VOLUME I

THE PROPOSED AMENDMENT AND SPLIT OF THE AUTHORISED PHEZUKOMOYA WIND ENERGY FACILITY, NORTHERN AND EASTERN CAPE PROVINCES (HARTEBEESTHOEK WEST WEF)

On behalf of

HARTEBEESTHOEK WIND POWER (PTY) LTD

June 2021

DFFE Reference: 14/12/16/3/3/2/1028, 14/12/16/3/3/2/1028/AM1, and 14/12/16/3/3/2/1028/2/AM1

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PROJECT DETAILS

DFFE Reference:	14/12/16/3/3/2/1028 and 14/12/16/3/3/2/1028/AM1 and 14/12/16/3/3/2/1028/2/AM1
Arcus Reference:	3329 Hartebeesthoek West WEF
Title:	Amendment Report for the Proposed Hartebeesthoek West Wind Energy Facility, Northern and Eastern Cape Provinces
EAP:	Ashlin Bodasing - Arcus Consultancy Services South Africa (Pty) Ltd
Project Applicant:	Hartebeesthoek Wind Power (Pty) Ltd
Report Status:	Revised Final Amendment Report – For Public Comment

Changes made to this Report	**Section**
Date changed from December 2019 to June 2021	Volume I: Section 1 to 11
Public Participation was updated to reflect process current process	Volume I
Added details of the Potential Wake Effect of the Proposed Development on the Operational Noupoort Wind Farm.	Volume I
Added the Wake Effect Analysis Report as part of the Specialists Studies	Volume II
Typographical and grammatical errors were corrected and minor clarifications were made throughout the document.	Volume I: Section 1 to 11
Added details regarding the appeal process.	Volume I

Note: No changes were made to Volume II: Specialist Assessment Reports / Letters. Wake Effect Analysis Impact Report added to Volume II.

PUBLIC PARTICIPATION LOCATION DETAILS

Invitation to Comment: Members of the public, local communities, and stakeholders are invited to comment on the draft Amendment Report which is made available for public review and comment from **Friday, 11 June 2021 to Monday, 12 July 2021** at the following locations.

Location	Physical Address	Contact person	Availability
Electronic Copy Location			
Arcus Website	https://arcusconsulting.co.za/projects/	Aneesah Alwie 021 412 1529	From Friday, 11 June 2021 to Monday, 12 July 2021
Hard Copy Location			
The Don Guesthouse	34 Murray St, Noupoort, 5950	Lizl de Swardt 049 843 1075	From Saturday, 12 June 2021 to Sunday, 13 June 2021
Noupoort Library	6 Shaw Street, Noupoort, 5950	Martha Van Eyk 084 243 1609	From Monday, 14 June 2021 to Monday, 12 July 2021
Kindly take note of COVID-19 Protocols No Mask = No Entry Please sanitize before and after use of the reports			
Comment Submission			
<u>Comments can be submitted to:</u> Arcus Consultancy Services South Africa (Pty) Ltd Office 607 Cube Workspace Icon Building Cnr Long Street and Hans Strijdom Avenue, Cape Town, 8001 T +27 (0) 21 412 1529 l E projects@arcusconsulting.co.za			

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1 INTRODUCTION

1.1 Previous Application Background

On 28 June 2018 the Department of Fisheries, Forestry and Environment (DFFE) issued an Environmental Authorisation (EA) to Phezukomoya Wind Power (Pty) Ltd ('Phezukomoya') for the construction of a 275 MW Wind Energy Facility (WEF) and its associated 132 kV grid connection (DFFE Ref. No. 14/12/16/3/3/2/1028 and 14/12/16/3/3/2/1028/AM1)

On 26 September 2019 Phezukomoya lodged an amendment application with DFFE in respect of the EAs issued on 28 June 2018. The proposed amendments sought to amend the authorised wind turbine specifications from 275 MW to 217 MW and split the original EA issued for the Phezukomoya WEF into two WEF facilities. The amendments had the following detail:

- **Hartebeesthoek West (up to 74.4 MW) consisting of up to 12 turbines with a generating capacity of up to 6.2 MW each (The Proposed Project) (DFFE Reference: 14/12/16/3/3/2/1028/2/AM1);** and
- Phezukomoya WEF (up to 217 MW) consisting of up to 35 turbines with a generating capacity of up to 6.2 MW each (subject to a separate report, assessment and application, DFFE Reference: 14/12/16/3/3/2/1028/1/AM1).

The DFFE approved the abovementioned amendments and issued the amended EAs to Phezukomoya Wind Power (Pty) Ltd on the 25 March 2020.

1.2 Appeal Background

On 30 July 2020, the Appeals Directorate received and appeal from Noupoort Wind Farm (RF) (Pty) Ltd ('Noupoort') against the approval of the amendment applications authorised above. The appeal broadly premised on the following grounds: Error of fact, Socio-Economic Impacts and Mitigation Hierarchy. Concerns raised in the appeal have been summarised below:

- Noupoort are concerned that Wake Effect (WE) within the amendment reports was not adequately addressed in terms of impacts on the Noupoort WEF. Noupoort are stated that the amended turbine layout and specification approved above "alters the wake impacts of the Noupoort WEF" and that "power curves and downstream wake effects have changed" due to the amendment.
- Moreover, Noupoort indicated that the updated Wake Effect impact analysis (compiled July 2020) that was submitted to them during the appeals commenting period, was not subjected to a transparent and fair Public Participation Process.

The ground of appeal mentioned above was upheld by the Minister. The second ground of appeal, which was Need and Desirability, has since been dismissed by the Minister.

A decision on the appeal against the approval of the amendment applications was reached by Barbara Creecy – Minister of Forestry, Fisheries and the Environment – on 07 June 2021. Interms of the Appeal decision, the Hartebeesthoek West EA is suspended until the updated wake effect impact assessments are subjected to a 30 day Public Particiaption Process and the revised EIR submitted back to the Department for decision making. . Directions of the ruling given by the MP read as follows:

> *"In the present matter. I have taken note of the wake impact analysis reports, in respect of the amendment applications, albeit outside of the EIA process. In light hereof, the appropriate remedy is to direct, as I hereby do, the applicant is to subject the wake impact analysis reports dated 01 July 2020, to a public participation as contemplated in the 2014 EIA Regulations. Any comments received from I&APs, as*

well as responses thereto by the applicants, must be incorporated into the final Amendment Reports, for submission to the Department for reconsideration of the amendment applications. In this regard, the timeframes prescribed by the 2014 EIA Regulations must be adhered to."

1.3 Revised and Updated Final Amendment Report (this report)

As instructed by the Minister in the Appeal decision, the applicant is subjecting the updated wake effect reports to a 30 days Public Participation Process in line with Chapter 6 of the 2014 EIA Regulations. The comments received from I&AP's will be captured and responded to in the final EIR which will be resubmitted to the Department for reconsideration.

As the proposed amendments require authorisation from the DFFE, Hartebeesthoek Wind Power (Pty) Ltd appointed Arcus Consultancy Services South Africa (Pty) Ltd ('Arcus'), as the Environmental Assessment Practitioner (EAP).

The proposed development site is located south-east of the town of Noupoort in the Northern Cape Province, bordering the Eastern Cape Province. The proposed development site falls within the Umsobomvu Local Municipality, in the Pixley ka Seme District Municipality in the Northern Cape, as well as in the Inxuba Yethemba Local Municipality and Chris Hani District Municipality in the Eastern Cape. The towns of Middelburg and Colesburg are located approximately 28 km and 59 km to the south and north-east of the site, respectively (Figure 1.2).

Two amendment applications for Environmental Authorisation (EA) have been submitted to the DFFE as each WEF will be required to have its own environmental authorisation. The number of turbines and the generation capacity which are being applied for with each application is defined below:

- **Hartebeesthoek West (up to 74.4 MW) consisting of up to 12 turbines with a generating capacity of up to 6.2 MW each (The Proposed Project) (DFFE Reference: 14/12/16/3/3/2/1028/2/AM1);** and
- Phezukomoya WEF (up to 217 MW) consisting of up to 35 turbines with a generating capacity of up to 6.2 MW each (subject to a separate report, assessment and application, DFFE Reference: 14/12/16/3/3/2/1028/1/AM1).

