely route for the majority of these deliveries to the proposed developments will be from the NR00107 via the TR03305/A & B.

### **Earthworks**

The construction of the sub-station platforms, battery storage area, roads and hardstand platforms adjacent to the WTG units will be constructed from suitable gravels. To minimise the unnecessary importing of suitable material, cut and fill operations shall be adopted as far as possible for these elements. It is envisaged that material excavated from the WTG foundations will also be used to augment any potential shortfall of material required for the earthworks.

However, provision has been made to source approximately 115 000 m<sup>3</sup> of suitable material from commercial quarries outside the study area. The gravel is assumed to be delivered to the proposed developments in 20 m<sup>3</sup> articulated rear tippers, over a period of 24 months. The increase in traffic volume for this activity is estimated to be in the order of 10 return trips per day, which equates to 2.5 vph.

Due to the size of the vehicles delivering this material, the most likely route for the majority of these deliveries to the proposed developments will be from the NR00107 via the TR03305/A & B.

### **Raw Material – Concrete**

It is estimated that approximately 66 500 m<sup>3</sup> of concrete will be mixed and placed on the proposed development, over a period of 24 months. The majority will be for the WTG foundation and the balance for the sub-station and battery storage facility.

A single on-site batching plant will be installed that will mix the concrete for the proposed developments. The raw material for the concrete is to be delivered to the proposed development from commercial sources and includes 23 250 tonnes of cement, 40 000 m<sup>3</sup> of sand, and 46 500 m<sup>3</sup> of stone.

The cement is assumed to be delivered to the proposed development using pneumatic bulkers, with a 40 m<sup>3</sup> tridem semi (payload 32 000 kg) and 15 m<sup>3</sup> pup (payload of 10 000 kg), as shown in Figure 16.





Figure 16 - Bulk Cement Tanker and Pup

The aggregate is assumed to be delivered to the proposed development in 20 m<sup>3</sup> articulated rear tippers.

The increase in traffic volume resulting from this activity is estimated to be in the order of ten return trips per day. Over an eight-hour day, this equates to 2.5 vph.

Due to the size of the vehicles delivering this material, the most likely route for the majority of these deliveries to the proposed developments will be from the NR00107 via the TR03305/A & B.

### WTG Components

The type and number of WTG components to be transported to the proposed developments for each WTG are listed in Table 11.

Table 11 - Wind Turbine Components

Components	Size	Weight	Number
Nacell	13 × 4.3 × 4 m	± 120 000 kg	1
Baldes	90 m (length)	± 25 000 kg	3
Steel Tower Section	4.2 m Ø × 30 m (length)	± 51 500 kg	5
Hub/Nose Cone	20' ICC Container	± 40 000 kg	1
Cables & Controlles	40' IAA Container	max 32 500 kg	1
Generator	40' IAA Container	max 32 500 kg	1
Foundation Insert	4.7 m Ø × 2.5 m (length)	± 27 500 kg	1
Sundaries	40' IAA Container	max 32 500 kg	1

Approximately 14 components are to be transported to the proposed development for each WTG to be installed. Of these 14 components, only nine are considered abnormal loads, and the rest are deemed normal loads. It must be noted that this information is generic as the details of the WTG components will only be available once the supplier has been appointed.

Based on the information provided in Table 1, no more than 35 WTG are to be installed per proposed development over a period of 24 months. The increase in traffic volume resulting from this activity is estimated to be in the order of less than two return trips per day. Over an eight-hour day, this equates to less than 0.5 vph.

Due to the size of the vehicles delivering this material, the most likely route for the majority of these deliveries to the proposed developments will be from the NR00107 via the TR03305/A & B.

### Battery Storage Facility

A Battery Energy Storage System (BESS) is to be constructed as part of the proposed development. The facility takes excess power generated by the wind farm, converts and stores it in batteries. The BESS consists mainly of purpose-



made steel containers, in which the batteries are stored and managed, together with inverters and transformers.

Since very little information is available regarding the number of trips generated for installing this equipment, the number of trips is based on how many containers can fit in the allocated area, considering fire and access requirements. Approximately 1 500 trips will be required over a period of six months. The increase in traffic volume resulting from this activity is estimated to be in the order of 12 return trips per day. Over an eight-hour day, this equates to 3 vph.

Due to the size of the vehicles delivering this equipment, the most likely route for the majority of these deliveries to the proposed developments will be from the NR00107 via the TR03305/A & B.

### Concrete

The concrete for the WTG foundations is batched on-site and transported to each foundation. Each foundation consists of approximately 1 450 m<sup>3</sup> of concrete and takes up to 18 hours to cast. The contractor is most likely to use 8 m<sup>3</sup> concrete mix trucks to transport concrete. Thus, to cast a WTG foundation, approximately 190 trips will be generated (including 2.5% wastage) over a period of 18 hours. Therefore the expected increase in traffic (in one direction) will be approximately 10 vehicles per hour (one every six minutes). If the vehicles are using the same return route, the traffic will increase by the same volume.

The internal road network of the proposed development is such that the delivery of concrete will not result in interaction on the public road network.

### Summary

Based on the above information, a summary of the expected Diurnal Traffic on the various roads for the proposed developments are provided in Table 12.

Table 12 - Construction Phase - Diurnal Traffic

Road	Construction Equipment and Material	Earthworks	Raw Material for Concrete	WTG Components	Batter Energy Storage System	Total
NR00107/W	2.10 v/h	2.63 v/h	2.63 v/h	0.53 v/h	3.15 v/h	11.00 v/h
NR00107/E	3.30 v/h	4.13 v/h	4.13 v/h	0.83 v/h	4.95 v/h	17.50 v/h
TR03305/A	5.40 v/h	6.75 v/h	6.75 v/h	1.35 v/h	8.10 v/h	28.50 v/h
TR03305/B	5.70 v/h	7.13 v/h	7.13 v/h	1.43 v/h	8.55 v/h	30.00 v/h
TR03305/C	0.30 v/h	0.38 v/h	0.38 v/h	0.08 v/h	0.45 v/h	1.50 v/h
TR03305/D	0.30 v/h	0.38 v/h	0.38 v/h	0.08 v/h	0.45 v/h	1.50 v/h
TR03305/E	0.30 v/h	0.38 v/h	0.38 v/h	0.08 v/h	0.45 v/h	1.50 v/h
MR00372	0.00 v/h	0.00 v/h	0.00 v/h	0.00 v/h	0.00 v/h	0.00 v/h
DR02307	0.30 v/h	0.38 v/h	0.38 v/h	0.08 v/h	0.45 v/h	1.50 v/h
JESSA WEF	6.00 v/h	7.50 v/h	7.50 v/h	1.50 v/h	9.00 v/h	31.50 v/h

An argument could be made that all earthwork activities would be complete by the time the BESS is installed. However, as a worst-case scenario, it shall be assumed that these activities occur concurrently.

The information provided above is an informed estimate. Construction-related traffic may vary and be different from the information provided above due to the availability of contractors' resources and schedules.



## 7.4 OPERATIONAL PHASE

The operational life of the proposed development is expected to be approximately 20 years. The proposed development will operate on a 24-hour basis, except when there is a mechanical breakdown, extreme weather conditions or maintenance activities. Wind turbines will be subject to regular maintenance and inspection (i.e. routine servicing) to ensure the optimum performance of the turbine components.

The only on-site activities related to the development will be monitoring, routine servicing and unscheduled maintenance of the WTG units.

### 7.4.1 Peak Traffic

It is envisaged that the proposed developments are maintained and operated by a team of approximately 40 personnel.

Thus, the envisaged traffic volumes on the various public roads for the proposed development is depicted in Table 13.

Table 13 - Operational Phase - Peak Traffic

Road	Number of Vehicles
NR00107/W	3.00 vph
NR00107/E	9.00 vph
TR03305/A	12.00 vph
TR03305/B	18.00 vph
TR03305/C	9.00 vph
TR03305/D	9.00 vph
TR03305/E	3.00 vph
MR00372	6.00 vph
DR02307	6.00 vph
JESSA WEF	27.00 vph

Peak traffic is generated by commuting personnel to and from the proposed developments in the morning and afternoon. The maximum number of additional vehicles on the public road network is in the order of 18 vph.

### 7.4.2 Diurnal Traffic

The servicing, delivery of goods and visitors to the proposed developments are the only Diurnal Traffic envisaged for the proposed development and is assumed to be in the order of two vehicles per day. It is assumed that this traffic will travel to the proposed development from Beaufort West via both the TR00107 and DR02307.

Thus, the envisaged traffic volumes on the various public roads during the operational phase for the proposed development is depicted in Table 14.

Table 14 - Operational Phase - Diurnal Traffic

Road	Number of Vehicles/Hour
NR00107/E	0.75 vph
TR03305/A	0.75 vph
TR03305/B	1.50 vph
DR02307	0.75 vph
JESSA WEF	1.50 vph



Based on the information provided above, the maximum number of vehicles on the road network contributing to the Diurnal Traffic is in the order of 1.5 vph.

## **7.5 DECOMMISSIONING PHASE**

At the end of the operational phase, the development may be decommissioned, or its continued economic viability may be investigated. If the development is still deemed economically viable, the development may be re-engineered, and the operational life may be extended. If the development is not economically viable, then the development shall be decommissioned. The components will be disassembled, reused, recycled or disposed of in accordance with the relevant regulatory requirements. The turbines may also be traded or sold as there is an active second-hand market for wind turbines, or they may be used as scrap metal. The decommissioning procedures will be undertaken in line with an Environmental Management Plan, and the site will be rehabilitated and returned to its pre-construction state.

The decommissioning phase of the development is expected to create skilled and unskilled employment opportunities. The traffic impacts on the public roads during the decommissioning phase of the site will be significantly less than the traffic impact determined during the construction phase, as many of the internal infrastructures will be retained by the landowners.

As part of the decommissioning process, a separate traffic impact assessment should be undertaken since many of the characteristics related to the traffic impact assessment, i.e. access routes, road geometry, traffic volumes, etc., would have changed over the operational life of the development. Thus, a specific decommissioning assessment has not been undertaken at this stage.

## **8 ASSESSMENT OF IMPACTS**

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As described in section 6.2, the proposed development is primarily accessed from the NR00107 via TR03305.

The level of service of these roads in this assessment is based on the 'Follower Density'. This minimum level of service for Class 1 and 2 roads is LOS B, and for Class 3 to 5 roads is LOS C.

### **8.1 CONSTRUCTION PHASE**

The duration of the construction phase is estimated to be in the order of 24 months. During the construction phase, traffic will be generated through two distinct sources:

- The commuter traffic, getting personnel to and from the proposed developments (Peak Traffic); and
- The freight traffic, the delivery of materials and equipment to the proposed development (Diurnal Traffic).

It is envisaged that the transportation of the site personnel will result in Peak Traffic, while the delivery of equipment and materials to the site will be distributed throughout the day.

The traffic volumes generated, for both Peak Traffic and Diurnal Traffic, resulting from the proposed developments has been addressed in Section 7. Thus, the combined expected increase in the traffic volumes on the road network during the peak construction phase of the proposed developments is summarised in Table 15.



Table 15 - Construction Phase – Traffic Volumes

Roads	Day (divided into three-time frames)			
	06:30 Morning Peak Traffic (vph)	07:30 Diurnal Traffic (vph)	16:30 Afternoon Peak Traffic (vph)	17:30
NR00107/W	6.0 vph	10.5 vph	6.0 vph	
NR00107/E	24.0 vph	18.0 vph	24.0 vph	
TR03305/A	30.0 vph	28.5 vph	30.0 vph	
TR03305/B	51.0 vph	30.0 vph	51.0 vph	
TR03305/C	12.0 vph	1.5 vph	12.0 vph	
TR03305/D	12.0 vph	1.5 vph	12.0 vph	
TR03305/E	6.0 vph	1.5 vph	6.0 vph	
MR00372	6.0 vph	0.0 vph	6.0 vph	
DR02307	21.0 vph	1.5 vph	21.0 vph	
JESSA WEF	63.0 vph	31.5 vph	63.0 vph	

Based on the information provided in the table above, the peak traffic volumes on the TR03305/B is increased by more than 50 trips an hour, thus requiring a TIA, as per section 2.6 of the "South African Traffic Impact and Site Traffic Assessment Manual", which reads as follows; "A Traffic Impact Assessment shall be undertaken and submitted when an application is made for a change in land use and when the highest total additional hourly vehicular trip generation (including pass-by and diverted trips) as a result of the application exceeds 50 trips per hour".

Traffic volume generated during the peak construction phase of the development is in the order of:

- **Peak Traffic:** The maximum number of additional vehicles due to the proposed development on the TR03305/B within a given hour is estimated to be in the order of 51 vph. The access to the WEF is in the order of 63 vph.
- **Diurnal Traffic:** The maximum number of additional vehicles due to the proposed development on the TR03305/B within a given hour is estimated to be in the order of 30 vph. Which equates to approximately 240 vehicles, over an eight hour period.

The ADT generated during the peak construction phase on the roads, expressed as an "Increased ADT", are shown in Table 16.

Table 16 - Construction Phase - Traffic Assessment

Road	ADT Baseline*	Additional Traffic Generated**	Increased ADT
NR00107/W	3100	(12+84) = 96	3196
NR00107/E	3875	(48+144) = 192	4067
TR03305/A	872	(60+228) = 288	1160
TR03305/B	924	(102+240) = 342	1266
TR03305/C	884	(24+12) = 36	920
TR03305/D	884	(24+12) = 36	920
TR03305/E	878	(12+12) = 24	902
MR00372	37	(12+0) = 12	49
DR02307	370	(42+12) = 54	424
JESSA WEF	0	(126+252) = 378	378

\* Average AADT of the legs along the section of road

\*\* The first value represents the Peak Traffic and the second value represents the Diurnal Traffic

The expected ADT on TR03305/B is expected to increase from 924 to 1 266trips per day. The most significant increase occurs during the Peak Traffic, 51 vph in



one direction. Based on traffic flow of 102 vph and a speed of 90 km/h, the traffic volume will result in a Following Density of 1.133 v/km, equating to a LOS B. The Diurnal Traffic of approximately 60 vph, in both directions, based on a speed of 90 km/h, the traffic volume will result in a Following Density of 0.333 v/km, equating to a LOS A.

The additional traffic volumes on the road network, does not compromise the level of service for these roads. Thus the additional traffic volumes on the road network are deemed acceptable.

### Concrete Transportation

Since all the WTG's are located west of the TR03305 and are accessed via an internal road network, there is no need for the concrete trucks to travel on the public roads during the casting of the WTG foundations for this development. Thus, there is no impact on the public road network due to concrete transportation for the WTG foundations casting.

## 8.2 OPERATIONAL PHASE

The duration of the operational phase of the proposed developments is estimated to be in the order of 20 years. During this phase, traffic will be generated through two distinct sources:

- The commuter traffic, getting personnel to and from the proposed developments (Peak Traffic); and
- The delivery of goods and servicing of the proposed development (Diurnal Traffic).

It is envisaged that the transportation of the site personnel will result in Peak Traffic, while daily inspections, periodical maintenance, delivery of goods and servicing of the proposed development will be distributed throughout the day.

The traffic volumes generated, for both Peak Traffic and Diurnal Traffic, resulting from the proposed development's operational phase have been addressed in Section 7. Thus, the expected increase in the traffic volumes on the various roads during the operational phase of the proposed developments are summarised in Table 17.

Table 17 - Operational Phase – Traffic Volumes

Roads	Day (divided into three-time frames)			
	06:30	Morning Peak Traffic (vph)	07:30	Diurnal Traffic (vph)
NR00107/W		3.0 vph		0.0 vph
NR00107/E		9.0 vph		0.8 vph
TR03305/A		12.0 vph		0.8 vph
TR03305/B		18.0 vph		1.5 vph
TR03305/C		9.0 vph		0.0 vph
TR03305/D		9.0 vph		0.0 vph
TR03305/E		3.0 vph		0.0 vph
MR00372		6.0 vph		0.0 vph
DR02307		6.0 vph		0.8 vph
JESSA WEF		27.0 vph		1.5 vph

Based on the information provided in the table above, no traffic volumes are increased by more than 50 trips an hour. Thus negating the requirement for a TIA



as specified in section 2.6 of the "South African Traffic Impact and Site Traffic Assessment Manual", which reads as follows; "A Traffic Impact Assessment shall be undertaken and submitted when an application is made for a change in land use and when the highest total additional hourly vehicular trip generation (including pass-by and diverted trips) as a result of the application exceeds 50 trips per hour".

Traffic volume generated during the operational phase of the proposed developments are as follows:

- **Peak Traffic:** The maximum number of vehicles on the public road network within a given hour is estimated to be in the order of 18 vph.
- **Diurnal Traffic:** The maximum number of vehicles on the public road network within a given hour is estimated to be in the order of 1.5 vph. Which equates to approximately 4 vehicles, over an eight hour period.

The ADT generated during the operational phase on the public road network, expressed as an "Increased ADT", are shown in Table 18.

Table 18 - Operational Phase - Traffic Assessment

Road	ADT Baseline*	Additional Traffic Generated**	Increased ADT
NR00107/W	3100	(6+0) = 6	3106
NR00107/E	3875	(18+6) = 24	3899
TR03305/A	872	(24+6) = 30	902
TR03305/B	924	(36+12) = 48	972
TR03305/C	884	(18+0) = 18	902
TR03305/D	884	(18+0) = 18	902
TR03305/E	878	(6+0) = 6	884
MR00372	37	(12+0) = 12	49
DR02307	370	(12+6) = 18	388
JESSA WEF	0	(54+12) = 66	66

\* Average AADT of the legs along the section of road

\*\* The first value represents the Peak Traffic and the second value represents the Diurnal Traffic

The expected ADT on TR03305/B is expected to increase from 924 to 972 trips per day. The most significant increase occurs during the Peak Traffic, 10 vph in one direction. Based on a traffic volume of 80 vph and a speed of 90 km/h, the traffic volume will result in a Following Density of 0.889 v/km, equating to a LOS A. The increase in Diurnal Traffic is negligible.

The additional traffic volumes on the road network, does not compromise the level of service for these roads and is deemed insignificant.

### 8.3 DECOMMISSIONING PHASE

As described in Section 7.4 above, a separate traffic impact assessment should be undertaken as part of the decommissioning process since many of the characteristics related to the traffic impact assessment, i.e. access routes, road geometry, traffic volumes, etc., would have changed over the operational life of the development. Thus, no traffic assessment for the decommissioning phase has been undertaken in this report.

## 9 ASSESSMENT OF CUMULATIVE IMPACTS

The assessment of the cumulative increased traffic volumes on the road network within the study area during this proposed development's construction, operational and decommissioning phases are delineated below.



The construction of the proposed development is subject to the relevant approval by the various authorities.

In addition to the proposed developments there is only one other proposed development on the TR03305 within a 30 km radius, as detailed in Section 6.4. However, several other renewable energy developments and grid connections are proposed further to the South, outside the 30 km radius of the proposed development. The impact of this traffic has not been included in this assessment.

It is unclear whether all three of the Jessa Wind Farm Projects will be constructed concurrently or sequentially. As a worst-case scenario, concurrent construction of these three developments and the Wind Farm X are assumed for evaluation.

To summarise:

- The cumulative construction phase assessment includes the simultaneous construction of the three Jessa Wind Farm Projects and the Wind Farm X;
- The cumulative operation phase assessment includes the simultaneous operation of the three Jessa Wind Farm Projects and the Wind Farm X.

For assessment purposes, the traffic generated by Wind Farm X shall be assumed to be equal to the traffic generated by a single Jessa Wind Farm development.

## 9.1 CONSTRUCTION PHASE

The cumulative traffic volumes during the construction phase of the Jessa Wind Farms and Wind Farm X, are based on:

- A combined workforce complement of 750 for the three Jessa Wind Farm Projects, which includes the construction of the BESS and Substations;
- A workforce complement of 250 for Wind Farm X.

Thus the cumulative traffic volumes on the road network related to the proposed development are based on a combined workforce of 1 000 individuals. The Peak Traffic and Diurnal Traffic is provided in Table 19.

Table 19 - Cumulative Peak Constructional Phase - Traffic Volume

Roads	Day (divided into three-time frames)			
	06:30	Morning Peak Traffic (vph)	07:30	Diurnal Traffic (vph)
			16:30	Afternoon Peak Traffic (vph)
				17:30
NR00107/W		8.0 vph		14.0 vph
NR00107/E		32.0 vph		24.0 vph
TR03305/A		40.0 vph		38.0 vph
TR03305/B		68.0 vph		40.0 vph
TR03305/C		38.0 vph		11.5 vph
TR03305/D		16.0 vph		2.0 vph
TR03305/E		8.0 vph		2.0 vph
MR00372		8.0 vph		0.0 vph
DR02307		28.0 vph		2.0 vph
JESSA WEF		63.0 vph		31.5 vph

Based on the information provided in the table above, there is only one sections on the TR03305 where the traffic volume is increased by more than 50 trips an hour, thus requiring a TIA, as per section 2.6 of the "South African Traffic Impact and Site Traffic Assessment Manual", which reads as follows; "A Traffic Impact Assessment shall be undertaken and submitted when an application is made for a change in



land use and when the highest total additional hourly vehicular trip generation (including pass-by and diverted trips) as a result of the application exceeds 50 trips per hour".