The focus of this amendment report is on the Hartebeesthoek West WEF consisting of up to 12 turbines.

1.4 The Authorised Phezukomoya WEF

On 28 June 2018, the DFFE approved the following infrastructure as part of the Phezukomoya WEF (Figure 1.1).

Table 1.1: Co-ordinates, as per the EA, of the Authorised WEF Site and Associated Infrastructure

	Authorised Latitude	**Authorised Longitude**
Alternative (preferred site)		
North-West Corner	-31.1759	24.88607
North-East Corner	-31.20629	24.98597
South-West Corner	-31.3217	24.83593
South-East Corner	-31.28262	25.05602

	Authorised Latitude	Authorised Longitude
Substation location (centre point)	-31.25053	24.92819
Construction camp laydown area	-31.21531	24.90027
Preferred powerline route (Preferred Alternative)		
Start	-31.25427	24.82516
Middle	-31.30298	24.87821
End	-31.25263	24.92765
Access to Site Point 1	-31.195496	24.877421
Access to Site Point 2	-31.195269	24.961468
Access to Site Point 3	-31.278405	24.940615
Access to Site Point 4	-31.268857	24.941613
Access to Site Point 5	-31.206607	24.052748

For the authorised 275 MW Phezukomoya WEF and associated infrastructure including electrical grid connection located south-east of the town of Noupoort, the following project descriptions apply:

- A maximum generating capacity of 275 MW in total;
- 55 turbines with a generation capacity between 3 – 5 MW and a rotor diameter of 150 m, a hub height of 150 m and blade length of 75 m (all maximums);
- Foundations (25 m x 25 m) and hardstands associated with the wind turbines;
- Internal access roads of between 8 m (during operation) and 14 m (during construction) wide to each turbine;
- Medium voltage underground cabling between turbines and the on-site switching stations (each 10000 m^2), to be laid underground where technically feasible;
- Two overhead medium voltage cables between the on-site switching stations and on-site substation (approximately 3 km and 5.6 km in length) and between turbine rows where necessary;
- An on-site sub-station & OMS complex (180000 m^2) to facilitate stepping up the voltage from medium to high voltage (132 kV) to enable the connection of the WEF to the national grid;
- A 16 km 132 kV high voltage overhead powerline from the on-site substation to the proposed Umsobomvu Substation to the national grid;
- A 100 m corridor surrounding the Umsobomvu Substation so that the grid connection can turn into the substation from any direction;
- Temporary infrastructure including a construction camp with batching plant (90000 m^2); and
- A laydown area approximately 7500 m^2 in extent, per turbine.

Table 1.2: Technical Details of the Authorised WEF and Grid Connection

Component	Description / Dimensions
WEF	
Location of the Site	Approximately 6km south-east of the town of Noupoort
Farm and SG Codes	» RE/118: C03000000000011800000 » RE/1/1: C048000000000000100001 » 18/1: C04800000000000100018 » RE/11/1: C04800000000000100011 » 3/1: C04800000000000100003 » 2/11: C04800000000001100002 » 2: C04800000000000200000 » 12/1: C04800000000000100012 » 21/1: C04800000000000100021 » RE/13/1: C04800000000000100013 » RE/117: C03000000000011700000 » RE/1/117: C03000000000011700001 » 47/182: C02100000000018200047 » RE/182: C02100000000018200000 » 15/182: C02100000000018200015 » RE/13: C04800000000001300000 » RE/181: C02100000000018100000
Site Access	-31.195496°; 24.877421° and -31,195269°; 24,961468
Export Capacity	Up to 275 MW
Proposed Technology	Wind Turbines
Number of Turbines	Up to 55
Hub Height from Ground Level	150 m
Rotor Diameter	150 m
Width and Length of Internal Roads	Internal roads width: Up to 14 m during construction and up to 8 m during operation Internal roads length: Approximately 58 km
Powerline (Grid Connection)	
Location of the Site	Approximately 7 – 21 km south of Noupoort
Length	Approximately 16 km

Component	Description / Dimensions
Farm and SG Codes	Farm 21/1 Edendale C04800000000000100021 Farm 13/1 Edendale C04800000000000100013 Farm RE/1/1 Vrede C04800000000000100001 Farm RE/118 Winterhoek C03000000000011800000 Farm RE/135 Bergplaas C03000000000013500000 Farm RE/136 Bergplaas C03000000000013600000
Preferred Access	-31.278405; 24.940615
Export Capacity	132 kV
Proposed Technology	Eskom specifications (concrete or steel monopole or lattice towers)
Height of Poles	A maximum of 45 m
Width and Length of Servitude	34 m in width and 16 km in length

1.5 Aim and Purpose of this Report

This report highlights the proposed amendments to the authorised Phezukomoya WEF and associated Grid Connection. The report aims to comply with the relevant National Environmental Management Act, 1998 (Act 107 of 1998 - NEMA) EIA Regulations, 2014, as amended. The report further aims to provide the updated assessment of the specialist's studies conducted for the authorised Phezukomoya WEF and provide an opinion of the proposed amendments that should be granted by the DFFE.

2 DETAILS OF THE PROPOSED AMENDMENTS

The amendment being applied for is to split the authorised Phezukomoya Wind Energy Facility (WEF) into two separate wind energy facilities, namely Phezukomoya WEF (Split 1) and Hartebeesthoek West WEF ('Split 2') ('HBH West') (Figure 2.1). Phezukomoya WEF (Split 1) WEF is subject to a separate amendment application process. This report focuses on the amendments relating to the HBH West WEF application only. The proposed components requiring amendments are detailed below for Hartebeesthoek West WEF.

Table 2.1: Changes to the Holder of the Authorisation

	Authorised	Amendment
Holder of Authorisation	Phezukomoya Wind Power (Pty) Ltd	Hartebeesthoek Wind Power (Pty) Ltd
Company Representative	Louis Dewavrin	Sheldon Vandrey

	Authorised	Amendment
Name of Development	The 275 MW Phezukomoya Wind Energy Facility (WEF) and associated 132 kV grid connection transmission line near Noupoort within the Umsobomvu Local Municipality in the Northern Cape Province and the Inxuba Yethemba Local Municipality in the Eastern Cape Province.	The up to 74.4 MW Hartebeesthoek West Wind Energy Facility near Noupoort within the Umsobomvu Local Municipality in the Northern Cape Province and the Inxuba Yethemba Local Municipality in the Eastern Cape Province.

Table 2.2: Co-ordinates of the Amended WEF Site

	Proposed Latitude	Proposed Longitude
Hartebeesthoek West WEF		
North-West Corner	31° 14' 26.618" S	24° 58' 35.8612" E
North-East Corner	31° 14' 08.4855" S	24° 59' 46.0334" E
South-West Corner	31° 16' 21.9496" S	24° 59' 00.6293" E
South-East Corner	31° 15' 49.4609" S	25° 00' 56.5265" E
Substation location (centre point)	31° 15' 1.91" S	24° 55' 41.48" E
Construction camp laydown area	31° 12' 55.12" S	24° 54' 0.97" E

Table 2.2: Technical Details of the Amended WEF

Component	Description / Dimensions
WEF	
Location of the Site	Approximately 8 km south of Noupoort
Farm and SG Codes	47/182: C02100000000018200047 2: C04800000000000200000 RE/13: C04800000000001300000 1/11: C04800000000001100001 RE/13/1: C04800000000000100013
Site Access	Access Point 1: -31.195496; 24.877421 Access Point 2: -31.195269; 24.961468 Access Point 3: -31.278405; 24940615 Access Point 4: -31.268857; 24.941613 Access Point 5: -31.206607; 25.052748
Export Capacity	Up to 74.4 MW
Proposed Technology	Wind Turbines

Component	Description / Dimensions
Number of Turbines	Up to 12
Hub Height from Ground Level	Up to 137 m
Rotor Diameter	Up to 175 m
Width and Length of Internal Roads	Internal roads width: Up to 14 m during construction and up to 8 m during operation Internal roads length: Approximately 35 km

For the proposed up to 74.4 MW Hartebeesthoek West WEF and associated infrastructure including electrical grid connection located south of the town of Noupoort, the facility will comprise the following:

- A maximum generating capacity of up to 74.4 MW in total (below the authorised 275 MW);
- 12 turbines with a generation capacity of up to 6.2 MW and a rotor diameter of 175 m, a hub height of 137 m and a blade length of 87.5 m (all maximums) ***(changing from authorised)***;
- Foundations (25 m x 25 m) and hardstands associated with the wind turbines ***(not changing from authorised)***;
- Internal access roads of between 8 m (during operation) and 14 m (during construction) wide to each turbine ***(not changing from authorised)***;
- Medium voltage underground cabling between turbines and the on-site switching stations (approximately 10000 m^2), to be laid underground where technically feasible ***(not changing from authorised)***;
- Two overhead medium voltage cables between the on-site switching stations and on-site substation (approximately 3 km and 5.6 km in length) and between turbine rows where necessary ***(be removed or amended)***,
    - Amendment to read: "Overhead medium voltage cables between the on-site switching station and Phezukomoya substation and between turbine rows where necessary";
- An on-site sub-station & OMS complex to facilitate stepping up the voltage from medium to high voltage (132 kV) to enable the connection of the WEF to the national grid ***(not changing from authorised and can be removed for this amendment)***;
- A 16 km 132 kV high voltage overhead powerline from the on-site substation to the proposed Umsobomvu Substation to the national grid ***(not changing from authorised)***;
    - Note: This overhead powerline is applicable to this proposed development, however, as part of a separate basic assessment application process, Hartebeesthoek West are applying for three grid connection options to connect to the proposed Umsobomvu Substation and to the national grid.[1]
- A 100m corridor surrounding the Umsobomvu Substation so that the grid connection can turn into the substation from any direction ***(not changing from authorised)***,

[1] The three grid connection options is: electricity is transferred via a proposed 132 kV OHL from the proposed HBH West on-site switching station (1) to the San Kraal substation and via the HBH Corridor to the Umsobumvu substation OR (2) to the Phezukomoya substation and via the Phezukomoya corridor to the Umsobomvu substation OR (3) to the San Kraal substation and via the San Kraal corridor to the Umsobomvu substation. From either of these substations electricity is transferred to the proposed SK-PH Collector substation OR directly to the proposed Umsobomvu substation via one of three corridor options, i.e. San Kraal Corridor, Phezukomoya Corridor or the proposed HBH Corridor.

- This remains unchanged from authorised. However, it must be noted that turn in options will be assessed as part of a separate application process;

- Temporary infrastructure including a construction camp with batching plant (90000 m^2) ***(not changing from authorised)***;
  - It must be noted that a batching plant 2 has been applied for as a separate application process; and
- A laydown area approximately 7500 m^2 in extent, per turbine ***(not changing from authorised)***.

The proposed HBH West WEF will comprise 12 wind turbines with a generation capacity of 6.2 MW each for a total WEF output of up 74.4 MW. The wind farm will connect to the SK-PH collector substation via medium voltage lines, which will, in turn, connect to the Umsobomvu Substation via an approved 132 kV transmission line. The new on-site substation, collector substation and other associated infrastructure are subject to a separate Basic Assessment Process.

2.1 Conditions of Authorisation to be Retained or Changed

Table 2.3 Conditions of Authorisation Requiring Amendment

No. of Condition in EA	Page No.	Current Condition	Amend / Correct Condition	Motivation / Reason for change request
The facility will comprise the following	6	An on-site substation & OMS complex (180000m2) to facilitate stepping up the voltage from medium to high voltage (132 kV) to enable the connection of the WEF to the national grid.	To be removed from the EA.	In the HBH West amendment report it was stated that this point is not changing from authorised and can be removed for this amendment.
Technical details of the WEF: Site Access	7	-31.195946; 24.877421 and -31.195269; 24.961468	Should read: Access to site: Access Point 1: -31.195496; 24.877421 Access Point 2: -31.195269; 24.961468 Access Point 3: -31.278405; 24940615 Access Point 4: -31.268857; 24.941613 Access Point 5: -31.206607; 25.052748	Add additional access points as authorised for Phezukomoya WEF, 2018. Required due to the complexity of the site.
Technical details of the WEF: Export capacity	7	"74.4 MW"	"up to 74.4MW"	As per the amendment report.
Technical details of the WEF: Number of Turbines	7	"12"	"up to 12"	As per the amendment report.
Technical details for the proposed powerline:	8	"A max of 30 m"	"A max of 45 m"	Maximum height permitted based on SACAA.

Height of poles				
Condition 2.	8	The occupants of the accommodation at S31.210196°, E24.896746° must be accommodated in alternative suitable accommodation on the farm before construction commences.	Condition to be removed from the EA.	The location is situated on the Phezukomoya Split 1 Site Boundary and thus is not applicable to this EA.
Condition 44.	16	Turbines 7, 62 and 63 must be relocated to the top of the plateau as they pose a high collision risk on the slopes where they are situated.	Condition to be removed from the EA.	Turbine layout was changed based on the amendment applications and thus this condition is not applicable.
Condition 58.	18	All internal powerline/cables must follow internal access roads.	All internal powerline/cables must follow internal access roads where technically feasible.	Allow for scope if following the internal access roads is not technically feasible.
Condition 59.	18	All powerlines linking the turbines to the on-site substation must be buried.	All internal powerline/cables must follow internal access roads where technically feasible.	Allow for scope if following the internal access roads is not technically feasible.
Condition 101.	21	No turbines must be placed within 1km of the N9, N10 and R389 provincial road.	No turbines must be placed within 500 m of the N9, N10 and R389 provincial road.	Condition to be amended to state "No turbines should be placed within 500 m of the N9, N10 and R389 provincial road." As per the visual amendment report.

3 LEGISLATIVE REQUIREMENTS

The Amendment Report has been compiled in compliance with the National Environmental Management Act No. 107 of 1998 (NEMA) EIA Regulations 2014, as amended. Phezukomoya Wind Power (Pty) Ltd are applying for an amendment to the EA issued by the DFFE (DFFE Reference: 14/12/16/3/3/2/1028 and 14/12/16/3/3/2/1028/AM1) in terms of Regulation 31 and 32 of the NEMA EIA Regulations. Regulation 31 of the NEMA EIA Regulations 2014, as amended states that:

'An environmental authorisation may be amended by following the process prescribed in this Part if the amendment will result in a change to the scope of a valid environmental authorisation where such change will result in an increased level or change in the nature of impact where such level or change in nature of impact was not-

(a) assessed and included in the initial application for environmental authorisation; or

(b) taken into consideration in the initial environmental authorisation;

and the change does not, on its own, constitute a listed or specified activity.'

In compliance with Regulation 32 of the NEMA EIA Regulations 2014, as amended the specialists assessed the proposed changes to the approved project description and highlighted the advantages and disadvantages of the proposed amendments, and finally provided further recommendations or mitigation measures if necessary.

Table 3.1: Legislative Requirements of the Amendment Report

Contents of the Amendment Report	Reference
32 (1) The applicant must within 90 days of receipt by the competent authority of the application made in terms of regulation 31, submit to the competent authority –	
(a) A report, reflecting –	
An assessment of all impacts related to the proposed change;	Section 6: Specialist Assessment of the Proposed Amendments Volume II: Specialist Reports
Advantages and disadvantages associated with the proposed change;	Section 7: Advantages and Disadvantages of the Proposed Amendments
Measures to ensure avoidance, management and mitigation of impacts associated with such proposed change; and	Section 10: Recommendations and Conclusion
Any changes to the EMP.	Appendix B: EMPr
aa. Had been subjected to a Public Participation Process (PPP), which had been agreed to by the competent authority, and which was appropriate to bring the proposed change to the attention of potential and registered interested and affected parties, including organs of state, which have jurisdiction in respect of any aspect of the relevant activity, and the competent authority, and	Section 8: Public Participation
bb. Reflects the incorporation of comments received, including any comments of the competent authority.	Section 8: Public Participation

3.1 Authorised Listed Activities

The following listed activities were applied for and approved by the DFFE. The listed activities will not change based on the amendments being applied for.