The maximum cumulative traffic volumes generated on the various roads during the construction phase of the proposed developments are in the order of:

- **Peak Traffic:** The maximum number of vehicles on the public road network within a given hour is estimated to be in the order of 68 vph.
- **Diurnal Traffic:** The maximum number of vehicles on the public road network within a given hour is estimated to be in the order of 40.0 vph. Which equates to approximately 320 vehicles, over an eight hour period.

The assessment of the cumulative traffic impact generated during the peak construction phase expressed as an "Increased ADT" is provided in Table 20.

Table 20 - Cumulative Constructional Phase - Traffic Assessment

Road	ADT Baseline*	Additional Traffic Generated**	Increased ADT
NR00107/W	3100	(16+112) = 128	3228
NR00107/E	3875	(64+192) = 256	4131
TR03305/A	872	(80+304) = 384	1256
TR03305/B	924	(136+320) = 456	1380
TR03305/C	884	(76+92) = 168	1052
TR03305/D	884	(32+16) = 48	932
TR03305/E	878	(16+16) = 32	910
MR00372	37	(16+0) = 16	53
DR02307	370	(56+16) = 72	442
JESSA WEF	0	(126+252) = 378	378

\* Average AADT of the legs along the section of road

\*\* The first value represents the Peak Traffic and the second value represents the Diurnal Traffic

The maximum expected ADT is on TR03305/B, and the ADT will increase from 924 to 1 380 trips per day. During Peak Traffic, the max estimated ADT on this section of the road is in the order of 82 vph, which with the estimated peak traffic of all the projects, is increased to 109 vph. The Following Density of the traffic on this section of the road, assuming a speed of 90 k/h is 1.211 v/km, equating to a LOS B. During Diurnal Traffic, the max estimated ADT on this section of the road is in the order of 41 vph, which with the estimated peak traffic of all the projects, is increased to 81 vph (both directions). The Following Density of the traffic on this section of the road, assuming a speed of 90 k/h is 0.450 v/km, equating to a LOS A.

### Concrete Transportation

The transportation of concrete delivery for the casting of the WTG foundations uses the internal road network proposed developments and does not use the public road network. Thus, there is no impact on the public road network.

## 9.2 OPERATIONAL PHASE

The cumulative traffic volumes during the operational phase of the Jessa Wind Farms and Wind Farm X are based on a combined workforce of 160 individuals. The cumulative Peak Traffic and Diurnal Traffic is provided in Table 21.



Table 21 - Cumulated Operational Phase – Traffic Volumes

Roads	Day (divided into three-time frames)		
	06:30 Morning Peak Traffic (vph)	07:30 Diurnal Traffic (vph)	16:30 Afternoon Peak Traffic (vph) 17:30
NR00107/W	4.0 vph	0.0 vph	4.0 vph
NR00107/E	12.0 vph	1.0 vph	12.0 vph
TR03305/A	16.0 vph	1.0 vph	16.0 vph
TR03305/B	24.0 vph	2.0 vph	24.0 vph
TR03305/C	15.0 vph	0.5 vph	15.0 vph
TR03305/D	12.0 vph	0.0 vph	12.0 vph
TR03305/E	4.0 vph	0.0 vph	4.0 vph
MR00372	8.0 vph	0.0 vph	8.0 vph
DR02307	8.0 vph	1.0 vph	8.0 vph
JESSA WEF	27.0 vph	1.5 vph	27.0 vph

Based on the information provided in the table above, there are no traffic volumes that are increased by more than 50 trips an hour, thus negating the requirement for a TIA as specified in section 2.6 of the "South African Traffic Impact and Site Traffic Assessment Manual", "A Traffic Impact Assessment shall be undertaken and submitted when an application is made for a change in land use and when the highest total additional hourly vehicular trip generation (including pass-by and diverted trips) as a result of the application exceeds 50 trips per hour".

The cumulative traffic volumes generated on the road network within the study area during the combined operational phase is in the order of:

- **Peak Traffic:** The maximum number of vehicles on the public road network within a given hour is estimated to be in the order of 24 vph;
- **Diurnal Traffic:** The maximum number of vehicles on the public road network within a given hour is estimated to be in the order of 2.0 vph. Which equates to approximately 16 vehicles, over an eight hour period.

The assessment of the cumulative traffic impact generated during the operational phase expressed as an "Increased ADT" is provided in Table 22.

Table 22 - Cumulative Operational Phase – Traffic Assessment

Road	ADT Baseline*	Additional Traffic Generated**	Increased ADT
NR00107/W	3100	(8+0) = 8	3108
NR00107/E	3875	(24+8) = 32	3907
TR03305/A	872	(32+8) = 40	912
TR03305/B	924	(48+16) = 64	988
TR03305/C	884	(30+4) = 34	918
TR03305/D	884	(24+0) = 24	908
TR03305/E	878	(8+0) = 8	886
MR00372	37	(16+0) = 16	53
DR02307	370	(16+8) = 24	394
JESSA WEF	0	(54+12) = 66	66

\* Average AADT of the legs along the section of road

\*\* The first value represents the Peak Traffic and the second value represents the Diurnal Traffic

The maximum expected ADT is on TR03305/B, and the ADT will increase from 924 to 988 trips per day. During Peak Traffic, the max estimated ADT on this section of



the road is in the order of 82 vph, which with the estimated peak traffic of all the projects, is increased to 65 vph (one direction). The Following Density of the traffic on this section of the road, assuming a speed of 90 k/h is 0.722 v/km, equating to a LOS A. During Diurnal Traffic, the max estimated ADT on this section of the road is in the order of 41 vph, which with the estimated peak traffic of all the projects, is increased to 43 vph (both directions). The Following Density of the traffic on this section of the road, assuming a speed of 90 k/h is 0.239 v/km, equating to a LOS A.

### **9.3 DECOMMISSIONING PHASE**

As described in Section 7.4 above, a separate traffic impact assessment should be undertaken as part of the decommissioning process since many of the characteristics related to the traffic impact assessment, i.e. access routes, road geometry, traffic volumes, etc., would have changed over the operational life of the development. Thus, no cumulative traffic assessment for the decommissioning phase of the proposed development has been undertaken in this report.

## **10 RISKS AND IMPACTS**

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Developments within an established environment can cause a significant impact on the road network, mainly when new developments are introduced into the environment, which leads to an increase in traffic on the existing public roads. The traffic volume will vary depending on the phase of the development. More traffic is envisaged during the construction and decommissioning phases of the proposed developments, while traffic volumes during the operational phase of the proposed developments are deemed insignificant.

With the increase of traffic on the roads comes the potential increase in incidents. The incidents could vary from minor damage to the vehicle due to the road conditions to fatal collisions with other vehicles, pedestrians or even animals.

Traffic safety is directly related to the attitude of the drivers using the roads. The road condition will dictate the safe speed limit a responsible driver will travel. However, not all road users are responsible, resulting in frustrated drivers taking unnecessary chances, many of which involve excessive speeding.

Thus, to improve traffic safety on the roads, it is strongly suggested that all key personnel, including mini-bus and bus drivers, be provided with advanced driver training.

### **10.1 RISKS**

The existing road network has numerous intrinsic risks, which could be exacerbated by the traffic generated due to the proposed developments. The most pertinent risks that need to be considered by the developer during the various phases of the proposed developments include the following:

- Congestion on the roads due to the abnormal loads and mixed modes of traffic, resulting in drivers taking unnecessary and dangerous “chances”.
- Reduced visibility
- Incidents with other road users, i.e. vehicles, cycles, pedestrians and animals
- Road degradation resulting in increased maintenance.

#### **10.1.1 Congestion**

Congestion on the road network will be significantly more during the construction phase than expected during the proposed developments' operational phase.



*During the construction phase of the proposed developments, a significant increase in traffic is anticipated during the morning and afternoon peaks. The diurnal traffic related to this development is less significant as it is spread over the entire day.*

*Abnormal loads will typically be transported to the proposed developments in convoys under escort, resulting in queues of slow-moving vehicles behind the convoy.*

*During the operational phase of the development, there will be a nominal increase in traffic on the local road network. The increase in traffic volumes will be limited to peak traffic with negligible diurnal traffic generated.*

*The increased traffic volumes will increase the potential of incidents on the roads within the study area, specifically at intersections and with other road users.*

*A Transport Management Plan will need to be compiled to identify and manage mitigation measures for the project.*

### **10.1.2 Reduced Visibility**

*Numerous natural phenomena could compromise the road user's visibility, thus increasing the potential for accidents. These include inter alia:*

- Sun glare: When driving on the road into the sun, there is a high probability of being blinded by the sun, not being able to observe activities along the road and at intersections, which could result in an incident;*
- Inclement weather: Visibility is the primary concern when driving in inclement weather. Reduced visibility resulting from either the rain itself or from the spray of the vehicles travelling on the road. Skidding and aquaplaning resulting from water on the road surface is a probable risk;*
- Dust: The generation of dust when travelling on unpaved roads is inevitable. The larger the vehicle, the more dust is generated. This dust hinders the drivers wishing to over-take with a clear view for over-taking, resulting in drivers taking unnecessary chances, resulting in unfavourable consequences.*

*Mitigation measures to consider include*

- Compile a Transport Management Plan, sections of which to be part of induction training for all personnel travelling to the development,*

### **10.1.3 Pedestrians and Animals**

*The development is to be constructed in the rural area, consisting predominately of wide-open areas. Large portions of the area are undeveloped and are home to various species of antelope.*

*Stray livestock, wild animals, pedestrians and cyclists are all potential risks to road users. If drivers take evasive action at high speed, there is a strong probability that the vehicle could roll, resulting in severe injuries or even fatalities. Failing to take evasive action will result in the inevitable fatality of the animal or other road users.*

*Mitigation measures are limited to providing drivers with advanced driver training and training on how to handle a vehicle in the event of a tire blow-out or an antelope jumping in the road, as the incorrect evasive action could have dire consequences*

### **10.1.4 Road Degradation**

*The majority of the roads in the study area are paved, and the structure varies from wide, well-maintained roads to narrow, poorly maintained gravel roads.*



During the construction phase of the proposed developments, there will be an increase in the traffic volumes on the local road network. The increased traffic volumes will place an additional burden on the roads within the study area.

Mitigation of this impact is regular maintenance of the roads by the local roads' authorities. However, it is unlikely that the local authorities will undertake the necessary road maintenance due to budget constraints. As is standard practice and customarily enforced as part of the planning approval for the development, the developer undertakes to contribute towards or conducts regular maintenance of the roads network used by the developer.

## 10.2 IMPACTS

The road network within the study area is limited, offering very little opportunity of selecting alternative routes. All routes evaluated for the development are existing roads, and no new roads need to be constructed.

Traffic-related risks and impacts on the road network within the study area have been assessed using an assessment methodology provided by SLR Consulting South Africa (Pty) Ltd for various phases of this development.

### 10.2.1 Construction Phase

During the peak construction phase of the development, the following safety and road network integrity impacts have been assessed.

#### Increased Road Incidents

The impact of increased traffic volumes on the public roads, which will increase the potential of incidents on the road network within the study area, is provided in Table 23.

Table 23 - Construction Phase - Increased Road Incidents

Issue	Increased Road Incidents	
Description of Impact		
The increased traffic volumes on the public roads will increase the potential of incidents on the road network within the study area		
Type of Impact	Indirect	
Nature of Impact	Negative	
Phases	Construction	
Criteria	Without Mitigation	With Mitigation
Intensity	Very High	Very High
Duration	Short-term	Short-term
Extent	Local	Local
Consequence	Medium	Medium
Probability	Definite / Continuous	Conceivable
Significance	Medium	Low
Degree to which impact can be reversed	The resource is irreparably damaged and is not represented elsewhere	
Degree to which impact may cause irreplaceable loss of resources	The resource is irreparably damaged and is not represented elsewhere	
Degree to which impact can be mitigated	Mitigation does not exist, or mitigation will slightly reduce the significance of impacts	
Mitigation actions		
The following measures are recommended:	Post relevant road signage along affected routes; Create local WhatsApp Group, notifying other road users of expected deliveries and associated routes; Transport Management Plan(TMP) is to be compiled once the contractor has been appointed and all the relevant details of the construction process are known. Refer to Section 11.The TMP needs to address, inter alia: - clearly defined route/s to the site for specific vehicles needed to transport	



	<i>equipment and materials - scheduled deliveries to avoid local congestion; Ensure all vehicles are roadworthy, visible, adequately marked, and operated by an appropriately licenced operator.</i>	
<b>Monitoring</b>		
<b>The following monitoring is recommended:</b>	<i>Incident register and ongoing road safety awareness training</i>	
<b>Cumulative impacts</b>		
<b>Nature of cumulative impacts</b>	<i>The cumulative impact resulting from the traffic volumes on the road network</i>	
<b>Rating of cumulative impacts</b>	<b><i>Without Mitigation</i></b>	<b><i>With Mitigation</i></b>
	<b><i>Medium</i></b>	<b><i>Low</i></b>

## Road Degradation

The impact of increased traffic volumes on the public roads, which will increase the potential for localised road network degradation within the study area, is presented in Table 24.

Table 24 - Construction Phase - Road Degradation

Table 21 Construction Phase Road Degradation		
Issue	Road Degradation	
Description of Impact		
The increased traffic volumes on the public roads will increase the potential for localised road network degradation within the study area.		
Type of Impact	Indirect	
Nature of Impact	Negative	
Phases	Construction	
Criteria	Without Mitigation	With Mitigation
Intensity	Medium	Low
Duration	Short-term	Short-term
Extent	Local	Local
Consequence	Medium	Medium
Probability	Definite / Continuous	Conceivable
Significance	Medium	Low
Degree to which impact can be reversed	The affected environment will be able to recover from the impact	
Degree to which impact may cause irreplaceable loss of resources	The resource is not damaged irreparably or is not scarce	
Degree to which impact can be mitigated	Mitigation exists and will notably reduce the significance of impacts	
Mitigation actions		
The following measures are recommended:	Create a local WhatsApp Group and post notices of road conditions and proposed alternatives. Developer to contribute to the maintenance of the public roads in the area during construction phase of the development/s. A photographic record of the road condition should be maintained throughout the various phases of the development/s. This provides an objective assessment and mitigates any subjective view from road users. Upgrade unpaved roads to a suitable condition for proposed construction vehicles; Ensure that the roads are left in the same or better condition, post-construction.	
Monitoring		
The following monitoring is recommended:	Weekly inspection,	
Cumulative impacts		
Nature of cumulative impacts	The cumulative impact resulting from the traffic volumes on the road network	
Rating of cumulative impacts	Without Mitigation	With Mitigation
	Medium	Lo -

## Dust

The larger the vehicle, the more dust is likely to be generated. This dust hinders the drivers wishing to over-take without a clear view for over-taking, resulting in drivers



taking unnecessary chances, which could result in unfavourable consequences. The impact of increased traffic volumes on the unpaved public roads that will generate dust is presented in Table 25.

Table 25 - Construction Phase – Dust

Issue	Dust	
Description of Impact		
The increased traffic volumes on the unpaved public roads will generate more dust. The larger the vehicle, the more dust is likely to be generated. This dust hinders the drivers wishing to over-take without a clear view for over-taking, resulting in drivers taking unnecessary chances, which could result in unfavourable consequences		
Type of Impact	Indirect	
Nature of Impact	Negative	
Phases	Construction	
Criteria	Without Mitigation	With Mitigation
Intensity	High	High
Duration	Medium-term	Short-term
Extent	Regional	Regional
Consequence	High	Medium
Probability	Possible / frequent	Conceivable
Significance	Medium -	Low -
Degree to which impact can be reversed	The affected environment will not be able to recover from the impact - permanently modified	
Degree to which impact may cause irreplaceable loss of resources	The resource is irreparably damaged and is not represented elsewhere	
Degree to which impact can be mitigated	Mitigation does not exist, or mitigation will slightly reduce the significance of impacts	
Mitigation actions		
The following measures are recommended:	Reduce travel speed for construction vehicles on the gravel road to reduce dust Dust suppression of the roads in the immediate vicinity of the site where feasible Regular preventative maintenance of roads within the immediate vicinity of the site should be conducted over weekends to minimise the impact on the average construction period.	
Monitoring		
The following monitoring is recommended:	Continues observation, remedial action needs to be taken as and when required	
Cumulative impacts		
Nature of cumulative impacts	The development would contribute to cumulative impacts on Riverine Rabbits especially due to vehicle collisions, but this would be transient and the overall contribution to cumulative impact would be low.	
Rating of cumulative impacts	Without Mitigation	With Mitigation
	Medium -	Low -

## Intersection Safety

The impact due to the increased traffic volumes at intersections, which will increase the potential risk of accidents at the intersections, resulting in serious injuries or even fatalities, is presented in Table 26, especially at the intersection on the main roads, when vehicles from the site needing to cross over oncoming traffic.

Table 26 - Construction Phase - Intersection Safety

Table 26 Construction Phase Intersection Safety	
Issue	Intersection Safety
Description of Impact	
The increased traffic volumes at intersections will increase the potential risk of accidents at the intersections, resulting in serious injuries or even fatalities, especially at the intersection on the main roads, when vehicles from the site need to cross over oncoming traffic.	
Type of Impact	Indirect
Nature of Impact	Negative
Phases	Construction



Criteria	Without Mitigation	With Mitigation
Intensity	High	High
Duration	Short-term	Short-term
Extent	Site	Site
Consequence	Medium	Medium
Probability	Definite / Continuous	Definite / Continuous
Significance	Medium -	Medium -
Degree to which impact can be reversed	The affected environment will not be able to recover from the impact - permanently modified	
Degree to which impact may cause irreplaceable loss of resources	The resource is irreparably damaged and is not represented elsewhere	
Degree to which impact can be mitigated	Mitigation exists and will notably reduce significance of impacts	
Mitigation actions		
The following measures are recommended:	Compile TMP, refer to Section 11 of the Traffic Report/ Section x of EIA Reduce speed at intersections and use appropriate traffic warning signs Identify alternative routes where possible Request the assistance of local law enforcement Ensure that all construction vehicles are roadworthy, visible, adequately marked, and operated by an appropriately licenced operator.	
Monitoring		
The following monitoring is recommended:	Incident register and ongoing road safety awareness training	
Cumulative impacts		
Nature of cumulative impacts	The cumulative impact due to the increased traffic volumes at intersections, which will increase the potential risk of accidents at the intersections, resulting in serious injuries or even fatalities, especially at the intersection on the main roads, when vehicles from the site need to cross over oncoming traffic.	
Rating of cumulative impacts	Without Mitigation	With Mitigation
	Medium -	Low -

## 10.2.2 Operational Phase

During the operational phase of the development, the traffic volumes are considerably less than during the construction phase of the proposed development. Thus all impacts associated with increased traffic volumes have been omitted. Therefore, the only impact deemed essential during the operational phase of the proposed development is addressed below.

### Intersection Safety

The cumulative impact due to the increased traffic volumes at intersections, which will increase the potential risk of accidents at the intersections, resulting in serious injuries or even fatalities, is presented in Table 27, especially at the intersection on the main roads, when vehicles from the site need to cross over oncoming traffic.

Table 27 - Operational Phase - Intersection Safety

Table 27: Operational Phase - Intersection Safety		
Issue	Intersection Safety	
Description of Impact		
The increased traffic volumes at intersections will increase the potential risk of accidents at the intersections, resulting in serious injuries or even fatalities, especially at the intersection on the main roads, when vehicles from the site need to cross over oncoming traffic.		
Type of Impact	Indirect	
Nature of Impact	Negative	
Phases	Operation	
Criteria	Without Mitigation	With Mitigation
Intensity	High	High
Duration	Short-term	Short-term
Extent	Site	Site
Consequence	Medium	Medium



Probability	Definite / Continuous	Definite / Continuous
Significance	Medium -	Medium -
Degree to which impact can be reversed	The affected environment will not be able to recover from the impact - permanently modified	
Degree to which impact may cause irreplaceable loss of resources	The resource is irreparably damaged and is not represented elsewhere	
Degree to which impact can be mitigated	Mitigation exists and will notably reduce the significance of impacts	
Mitigation actions		
The following measures are recommended:	Compile TMP, refer to Section 11 of the Traffic Report/ Section x of EIA Reduce speed at intersections and use appropriate traffic warning signs Identify alternative routes where possible Request the assistance of local law enforcement Ensure that all construction vehicles are roadworthy, visible, adequately marked, and operated by an appropriately licenced operator.	
Monitoring		
The following monitoring is recommended:	Incident register and ongoing road safety awareness training	
Cumulative impacts		
Nature of cumulative impacts	The cumulative impact due to the increased traffic volumes at intersections, which will increase the potential risk of accidents at the intersections, resulting in serious injuries or even fatalities, especially at the intersection on the main roads, when vehicles from the site need to cross over oncoming traffic.	
Rating of cumulative impacts	Without Mitigation	With Mitigation
	Medium -	Low -

### 10.2.3 No-go Alternative

*If the proposed development does not materialise, the increase in the traffic volume will not transpire, resulting in the following impacts:*

#### **Road Degradation**

*Less traffic on the roads means that the rate of degradation to the roads will be less. However, the maintenance of the roads will not be augmented by the proposed development. Improved maintenance of the roads will improve the quality of life to the road users and increase the economic opportunities in the area.*

#### **Road Safety**

*Less traffic on the roads means less probability of an incident, reducing the likelihood of a fatality.*

#### **Statement**

*The improved road maintenance counteracts the negative impacts on the road network due to the development and economic prospects the development will bring to the local community and the impact the development has on a national scale.*

## 11 TRANSPORT MANAGEMENT PLAN

*A Transport Management Plan (TMP) for the project shall be developed once the construction contractor has been appointed. The TPM must consider all the potential risks along the access routes and the roads on the site.*

*The main objectives of a TMP are to identify potential risks and mitigation measures to be implemented to negate the potential risks as far as reasonably possible. Preventing traffic congestion on public roads needs to be a key consideration when compiling the TMP. The implementation of the TMP needs to be vigorously managed.*

*A description of the most pertinent elements, together with the proposed transportation routes, are summarised below:*



- Abnormal loads, including WTG components and transformers for the proposed developments, emanating from one of the Terminal and/or Commercial centres in South Africa, is expected to be via the TR03305;
- Aggregate and cement for the concrete batching plant is envisaged to be transported to the proposed development from commercial sources is via the TR03305;
- Personnel commuting routes originating from the local community will access the proposed developments either via the TR05801 or DR02315;
- Movement of material on site. Due to the layout of the proposed development, the interaction of site vehicles with vehicles on the public road network is unlikely.