LISTING NOTICE	ACTIVITIES
LN 1 GN R327[2]	11(i); 14, 19 (i); 24 (ii); 56 (ii)
LN 2 GN R325[3]	1; 6; 9; 15.
LN 3 GN R324[4]	4 (a)(i)(bb) & (g)(bb)(ee); 12(g)(ii); 18 (a)(i)(bb)

3.2 DFFE Comments on Draft Amendment Report

On 17 October 2019, the DFFE submitted comments on the amendment report. The table below reflects the responses to the comments submitted by the DFFE and also highlights the sections in the report, where these have been addressed.

Table 3.2: Responses to DFFE Comments of Draft Report

[2] "Listing Notice 1 of the EIA Regulations, promulgated under Government Notice R983 of 4 December 2014, as amended by Government Notice R327 of 7 April 2017."
[3] "Listing Notice 2 of the EIA Regulations, promulgated under Government Notice R984 of 4 December 2014, as amended by Government Notice R325 of 7 April 2017."
[4] "Listing Notice 3 of the EIA Regulations, promulgated under Government Notice R985 of 4 December 2014, as amended by Government Notice R324 of 7 April 2017."

No.	Comment from DFFE	EAP Response	Section in Report
The Environmental Authorisation (EA) issued for the above application by this Department on 28 June 2018 (14/12/16/3/3/2/1028); the Application for Environmental Authorisation (EA) and Draft Amendment report received by the Department on 26 September 2019 and the acknowledgement letter from the Department dated 02 October 2019, refer.			
The application for amendment of the EA addresses the following:			
i.	The applicant, Phezukomoya Wind Power (Pty) Ltd intends to split the EA for 14/12/16/3/3/2/1028 into two smaller projects within the authorised boundary, to be known as Phezukomoya Split 1 (separate application) and Hartebeesthoek Wind Energy Facility (this amendment application).		
ii.	In addition, the applicant intends to amend the following		
	Split of the authorised Phezukomoya WEF into two smaller projects within the authorised boundary, i.e. Phezukomoya Split 1 and Hartebeesthoek West WEF Split 2;		
	Name and coordinates of the development;		
	Change to the holder of the authorisation to Hartebeesthoek Wind Power (Pty) Ltd;		
	Hub Height of up to 137 m, rotor diameter of 175 m and turbine output of up to 6.2 MW;		
	Project output of up to 74.4 MW;		
	Turbine numbers reduced to 12 turbines;		
	A new final layout.		
iii	The amendment is requested as the authorised technology is no longer the most efficient turbine model, and it will ensure their project is amongst the forefront of technological advancements. The amendment will result in fewer turbines with increased MW that would be less than or equal to the overall authorised 275 MW.		
iv.	There are no amendments being applied for in terms of the grid connection and associated infrastructure related to the original EA with reference number 14/12/16/3/3/2/1028.		
v.	Two Separate amendment applications and reports have been submitted to the Department in order to facilitate the split of the EA. The applications are currently registered with the Department as 14/12/16/3/3/2/ 1028/1/AM1 and 14/12/16/3/3/2/1028/2/AM1.		
The Department has the following comments on the abovementioned application (14/12/16/3/3/2/1028/2/AM1):			
(a)	**Public Participation Process**		
The following information must be submitted with the Final Amendment Report:			
i.	A list of registered interested and affected parties as per Regulation 42 of the NEMA EIA Regulations, 2014, as amended	The list of registered interested and affected parties has been updated and is included as per Regulation 42 of the NEMA EIA Regulations, 2014, as amended.	Appendix D

No.	Comment from DFFE	EAP Response	Section in Report
ii.	Please ensure that copies of original comments received from I&APs and organs of state, which have jurisdiction in respect of the proposed activity are submitted to the Department with the final Amendment Report. Kindly ensure that the Square Kilometer Array (SKA) comments and comments from this Departments Biodiversity and Conservation Directorate are included in the document.	All original comments received from organs of state and I&APs in respect of the proposed activity have been included in this final submission for authorisation. Where comments were not received from an organ of state within the comment period, the EAP followed up to request comment. Proof of this correspondence is also included in this final submission.	Appendix G
iii.	Proof of correspondence with the various stakeholders, including organs of state which have jurisdiction in respect of the proposed activity, must be included in the final Amendment Report. Should you be unable to obtain such comments, proof should be submitted to the Department of the attempts that were made to obtain the comments.	Proof of all correspondence during the amendment application process is included in this final amendment report submission.	Appendix G and Appendix H
iv.	All issues raised and comments received during the circulation of the draft amendment report from I&APs and organs of state which have jurisdiction in respect of the proposed activity are adequately addressed in the final amendment report, including comments from this Department, and must be incorporated into a Comments and Response Report	All issues raised and comments received during the comment period have been included in this report and responded to where applicable. The comments and response report has been updated to reflect this.	Appendix H
v.	Please refrain from summarising comments made by I&APs. All comments from I&APs must be copied verbatim and responded to clearly. Please note that a response such as "noted" is not regarded as an adequate response to an I&AP's comments	The EAP has not summarised any comments received. All comments included in the comments and response report are included as they were received. Copies of the comments received have also been included to ensure that nothing has been misrepresented.	Appendix G and Appendix H
(b)	**<u>General</u>**		
vi.	The requirements of the acknowledgement letter 02 October 2019 must also be fulfilled.	The requirements included in the acknowledgement letter dated 02 October 2019 have been fulfilled.	Appendix G and Appendix H

No.	Comment from DFFE	EAP Response	Section in Report
vii.	The Department requires that you clearly indicate which conditions in the EA are applicable to the above project, i.e. 14/12/16/3/3/2/1028/2/AM1. Ensure that the Environmental Management Programme (EMPr) has mitigations and measures applicable only to the abovementioned project as well.	The EAP has indicated which condition in the original EA are applicable to this project. The EMPr contained the mitigation measures applicable to this project.	Section 2.1
viii.	Further, clearly, indicate whether conditions for the grid infrastructure are to be removed in entirety or retained to some extent. It would be best to list which conditions of the EA are relevant to amendment process.	Table 2.3 lists the conditions of authorisation that are relevant to the amendment process. All conditions in the EA related to grid infrastructure are to be retained. The application for additional grid infrastructure is separate and will require an additional set of conditions.	Section 2.1
ix.	You are requested to submit one (1) unprotected electronic copy (1 CD/USS) and one (1) hard copy of the final Amendment Report to the Department. Please ensure that this copy contains an electronic version of the amendment application form.	One USB and one hard copy of the final report is submitted. The amendment application form has been included as well as requested.	
You are also advised to comply with the requirements of the Regulations 32 of the EIA Regulations 2014, as amended.		The EAP has complied with the requirements of the Regulations 32 of the EIA Regulations 2014, as amended.	
Further note that in terms of Regulation 45 of the EIA Regulations 2014, this application will lapse if the applicant fails to meet any of the timeframes prescribed in terms of these Regulations unless an extension has been granted in terms of Regulation 3(7).		This is acknowledged, and the EAP will ensure that the final report is submitted within the regulated timeframes.	
You are hereby reminded of Section 24F of the National Environmental Management Act, Act No 107 of 1998, as amended, that no activity may commence prior to an environmental authorisation being granted by the Department.		The applicant has been made aware of the Section 24F of NEMA, 1998, as amended.	

4 PROJECT TEAM

The coordination and management of this amendment application process is being conducted by Arcus Consultancy Services South Africa (Pty) Ltd ('Arcus') with the lead EAP being Ashlin Bodasing. Refer to Appendix A for the EAP's Declaration of Interest and Curriculum Vitae.