Other key points include, inter alia:

- Compile a Transport Management Plan, sections of which to be part of induction training for all personnel travelling to the proposed development;
- Outline specific traffic management measures across all phases of the proposed development;
- Defined specific routes for each type of vehicle needed to transport equipment, materials and personnel to the proposed development;
- Identify mitigation measures to minimise impacts on existing road users;
- Reduce the number of individual vehicles travelling to the proposed development;
- Provide minibuses/buses for personnel commuting to the proposed development;
- Schedule deliveries by heavy vehicles to avoid the formation of convoys. Sufficient distance must be maintained between heavy vehicles to allow light vehicles to overtake safely;
- Avoid route which passes through dangerous intersections;
- Traffic routes to and from the proposed development are to be spread as far as possible.
- Define the repair and maintenance strategy to be adopted during the various phases of the development;

## 12 CONCLUSION AND RECOMMENDATIONS

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ENERTRAG South Africa (Pty) Ltd propose developing three wind energy facilities southwest of Beaufort West within the Central Karoo District Municipality of the Western Cape. The proposed wind farms are the Jessa M Wind Farm, the Jessa S Wind Farm, and the Jessa Z Wind Farm, collectively referred to as the Jessa Wind Farm Cluster.

### 12.1 CONCLUSION

Based on the information provided in this document, the following conclusions can be drawn:

#### **Assessment Assumptions**

- A 24-month construction phase for each WEF is expected;
- Cumulative impact during the peak construction phase, worst-case scenario, includes simultaneous construction of the three Jessa Wind Energy Facilities and Wind Farm X. The combined workforce complement is assumed to be in the order 1 000;



- Cumulative impact during the operational phase includes the simultaneous operation of the three Jessa Wind Energy Facilities and Wind Farm X. The combined workforce complement is assumed to be in the order 160;
- It is not possible to determine the volume of traffic that will be generated during the decommissioning phase. It can, however, be expected that the volumes will be lower than during the construction phase. As part of the decommissioning process a separate traffic impact assessment should be undertaken, since many of the characteristics related to the traffic impact assessment, i.e. access routes, road geometry, traffic volumes etc., would have changed over the operational life of the proposed developments;

### **Road Conditions**

- The TR03305, between the NR00107 and the proposed development, is relatively flat with minor inclination. The trunk road has a paved surface with gravel shoulders. The current condition is fair but is expected to deteriorate due to the envisaged traffic volumes. The maintenance regime on this road is questionable, and the developer would have to assist local roads authorities with regular maintenance of this road;
- It is proposed that the majority of the deliveries to the proposed development will be via the TR03305, between the NR00107 and the proposed development.
- In consultation with the relevant roads' authorities, the developer would need to investigate constructing a new intersection at the entrance of the proposed development from the TR03305 to accommodate the expected transportation requirements. This upgrade would need to be implemented to facilitate all deliveries, including abnormal loads, to the site;
- The expected traffic increase on the road network during the peak construction phase will lead to greater wear and tear of the roads but will not have an undue detrimental impact on the structure of the roads if the roads are properly maintained. The developer shall contribute to maintaining the public road network affected by the development as identified by the local roads' authorities. It is proposed that the developer contribute to the maintenance of the road network during the construction and the operational phases, commencing the year after successfully achieving Commercial Operation;
- Additional ongoing funding from the wind farms towards the maintenance of the roads will have a positive impact on the local road conditions and community;

### **Transportation Route**

- The development is accessed from well-established transportation routes between large commercial centres within South Africa;
- Previously established transportation routes from the Ngqura Container Terminal, near Gqeberha, to existing wind farms, could be used for the transportation of equipment and material, including abnormal loads;
- The final route selection is subject to the limitations specified in the transport permits and the vehicles to be used by the appointed logistics company;
- All site entrances from public roads, existing intersection and road alignments that require upgrading to accommodate the transportation requirements of equipment and material, are to comply with geometric standards and approved by the relevant roads' authorities;
- All equipment and material transported to the proposed development shall be via the TR03305;
- Any constraints along the proposed transportation routes will have to be resolved once the appointed logistics contractor has identified the final route;



- No anomalies associated with the proposed transportation routes were observed or identified that will compromise the development. However, this will have to be confirmed by the logistics contractor once the preferred WTG supplier has been selected;

### **Traffic Volumes**

- The most significant impact on traffic volumes is as a result of commuting personnel to and from the site, in the morning and the afternoon;
- The combined traffic volume on the TR03305 exceeds 50 trips per hour during the construction phases for the proposed development, which is the threshold for a detailed Traffic Impact Assessment;
- At no point during the operational phases for the combined proposed development does the traffic volume on the various roads exceed 50 trips per hour, which is the threshold for a detailed Traffic Impact Assessment;
- The cumulative traffic volumes resulting from the construction phase of the Jessa Wind Energy Facilities and Wind Farm X, result in traffic volumes exceeding 50 trips per hour;
- The traffic volume generated during the peak construction phase of the combined proposed developments is in the order of:
  - Peak Traffic: The maximum number of vehicles on the public road network within a given hour is estimated to be in the order of 51 vph;
  - Diurnal Traffic: The maximum number of vehicles on the public road network within a given hour is estimated to be in the order of 30 vph. Which equates to approximately 240 vehicles, over an eight hour period.
- The traffic volume generated during the operational phase of the combined proposed developments is in the order of:
  - Peak Traffic: The maximum number of vehicles on the public road network within a given hour is estimated to be in the order of 18 vph;
  - Diurnal Traffic: The maximum number of vehicles on the public road network within a given hour is estimated to be in the order of 1.5 vph. Which equates to approximately 12 vehicles, over an eight hour period.
- The cumulative traffic volume generated during the peak construction phase of the three Jessa Wind Farms and Wind Farm X, is in the order of:
  - Peak Traffic: The maximum number of vehicles on the public road network within a given hour is estimated to be in the order of 68 vph;
  - Diurnal Traffic: The maximum number of vehicles on the public road network within a given hour is estimated to be in the order of 40.0 vph. Which equates to approximately 320 vehicles, over an eight hour period.
- The cumulative traffic volume generated during the operational phase of all the three Jessa Wind Farms and Wind Farm X, is in the order of:
  - Peak Traffic: The maximum number of vehicles on the public road network within a given hour is estimated to be in the order of 24 vph;
  - Diurnal Traffic: The maximum number of vehicles on the public road network within a given hour is estimated to be in the order of 2.0 vph. Which equates to approximately 16 vehicles, over an eight hour period.
- The minimum required level of service for a Class 2 road is LOS B. The combined and cumulative effects of the peak traffic result in a LOS B, which is the minimum requirement. While the combined and cumulative diurnal traffic results in a LOS A. Thus, the additional traffic volume does not compromise the level of service of the roads.



## **Safety**

- *This is an agricultural area, home to many species of small fauna, including livestock and wild animals. Stray animals on or crossing the road is a common occurrence that could result in a collision;*
- *Additional vehicles on the road will be subject to these hazards, with a potential for an increase in incidents;*
- *Intersections on the TR03305 are high-risk areas for incidents that need to be addressed.*

## **12.2 RECOMMENDATIONS**

*Based on the conclusions of this report, the following recommendations are made and should be included in the conditions of the environmental authorisation:*

- *The developer shall upgrade the intersection at the entrance to the proposed development from the TR03305 to accommodate the expected transportation requirements. This upgrade would need to be implemented to facilitate the deliveries, including abnormal loads, to the proposed development;*
- *The developer shall contribute to the maintenance of all roads affected by the development, during the construction and operational phases of the development;*
- *A Traffic Management Plan (TMP) is required. The TMP is to be compiled once the contractor has been appointed and all the relevant details of the construction process are known;*
- *The TMP should consider the scope of the development and take cognisance of the existing condition of the road network at the time the project commences;*
- *Intersections are high-risk areas and shall be a key area of consideration;*
- *The developer shall ensure that the contractor provides the necessary driver training to key personnel to minimise the potential of incidents on the public road network;*
- *Temporary signs warning motorists of construction vehicles should be erected on the approaches to the access road;*
- *The developer shall ensure that the condition of the roads impacted by construction of the development is left in a similar or better state once the construction phase is complete;*

*Considering the above findings, it can be concluded that the proposed development of the Jessa Wind Farm Cluster will have a notable increase in traffic volumes on the road network during the peak construction phase of the proposed developments. However, this report has assessed the impact of these additional traffic volumes on the surrounding road network. It can conclude that the level of service on all the roads are acceptable. Although the road network is not well maintained due to budgetary constraints within various spheres of government. The increase in traffic volumes will lead to greater wear and tear, especially during construction, but will not have an undue detrimental impact on the road network within the study area if the mitigation measures are undertaken.*

*It is the reasoned opinion of the author that the proposed development of the Jessa Wind Farm Cluster can be approved from a traffic and transportation perspective as there are no constraints or notable impacts that would jeopardise the implementation of the development, subject to the specific requirements included within this report.*



## 13 APPENDICES

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*Appendix 1: Declaration*

*Appendix 2: NEMA Requirements for Specialist Reports*

*Appendix 3: Curriculum Vitae*

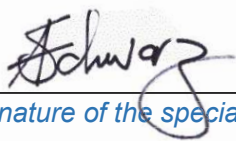


## APPENDIX 1 - DECLARATION

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*I, Athol Carl Schwarz, as the appointed specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:*

- *in terms of the general requirement to be independent:*
  - *other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or*
  - *am not independent, but another specialist that meets the general requirements set out in Regulation 13 has been appointed to review my work (Note: a declaration by the review specialist must be submitted);*
- *in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;*
- *have disclosed/will disclose, to the applicant, the Department and interested and affected parties, all material information that has or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;*
- *have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation by interested and affected parties was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;*
- *have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application;*
- *have ensured/will ensure the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;*
- *have kept/will keep a register of all interested and affected parties that participate/d in the public participation process; and*
- *am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.*



*Signature of the specialist:*

*Athol Schwarz*

*Name:*

*15<sup>th</sup> February 2022*

*Date:*



## APPENDIX 2 - NEMA REQUIREMENTS FOR SPECIALIST REPORTS

Appendix 6	Specialist Report content as required by the NEMA 2014 EIA Regulations, as amended	Section
1 (1)(a)	(i) the specialist who prepared the report; and	Appendix 3
	(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	
(b)	a declaration that the specialist is independent in a form as may be specified by the competent authority;	Appendix 1
(c)	an indication of the scope of, and the purpose for which, the report was prepared;	Section 5.2
(cA)	an indication of the quality and age of the base data used for the specialist report;	Section 7.1.2
(cB)	a description of existing impacts on the site, cumulative impacts of the development and levels of acceptable change;	Section 8 & 9
(d)	the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 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 5.4
(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;	Section 6.1
(g)	an identification of any areas to be avoided, including buffers;	NA
(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;	NA
(i)	a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 5.5
(j)	a description of the findings and potential implications of such findings on the impact of the proposed activity, or activities;	Section 10
(k)	any mitigation measures for inclusion in the EMPr;	Section 12.2
(l)	any conditions for inclusion in the environmental authorisation;	Section 12.2
(m)	any monitoring requirements for inclusion in the EMPr or environmental authorisation;	NA
(n)	a reasoned opinion-	Section 12.2
	(i) whether the proposed activity or portions thereof should be authorised; and	
	(iA) regarding the acceptability of the proposed activity or activities; and	
	(ii) if the opinion is that the proposed activity 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;	
(o)	a description of any consultation process that was undertaken during the course of preparing the specialist report;	Section 6.1.5
(p)	a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	NA
(q)	any other information requested by the competent authority.	NA
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



## APPENDIX 3 - CURRICULUM VITAE

### **ATHOL SCHWARZ Pr Tech Eng**

#### *Independent Author*

Athol, is a Professionally Registered Civil Engineering Technologist with more than 35 years of experience, specialising in Civil and Structural Engineering services for renewable energy facilities and infrastructure. These services range from the concept phase all the way through to project close-out, including inter alia: design, contract and construction management phases.

Since 2010, Athol was employed by Hatch, as a Civil Engineering Author working on numerous infrastructure and renewable energy projects (including wind farms, fixed and rotating PV solar plants, CPV solar plants) for various Independent Power Producers (IPP) / Developers.

Athol has experience in traffic impact assessments, transportation route analysis, infrastructure development and design, construction and project management (NEC), with a keen eye for detail.

#### **SPECIFIC RELEVANT EXPERIENCE**

- Red Cap Energy (Pty) Ltd - Impofu Wind Farms consisting of Impofu North Wind Farm, Impofu West Wind Farm and Impofu East Wind Farm
- juwi Renewable Energies (Pty) Ltd – Paulputs Traffic Impact Assessment
- CPV1 Solar - Touwsriver Solar, Western Cape, 36 MW Concentrated Photovoltaic Plant (1500 trackers), supervised civil infrastructure activities
- juwi Renewable Energies (Pty) Ltd - Moorreesberg Wind Energy Facility, Moorreesberg, Western Cape, consisting of 25 wind Turbine Generators - feasibility study for the routing of the access roads.
- juwi Renewable Energies (Pty) Ltd - Garob Wind Farm, Copperton, Northern Cape, consists of 46 Acciona 3.0 MW Wind Turbine Generators - conducted a hydrological study to determine the potential impact of the flood levels on the development,
- juwi Renewable Energies (Pty) Ltd - Wolf Wind Farm, Kleinpoort, Eastern Cape, consisting of 28 Wind Turbine Generators - identify the most viable access point onto the property and internal access road.
- Scatec Solar AS (Norway) - Dreunberg Filter Yard (Capacitor bank), 75 MW Single-axis PV plant – Burgersdorp, Eastern Cape – Quality control of civil activities.
- Scatec Solar AS (Norway) - Linde Filter Yard (Capacitor bank), 36.8 MW Single-axis PV plant – Hanover, Northern Cape – Quality control of civil activities.
- Scatec Solar AS (Norway) - Kalkbult Filter Yard (Capacitor bank), 75 MW Single-axis PV plant – De Aar, Northern Cape – Quality control of civil activities.
- juwi Renewable Energies (Pty) Ltd - Keiskammahoek Wind Farm, King William's Town, Eastern Cape, consisting of 16 Wind Turbine Generators - feasibility study to minimise the impact on the commercial plantation due to the development of Keiskammahoek Wind Farm
- South Africa Mainstream Renewable Power De Aar PV (Pty) Ltd - 50 MW PV Plan – De Aar, Northern Cape – clients engineer
- South Africa Mainstream Renewable Power Droogfontein PV (Pty) Ltd – 50 MW PV Plan – Kimberly, Northern Cape – clients engineer
- juwi Solar ZA Construction 3 (Pty) Ltd - Aries, 9.7 MW PV Plant – Kenhardt, Northern Cape - civil author services and Traffic Impact Assessment
- juwi Solar ZA Construction 3 (Pty) Ltd - Konkoonsies, 9.7 MW PV Plan – Pofadder, Northern Cape - civil author services and Traffic Impact Assessment
- juwi Renewable Energies (Pty) Ltd - Namies Wind Energy Facility, near Aggeneys, Northern Cape, consists of between 46 and 58 wind turbine generators - transportation route assessment



#### **EDUCATION**

Master's Diploma in Technology – Civil: Structures (1989)

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National Diploma (1986)

#### **LANGUAGES**

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- SAICE - South African Institution of Civil Engineering - Member

#### **COMPETENCES**

- Structural Design (concrete and steel),
- Project and Construction Management

#### **SOFTWARE**

- MS Office
- MS Projects
- Micro Station and Autocad
- Prokon
- Model Maker



- *juwi Renewable Energies (Pty) Ltd - Outeniqua Wind Farm (North), Uniondale, Western Cape - transportation route assessment*
- *juwi Renewable Energies (Pty) Ltd - Wolf Wind Farm, Kleinpoort, Eastern Cape consisting of 25 Wind Turbine Generators - feasibility study for the access routes*
- *juwi Renewable Energies (Pty) Ltd - Outeniqua Wind Farm (South), Uniondale, Western Cape, 16 Wind Turbine Generators - feasibility study for the access routes*
- *UMOYA ENERGY (Pty) Ltd - Hopefield Wind Farm, approximately 6 km south-east of the town of Hopefield, Western Cape, consisting of 37, Vestas 1.8 MW WTG – ACS HV Yard and Substation.*
- *South Africa Mainstream Renewable Power Jeffreys Bay (Pty) Ltd - Jeffreys Bay Wind Farm, Humansdorp, Eastern Cape, consists of 60 Siemens 2.3 MW WTG - review the foundation design for the wind towers - review the designs for compliance to the national standards.*
- *juwi Solar ZA Construction 3 (Pty) Ltd - RustMo1, 6.8 MW PV Plant – Rustenburg, North-West - author services regarding access and internal gravel roads*
- *Barrick Africa (Pty) Ltd - Buzwagi Gold Mine in Tanzania – a feasibility study.*
- *juwi Renewable Energies (Pty) Ltd - Garob Wind Farm, Copperton, Northern Cape, consists of 46 Acciona 3.0 MW Wind Turbine Generators - transportation management plan.*
- *Slim Sun Swartland Solar Park - SlimSun Solar - 5 MW PV Plant – Malmesbury, Western Cape – ACS for HV Yard and Substation.*
- *Cennergi (Pty) Ltd - Kopleegte Switching Station at Amakhala Emoyen Phase 1, Bedford, Eastern Cape, consisting of 56 Nordex, 2,4 MW Wind Turbines Generators- ACS for HV Yard and Substation.*
- *EXXARO Resources Ltd And Watt Energy (Pty) Ltd - Wittekleibosch Switching Station at Tsitsikamma Community Wind Farm, Tsitsikamma, Eastern Cape, consists of 31 Vestas 3.0 MW WTG - ACS for HV Yard and Substation.*
- *Windlab Developments South Africa (Pty) Ltd - AMAKALA EMOYENI – Phase 2, Bedford, Eastern Cape, consisting of 66 WTG - feasibility study for access and internal road network*
- *Windlab Developments South Africa (Pty) Ltd – Phase 1, Bedford, Eastern Cape, consisting of 56 Nordex, 2,4 MW Wind Turbines Generators - feasibility study for access and internal road network*
- *IBEDRROLA - Klip Heuvel Switching Station at Caledon Wind Farm, Caledon, Western Cape, consisting of 9, Sinovel 3.0 MW Wind Turbines Generators – ACS for HV Yard and Substation.*
- *EXXARO Resources Ltd - Lephalale 60 MW PV Plant, 13 km north-west of the town of Lephalale, Limpopo - ACS for HV Yard and Substation.*
- *SASOL Technology - 3.6 MW PV Demonstration Plant – civil author services*
- *Solafrica Pty (Ltd) - Bokpoort CSP Project, a 50 MW Concentrating Solar Thermal Power Station (CSP – parabolic trough) located approximately 80 km east-south-east of Upington, Northern Cape - prepared enquiry documentation for the geotechnical investigation and topographic survey*



## ANNEXURE G | VISUAL IMPACT ASSESSMENT



# **Proposed Jessa M, Jessa S and Jessa Z Wind Energy Facilities and Associated Infrastructure**

## **Visual Impact Assessment**



---

### **DFFE Reference:**

<b>Prepared by:</b>	Quinton Lawson and Bernard Oberholzer
<b>Issue Date:</b>	17 January 2022
<b>Version No.:</b>	Version 2.0



## **EXECUTIVE SUMMARY**

The current visual assessment is based on the preliminary layout of the three proposed Jessa Wind Energy Facilities (WEFs), being Jessa M, Jessa S and Jessa Z. The visual assessment of the grid connection forms part of a separate visual specialist assessment.

The study area consists of a flat plain known as 'Die Vlake' with few scenic resources on or in close proximity to the site, the main feature being the dry Boeteka River, which cuts across the site from east to west.

The general area is sparsely populated, although there are a number of visual receptors in close proximity to the proposed WEFs, these being mainly farmsteads, some of which have guest accommodation. The field trip revealed that a few of the farmsteads are no longer occupied or are derelict.

The overall visual impact significance for the wind turbines on all three of the proposed WEFs has been rated as high, before and after mitigation, given that there will be a significant change in character to the area. The visual impact significance for related infrastructure has been rated as medium, and therefore not considered visually intrusive in relative terms.

The cumulative visual impact significance of the three proposed Jessa WEFs, seen in combination with other wind and solar renewable energy projects within 35km, has been rated as high, given the change in character to the Karoo landscape and the proximity of the N12 National Road.

The layouts of the three Jessa WEFs largely avoid visual 'no-go' areas, and micro-siting of the turbines should be relatively easy. Where a situation exists that not all the turbines would be required, consideration should be given to removing or relocating outlier turbines and those that are in the 'high' visual sensitivity category (mostly steep slopes), as well as those closest to the N12 National Road.