Ashlin Bodasing

Qualifications	Bachelor of Social Science (Geography and Environmental Management). Registered EAP.

Experience in Years	16
Experience	Ashlin Bodasing is the Technical Director at Arcus, located in Cape Town. Having obtained her Bachelor of Social Science Degree from the University of Kwa-Zulu Natal; she has over 14 years' experience in the environmental consulting industry in southern Africa. She has gained extensive experience in the field of Integrated Environmental Management, environmental impact assessments and public participation. She has also been actively involved in a number of industrial and infrastructural projects, including electricity power lines and substations; road and water infrastructure upgrades and the installation of telecommunication equipment, green field coal mines, as well as renewable energy facilities, both wind and solar. Ashlin has major project experience in the development of Environmental Impact Assessments, Environmental Management Plans and the monitoring of construction activities. Her areas of expertise include project management, environmental scoping and impact assessments, environmental management plans, environmental compliance monitoring and environmental feasibility studies. Experience also includes International Finance Corporation Performance Standards and World Bank Environmental Guidelines environmental reviews. She has worked in Mozambique, Botswana, Lesotho and Zimbabwe.

Aneesah Alwie

Qualifications	Bachelor of Science (Environmental and Water Science)
Experience in Years	8
Experience	Aneesah Alwie is an Environmental Consultant at Arcus. Having obtained her Bachelor of Science Degree (Environment and Water Science) from the University of the Western Cape; she has over 10 years public relations experience in conjunction with 6 years' experience as support to a technical team and 2 years' experience as a professional. She has also attended certified training courses in Environmental Law and Compliance. Aneesah assists in report writing and public participation processes and manages the EIA processes for projects across South Africa. She has a proven track record in producing work of quality standards, within timeframes and budgets. Her excellent organisational and project management skills development enables smooth flow of the assigned project duties and client relations. Starting off as administrator at Arcus she still provides on-going administrative and technical support to colleagues to ensure that their projects are completed in time and within budget.

Arcus is a specialist environmental consultancy providing environmental services to the renewable energy market. Arcus has advised on over 150 renewable energy projects with in-house specialist services and environmental management, in South Africa and the United Kingdom.

4.1 Specialist Input

The team of specialists to support the project team are the same as the original specialists (see Table 4.1 below). The only new specialist is the bat specialist[5]. Each specialist reviewed the amendments to the authorised development and provided an opinion and assessment of the changes. Where necessary, additional site work was conducted in order to assess the potential impacts of the proposed amendments.

Table 4.1: Specialist Team

Technical Discipline	Specialist Organisation	Lead Specialist
Aquatic / Freshwater	Enviro Sci	Brian Colloty[6]
Bats	Arcus	Jonathan Aronson

[5] The original specialist, Animalia (Werner Marais) no longer conducts bat assessments and therefore a new specialist was appointed.

[6] Brian Colloty was the original specialist, but this was under another company, he no longer works for that company.

Bats External Review	Private Consultant	Monika Moir
Avifauna	Chris van Rooyen Consulting	Chris van Rooyen
Ecology (Fauna and Flora)	3foxes	Simon Todd
Cultural Heritage	ACO Associates cc	Tim Hart
Noise	Enviro Acoustic Research cc	Morné de Jager
Social	Tony Barbour	Tony Barbour
Agriculture and Soils	Agricultural Research Council – Soil, Climate and Water	Garry Paterson
Traffic	SMEC South Africa (Pty) Ltd	Charlotte Xhobiso
Visual Impact	SiVest	Andrea Gibb
Wake Effect	3E	David Schillebeeckx

5 MOTIVATION FOR THE PROPOSED AMENDMENT

The authorised turbine model with specifications of 150 m hub height and 150 m rotor diameter is no longer the preferred wind turbine technology. The applicant, therefore, wants to amend the authorised turbine specifications to reduce the number of turbines and to change the hub height to up to 137 m and the rotor diameter to up to 175 m to facilitate the most efficient turbine model and to further future proof the project amidst rapid technology developments.

From the authorised application, Hartebeesthoek Wind Power (Pty) Ltd intended to bid and develop the Hartebeesthoek West WEF under the Department of Energy's REIPPPP. For Hartebeesthoek to meet the bidding requirements, the applicant proposed to split the authorised Phezukomoya WEF into two smaller wind farms (namely Phezukomoya Split 1 WEF and Hartebeesthoek West WEF).

The split of the authorised Phezukomoya WEF will see fewer turbines being erected and the maximum authorised capacity (275 MW) will not be exceeded. The MW per WTG of the authorised Phezukomoya WEF would be increased, and fewer turbines will be built (fewer turbines with increased MW would be less than or equal to the overall authorised 275 MW).

The authorised layout has been updated due to the project split and reduction in the number of proposed wind turbines, from 55 to 12 turbines, for the Hartebeesthoek West WEF (Figure 5.1).

The findings and assessment of the authorised Phezukomoya WEF (Arcus, 2018) indicated that renewable energy is strongly supported at a national, provincial and local level. Therefore, the need and desirability of the authorised Phezukomoya WEF (Arcus, 2018) remain valid.

The development of and investment in renewable energy is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all make reference to renewable energy. At a provincial level, the development of renewable energy is supported by the Northern Cape Provincial Growth and Development Strategy and Northern Cape Provincial Spatial Development Framework, as well as the Eastern Cape Provincial Development Plan (2014) and the Eastern Cape Climate Change Response Strategy.

The establishment of the proposed WEF and the other renewable energy facilities in the Umsobomvu Local Municipality (ULM) and Inxuba Yethemba Local Municipality (IYLM) may place pressure on local services, specifically medical, education and accommodation. This pressure will be associated with the potential influx of workers to the area associated with

the construction and operational phases of renewable energy projects proposed in the area, including the proposed WEF. The potential impact on local services can be mitigated by employing local community members.

In addition, as indicated below, this impact should also be viewed within the context of the potential positive cumulative impacts for the local economy associated with the establishment of renewable energy as an economic driver in the area.

The establishment of the proposed WEF and other renewable energy projects in the area also has the potential to create a number of socio-economic opportunities for the ULM and IYLM, which, in turn, will result in a positive social benefit. Figure 5.2 shows the WEF site and a 35 km radius and reflect any renewable energy projects within this radius. The positive cumulative impacts include the creation of employment, skills development and training opportunities, creation of downstream business opportunities. The Community Trusts associated with each project will also create significant socio-economic benefits.

6 SPECIALIST ASSESSMENT OF THE PROPOSED AMENDMENTS

The previous EIA conducted by Arcus in 2018 assessed the potential impacts of developing the original Phezukomoya WEF using specialist input. The same methodology was utilised during this EA Amendment process.

Specialists were commissioned to:

- Assess the changes proposed in relation to the amendment application,
- Determine the impacts as a result of the proposed amendment,
- Assess whether or not the mitigation measures proposed in the EIA are valid for the proposed amendment or not,
- Discuss the advantages and the disadvantages in respect of the amendments for the specialist environmental feature, and
- Provide a reasoned opinion as to whether or not the proposed amendment should be authorised.

The Phezukomoya WEF Final EIA Report (Arcus, March 2018) concluded that there are no negative high residual impacts, including potential cumulative impacts associated with the proposed development.

During the current, EA Amendment application process specialists were requested to identify changes, if any, to the impact significance ratings, recommendations and mitigation measures contained in the previous EIA. Extracts and summaries from specialist letters and reports provided during this EA Amendment application process are provided below. Specialist EA Amendment letters and reports are provided in Volume II.

6.1 Agricultural Potential and Soils

The original soil specialist study was completed in 2016, and for that study, a single larger study area was assessed.

The proposed amendments to the turbine specifications, layout, and the proposed HBH West study area falls within the area originally assessed area. Therefore, the findings of the original report on soils and agricultural potential will remain **unchanged**, specifically:

- The impacts that were identified and the significance ratings assessed as Medium to Low; and
- The impact management and/or mitigation measures.

The likelihood of cumulative impacts is small. Only if other developments (whether wind farms or not) were to occur, using the same access roads and thereby increasing potential soil erosion aspects, would cumulative impacts need to be considered.

Table 6.1: Agricultural Potential and Soils Impact Assessment (Unchanged from the Original Assessment)

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Construction Phase							
Loss of Agricultural land	Low	Low	Low	Negative	**Low**	High	High
With Mitigation	Low	Low	Low	Neutral	**Low**	High	High
Increased soil erosion hazard	Low	Medium	Medium	Negative	**Medium**	High	High
With Mitigation	Low	Low	Low	Neutral	**Low**	High	High
Operation Phase							
Loss of Agricultural land	Low	Low	Low	Negative	**Low**	High	High
With Mitigation	Low	Low	Low	Neutral	**Low**	High	High
Increased soil erosion hazard	Low	Medium	Medium	Negative	**Medium**	High	High
With Mitigation	Low	Low	Low	Neutral	**Low**	High	High

No further recommendations were provided regarding soil impacts for the proposed development.

6.2 Aquatic

When considering the authorised development and the proposed amendment, the amendment will make use of an existing track/road network and will not require any new watercourse crossings. The original aquatic impact assessment for the Phezukomoya project was submitted in 2016 and will remain **unchanged**, although the amendment review was conducted with the following requirement updates, post-2016.

- Macfarlane *et al.*, (2017) Wetland and Rivers Buffers model was utilised in this assessment/review of the proposed amendments. Using this new buffer model, a buffer of 18m was determined for all the watercourses, but the 32 m indicated in the 2016 report was retained; and
- Cumulative impact assessment.

With these in mind, the findings of the aquatic assessment can be upheld, especially considering that the modelled buffers are less than those originally prescribed. The final impact of the proposed layout on the aquatic environment with suitable stormwater management and improvement of current water courses crossings will remain low for all impacts assessed.

Table 6.2: Aquatic Impact Assessment (Unchanged from the Original Assessment)

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Construction Phase							
Loss of riparian systems and watercourses during the construction phase of the WEF	Low	Medium	Low	Negative	**Medium**	High	High
With Mitigation	Low	Low	Low	Negative	**Low**	Low	High
Increase in sedimentation and	Low	Medium	Low	Negative	**Medium**	High	High

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
erosion within the development footprint during the construction phase and to a lesser degree the operational phase							
With Mitigation	Low	Low	Low	Negative	**Low**	Low	High
Impact on localised surface water quality	Low	Medium	Low	Negative	**Medium**	High	High
With Mitigation	Low	Low	Low	Negative	**Low**	Low	High
Operation Phase							
Impact on riparian systems through the possible increase in surface water runoff from hard surfaces and or new road crossings on riparian form and function	Low	Low	Low	Negative	**Medium**	High	High
With Mitigation	Low	Low	Low	Negative	**Low**	Low	High
Increase in sedimentation and erosion within the development footprint during the construction phase and to a lesser degree the operational phase	Low	Medium	Low	Negative	**Medium**	High	High
With Mitigation	Low	Low	Low	Negative	**Low**	Low	High
Cumulative Phase							
Overall cumulative impact during the construction and operational phases	Low	Medium	Low	Negative	**Medium**	High	High
With Mitigation	Low	Low	Low	Negative	**Low**	Low	High

In the updated assessment of potential cumulative impacts, no additional impacts or changes to the previously assessed impacts would be required due to the proposed amendment. This is also based on the consideration that the number of roads has been consolidated in this application while keeping the new watercourse crossings away from wide/main stem watercourses, and well away from any known wetlands within the region (closest 3 km away). Lastly, no changes to the original Mitigations or EMPr considerations are required.

6.3 Ecology

In terms of a comparative assessment of the approved layout and the current amended layout, there are no differences in impact associated with the proposed change. The original extent of new access roads is estimated at 61.8 km, and the combined length of the access roads required on the new amended layout, of Phezukomoya Split 1 and Hartebeesthoek West WEF, is 55.6 km. The total extent of the roads required for the combined layouts are estimated to decrease by about 10%. Furthermore, the larger turbines are expected to

require somewhat larger hardstands and laydown areas, with the result that the footprint of each turbine could potentially increase. However, the total number of turbines would decrease from 55 to 12, with the result that this is likely to offset any increase in the required footprint and the total extent of habitat loss. Therefore, impacts resulting from the turbines would remain similar. The assessed impacts are considered robust and conservatively assessed, and while the footprint of the development may decrease slightly, this is not substantive and would not change any of the assessed impacts to a higher or lower significance from that assessed. As such, there are no changes in the assessed impacts associated with the split of the Phezukomoya project into the two projects as proposed.

In terms of impact on CBAs, the original layout had a total of 12 turbines within CBA 2 areas and 19 turbines within CBA 1 areas. This compares to 11 turbines in CBA 2 areas 14 turbines in CBA 1 areas in the amendment. As such, there is a moderate decrease in the number of turbines within the CBAs, which can be seen as favourable in terms of expected impacts on CBAs. However, this decrease is not considered sufficient to decrease the assessed impact of the development from moderate to low significance. As such, there is no overall change in the assessed impact of the development on CBAs. In addition, there were no turbines within the Northern Cape Protected Area Expansion Strategy Focus Areas in the original assessment, and the amendment similarly avoids these areas.

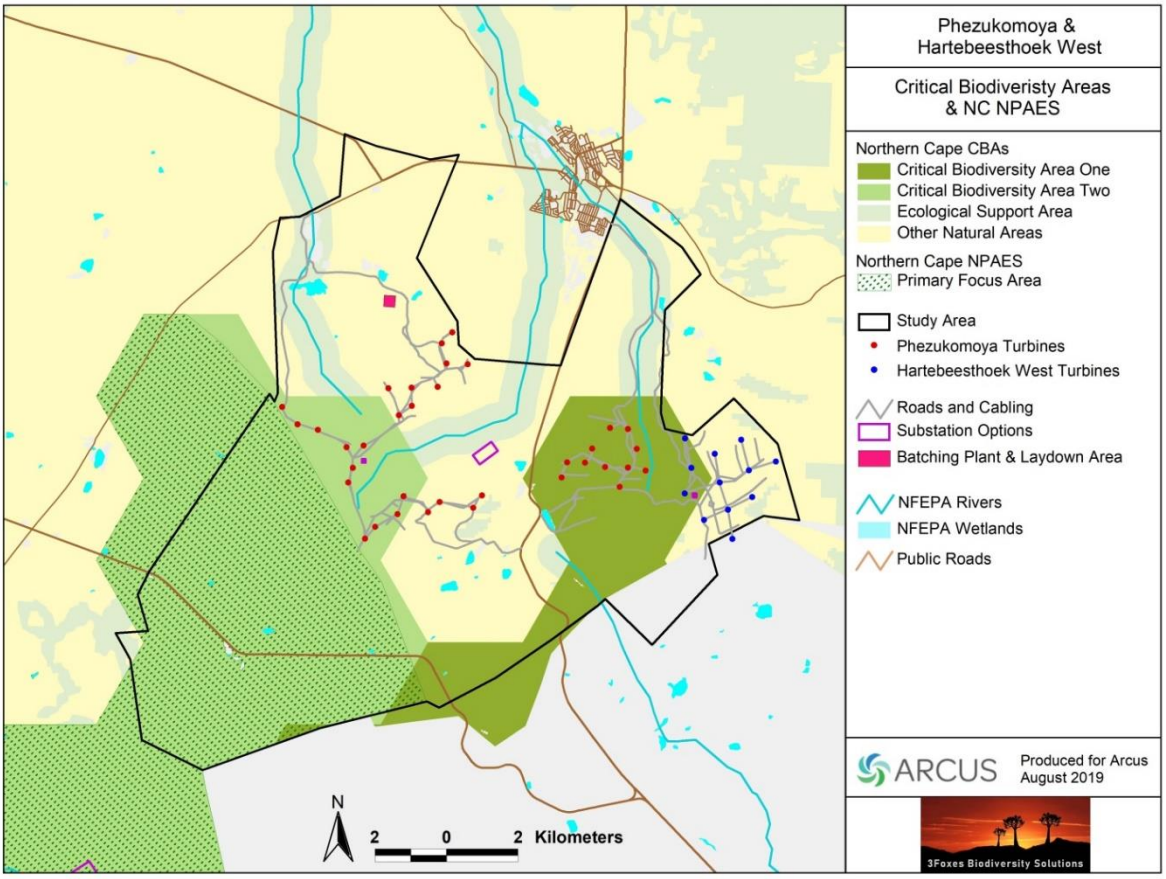

Figure 6.1 Phezukomoya Split 1 and Hartebeesthoek West Ecological Sensitivity

The assessed impacts following the split of Phezukomoya WEF are similar, and there are no significant differences in impact between the authorised 55 turbine facility and the proposed amendment. The assessment for the Phezukomoya Wind Energy Facility, before and after mitigation, and the amended turbine layout **remains the same** before and after mitigation (Table 6.3).