It is not anticipated that the three proposed WEFs would present a potential fatal flaw in visual terms, particularly as the proposed project lies within the Beaufort West Renewable Energy Development Zone (REDZ 11), and could be seen as part of a renewable energy node.



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

<b>Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6</b>	<b>Section of Report</b>
1. (1) A specialist report prepared in terms of these Regulations must contain-	Page v and Appendix A
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;	
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page iv and v
c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 2
(cA) an indication of the quality and age of base data used for the specialist report;	Section 2
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 7
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 5
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
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 7
g) an identification of any areas to be avoided, including buffers;	Sections 7, 8 and 9
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;	Maps 6 to 10
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 2
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;	Section 7
k) any mitigation measures for inclusion in the EMPr;	Section 8
l) any conditions for inclusion in the environmental authorisation;	Section 8
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 8
n) a reasoned opinion-	Section 9
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, 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 <i>gazetted</i> 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





## forestry, fisheries & the environment

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

### APPLICATION FORM FOR ENVIRONMENTAL AUTHORISATION

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 JESSA WIND ENERGY FACILITIES:  
Jessa M, Jessa S and Jessa Z Wind Energy Facilities and Associated Infrastructure

Indicate if the **DRAFT** report accompanies the application

Yes ☐  
No ☐

#### PRE-APPLICATION CONSULTATION

Was a pre-application meeting held	Yes		No	
Date of the pre-application meeting				
Reference number of pre-application meeting held				
Was minutes compiled and submitted to the Department for approval	Yes		No	

A copy of the pre-application meeting minutes must be appended to this application.

#### 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 application form is current as of **April 2021**. 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. The onus is on the Applicant/EAP to determine all applicable listed activities that would require Environmental Authorisation prior to the commencement of the construction activities. Should any revision of your development comprise any other activities that constitute a listed activity/ies as defined in Listing Notice 1, 2, or 3 of the EIA Regulations, 2014 as amended, it must also form part of the Application for Environmental Authorisation.
4. An application fee is applicable. Proof of payment must accompany this application. The application will not be processed without proof of payment unless one of the exclusions provided for in the Fee Regulations is applicable AND such information in the exclusion section of this application form has been confirmed by this Department.
5. A cover letter on your company letterhead indicating the nature of this application must be appended to this form i.e. new application for Environmental Authorisation, updated application for Environmental Authorisation.
6. An electronic copy of the signed application form must be submitted of both the Applicant and EAP.
7. This form must be marked "**for Attention: Chief Director: Integrated Environmental Authorisations**" and submitted to the Department at the format as prescribed in the process to upload documents form.
8. The required information must be typed within the spaces provided in the form. The sizes of the spaces provided are not necessarily indicative of the amount of information to be provided. Spaces are provided in tabular format and will extend automatically when each space is filled with typing. A legible font type and size must be used when completing the form. The font size should not be smaller than 10pt (e.g. Arial 10).
9. Where applicable black out the boxes that are not applicable in the form.



10. The use of the phrase “not applicable” in the form must be done with circumspection. Where it is used in respect of material information that is required by the Competent Authority for assessing the application, this may result in the rejection of the application as provided for in the Regulations.
11. Unless protected by law, all information contained in and attached to this application, will become public information on receipt by the Competent Authority. Upon request during any stage of the application process, the Applicant / EAP must provide any registered interested and affected party with the information contained in and attached to this application.
12. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report and declaration of interest of the specialist must also be submitted.
13. Please note that this form must be copied to the relevant Provincial Environmental Department(s)
14. An application for Environmental Authorisation lapses if the applicant fails to meet any of the timeframes prescribed in terms of the EIA Regulations, 2014, as amended.
15. An application for environmental authorisation must be accompanied by a report generated by the web based environmental screening tool (in Appendix 11). This has been stipulated as a requirement for the submission of applications for environmental assessment in the Environmental Impact Assessment Regulations. The Screening Tool allows for the generation of a Screening Report referred to in Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended, whereby a Screening Report is required to accompany any application for Environmental Authorisation.

#### **Departmental Details**

**Online Submission:**

EIAApplications@environment.gov.za or <https://sfiler.environment.gov.za:8443/>.

**Please read the process for uploading files to determine how files are to be submitted to this Department.**

**Postal address:**

Department of Forestry, Fisheries and the Environment  
Attention: Chief Director: Integrated Environmental Authorisations  
Private Bag X447  
Pretoria  
0001

**Physical address:**

Department of Forestry, Fisheries and the Environment  
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](mailto:EIAAdmin@environment.gov.za)



## SPECIALIST INFORMATION

Specialist Company Name:			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)		Percentage Procurement recognition
Specialist name:			
Specialist Qualifications:			
Professional affiliation/registration:			
Physical address:			
Postal address:			
Postal code:		Cell:	
Telephone:		Fax:	
E-mail:			

## DECLARATION BY THE SPECIALIST

I, \_\_\_\_\_, 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:

\_\_\_\_\_  
Date



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Photomontages (6 montages)

## APPENDICES

Appendix A: Curriculum Vitae of Visual Specialists
Appendix B: Impact Assessment Criteria



## Abbreviations and Glossary

### List of Abbreviations

CAA	Civil Aviation Authority
DFFE	Department of Forestry, Fisheries and Environment
DEM	Digital Elevation Model
EAP	Environmental assessment practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
GN	Government Notice
GPS	Global Positioning System
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Areas
O&M	Operations and maintenance
REDZ	Renewable Energy Development Zone
REEA	Renewable Energy EIA Application Database
SACAA	South African Civil Aviation Authority
SACAD	South African Conservation Areas Database
SAPAD	South African Protected Areas Database
VIA	Visual Impact Assessment
WEF	Wind energy facility

### Glossary

Definitions	
Receptor	Individuals, groups or communities who are subject to the visual influence of a particular project.
Viewpoint	A selected point in the landscape from which views of the project are ascertained.
Viewshed	The outer boundary defining a view catchment area, used to determine the zone of visual influence.
View shadow	An area within the view catchment visually obscured from the project, usually by topography.
Visual absorption capacity	The ability of an area to visually absorb development by means of screening topography, vegetation or buildings.



## 1. INTRODUCTION

Quinton Lawson and Bernard Oberholzer (see Appendix A for CVs) have been appointed by SLR South Africa Consulting (PTY) Ltd, on behalf of ENERTRAG South Africa (Pty) Ltd hereafter referred to as “ESA”, to undertake a visual impact assessment for the proposed construction of three wind energy facilities and associated grid connection (together known as the Jessa Projects) near Beaufort West in the Western Cape Province, South Africa, (see Figure 1).

In terms of the EIA Regulations various aspects of the proposed development may have an impact on the environment and are considered to be listed activities. These activities require authorisation from the National Competent Authority (CA), namely the Department of Forestry, Fisheries and the Environment (DFFE), prior to the commencement thereof. Specialist studies have been commissioned to verify the sensitivity and assess the impacts of the wind farms under the Gazetted specialist protocols (GN R 320 and GN R 1150 of 2020). The scope of this report covers the Jessa M, Jessa S, and Jessa Z Wind Energy Facilities. Even though these are three separate applications they will be considered in the same specialist report.

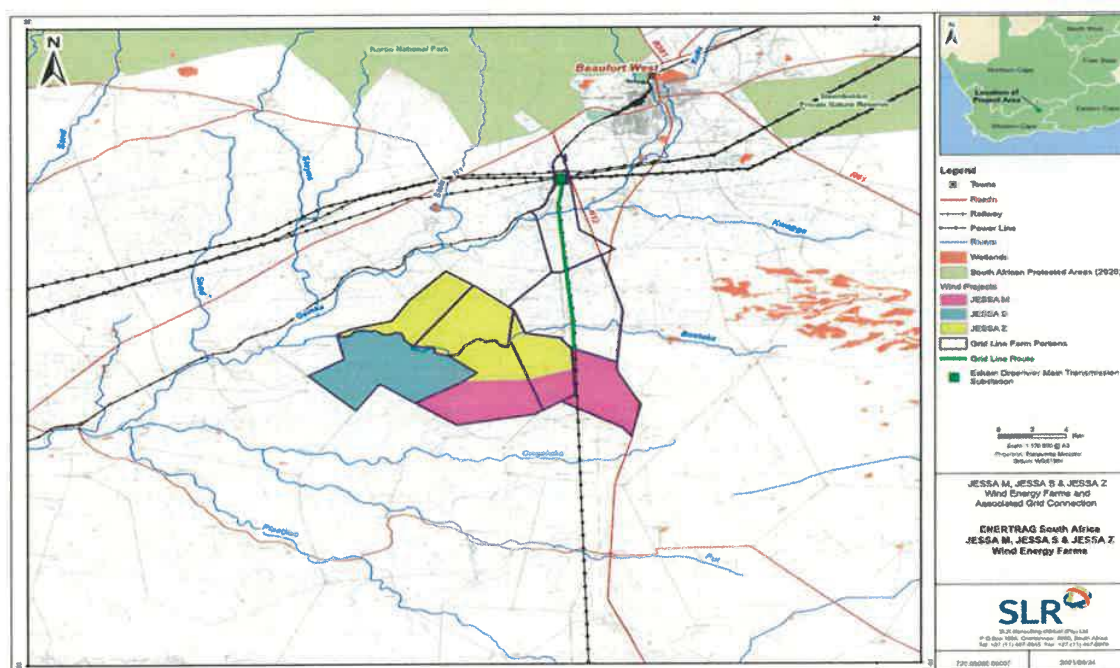


Figure 1: Regional context map

## 2. ASSESSMENT METHODOLOGY

### 2.1 Terms of Reference

A Terms of Reference has been provided by SLR (2021), which includes a template for the specialist assessment reports, a detailed project description and an impact rating methodology, included here as Appendix B.

### 2.2 Approach

The visual assessment methodology included the following steps:

- A 3D digital terrain model of the study area was prepared in order to determine the viewshed of the project, based on the latest layout provided by ESA.



- Potential sensitive receptors, such as farmsteads outside the site, were identified using the viewshed map and Google Earth.
- Landscape features and sensitive receptors were mapped together with recommended buffers on the base maps. The buffers for wind turbines, buildings, roads and powerlines were separately mapped.
- Field work was used to verify the existence and significance of the landscape features and receptors in order to refine the visual mapping layers.
- A photographic record was made with the emphasis on views from potential sensitive receptors (mainly surrounding farmsteads) of the proposed project at varying distances.
- The panoramic photographs, which included their GPS positions, were then used to create the post – mitigation photomontages.
- Potential visual impacts relating to the proposed WEFs for construction, operational and decommissioning phases of the project were assessed along with their relative significance.
- Mitigation measures to avoid or minimise potential negative visual impacts were formulated.
- Cumulative visual impacts in relation to other existing and proposed wind energy facilities in the area were assessed.
- Impact significance ratings were determined based on the methodology provided by SLR.

Site visits were carried out on 22 to 24 September 2021. The track used during the fieldwork is indicated on Map 4. The season was not a consideration for the visual survey, but clear visibility was required.

### 2.3 Assumptions and Limitations

The actual turbine model that may be used has not been determined at this stage, but a worst-case scenario from a visual perspective has been used in this visual assessment (in terms of height and rotor diameter). Assumptions were made regarding the footprint and height of the proposed substation (including associated battery facility) and operation and management (O&M) buildings, relating to the proposed project as detailed design of these would only become available at a later stage.

## 3. LEGAL REQUIREMENT AND GUIDELINES

Legal and policy documents relating to visual and scenic resources are described below. These tend to fall under the National Heritage legislation, the natural heritage being part of the 'national estate', and therefore the VIA Report needs to be read in conjunction with the HIA.

<i>National Heritage Resources Act (Act 25 of 1999 NHRA)</i>	The Act includes protection of national and provincial heritage sites, as well as areas of environmental or cultural value, and proclaimed scenic routes. Natural heritage, including scenic resources, form part of the 'national estate'.
<i>Provincial Government of the Western Cape 2005: Guideline for Involving Visual and Aesthetic Specialists in EIA Processes. B. Oberholzer.</i>	A guideline document for specialist visual input with respect to determining potential visual impacts, along with criteria for rating the significance of impacts.
<i>Provincial Government of the Western Cape, 2006: Strategic Initiative to Introduce Commercial and Land Based Wind Energy Development to the W. Cape.</i>	A broad guiding framework for the location of wind energy facilities based on the sensitivity and capacity of landscape types and the scale of the project.
<i>CSIR, 2018. Draft National Wind and Solar SEA Phase 2: Visual and Scenic Resources Chapter, B. Oberholzer and Q. Lawson.</i>	Phase 2 Wind and Solar PV SEA provides a high-level visual assessment of focus areas, building on the previous Phase 1 Wind and Solar PV SEA, 2015.



## 4. PROJECT DESCRIPTION

### 4.1 Project Location

The proposed project is located approximately 15km south of the town Beaufort West in the Beaufort West Local Municipality, Western Cape. The site is also located adjacent to the N12 road as shown on Map 1.

### 4.2 Wind Energy Facilities components

Each wind farm consists of wind turbines, roads, underground cables and overhead medium voltage power lines (up to 33 kV), a substation (including an operations and maintenance area), and a battery storage facility in the vicinity of the substation.

Table 1 below represents the various wind farm components and their specifications that have visual implications. Temporary areas necessary for construction are also included. The layout of these components for each wind farm site is shown on Map 4.

*Table 1: Summary of components and approximate footprint of Jessa Wind Energy Facilities*

Components	Description	JESSA Z	JESSA M	JESSA S
<b>Location</b>	Central coordinates:			
<b>Access</b>	The proposed site is located next to the N12. Access road/s to the site and internal roads between project components to be developed within a 20m corridor, cable trenches, stormwater channels and turning circle/bypass areas.			
<b>Extent</b>	The total area of the site being considered for developing each wind facility:			
<b>Number of wind turbines and generation capacity</b>	Maximum of 40 wind turbines per wind farm.	35	29	28
	Targeted nameplate generation capacity for each wind farm 220 MW.	220 MW	220 MW	203.5 MW
<b>Wind turbine specifications</b>	Rotor diameter: up to 200m Hub height: up to 200m Rotor top tip height: up to 300m	-	-	-
<b>Turbine Foundations, hardstands and laydown areas</b>	Diameter up to 25m, alongside 1500m <sup>2</sup> hardstand. Permanent total footprint as indicated.	31 ha (permanent) 30 ha (temporary)	31 ha (permanent) 30 ha (temporary)	31 ha (permanent) 30 ha (temporary)
<b>Wind farm Substations</b>	33 kV portion up to 3ha including switching station.	1.5 ha	1,5 ha	1.5 ha
<b>Battery energy storage system (BESS)</b>	BESS up to 200 MW / 800 MWh Total footprint up to 10ha (on-site substation included), including internal roads, temporary construction laydown area and firebreak.	3 ha	3 ha	3 ha
<b>Cabling</b>	Turbines connected to on-site substation via 33 kV cables laid underground in trenches mainly adjacent to proposed internal roads. In some instances, cables would deviate from the road.			
<b>Operations and maintenance (O&amp;M) area</b>	The O&M area, including offices, stores, workshops and laydown area.	500m <sup>2</sup>	500m <sup>2</sup>	500m <sup>2</sup>
<b>Security</b>	Security gate and hut installed at most entrances to wind farm site (estimated 4 entrances each at 20m <sup>2</sup> ). Existing fencing around perimeter of properties to remain. Temporary and permanent yard areas enclosed with 2.4m high fence.	80m <sup>2</sup>	80m <sup>2</sup>	80m <sup>2</sup>
<b>Temporary areas required for construction</b>	Temporary site camp/s. Temporary staff accommodation. Batching plant area. Temporary and permanent laydown areas for assembly.			



### 4.3 Turbine specifications

Since the turbine technology is continually evolving it is not possible for the developer, at this early stage in the development process, to specify the exact turbine model and specification.

Assumptions have therefore been made as to the maximum possible area of impact by the potential turbine blades based on a range of turbine sizes. This area of impact is referred to as the “exaggerated rotor swept area envelope”, as it 1) takes into account multiple turbine size scenarios at once, and 2) assumes each turbine has the largest blade it can from the lowest hub height and extends this all the way up to the highest hub height (see Figure 2). This reflects an exaggerated worst-case scenario.

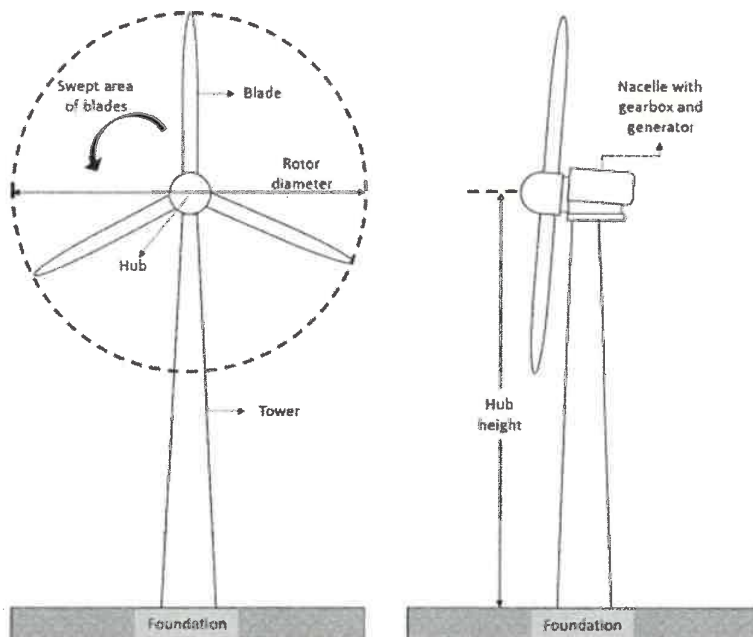


Figure 2: Exaggerated rotor swept area envelope

### 4.4 Power transmission

#### 4.4.1 Cables

Each turbine will be connected to their respective Wind Farm substation via 132kV power lines. For the most part cables will be laid underground in trenches (~1 m deep), generally running alongside existing or proposed internal roads, but sometimes deviating from these. In limited instances, where burying of cables is not possible due to technical, geological, environmental or topographical constraints, then short overhead power lines will be erected to traverse these constrained areas.

Internal overhead power lines will be spanned using short 132 kV type monopoles of not more than 20m in height. The typical design for the proposed internal overhead power line monopoles is depicted in Figure 3 below.

Maps 4 and 5 depict the site layout and visual features for Hoogland 3 and 4 WEFs. Maps 6 to 10 indicate the respective sensitivity levels for wind turbines, buildings (including substations and BESS), internal overhead powerlines and roads and underground cables.

The Jessa Wind Energy Facilities would connect to the Eskom Droerivier Main Transmission Substation via a 132kV transmission line (either single circuit or double circuit) from each WEF substation.



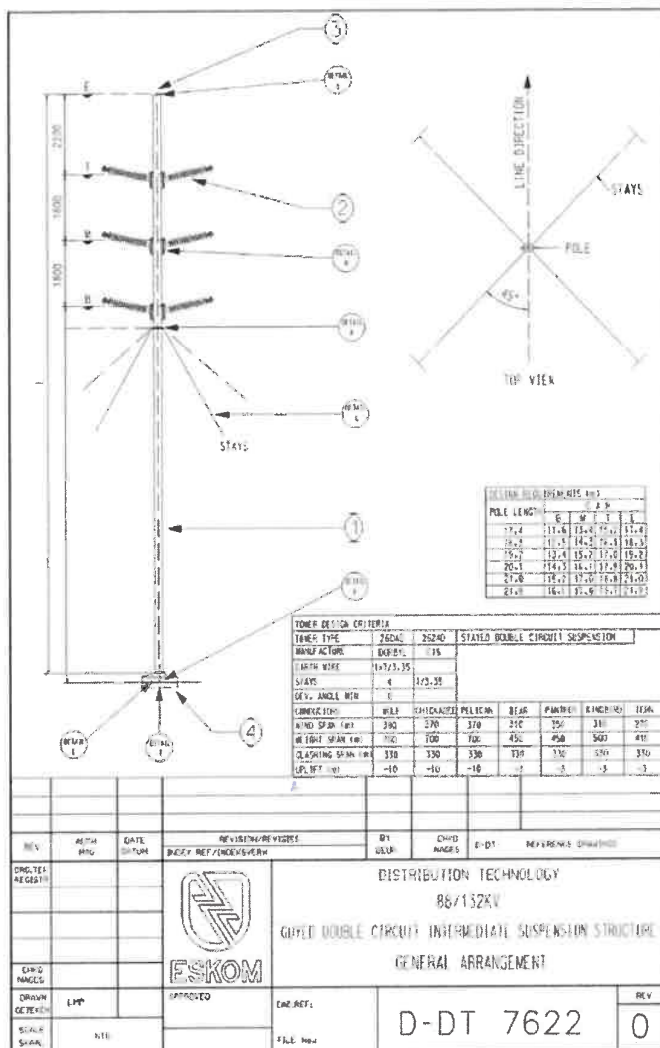


Figure 3: Typical design of proposed 33kV monopoles for internal overhead powerlines (source: SLR, 2021)

#### 4.4.2 Substations

Each WEF application would include an onsite high voltage connector substation (33kV/132kV), covering an area of up to 4ha to allow for transformers, control building, telecommunication infrastructure and access roads. Switching gear, step-up transformers and protection equipment are also mounted on concrete plinths as part of the substation.

#### 4.4.3 Battery facility

All three WEF projects would consider a battery energy storage system (BESS) of up to 220MW / 880MWh to allow for a more continuous source of electricity to the grid, helping to smooth out the fluctuations in energy generation from the renewable energy sources. The BESS includes batteries, a power conversion system and transformer and will be placed on a platform that covers approximately 10ha.

The BESS would be located in close proximity to the WEF substations, fenced off and linked to the substation via internal cables and would not have any additional office/ operation/ maintenance infrastructure.

It is proposed that Lithium Battery Technologies, such as Lithium Iron Phosphate, Lithium Nickel Manganese Cobalt oxides or Vanadium Redox flow technologies will be considered as the preferred battery technology.



However, the specific technology will be determined following Engineering Procurement Construction (EPC) procurement. A brief description of some of the battery technology is provided below.

#### **Lithium-Ion**

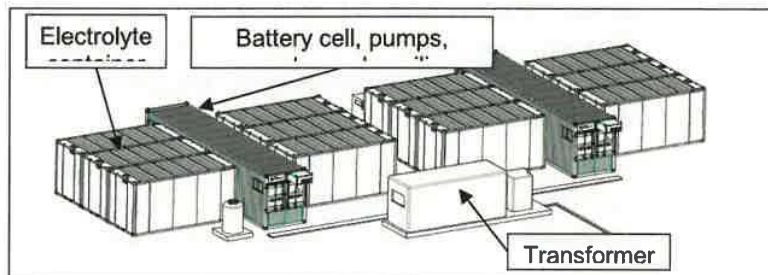
Lithium-Ion battery containers are normally a standard size of about 12m long x 2.5m wide x 2.7 to 3m high. Multiple containers (e.g. approximately 240, with an extra 3-5 containers for electrical connections and controls), would be required (Figure 4 indicates an example).



*Figure 4: Example of a Lithium-Ion BESS installation*

#### **Redox Flow**

specially designed steel containers would house the batteries. Adjacent to these is another container housing the conversion and auxiliary systems (Figure 5). The height of the installation will not exceed 3m.



*Figure 5: Indicative layout of a Flow battery of approximately 0.1 ha*

### **4.5 Site Layouts**

The site layout for each wind farm has been through various iterations during the Screening and initial design phases. The current layout makes provision for a number of potential turbine positions specific to each wind energy facility (as detailed in Table 1 above), with associated infrastructure as shown on Map 4.

### **4.6 Alternatives**

An iterative design process is being followed to inform the respective Jessa WEF projects. This integrated design approach negates the need for the assessment of alternatives in the detailed Environmental Impact Assessment (EIA). The 'no-go' alternative is the option of not constructing the Project where the status quo of the current farming activities on the site would prevail.



## 5. BASELINE DESCRIPTION OF THE RECEIVING ENVIRONMENT

A brief description of the landscape and scenic features of the study area are given below, and in the accompanying photographs. Landscape features are indicated on Map 5.

### Landscape setting

The proposed wind energy facilities are located on a flat plain, known as 'Die Vlake', and also 'Die Koup' in the southern part of the Great Karoo. The Karoo National Park boundary is about 10 km to the north of the proposed wind farms. The site lies on the western side of the N12 National Route, about 14 km south of the town of Beaufort West. Scattered farmsteads, about 5 to 10km apart, and often more, occupy the open plains. Some of the farms in the surrounding area are game farms or have lodges / guest accommodation.



Figure 6: Boeteka farmstead on the proposed Jessa wind energy site

### Geology and landforms

The geology for this area consists of the Middleton Formation of the Beaufort Group mudstones and sandstones (Cape Farm Mapper 6 Dec. 2021), the layers of which are visible in the road cuts along the N12 Route. The soils are thin and stony, except for the sandy bottomlands along drainage courses. The flattish to slightly undulating plains vary from 800 to 825m elevation.

The Boetekarivier drainage course cuts east-west roughly across the middle of the site, with a small, scenically attractive gorge near the Boeteka farmstead. The rivers of the general area are mostly dry, and flow only during storm events. There are no prominent *koppies* or other water features, except for small tributaries, on the sites of the three proposed WEFs.



Figure 7: Beaufort Group sandstones, shales and mudstone visible in road cuts along the N12 Route





*Figure 8: Small gorge with eroded cliffs along the Boeteka River, on the proposed Jessa wind energy site*

### **Vegetation cover**

The vegetation type is Gamka Karoo of the Nama-Karoo Biome dominated by Karoo dwarf, sometimes spiny, shrubs and drought-resistant grasses. The area has low rainfall, being in the rain shadow of the Cape Fold Mountains to the south. (Mucina and Rutherford, 2006). Sweet thorn (*Acacia karoo*) is found along the dry river courses.



*Figure 9: The sparse vegetation of the arid Karoo landscape*

### **Land use**

There are only two farmsteads, Boeteka and Besville, on the proposed Jessa WEF site. Farmsteads surrounding the site are on average 5 to 10km plus apart, linked by narrow gravel roads. A list of surrounding farmsteads, and their distances from the proposed wind farms are given in Table 2.

Farmsteads are sheltered by exotic gum trees, palms, cypresses and pepper trees, as well as the local sweet thorn. A few of the farmsteads in the area seemed unoccupied or derelict. Agricultural activities include game farms and grazing with merino and dorper sheep, although the low rainfall is a limiting factor.

The nearby Olive Grove Guest Farm, to the east of the N12 Route, has large plantations of olive trees, while across the N12, the 'Boeteka Padstal' offers refreshments and memorabilia.





*Figure 6: Extensive olive groves along the Boeteka River / Lombaardskraal River Valley*

### **Sense of place**

As the name of the region 'Die Vlakte' implies, the landscape is vast and fairly featureless in terms of topography. It is also known for its Karoo stillness, even during the day, and for dark nights with starry skies. Small, isolated farmsteads form green oases in the semi-arid landscape, sheltered from the heat by largely exotic trees. The dry-packed stone walls, constructed from the local shales, were historically used for small *kraals*, and are a characteristic feature of the region.



*Figure 7: Bothasdale farmstead on the N12 National Road*



*Figure 8: Traditional dry-packed stone walls used for kraals in the region*



## 6. VISUAL SENSITIVITY MAPPING

### Viewsheds and Viewpoints

A preliminary viewshed of the draft wind turbine layouts is indicated on Map 3 being the zone of visual influence of the turbines for the three WEFs, while the white areas are in a view shadow and therefore not visually affected. (The viewshed is based on the tip height of the turbines).

Viewpoints identified during the field trip are indicated on Map 2. These are based on potentially sensitive receptors, mainly surrounding farmsteads, some of which have guest accommodation. In addition, the viewpoints were selected to represent a range of distances from the proposed wind farms to give an idea of their relative visibility.

Viewpoints visited on the field trip are listed in Table 2 below, together with distances to the nearest wind turbine and the potential level of visibility of the proposed wind farms. Distances to other farmsteads within the viewshed are listed in **Error! Reference source not found.**, these having varying visibility of the proposed wind farms.

Table 2: Viewpoints: Farmsteads Outside the Proposed Jessa WEF sites

Viewpoint	Name	Latitude	Longitude	Distance	Visibility
W1	N1 Karoo National Park	-32.381300	22.519400	10.83km	Marginal visibility, Eskom powerlines in foreground
W2*	N1 Teri-Lemveli entrance	-32.414700	22.461600	6.18km	Moderate visibility
W3	Steynskraal	-32.479200	22.395300	4.17km	High visibility
W4	Die Skooltjie	-32.504200	22.375200	3.16km	High visibility
W5	Railway crossing	-32.573600	22.279900	4.28km	High visibility
W6	Klein Heuninglaagte	-32.625200	22.350500	13.09km	Marginal visibility, partly screened by trees
W7	Kroonplaas	-32.599675	22.317222	10.69km	In a view shadow screened by topography
W8	Plaatjiesrivier 1	-32.626734	22.344413	10.93km	Marginal visibility, partly screened by topography
W9*	Quaggasfontein guest farm	-32.502900	22.561700	9.60km	Moderate visibility, partly screened
W10	Boeteka padstal	-32.504489	22.555600	2.57km	High visibility
W11	N12 opp. Lapaix	-32.529500	22.561200	672m	Very high visibility
W12	N12 opp. Nobelsfontein	-32.589800	22.563400	3.11km	High visibility
W13	Jonkersleegte gate	-32.643300	22.583100	9.14km	Moderate visibility
W14	Moerbeifontein	-32.646800	22.554800	9.42km	Moderate visibility
W15	Brakwater	-32.643800	22.528900	9.66km	Moderate visibility
W16	Helderstroom	-32.639900	22.488200	9.02km	Moderate visibility
W17	Putvlei	-32.628900	22.467800	7.84km	Moderate visibility
W18*	Elandsfontein gate (Zoetvlei)	-32.591800	22.447400	4.53km	High visibility
W19	De Puts	-32.648700	22.423600	11.12km	Marginal visibility
W20	Skilpadfontein	-32.637800	22.378800	10.85km	Marginal visibility
W21	Plaatjiesrivier 2	-32.639200	22.386700	10.75km	In a view shadow screened by topography
W22	Putfontein	-32.623300	22.439900	7.91km	Moderate visibility
W23	N12 Skeurfontein gate	-32.685900	22.559200	13.71km	Marginal visibility, in a hollow
W24	N12 Skeurfontein padstal	-32.693400	22.564000	14.53km	Marginal visibility
W25	N12 Good Hope gate	-32.715084	22.568025	16.78km	Marginal visibility, screened by trees
W26	N12 Bothasdale gate	-32.742800	22.579700	20.06km	Marginal visibility, in a hollow
W27*	Olive Grove Guest Farm	-32.502000	22.573400	3.35km	High visibility, screened by trees



W28	Beaufort West outskirts	-32.375900	22.589900	15.16km	Marginal visibility, foreground clutter
Receptors in close proximity not visited because of lack of access					
R1	Klipbanksfontein	-32.431707	22.461721	4.32km	High visibility
R2	Bellevue	-32.468764	22.411292	4.79km	High visibility
R3	Vergenoeg	-32.511463	22.402284	1.70km	Very high visibility
R4	Nooitgedacht	-32.516036	22.367230	4.57km	High visibility
R5	Leeufontein 1	-32.541711	22.396251	1.49km	Very high visibility
R6	Leeufontein 2	-32.551869	22.360968	5.10km	Moderate visibility
R7	Cypherfontein	-32.561164	22.528771	1.38km	Very high visibility
R8	Nobelsfontein	-32.588040	22.522743	4.04km	High visibility

\* Game farms, guest accommodation

V. high visibility: Prominent feature within the observer's viewframe 0-2.5km  
High visibility: Relatively prominent within observer's viewframe 2.5-5km  
Moderate visibility: Only prominent with clear visibility as part of the wider landscape 5-10km  
Marginal visibility: Seen in very clear visibility as a minor element in the landscape 10-20km

### Visual Sensitivity Mapping Criteria

Landscape features of visual or scenic value, along with potential sensitive receptors in the surroundings, are described in

Table below. These provide a visual baseline for the study area. (See Map 5).

Table 3: SEA Visual Sensitivity Mapping Criteria

Scenic Resources	
Topographic features	Landscape features contribute to scenic and natural heritage value. These include features that provide visual interest or contrast in the landscape such as ridges, escarpments, steep slopes and geological features. Intact wilderness or rural landscapes tend to have higher scenic value and greater sensitivity to development.
Water Features	Rivers, dams and wetlands generally have aesthetic, scenic and amenity value. Sensitivity relates to their national, regional or local significance.
Cultural landscapes	Cultural landscapes tend to have rural scenic value and historical or cultural significance. These need to be correlated with the Heritage Assessment.
Sensitive Receptors	(includes residents, commuters, visitors and tourists)
Protected Areas	These include, National Parks and Nature Reserves, which have wilderness and scenic attributes in addition to their biological conservation role, serving as important visitor / tourist destinations. Visual significance is increased by their protection status. (The Karoo National Park is about 10km from the site).
Game reserves and resorts	Private nature reserves, game farms, recreation resorts and guest accommodation are important for the local economy, and tend to be sensitive to loss or degradation of scenic quality. (There are a few game farms / guest farms in close proximity to the site).
Heritage sites	These form part of the heritage study, but could have visual sensitivity implications.
Human settlements	Towns and farmsteads tend to be sensitive to visual intrusions, including an effect on property values and tourism. Farmsteads within the site would not be visually sensitive. (Beaufort West is about 14km from the site).
Scenic routes and arterial roads	National, provincial and main district roads, used by commuters, visitors and tourists are sensitive visual corridors. (The N12 runs along the eastern border of the site).
Airfields and airports	Small local airfields and major airports have visual restrictions regulated by the CAA. (Beaufort West aerodrome is 25km from the site).

### Recommended Buffers for Wind farms



Guidelines prepared in the past for buffers around wind energy farms are indicated in Table below. These are, however, intended for regional scale mapping purposes and have been adapted at the local project scale for individual wind farms (Table 5). For example, buffers vary depending on viewshed mapping, actual site conditions and the design height of wind turbines, which have become taller in recent years.

*Table 4: Visual Guidelines for Wind Turbines*

Landscape features	PGWC Guidelines <sup>1</sup>	SEA Visual Guidelines <sup>2</sup>	Comment
Project area boundary	-	-	Usually 1.5 times height of the proposed turbines.
Prominent topographic features	500m	500m	Includes prominent ridgelines, peaks and scarps.
Steep slopes	>1:4	>1:4 and >1:10	Generally avoid slopes >1:10.
Perennial rivers, large dams,	500m	250 - 500m	Subject to specialist freshwater assessment.
National roads	3 km	1 to 3 km	Depends on local context, e.g. rural or urban areas.
Provincial / arterial roads	500m	500m to 1 km	Depends on local context, e.g. rural or urban areas.
Scenic routes and passes	2.5 km	1 to 2,5 km	Could be less if in a view shadow.
National parks/ protected areas	2 km	3 to 5 km	Could be less if in a view shadow.
Private reserves/ game farms	500m	1,5 to 3 km	Could be less if in a view shadow.
Farmsteads	400m (noise)	500m	General literature recommends 500m to 2 km.
Settlements	800m	2 to 4 km	Could be less if in a view shadow.
Cultural landscapes/	500m	500m	Subject to heritage assessments.

<sup>1</sup> Provincial Government of the Western Cape, 2006. Recommended Criteria Thresholds for Regional and Site Level Assessment.

<sup>2</sup> CSIR, 2018. SEA for Wind and Solar Photovoltaic Energy in SA, Phase 2. Visual and Scenic Resources Chapter prepared by B. Oberholzer and Q. Lawson.

Scenic resources and sensitive receptors within the study area have been categorised into no-go, high sensitivity, medium and low visual sensitivity zones, as indicated in Table to Table below. The visual sensitivity mapping categories for wind turbines, buildings (including substations and BESS), internal roads and internal overhead powerlines are indicated on Maps 6 to 10.

*Table 5: Visual Sensitivity Mapping Categories for Wind Turbines (Maps 6 and 7)*

Scenic Resources	No-go areas	High visual sensitivity	Medium visual sensitivity	Low visual sensitivity
Topographic feature: prominent scarps, peaks and ridges	Feature	within 250m	within 500m	-
Topographic feature: minor ridges, scarps and outcrops	Feature	within 150m	-	-
Steep slopes	Slopes > 1:10	Slopes 1:10 - 1:20	-	-
Scenic water features	within 250m	within 500m	-	-
Cultural landscapes <sup>1</sup>	Refer to HIA	-	-	-
<b>Protected Landscapes / Sensitive Receptors</b>				
National Parks (Karoo NP)	within 5km	within 10km	within 15km	-
Private reserves / game farms outside the WEF sites	Within 1,5km	within 3 km	within 5 km	-
Settlements/ towns	within 2 km	within 4 km	within 6 km	-
Farmsteads outside site	within 1 km	within 1,5 km	within 2 km	-
Farmsteads inside site	within 500m	within 750m	within 1 km	-
National N12 Route	within 1 km	within 2 km	within 3 km	-
Main district roads	within 250m	within 500m	within 1 km	-
Landing strips	within 3 km	-	-	-
Airports	within 8 km	-	-	-

<sup>1</sup>Cultural Landscapes are the areas defined by the heritage specialists around important cultural feature/s as presented in the heritage report. Visual implications and sense of place need to be considered.







Table 6: Visual Sensitivity Mapping for Buildings, Substation and Battery Facility (Map 8)

Scenic Resources	No-go areas	High visual sensitivity	Medium visual sensitivity	Low visual sensitivity
Topographic feature: prominent scarps, peaks and ridges	within 100m	within 150m	-	-
Minor ridges, scarps and outcrops	within 50m	within 100m	-	-
Steep slopes	Slopes > 1:4	Slopes > 1:10	-	-
Scenic water features	within 100m	within 150m	within 250m	-
Cultural landscapes <sup>1</sup>	Refer to HIA		-	-
<b>Protected Landscapes / Sensitive Receptors</b>				
National Park (Karoo NP)	within 1 km	within 1,5 km	within 2 km	-
Private reserves / game farms	within 500m	within 1 km	within 1,5 km	-
Settlements, towns	within 500m	within 1 km	within 1,5 km	
Farmsteads outside	within 250m	within 500m	Within 1 km	-
Farmsteads inside	within 150m	within 250m	within 500m	-
National N12 Route	within 500m	within 1,5 km	within 2 km	-
Main district roads	within 250m	within 500m	Within 1 km	-

Table 7: Visual sensitivity mapping categories for internal overhead powerlines (Map 9)

Scenic Resources	No-go areas	High visual sensitivity	Medium visual sensitivity	Low visual sensitivity
Topographic feature: prominent scarps, peaks and ridges	Feature	within 100m	within 150m	-
Minor ridges, scarps and outcrops	Feature	within 50m	within 100m	-
Steep slopes	-	Slopes > 1:4	Slopes > 1:10	-
Scenic water features	within 100m	within 150m	-	-
Cultural landscapes	Refer to HIA			
<b>Protected Landscapes / Sensitive Receptors</b>				
National Parks	within 500 m	within 1 km	-	-
Private reserves / game farms	within 150 m	within 250 m	-	-
Settlements / towns	within 100 m	within 150 m	-	
Farmsteads outside	within 150 m	within 250 m	-	-
farmsteads inside	within 100 m	within 150 m	-	-
National N12 Route	within 250m	within 500 m	-	-
Main district roads	within 50 m	within 100 m	-	-

Exceptions would apply where internal overhead power lines ascend/descend scarps at right angles.

Table 8: Visual sensitivity mapping categories for internal access roads (Map 10)

Scenic Resources	No-go areas	High visual sensitivity	Medium visual sensitivity	Low visual sensitivity
Topographic feature: prominent scarps, peaks and ridges	Feature	within 50m	-	-
Minor ridges, scarps and outcrops	Feature	Feature	-	-
Steep slopes	Slopes > 1:4	Slopes > 1:10	-	-
Scenic water features	within 50m	within 100m	-	-
Cultural landscapes <sup>1</sup>	Refer to HIA			
<b>Protected Landscapes / Sensitive Receptors</b>				
National Parks (Karoo NP)	-	-	-	-
Private reserves / game farms	-	-	-	-
Settlements / towns	-	-	-	
Farmsteads outside	within 100m	within 150m	within 200m	-
farmsteads inside	within 50m	within 100m	within 150m	-
National N12 Route	-	-	-	-
Main district roads	-	-	-	-



## 7. VISUAL IMPACT ASSESSMENT

### 7.1 Impact assessment

The visual assessments of the proposed WEFs are based on a number of quantitative and qualitative criteria to determine potential visual impacts, as well as their relative significance, including the considerations described below.

#### Visual Exposure

A viewshed of the proposed WEFs is indicated on Map 3, being the potential zone of visual influence of the current layout of the turbine locations. The white areas on the maps are in a view shadow and therefore not visually affected by the proposed WEFs. Visual exposure tends to be pronounced in the open plains, as can be seen on the viewshed map.

#### Visibility

A number of significant viewpoints have been identified, together with their relative distances and anticipated visibility of the proposed WEFs in Table 2. The viewpoints were selected based on proximity to the WEFs and the potential sensitivity of identified receptors, including users of the N12 National Road, as well as guest farms and farmsteads.

Degrees of visibility would depend on the number of turbines in the view field and their position in the landscape, as well as on foreground screening provided by topography or trees. See Figure 13 below for a comparison of visibility of turbines at various distances.