Table 6.3: Ecological Impact Assessment (Unchanged from the Original Assessment)

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Construction Phase							
Impacts on vegetation and listed or protected plant species resulting from construction activities	Low	High	High	Negative	**High**	High	High
With Mitigation	Low	Medium	Medium	Negative	**Medium**	High	High
Faunal impacts due to construction-phase noise and physical disturbance	Low	Medium	High	Negative	**Medium**	High	High
With Mitigation	Low	Medium	Low	Negative	**Medium**	High	Medium
Operation Phase							
Faunal impacts due to operational activities	Low	Medium	Medium	Negative	**Medium**	High	High
With Mitigation	Low	Medium	Low	Negative	**Low**	Medium	Medium
Soil Erosion Risk	Low	High	High	Negative	**High**	High	High
With Mitigation	Low	Low	Low	Negative	**Low**	Low	High
Alien Plant Invasion	Low	High	Medium	Negative	**Medium**	High	High
With Mitigation	Low	Low	Low	Negative	**Low**	Low	High
Impact on Critical Biodiversity Areas and Broad-Scale Ecological Processes	Medium	High	Medium	Negative	**High**	High	High
With Mitigation	Low	High	Medium	Negative	**Medium**	Medium	High
Decommission Phase							
Faunal impacts due to decommissioning phase activities	Medium	Low	High	Negative	**Medium**	High	High
With Mitigation	Low	Low	Medium	Negative	**Low**	Medium	High
Following decommissioning, the site will be highly vulnerable to soil erosion	Medium	High	Medium	Negative	**Medium**	High	High
With Mitigation	Low	Low	Low	Negative	**Low**	Low	High
Alien Plant Invasion following decommissioning	Low	High	Medium	Negative	**Medium**	High	High
With Mitigation	Low	Low	Low	Negative	**Low**	Low	High
Faunal impacts due to decommissioning phase activities	Medium	Low	High	Negative	**Medium**	High	High
With Mitigation	Low	Low	Medium	Negative	**Low**	Medium	High

From an ecological perspective, the changes associated with the amendment are not seen as increasing the impact associated with the development. In addition, cumulative impacts associated with the amendment would be similar to the assessed impacts and are considered acceptable.

The original conclusions regarding the positive acceptability of the development are therefore also upheld for the amendment, and no additional mitigation or avoidance measures are required for the amended layout.

6.4 Bats

The newly appointed bat specialist for the amendment assessment conducted a literature review on bats and wind energy impacts with a focus on the relationship between turbine size and bat fatality. In addition, the pre-construction bat monitoring report for the original Phezukomoya WEF was reviewed, along with the current bat sensitivity buffers. The original monitoring was conducted between July 2015 and September 2016.

During the pre-construction bat monitoring at the Phezukomoya WEF, bat activity was recorded at 10 m and 80 m. Relatively high bat activity was recorded overall, but the majority of this was at 10 m. These results suggest that on average, bat activity is greater at lower heights but that there are important differences across species – those species adapted to using open-air spaces are at greater risk. The core issue relevant to this assessment is the impact to bats of increasing the size of the turbines at the Hartebeesthoek West WEF. The proposed amendment to the turbines at the wind farm would result in a greater rotor swept area per turbine and hence a potentially greater likelihood that bats would collide with turbine blades or experience barotrauma.

Of the impacts identified in the original bat assessment report, only mortality of species due to collision with turbine blades or due to barotrauma, and cumulative impacts are relevant to this amendment. The significance of all other identified impacts on bats associated with the development will remain the same as per the original bat assessment report. The potential collision impact to bats, as well as the potential cumulative impacts, are currently rated as high before, and medium after mitigation. The primary mitigation measures are avoiding sensitive areas for bats and curtailment. However, even though changes to the turbine dimensions are proposed, which may impact bats, the impact ratings **will not change** from high before mitigation and medium after mitigation. The only change required is to update the sensitivity map, which has been done. Sensitive areas were defined as either high (with a 200 m buffer) or moderate (with a 100 m buffer). The current turbine layout adheres to these buffers, with no turbines located within them.

No bat activity data are available in the area between the heights of 10 m and 80 m or over 80 m, because activity at these heights was not monitored. Despite the available pre-construction monitoring data showing that bat activity at 80 m is low, it would be preferential to maximise the distance between the ground and blade tips by using turbines with the shortest possible blades and the highest possible hub height. This would reduce the number of species potentially impacted upon by turbine blades during the operation phase. It would also be preferential to use shorter blades so that they don't intrude into higher airspaces and in doing so reduces the potential impact to high flying species such as free-tailed bats. Despite the low activity at height, increasing evidence suggests that bats actively forage around wind turbines (Cryan *et al.* 2014; Foo *et al.* 2017), so the installation of turbines in the landscape may alter bat activity patterns, either by increasing activity at height and/or increasing the diversity of species making use of higher airspaces.

No additional mitigation measures are required, and as such, no changes to the EMPr are required either.

Table 6.4: Bat Impact Assessment (Unchanged from the Original Assessment)

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Construction Phase							
Destruction of bat roosts due to earthworks and blasting	Medium	Low	High	Negative	**Medium**	Medium	High
With Mitigation	Low	Low	Medium	Negative	**Low**	Low	High
Loss of foraging habitat	Low	High	Low	Negative	**Medium**	Medium	High
With Mitigation	Low	Medium	Low	Negative	**Low**	Low	High
Operation Phase							
Bat mortalities due to direct blade impact or barotrauma during foraging activities (not migration)	Low	High	High	Negative	**High**	High	High
With Mitigation	Low	High	Low	Negative	**Medium**	Medium	High
Artificial Lighting	Low	High	Medium	Negative	**Medium**	High	High
With Mitigation	Low	High	Low	Negative	**Low**	Low	High

6.5 Avifauna

A re-assessment of the potential turbine collision impact was carried out given the potential changes to the turbine specifications, in light of the proposed amendment and in order to establish if the original pre-mitigation assessment and the original mitigation measures, by Van Rooyen *et al*. (2017), need to be revised.

While the increase of 36.11 % in rotor swept area per turbine (from ~17 671 m² to ~24 052 m²) was considered significant, it was also recognised that the 14 % reduction in the planned maximum number of turbines (from 55 to 47) for the combined area reduces the potential impact of the larger turbines significantly, given the fact that fewer, larger turbines are preferable to more, smaller turbines. It is therefore concluded that the original pre-mitigation impact significance ratings are not affected by the proposed changes in the turbine numbers and dimensions and will remain **unchanged**.

The mitigation measures originally proposed for the Phezukomoya WEF by Van Rooyen *et al*. (2017) needed to be revisited, based on the "Best Practice Guidelines for Avian Monitoring and Impact Mitigation at Proposed Wind Energy Development Sites in Southern Africa", (Jenkins *et al*. 2011 as revised in 2015). This re-assessment was necessary in order to take cognisance of any changes in the environment, which may affect the risk to avifauna and to incorporate the latest available knowledge into the assessment of the risks. In order to give effect to this requirement, nest searches were repeated in June 2019 to ensure up to date information on the breeding status of priority species at the proposed Hartebeesthoek West WEF. No new nests were found which could be directly impacted upon by the proposed Hartebeesthoek West WEF.