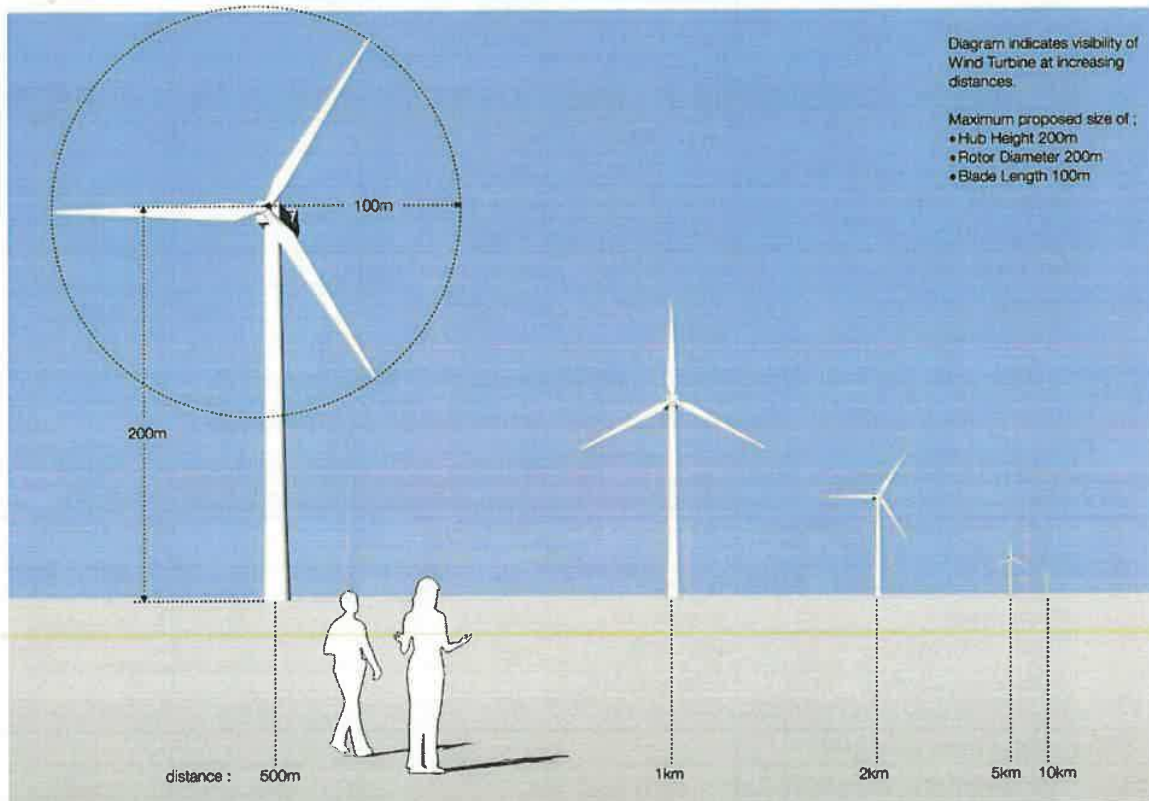


Figure 13: Comparison of visibility of wind turbines at various distances

#### Visual Absorption Capacity (VAC)

This relates to the potential of the landscape to screen the proposed WEFs from view. Wind turbines tend to be more exposed in the open plains. Turbines located on elevated landforms tend to be more visible in the



landscape, particularly when seen in silhouette. The sparse Karoo vegetation provides little screening effect. However dense clumps of trees around farmsteads tend to reduce visibility by receptors.

### Shadow Flicker Effect

Receptors falling within the shadow flicker envelope could potentially be affected by shadow flicker from the rotating wind turbine blades when the sun is low in the sky. However, the blades would need to be orientated toward the receptor, they would need to be rotating and the weather would need to be clear with bright sunlight to cast shadows. The orientation of buildings, as well as topography and trees would all determine the potential flicker effect.

There are a few farmsteads within 2km of the proposed WEFs that could potentially be affected (see Map 11), but incidences of flicker are expected to be low and can potentially be mitigated.

### Landscape Integrity

Landscape integrity tends to be enhanced by scenic or rural quality and intactness of the landscape, as well as absence of other visual intrusions. Natural or pristine landscapes tend to have higher visual quality and therefore higher value. Cultural landscapes, such as rural or farming scenes also have visual or scenic value. On the other hand, industrial activity and visual 'clutter', including substations and power lines, detract from these scenes.

Most of the site for the proposed WEFs has an uncluttered, expansive landscape with pastoral scenes, for which the Karoo is renowned, except for the Eskom powerline that runs parallel with the N12 Route.

### Visually Sensitive Resources

Natural and cultural landscapes, or scenic resources, form part of the 'National Estate' and may have local, regional or even national significance, usually, but not only, of tourism importance. Map 5 indicates features of interest.

### Visual Impact Intensity

The overall potential visual impact intensity is determined in Table 10 below by combining all the factors above, namely visual exposure, visibility, visual absorption capacity, landscape integrity and visually sensitive resources. Visual impact intensity is in turn used to assess visual impact consequence of the three proposed WEFs and related infrastructure, such as the substation (including associated battery facility), buildings, internal overhead powerlines and access roads.

Table 9: Visual Impact Intensity

Visual Criteria	Comments	Wind turbines	Related infrastructure
<b>Visual exposure</b>	Extensive viewshed relating to large scale and number of wind turbines.	High	Low
<b>Visibility</b>	Visible from the N12 Route, main district roads, and a number of farmsteads and guest farms.	High	Low
<b>Visual absorption capacity (VAC)</b>	Visually exposed plain, and therefore low VAC.	High	Medium
<b>Shadow flicker</b>	Limited to receptors within 2km.	Low	n/a
<b>Landscape integrity / intactness</b>	Effect on rural farming character and Karoo landscape.	Medium	Medium
<b>Landscape / scenic sensitivity</b>	Effect on scenic resources.	Medium	Low
<b>Impact intensity</b>	Summary	<b>High</b>	<b>Medium</b>

The quantification of overall visual impact significance for the proposed Jessa M, Jessa S and Jessa Z Wind Energy Facilities is based on the methodology provided by SLR (2021), as used in Tables 10 to 14 below. The assessment criteria are included in Appendix B of this report.



From the desktop and fieldwork studies, it was determined that the visual impacts would be similar for each of the three proposed WEFs, and therefore the visual impact assessment tables for these have not be separated and are applicable for all three WEFs equally.

**Table 3: Visual Impact Assessment – Construction Phase (All 3 WEFs)**

<b>Issue:</b> Visual intrusion of construction activities on the Karoo landscape.		
<b>Description of Impact:</b>		
Visual intrusion of cranes, heavy vehicles and construction activities required for the erection of wind turbines, and related infrastructure. Temporary construction areas e.g. camps and batching plants. Visual scarring from earthworks for assembly platforms. Soil/ rubble stockpiles from earthworks. Litter generated from construction site. Noise and dust from construction activity affecting the Karoo's sense of place.		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction	
Criteria	Without Mitigation	With Mitigation
Intensity	High	Medium
Duration	Short-term	Short-term
Extent	Local	Local
Consequence	Medium	Medium
Probability	Definite/ Continuous	Probable
Significance	Medium -	Medium -
Degree to which impact can be reversed	The impact is reversible by means of site rehabilitation after construction and removal of construction equipment.	
Degree to which impact may cause irreplaceable loss of resources	Scenic resources are not damaged irreparably.	
Degree to which impact can be mitigated	There is some scope for mitigation as per the recommended mitigation measures below.	
<b>Mitigation actions</b>		
The following mitigations are recommended	Disturbed areas to be rehabilitated / revegetated as soon as possible during the construction phase. Temporary laydown and areas and batching plants to be located away from arterial or district roads. Stockpiles to be demarcated and located within approved construction footprints. Recycling and refuse bins to be provided to eliminate litter from the site.	
<b>Monitoring</b>		
The following monitoring is recommended	Ensure visual management measures are included in EMP, monitored by an Environmental Control Officer (ECO), including siting of any construction camps, stockpiles, temporary laydown areas and batching plants outside of identified no-go areas, unless otherwise approved by the visual specialists, as well as the implementation of dust suppression and litter control measures.	
<b>Cumulative impacts</b>		
Nature of cumulative impacts	Cumulative visual impacts would occur if construction takes place simultaneously on all 3 proposed WEFs resulting in a short term disturbance to the stillness of the area.	
Rating of cumulative impacts	Without mitigation	With mitigation
	Medium -	Medium -

**Table 4: Visual Impact Assessment – Operation Phase: Turbines (All 3 WEFs)**

<b>Issue:</b> Visual intrusion of wind turbines on the Karoo landscape.	
<b>Description of Impact</b>	
Potential visual intrusion of the tall wind turbines on the rural landscape, scenic resources and sensitive receptors. Change in the pastoral Karoo character and sense of place of the local area.	
Type of Impact	Direct
Nature of Impact	Negative



Phases	Operational	
Criteria	Without Mitigation	With Mitigation
Intensity	High (see Table 9)	High
Duration	Long-term	Long-term
Extent	Local	Local
Consequence	High	High
Probability	Definite/ Continuous	Definite/ Continuous
Significance	High -	High -
Degree to which impact can be reversed	The impact could be reversible at the decommissioning phase by means of dismantling the turbines and site rehabilitation.	
Degree to which impact may cause irreplaceable loss of resources	Scenic resources are not damaged irreparably.	
Degree to which impact can be mitigated	Some potential for visual mitigation of wind turbines through relocation or micro-siting of turbines.	
Mitigation actions		
The following mitigations are recommended	Mitigation achievable by means of avoidance of no-go and high visual sensitivity areas in siting turbines, including turbines within 2km of N12. Consideration given to avoiding 'outlier' turbines.	
Monitoring		
The following monitoring is recommended	Visual mitigation measures to be monitored by management on an on-going basis, including maintenance of rehabilitated areas.	
Cumulative impacts		
Nature of cumulative impacts	Cumulative visual impacts would arise from the visual combination of the turbines for three WEFs, as well as the proposed grid connection, resulting in a change to the largely rural character and sense of place of the area. However, the proposed project is located within a REDZ.	
Rating of cumulative impacts	Without mitigation	With mitigation
	High -	High -

**Table 5: Visual Impact Assessment – Operation Phase: Substation and BESS (All 3 WEFs)**

<b>Issue:</b> Visual intrusion of infrastructure on the Karoo landscape.		
<b>Description of Impact</b>		
Visual effect of industrial-type substations and BESS on the rural Karoo landscape. Visual intrusion of internal overhead powerlines, including silhouette effect on skylines of ridges/ koppies. Visual intrusion of internal access roads and hardstands in the local area.		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Operational	
Criteria	Without Mitigation	With Mitigation
Intensity	Medium (see Table 10)	Low
Duration	Long-term	Long-term
Extent	Local	Local
Consequence	Medium	Medium
Probability	Definite/ Continuous	Definite/ Continuous
Significance	Medium -	Medium -
Degree to which impact can be reversed	The impact could be reversible at the decommissioning phase by means of dismantling the infrastructure and implementing site rehabilitation.	
Degree to which impact may cause irreplaceable loss of resources	Scenic resources are not damaged irreparably.	
Degree to which impact can be mitigated	Some mitigation is achievable through careful siting and screening of infrastructure.	
Mitigation actions		
The following mitigations are recommended	Substations and O&M Buildings to be located in unobtrusive low-lying areas away from the N12 and district roads where possible. On-site signage to be discrete, and billboards prohibited. Signage to be fixed	



	as low as possible, preferably against a backdrop to avoid intrusion on the skyline. Powerlines to follow valleys and avoid peaks/ridges where possible. (Final route of internal lines needs to be reviewed by the specialist/s). Security and other outdoor lighting to be fitted with reflectors to conceal the light source and prevent light spillage.	
<b>Monitoring</b>		
The following monitoring is recommended	Visual mitigation measures to be monitored by management on an on-going basis, including control of signage, lighting and wastes, with interim inspections by an environmental officer.	
<b>Cumulative impacts</b>		
Nature of cumulative impacts	Cumulative visual impacts would arise from the visual combination of the turbines and related infrastructure for three WEFs, as well as the proposed grid connection, resulting in a change to the largely rural character and sense of place of the area.	
Rating of cumulative impacts	Without mitigation	With mitigation
	High -	High -

**Table 6: Visual Impact Assessment – Operation Phase: Lighting at night (All 3 WEFs)**

<b>Issue:</b> Visual intrusion of lighting at night.		
<b>Description of Impact</b>		
Visual effect on the dark skies of the Karoo created by lights on turbines for aircraft navigation. Visual intrusion of area and security lighting around the substations and O&M buildings.		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Operational	
Criteria	Without Mitigation	With Mitigation
Intensity	Medium	Low
Duration	Long-term	Long-term
Extent	Local	Local
Consequence	Medium	Medium
Probability	Definite/ Continuous	Definite/ Continuous
Significance	Medium -	Medium -
Degree to which impact can be reversed	The impact could be reversible at the decommissioning phase by means of dismantling the turbines and other infrastructure and site rehabilitation.	
Degree to which impact may cause irreplaceable loss of resources	Scenic resources are not damaged irreparably.	
Degree to which impact can be mitigated	Some mitigation achievable for navigation lights by means of technological advances. Security and other outdoor lighting can be fitted with reflectors.	
<b>Mitigation actions</b>		
The following mitigations are recommended	Use of available technology to minimise the visual effect of navigation lights, conforming with CAA requirements. Use of reflectors on general area and security lighting to conceal light sources.	
<b>Monitoring</b>		
The following monitoring is recommended	Visual mitigation measures to be monitored by management on an on-going basis, including control of lighting.	
<b>Cumulative impacts</b>		
Nature of cumulative impacts	Cumulative visual impacts would arise from the visual combination of navigation lights for three WEFs, and to a lesser extent security lighting, resulting in a change to the largely rural character and sense of place of the area.	
Rating of cumulative impacts	Without mitigation	With mitigation
	Medium -	Medium -



**Table 7: Visual Impact Assessment – Operation Phase: Shadow Flicker Effect (All 3 WEFs)**

<b>Issue:</b> Visual disturbance caused by shadow flicker from wind turbines on nearby receptors.		
<b>Description of Impact</b>		
Receptors falling within the shadow flicker envelope could potentially be affected by shadow flicker from the rotating wind turbine blades when the sun is low in the sky. The effect is generally limited to receptors within 2km of the proposed turbines.		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Operational	
Criteria	Without Mitigation	With Mitigation
Intensity	Medium	Low
Duration	Long-term	Long-term
Extent	Local	Local
Consequence	Medium	Medium
Probability	Definite/ Continuous	Definite/ Continuous
Significance	Medium -	Medium -
Degree to which impact can be reversed		
The impact could be reversible at the decommissioning phase by means of dismantling the turbines.		
Degree to which impact may cause irreplaceable loss of resources		
Scenic resources are not affected.		
Degree to which impact can be mitigated		
Mitigation is generally achievable for shadow flicker effect.		
<b>Mitigation actions</b>		
The following mitigations are recommended		
Shadow flicker effect can be mitigated by means of screen planting. (Most farmsteads are already surrounded by trees). Window blinds in buildings can be used to block shadow flicker.		
<b>Monitoring</b>		
The following monitoring is recommended		
Potential shadow flicker to be monitored by the Developer during the construction phase to determine if mitigation measures are required.		
<b>Cumulative impacts</b>		
Nature of cumulative impacts		
Cumulative shadow flicker effects are expected to be low as most receptors are more than 2km from the proposed wind turbines.		
Rating of cumulative impacts	Without mitigation	With mitigation
	Low -	Low -

**Table 8: Visual Impact Assessment – Decommissioning Phase (All 3 WEFs)**

<b>Issue:</b> Visual intrusion of activities to remove infrastructure.		
<b>Description of Impact</b>		
Visual effect of construction activities to remove infrastructure at the end of the life of the project, including wind turbines, substation, buildings, internal overhead powerlines and access roads.		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Decommissioning	
Criteria	Without Mitigation	With Mitigation
Intensity	High	Medium
Duration	Very short-term	Very short-term
Extent	Local	Local
Consequence	Medium	Medium
Probability	Probable	Probable
Significance	Medium -	Medium -
Degree to which impact can be reversed		
The impact is reversible by means of site rehabilitation after construction and removal of construction equipment.		



Degree to which impact may cause irreplaceable loss of resources	Scenic resources are not damaged irreparably.	
Degree to which impact can be mitigated	There is some scope for mitigation as per the recommended mitigation measures below.	
Mitigation actions		
The following mitigations are recommended	Disturbed areas to be rehabilitated / revegetated as soon as possible after the decommissioning phase. Wind turbines and building structures removed at the end of the life of the project. Hardstands and access roads no longer required to be ripped and regraded. Exposed or disturbed areas to be revegetated and returned to grazing pasture or natural veld to blend with the surroundings.	
Monitoring		
The following monitoring is recommended	Procedures for the removal of wind turbines and building structures during decommissioning to be implemented, including recycling of materials and rehabilitation of the site to a visually acceptable standard, and signed off by the delegated authority. Access roads and concrete pads no longer required should be ripped and vegetation or grazing cover reinstated.	
Cumulative impacts		
Nature of cumulative impacts	Some cumulative visual impacts could occur while decommissioning construction takes place, resulting in short term disturbance to the stillness of the area. Impacts would be reduced with construction mitigations.	
Rating of cumulative impacts	With mitigation	With mitigation
	Medium -	Low -

## 7.2 Alternatives

An iterative design process is being undertaken to inform the respective Wind Farm layouts and associated infrastructure for the three Jessa Wind Energy Facilities. Therefore, no site or layout alternatives are being assessed, as initial layout alternatives were screened out of the project in the early Screening Phase.

However, the preferred layouts of the proposed WEFs, and respective Grid Corridors, are assessed against the **'no-go' alternative**. The 'no-go' alternative is the option of not constructing the Project, where the status quo of the current farming activities on the site would prevail.

The no-go alternative would mean that there would be no additional visual intrusion on the rural landscape and on farmsteads in the area by wind turbines and related infrastructure. Scenic features and the overall sense of place would therefore remain intact. The downside is that no renewable energy would be produced.

It is envisaged that the potential visual impact significance of the no-go alternative would be neutral as the status quo would likely continue and there would be no further visual impacts.

## 7.3 Cumulative Impacts

Other than the current three proposed Jessa WEFs, there are several other proposed or approved renewable energy projects within a 35km radius of the project site, (see Map 1). These include:

- Beaufort West Wind Energy Facilities at  $\pm 35$  km.
- Trakas Wind Energy Facility at  $\pm 25$  km.
- Steenrotsfontein Photovoltaic Park, to the south of Beaufort West.
- Kuilsport Solar Power Plant, to the north-west of Beaufort West.
- Beaufort West Solar Power Plant Sites 1, 2 and 3 south of Beaufort West.

The cumulative impact would therefore be the collective impact of the three proposed Jessa WEFs and Grid Connection applications, together with the renewable energy projects mentioned above, which, if developed would result in a change to the largely rural character and sense of place of the area. This could result in the



cumulative visual impact for the combined projects being of high visual impact significance, as indicated in the assessment tables in Section 7.1 above. However, following factors need to be taken into account:

- The nature of the topography would result in some visual screening between the three proposed Jessa WEFs, as well as the other more remote WEFs.
- The other proposed or approved wind farms are fairly distant at 25 to 35 km away, and it is unlikely that they would be seen in combination with the proposed Jessa WEFs.
- Several solar power facilities near Beaufort West are closer to the Jessa site ( $\pm 8$ km), but have a smaller footprint and viewshed, and would therefore also not be seen in combination with the proposed Jessa WEFs.
- Finally, all of the abovementioned projects, including the Jessa WEFs, fall within the Wind and Solar Renewable Energy Development Zone 11 (REDZ 11), Beaufort West, as indicated on Map 1, and therefore it is reasonable to assume that applications for renewable energy would occur in this Zone.

## **8. MITIGATION AND EMPR REQUIREMENTS**

Mitigation measures have been recommended for the siting of wind turbines and related infrastructure in the tables above, in order to minimise visual impacts on scenic resources and sensitive receptors. Some mitigation, through avoidance, can be achieved in further iterations to the layout by either removing or micro-siting certain turbines.

### **Environmental Management Programme**

Visual input into the Environmental Management Programme (EMPr) is discussed below. This should be included in the Environmental Authorisation for the project.

#### **Construction Phase Monitoring:**

Ensure that visual management measures are included as part of the EMPr, monitored by an Environmental Control Officer (ECO), including siting of any construction camps, stockpiles, temporary laydown areas and batching plants outside of identified no-go areas unless otherwise approved by the visual specialists (see mitigation measures in Section 7.1 above), as well as the implementation of dust suppression and litter control measures. Rehabilitation efforts to commence immediately after construction activities are completed.

**Responsibility:** ECO / Contractor.

**Timeframe:** Preparation of EMPr during the planning phase. Monitoring during the construction phase.

#### **Operation Phase Monitoring:**

Ensure that visual mitigation measures are monitored by management on an on-going basis, including the maintenance of rehabilitated areas, as well as control of any signage, lighting and wastes at the proposed wind farm, with interim inspections by the environmental officer based on site.

**Responsibility:** Wind Farm Operator and ECO.

**Timeframe:** During the operational life of the project.

#### **Decommissioning Phase Monitoring:**

Ensure that procedures for the removal of wind turbines and building structures during decommissioning are implemented, including recycling of materials and rehabilitation of the site to a visually acceptable standard, and signed off by the delegated authority.

It is assumed that some access roads and concrete pads would remain. Those that are not required should be ripped and the vegetation or grazing cover reinstated.



The revegetation measures are not described here as they would fall under the auspices of the vegetation/ biodiversity specialist.

**Responsibility:** ECO / Contractor / qualified rehabilitation ecologist or horticulturist.

**Timeframe:** During the decommissioning contract phase, as well as a prescribed maintenance period thereafter (usually one year).

## **9. SUMMARY AND CONCLUSION**

### **9.1 Summary of Findings**

The current visual assessment is based on a preliminary turbine layout for the three Jessa WEFs, being Jessa M, Jessa S and Jessa Z. Mitigation measures have been recommended in this Draft Visual Impact Assessment and these should be included where possible in future iterations of the layouts. Visual photomontages have been prepared to depict the current layout.

The preliminary visual assessment findings are the following:

- The viewshed is fairly extensive in all directions given the visually open nature of the plains.
- There are a number of visual receptors in close proximity to the proposed WEFs (see Table 2, and Map 2), these being mainly farmsteads, as well as guest accommodation at some farms.
- Two or three wind turbines are located in very high (no-go) visual sensitivity areas, and several more in the 'high' visual sensitivity area, which should ideally be micro-sited to minimize potential visual impacts, particularly those turbines closest to the N12 Route.
- The overall visual impact significance for the wind turbines has been rated as high, both before and after mitigation, as there would be a significant change in character to the area. However, some potential exists for mitigation, and the project is not regarded as a fatal flaw in visual terms.
- The visual impact significance for related infrastructure, (such as substations, BESS and O&M buildings) has been rated as medium, and therefore not considered visually intrusive in relative terms.
- The visual impact significance for navigation lights at night has been rated as medium, with some potential for mitigation depending on the technology used.
- The visual impact significance for potential shadow flicker effect is considered to be low, given the distance from most receptors, varied topography and trees around buildings.
- The cumulative visual impact significance of the three proposed Jessa WEFs, seen in combination with the proposed grid connection and other renewable energy projects in the area has been rated as high. However, the location of the Jessa WEFs within the Beaufort West REDZ could mean that the wider area becomes a renewable energy node in the future.
- Effective mitigation for the three proposed WEFs is mainly 'avoidance'. This could include the removal or micro-siting of wind turbines in the 'very high' and 'high' visual sensitivity categories. Where possible consideration should also be given to removing or relocating 'outlier' turbines, which extend the zone of visual influence.

### **9.2 Conclusion and Impact Statement**

The layouts of the three Jessa WEFs are subject to an iterative planning process, based on the various specialist findings, including the mapping of scenic resources and sensitive receptors. The currently proposed layouts succeed in largely avoiding most visual 'no-go' areas indicated on the visual sensitivity maps. Further refinements to the layouts have been recommended to minimise potential visual impacts.



The cumulative visual impact of the three proposed WEFs and related infrastructure, such as the substations, associated battery facilities and grid connection powerlines, could affect the rural quality, or sense of place of the general area, particularly when seen in combination. The other known wind farms planned within 35km of the Jessa WEFs, are considered to be too far away to significantly increase cumulative visual impacts.

Where a choice exists between turbines to be dropped or relocated, priority should be given to outlier turbines (that extend the zone of visual influence and detract from the visual cohesion of the proposed WEFs) and those in the 'high' visual sensitivity areas, particularly in proximity to the N12 Route.

It is the opinion of the Visual Specialists that while the three Jessa WEFs could have a 'high' visual impact significance, the layouts have avoided most of the scenic resources and visual receptors of the area. Provided the recommended mitigation measures are implemented (specifically the turbines in visual no-go areas), the project would not present a potential fatal flaw in visual terms. The final layouts of the three WEFs and related infrastructure, including access roads, would need to be assessed.



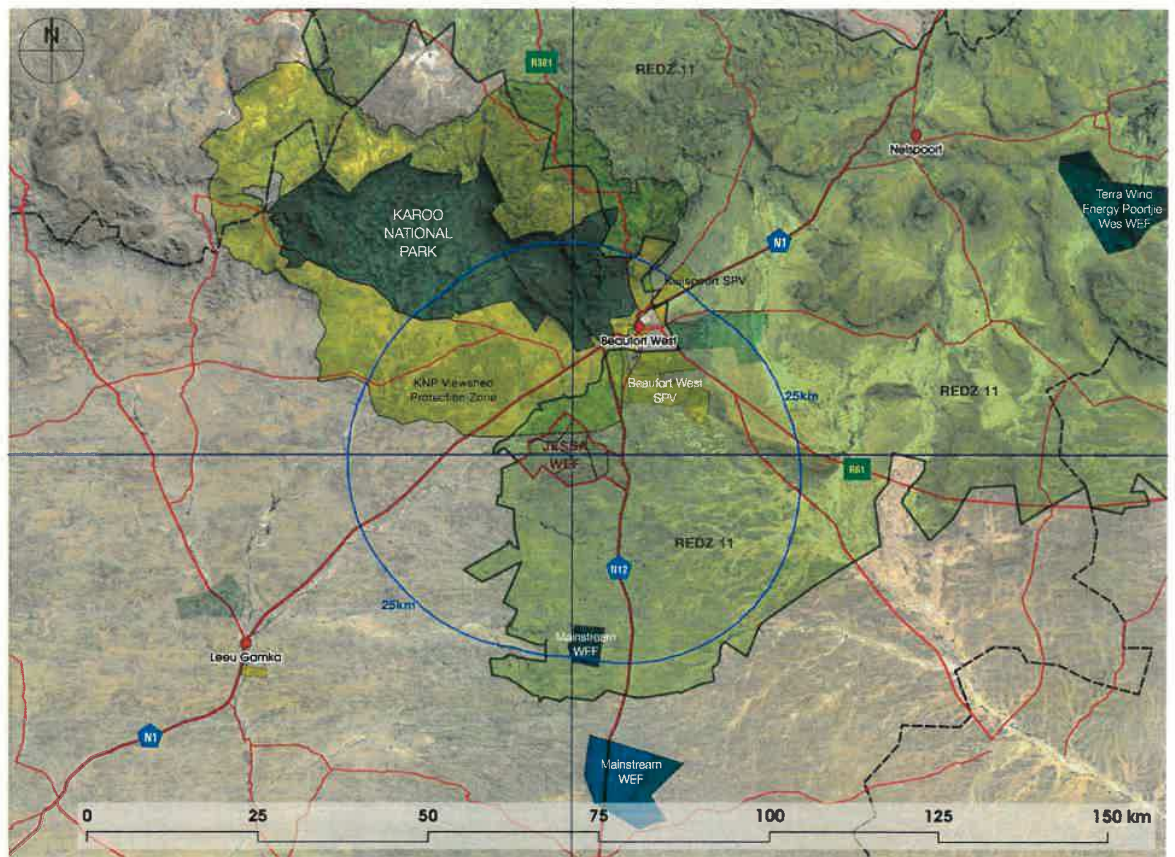
## **10. REFERENCES**

SLR, 2021. ENERTRAG South Africa, Jessa Cluster Wind Energy Facilities: Terms of Reference for Specialist Studies.

Mucina, L. and Rutherford, M.C. (eds) 2006. The Vegetation of South Africa, Lesotho and Swaziland. *Strelizia 19*. South African National Biodiversity Institute, Pretoria.

Oberholzer, B. 2005. Guideline for Involving Visual and Aesthetic Specialists in EIA Processes. Edition 1. Provincial Government of the Western Cape.

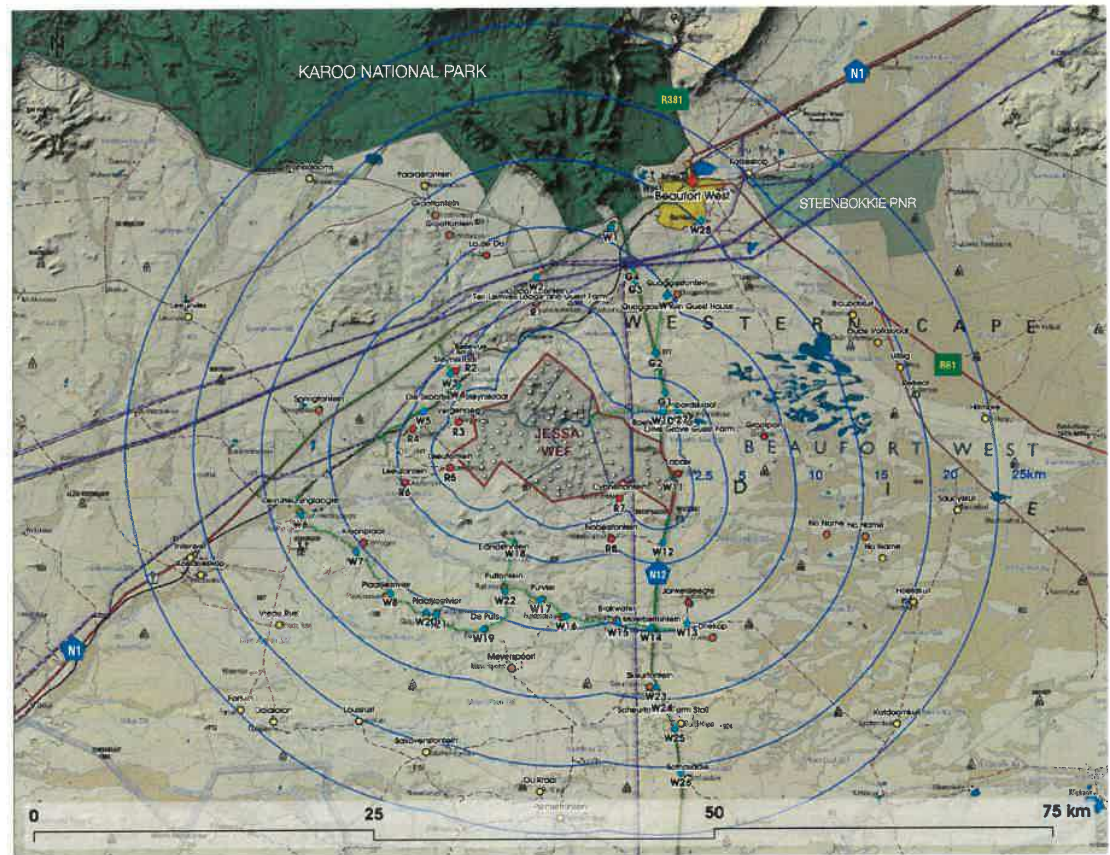




base map : Google Earth 2021

**Map 1 : Proposed JESSA WEF : Regional Locality, REDZ and REEA**



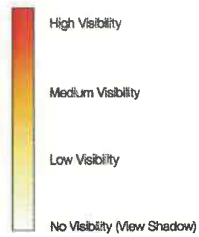


base map : NGI 1:250K Topo-Cadastral Series : 3222 Beaufort West

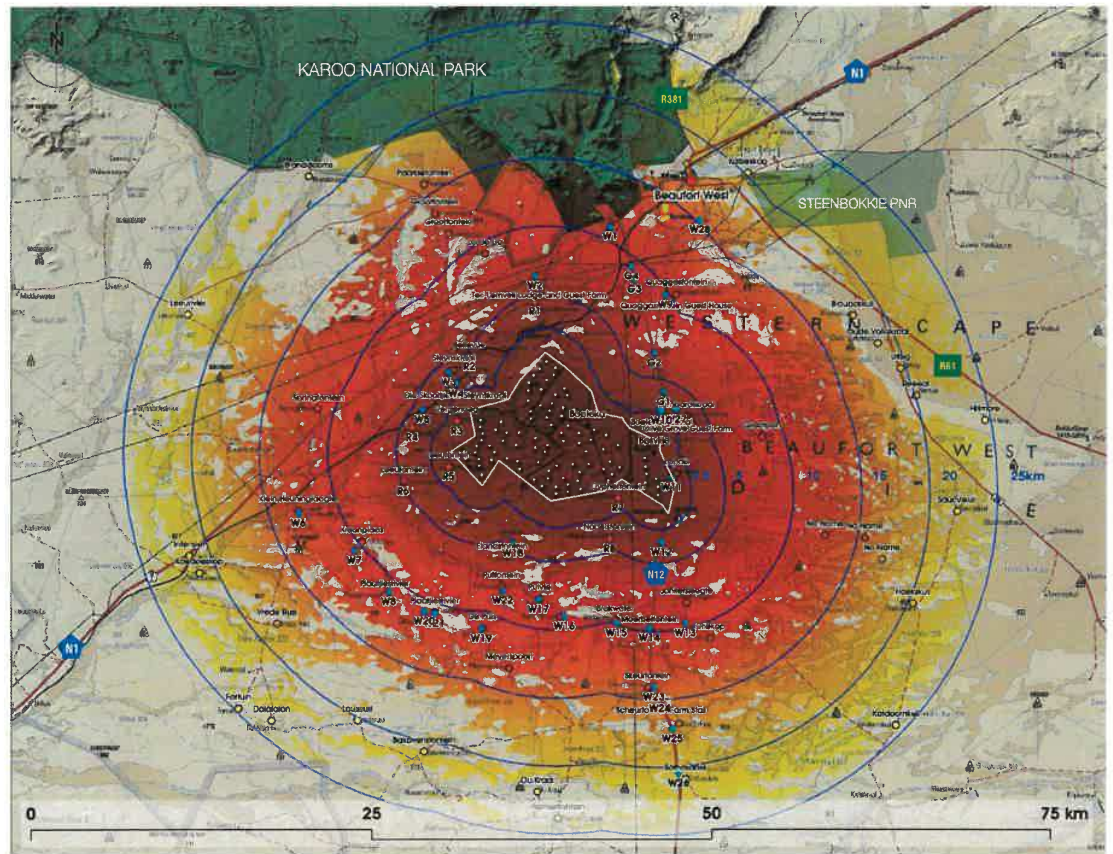
## Map 2 : Proposed JESSA WEF : Local Context, Fieldwork and Viewpoints



**Viewshed Legend :**



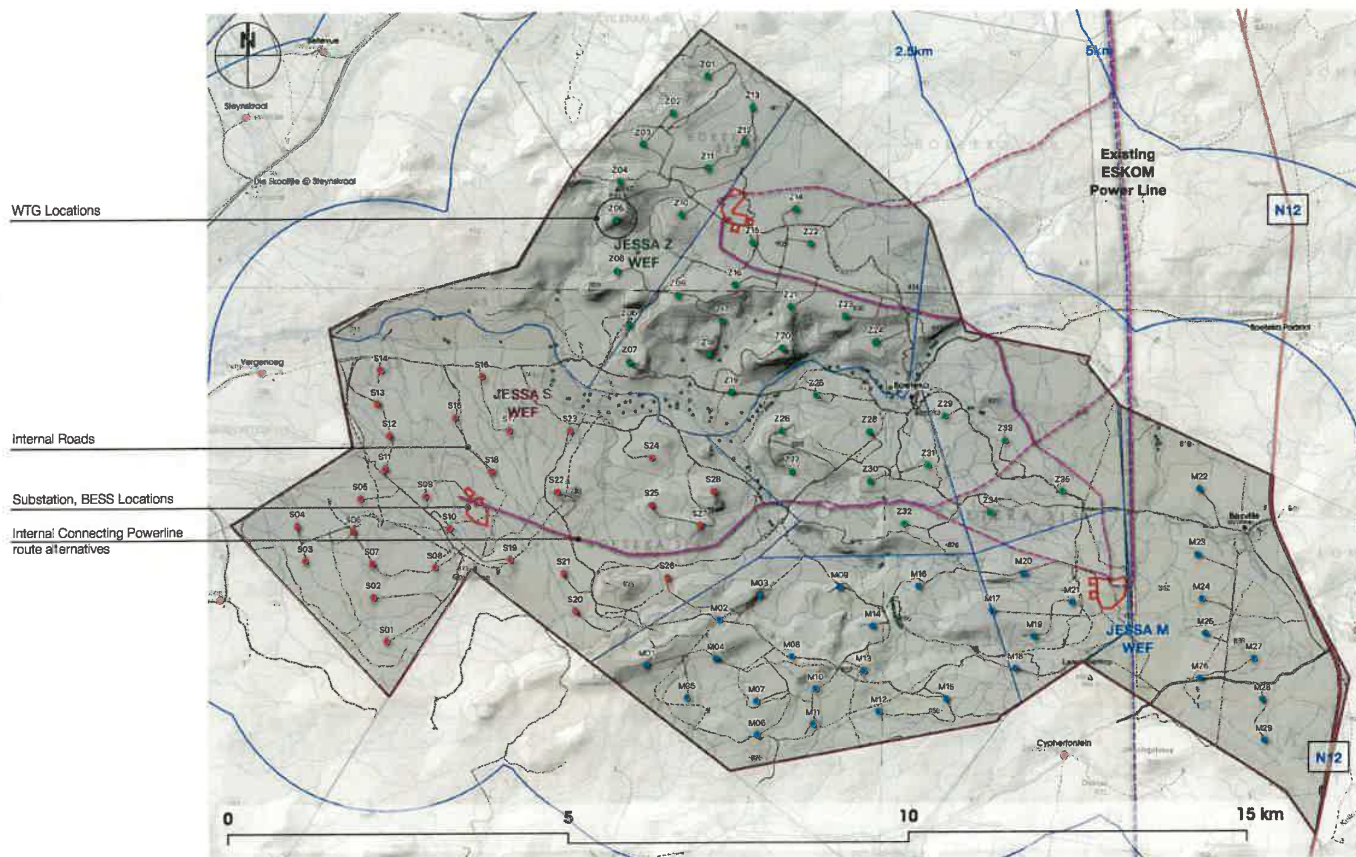
Viewshed based on Wind Turbine Generator (WTG) with a Hub Height of 200m and Rotor Diameter of 200m.  
Rotor Blade Tip Height of 300m



base map : NGI 1:250K Topo-Cadastral Series : 3222 Beaufort West

**Map 3 : Proposed JESSA WEF : Nominal Combined Viewshed of Hub Height 200m**










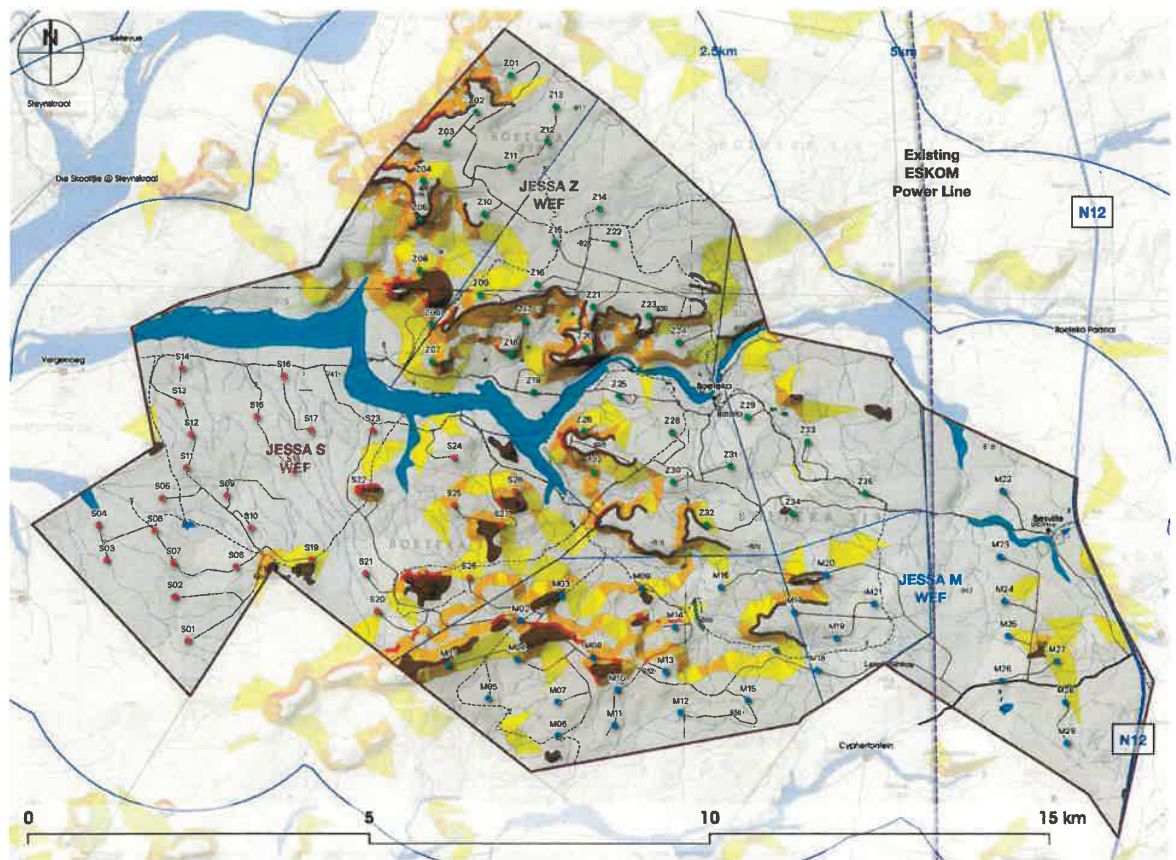
base map : NGI 1:50k Topographic Series : 3222AD Klipbank, 3222BC Beaufort West, 3222CB Lefjiesbos, 3222DA Moorbeltrein

**Map 4 : Proposed JESSA WEF : Wind Turbine, Facilities Layout 08/11/2021**



# Feature Legend :

-  Topographic Features, Ridgetines, Scarps
-  Steep Slopes  
> 1:20 (yellow) > 1:10 (orange) > 1:4 (red)
-  River Area, Wetlands, Major Dams
-  Farmsteads within the site
-  N12 National Road

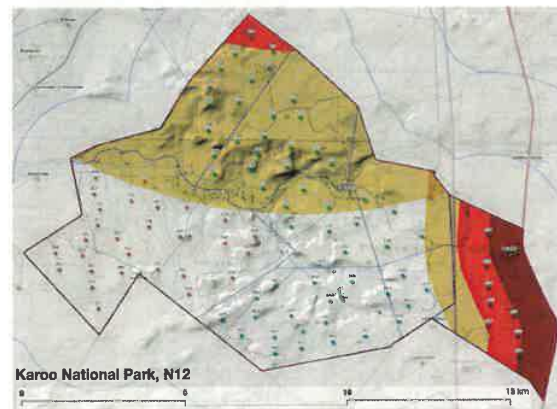
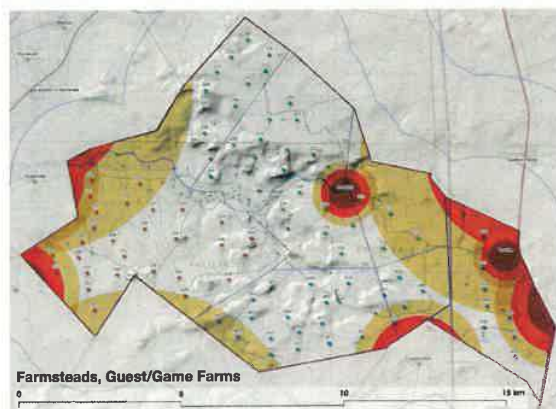
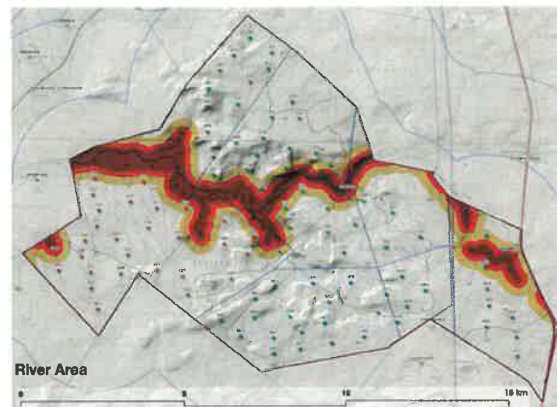
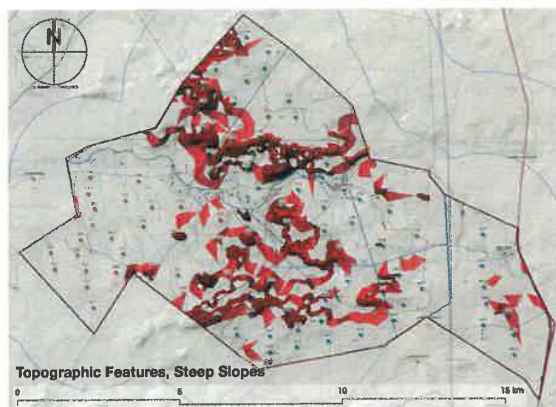
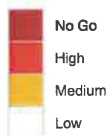


base map : NGI 1:50K Topographic Series : 3222AD Kilpank, 3222BC Beaufort West, 3222CB Leijesbos, 3222DA Moerbellfontein

**Map 5 : Proposed JESSA WEF : Visual Features**



**Visual Sensitivity  
Legend :**

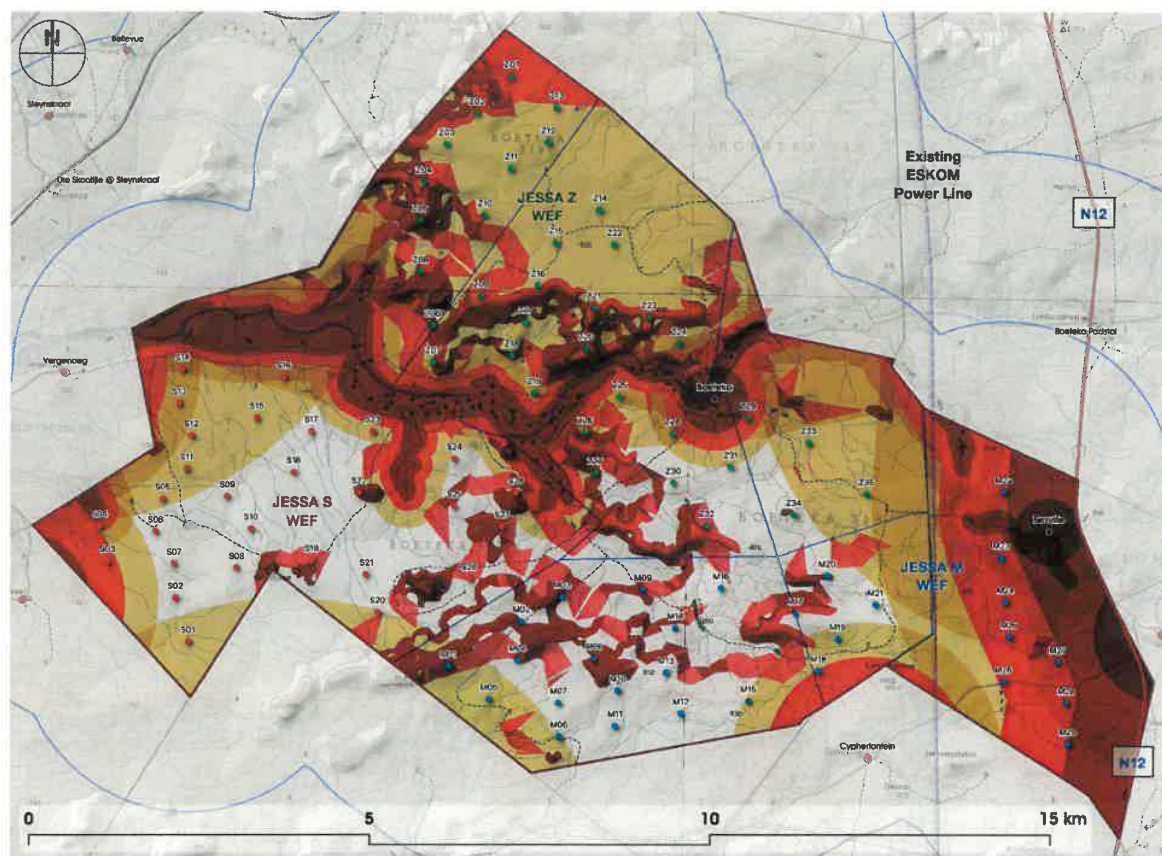
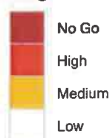


base map : NGI 1:50k Topographic Series : 3222AD Klipbank, 3222BC Beaufort West, 3222CB Lejiesbos, 3222DA Moerbellfontein

**Map 6 : Proposed JESSA WEF : Visual Sensitivity : Wind Turbines**



**Visual Sensitivity  
Legend :**

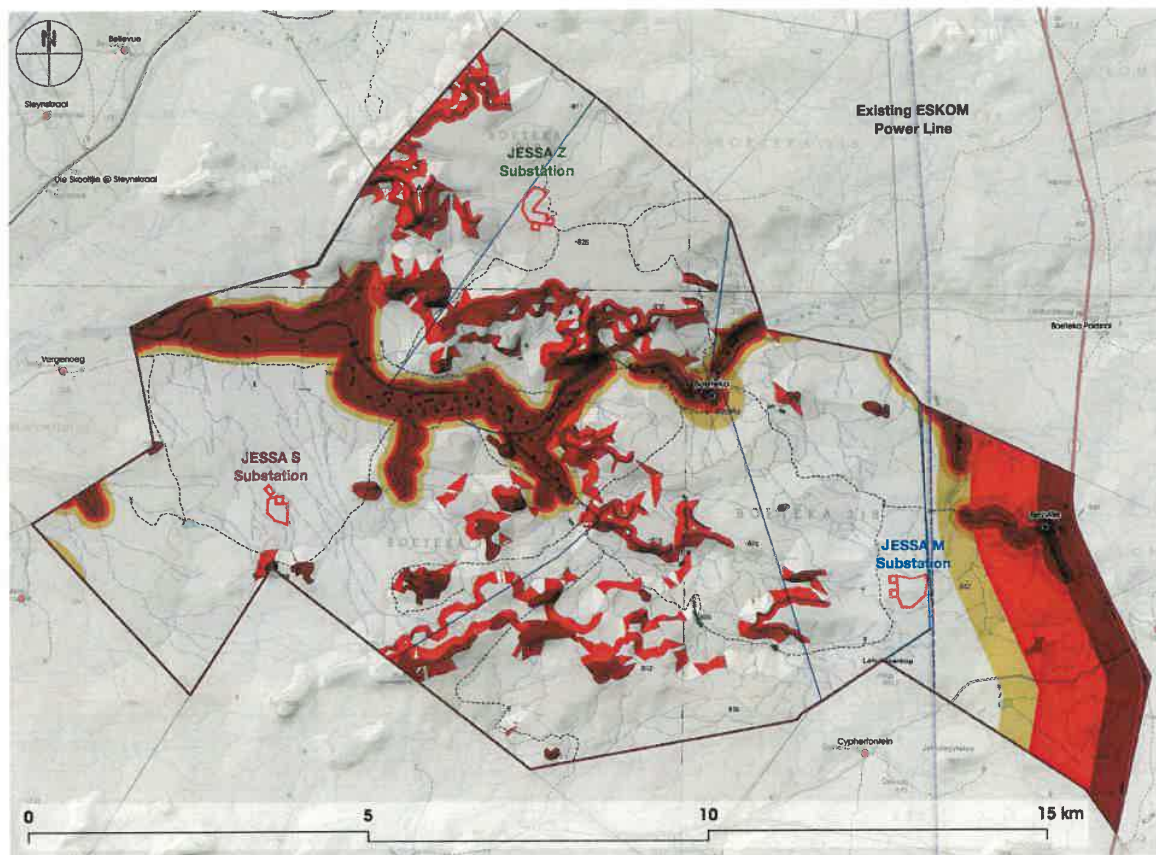
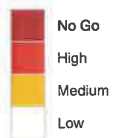


base map : NGI 1:50k Topographic Series : 3222AD Kipbank, 3222BC Beaufort West, 3222CB Lefjiesbos, 3222DA Moerbellfontein

**Map 7 : Proposed JESSA WEF : Visual Sensitivities Combined**



**Visual Sensitivity  
Legend :**



base map : NSI 1:50k Topographic Series : 3222AD Klipbank, 3222BC Beaufort West, 3222CB Lejiesbos, 3222DA Moerbellfontein

**Map 8 : Proposed JESSA WEF : Visual Sensitivity - Substations and BESS**



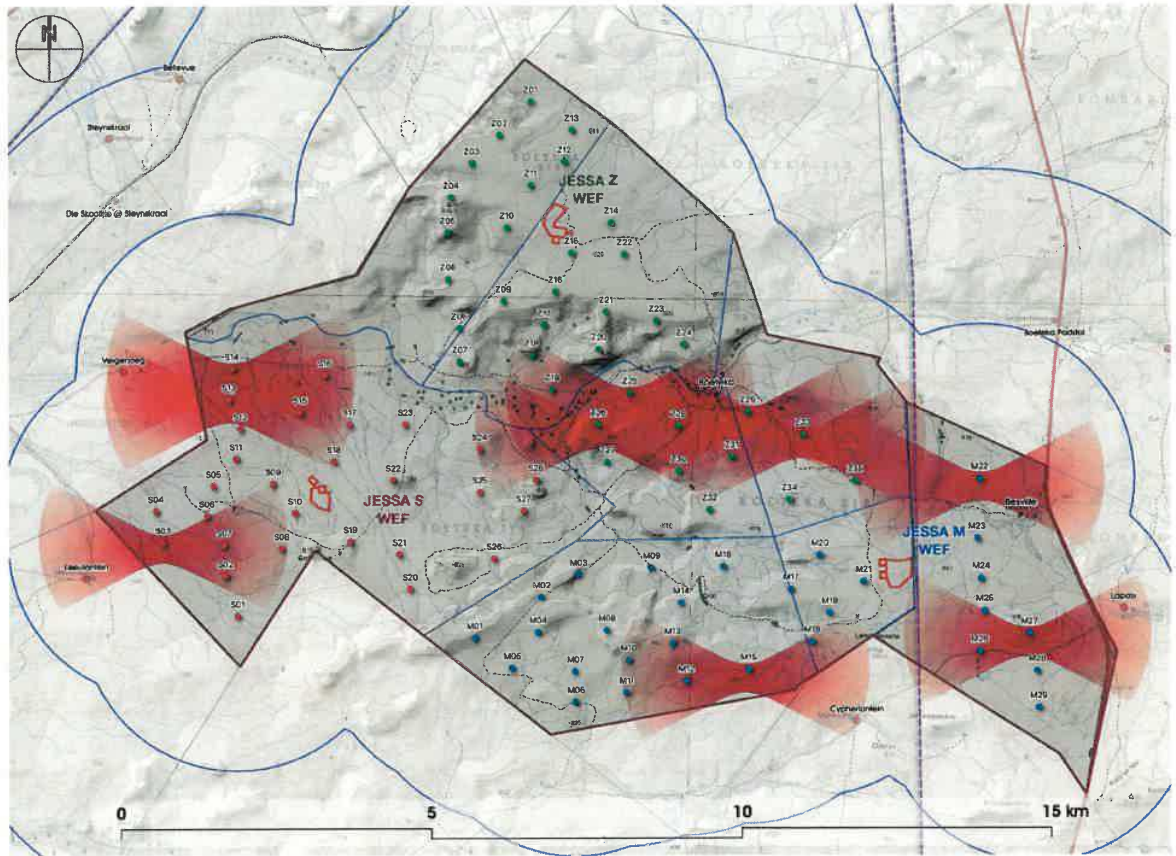








- Farm Vergenoeg potentially affected by shadow flicker from WTGs S13 and S14.
- Farm Leeufontein potentially affected by shadow flicker from WTGs S03.
- Farm Boeteka potentially affected by shadow flicker from WTGs Z25, Z26, Z28 and Z33.
- Farm Basville potentially affected by shadow flicker from WTG M22.
- Farm Lapax potentially affected by shadow flicker from WTG M27.
- Farm Cyphertontein potentially affected by shadow flicker from WTG M15.



**NOTE :** This method determines the potential shadow flicker 'envelope' for a specific geographic location and Wind Turbine parameters.

This may also be affected by weather conditions, wind direction and speed, as well as location and orientation of the receptor.

Beyond a distance of approximately 2km the blade shadows become too diffuse to create the shadow flicker effect.

base map : NGI 1:50k Topographic Series : S222AD Klipbank, S222BC Beaufort West, S222CB Lejiesbos, S222DA Moerbellontein

**Map 11 : Proposed JESSA WEF : Potential Shadow Flicker Effect**





**Viewpoint W11** • Looking West from the N12 opposite Lapaix Farm

Coordinates : 32.546809 S, 22.570647 E Distance : 1.07km



**Viewpoint W10** • Looking South-West from Boeteka Farmstall

Coordinates : 32.502853 S, 22.551799 E Distance : 2.76km

**Photomontage 1 :**

photos qarc 2021





**Viewpoint W4** • Looking East from Die Skooltjie Farm Cottage

Coordinates : 32.486783 S, 22.401227 E Distance : 3.34km



**Viewpoint W27** • Looking South-West from Olive Grove Farm road

Coordinates : 32.502000 S, 22.573400 E Distance : 3.43km

## Photomontage 2 :

photos qerc 2021





**Viewpoint W12** • Looking North from the N12 opposite Noblesfontein

Coordinates : 32.589800 S, 22.563400 E Distance : 3.45km



**Viewpoint W18** • Looking North from the Elandsfontein Gate

Coordinates : 32.591862 S, 22.447440 E Distance : 4.61km

### Photomontage 3 :

photos qarc 2021



## Appendix A: Visual Specialists

Bernard Oberholzer, Landscape Architect  
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### Expertise

Bernard Oberholzer has a Bachelor of Architecture (UCT) and Master of Landscape Architecture (U. of Pennsylvania), and has more than 20 years' experience in undertaking visual impact assessments. He has presented papers on *Visual and Aesthetic Assessment Techniques*, and is the author of *Guideline for Involving Visual and Aesthetic Specialists in EIA Processes*, prepared in association with the CSIR for the Dept. of Environmental Affairs and Development Planning, Provincial Government of the Western Cape, 2005.

Quinton Lawson has a Bachelor of Architecture Degree (Natal) and has more than 10 years' experience in visual assessments, specializing in 3D modelling and visual simulations. He has previously lectured on visual simulation techniques in the Master of Landscape Architecture Programme at UCT.

The authors have been involved in visual assessments for a wide range of residential, industrial and renewable energy projects. They prepared the 'Landscape/Visual Assessment' chapter in the report for the *National Wind and Solar PV Strategic Environmental Assessment (SEA)*, as well as the *National Electricity Grid Infrastructure SEA* in association with the CSIR, for the Department of Environmental Affairs in 2014-2015.



## Appendix B: Visual Assessment Methodology

**Table 1: Impact Assessment Methodology**

PART A: DEFINITIONS AND CRITERIA						
Determination of CONSEQUENCE	Consequence is a function of intensity, spatial extent and duration					
Determination of SIGNIFICANCE	Significance is a function of consequence and probability					
Criteria for ranking of the INTENSITY of environmental impacts	Very High	Severe change, disturbance or degradation caused to receptors. Associated with severe consequences. Targets, limits and thresholds of concern continually exceeded. Substantial intervention will be required.				
	High	Prominent change, or large degree of modification, disturbance or degradation caused to receptors or may affect a large proportion of receptors, possibly entire community.				
	Medium	Moderate change, disturbance or discomfort caused to receptors and/or which may affect a moderate proportion of receptors.				
	Low	Minor (slight) change, disturbance or nuisance caused to receptors which is easily tolerated without intervention, or which may affect a small proportion of receptors.				
	Very Low	Negligible change, disturbance or nuisance caused to receptors, barely noticeable or may have minimal effect on receptors or affect a limited proportion of receptors.				
Criteria for ranking the DURATION of impacts	Very Short-term	The duration of the impact will be < 1 year or may be intermittent.				
	Short-term	The duration of the impact will be between 1 - 5 years.				
	Medium-term	The duration of the impact will be Medium-term between, 5 to 10 years.				
	Long-term	The duration of the impact will be Long-term, between 10 and 20 years. (Likely to cease at the end of the operational life of the activity).				
	Permanent	The duration of the impact will be permanent				
Criteria for ranking the EXTENT of impacts	Site	Impact is limited to the immediate footprint of the activity and immediate surrounds within a confined area.				
	Local	Impact is confined to within the project site / area and its nearby surroundings.				
	Regional	Impact is confined to the region, e.g., coast, basin, catchment, municipal region, district, etc.				
	National	Impact may extend beyond district or regional boundaries with national implications.				
	International	Impact extends beyond the national scale or may be transboundary.				
PART B: DETERMINING CONSEQUENCE						
		EXTENT				
		Site	Local	Regional	National	International
Intensity- Very Low						
DURATION	Permanent	Low	Low	Medium	Medium	High
	Long-term	Low	Low	Low	Medium	Medium
	Medium-term	Very Low	Low	Low	Low	Medium
	Short-term	Very low	Very Low	Low	Low	Low
	Very Short-term	Very low	Very Low	Very Low	Low	Low
Intensity- Low						
DURATION	Permanent	Medium	Medium	Medium	High	High
	Long-term	Low	Medium	Medium	Medium	High
	Medium-term	Low	Low	Medium	Medium	Medium
	Short-term	Low	Low	Low	Medium	Medium
	Very Short-term	Very low	Low	Low	Low	Medium
Intensity- Medium						
DURATION	Permanent	Medium	High	High	High	Very High
	Long-term	Medium	Medium	Medium	High	High
	Medium-term	Medium	Medium	Medium	High	High
	Short-term	Low	Medium	Medium	Medium	High
	Very Short-term	Low	Low	Low	Medium	Medium



Intensity - High						
DURATION	Permanent	High	High	High	Very High	Very High
	Long-term	Medium	High	High	High	Very High
	Medium-term	Medium	Medium	High	High	High
	Short-term	Medium	Medium	Medium	High	High
	Very Short-term	Low	Medium	Medium	Medium	High
Intensity - Very High						
DURATION	Permanent	High	High	Very High	Very High	Very High
	Long-term	High	High	High	Very High	Very High
	Medium-term	Medium	High	High	High	Very High
	Short-term	Medium	Medium	High	High	High
	Very Short-term	Low	Medium	Medium	High	High
		Site	Local	Regional	National	International
EXTENT						
PART C: DETERMINING SIGNIFICANCE						
PROBABILITY (of exposure to impacts)	Definite/ Continuous	Very Low	Low	Medium	High	Very High
	Probable	Very Low	Low	Medium	High	Very High
	Possible/ frequent	Very Low	Very Low	Low	Medium	High
	Conceivable	Insignificant	Very Low	Low	Medium	High
	Unlikely/ improbable	Insignificant	Insignificant	Very Low	Low	Medium
		Very Low	Low	Medium	High	Very High
CONSEQUENCE						
PART D: INTERPRETATION OF SIGNIFICANCE						
Very High -	Very High +	Represents a key factor in decision-making. In the case of adverse effects, the impact would be considered a fatal flaw unless mitigated to lower significance.				
High -	High +	These beneficial or adverse effects are considered to be very important considerations and are likely to be material for the decision-making process. In the case of negative impacts, substantial mitigation will be required.				
Medium -	Medium +	These beneficial or adverse effects may be important but are not likely to be key decision-making factors. The cumulative effects of such issues may become a decision-making issue if leading to an increase in the overall adverse effect on a particular resource or receptor. In the case of negative impacts, mitigation will be required.				
Low -	Low +	These beneficial or adverse effects may be raised as localised issues. They are unlikely to be critical in the decision-making process but could be important in the subsequent design of the project. In the case of negative impacts, some mitigation is likely to be required.				
Very Low -	Very Low +	These beneficial or adverse effects will not have an influence on the decision, neither will they need to be taken into account in the design of the project. In the case of negative impacts, mitigation is not necessarily required.				
Insignificant		Any effects are beneath the levels of perception and inconsequential, therefore not requiring any consideration.				