It is therefore concluded that the original pre-mitigation impact significance ratings are not affected by the proposed changes in the turbine numbers and dimensions and no new mitigation measures are required in addition to the mitigation originally proposed by Van Rooyen *et al.* 2017.

Table 6.5: Avifaunal Impact Assessment (Unchanged from the Original Assessment)

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Construction Phase							
Displacement of priority species due to construction activities at the wind development area	Low	Low	Medium	Negative	**Medium**	High	Medium
With Mitigation	Low	Low	Low	Negative	**Medium**	Medium	Medium
Operation Phase							
Direct mortality of priority species due to electrocution associated with the internal medium voltage MV powerline at the wind development area	Low	Medium	Medium	Negative	**Medium**	High	High
With Mitigation	Low	Medium	Medium	Negative	**Low**	Low	High
Displacement of priority species due to habitat destruction at the wind development site	Low	High	Low	Negative	**Medium**	Medium	Medium
With Mitigation	Low	High	Low	Negative	**Low**	Low	Medium
Direct mortality of priority species due to collisions with the turbines at the wind development area	Low	Medium	Medium	Negative	**Medium**	High	Medium
With Mitigation	Low	Medium	Low	Negative	**Low**	Low	Low
Decommission Phase							
Displacement of priority species due to dismantling activities at the wind development area	Low	Low	Medium	Negative	**Medium**	High	Medium
With Mitigation	Low	Low	Low	Negative	**Medium**	Medium	Medium
Cumulative Phase							
Overall Impacts	Medium	Medium	Medium	Negative	**Medium**	High	High
With Mitigation	Medium	Medium	Low	Negative	**Low**	Low	Medium

6.6 Noise

The environmental noise impact assessment (ENIA) indicated that the noise impact would remain of medium significance on two potential noise-sensitive development (NSD) in the area during the construction phase, mainly due construction of access roads as well as construction traffic, and of low significance on all the potential noise-sensitive developments (NSDs) in the area during the operational phase, using the Acciona AW125/3000 wind turbine for all operational wind speeds (generating 108.4 dBA) – maximum noise level less than 40.9 dBA at NSD03.

The applicant is proposing the split of the Phezukomoya WEF into two smaller wind farms, namely the Phezukomoya Split 1 and Hartebeesthoek West wind farms (separate amendment application process). The ENIA for the split specifically addressed the following proposed changes in the wind turbine details, including:

- A hub height of 137 m with a rotor diameter of 175 m; and
- Increasing the turbine output to 6.2 MW per turbine.

The change, however, does not move any wind turbines closer than 1,000 m to any identified NSDs and will reduce the number of wind turbines. Considering the proposed changes to the layout, wind turbine specifications and the turbine output, it is the specialists' opinion that the change will not increase or change the significance of the noise impact.

A full noise impact assessment with new modelling was not required, and the recommendations as contained in the previous document are valid. This recommendation is based on the outcome of the report, which indicated that the extent of the potential impact is limited to 1,000 m from the closest wind turbines.

The impacts, significance, findings and the recommendations of the ENIA report, 2017 will **remain the same**, i.e. medium significance during the construction phase, with mitigation measures to minimise impact and low during the operation phase. While this project will have a very slight noise impact at a number of the closest noise-sensitive receptors, these impacts are of low significance (including access roads as well as construction traffic) and can be considered insignificant. Similarly, there is no risk of a cumulative noise impact. Furthermore, it was not required to do any additional, or other acoustic studies for the proposed changes and no mitigation measures are recommended for inclusion in the EMPr and conditions to be included in the EA remains as per the 2017 report.

Table 6.6: Noise Impact Assessment (Unchanged from the Original Assessment)

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Construction Phase							
Daytime construction of the Access Roads	Low	Low	High	Negative	**Low**	Low	High
With Mitigation	Low	Low	Low	Negative	**Low**	Low	High
Night-time construction of the Access Roads	Low	Low	High	Negative	**Medium**	High	High
With Mitigation	Low	Low	Low	Negative	**Low**	Low	High
Noise from daytime construction traffic	Low	Low	High	Negative	**Medium**	Medium	High
With Mitigation	Low	Low	Low	Negative	**Low**	Low	High
Noise from night-time construction traffic	Low	Low	High	Negative	**Medium**	High	High
With Mitigation	Low	Low	Low	Negative	**Low**	Low	High
Daytime construction of Wind Turbines	Low	Low	Low	Negative	**Low**	Low	High
With Mitigation	Low	Low	Low	Negative	**Low**	Low	High
Night-time construction of Wind Turbines	Low	Low	Low	Negative	**Low**	Low	High
With Mitigation	Low	Low	Low	Negative	**Low**	Low	High

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Operation Phase							
Daytime operation of Wind Turbines	Low	Medium	Low	Negative	**Low**	Low	High
With Mitigation	Low	Medium	Low	Negative	**Low**	Low	High
Night-time operation of Wind Turbines	Medium	Medium	Low	Negative	**Low**	Low	High
With Mitigation	Medium	Medium	Low	Negative	**Low**	Low	High
Cumulative Phase							
Daytime operation of Wind Turbines	Low	Medium	Low	Negative	**Low**	Low	High
With Mitigation	Low	Medium	Low	Negative	**Low**	Low	High
Night-time operation of Wind Turbines	Medium	Medium	Low	Negative	**Low**	Low	High
With Mitigation	Medium	Medium	Low	Negative	**Low**	Low	High

6.7 Heritage

A site visit was conducted by ACO from the 8 - 11 April 2019 to assess the new layout and cable/road alignment for heritage impacts. While it was not possible to survey all project components within the study area, the combined overall coverage of the 2017 and 2019 surveys was good, and the majority of proposed wind turbine generators (WTG) positions and a good portion of infrastructure alignments for the Hartebeesthoek West WEF have been archaeologically surveyed. The confidence in the findings is thus high.

The proposed amendments of the Hartebeesthoek West WEF relevant to archaeological resources are a reduction in the number of WTG from the authorised 55 to 12 for this proposed development; and the adjustment of the turbine, network cable and road layout within the WEF.

The 2017 survey of the Phezukomoya WEF indicated that there were very few archaeological sites on the Kikvorsberge. This tends to confirm what has proved to be the case across the Karoo: that high ridges, which are dry, windswept and very cold in winter, seldom attracted more than passing prehistoric human occupation. Unless there is a rock shelter, a source of water or of stone raw material, these areas are not likely to be archaeologically sensitive.

The 2017 archaeological field survey identified five archaeological occurrences and sites within the proposed 2019 footprint of the Hartebeesthoek West WEF. The majority of these are ephemeral surface scatters of stone artefacts, made largely on hornfels and dating from the MSA. No ceramic period sites, rock engravings or San rock paintings were identified, but a number of historical period structures (a kraal, packed stone walls and a wolwehok) were recorded. No sites identified in 2017 and now within the Hartebeesthoek West WEF were identified by the Phezukomoya HIA as likely to be impacted by the construction of that WEF and no mitigation was proposed for any of the sites identified.

After consultation with the South African Heritage Resources Agency (SAHRA) case officer, the intention of the 2019 field survey for the Hartebeesthoek West WEF was to concentrate on visiting new WTG locations that were more than 150 m from any position covered by the 2017 survey. Table 6.7 shows that only a single site is likely to be impacted by the current WEF layout.

An assessment of the impact of the proposed amendments to palaeontological resources was not conducted as part of the EA Amendment applications as the existing study, done by Dr. John Almond, October 2017, for the authorised San Kraal WEF is still considered to be valid. Dr. John Almond ('Almond') has taken impact assessments in the area for the Noupoort Wind Farm to the East and bordering directly on the San Kraal parcel. The specialist also undertook the San Kraal and Phezukomoya assessment, all of which involved broad field work components prospecting any likely areas outside and within the land parcels involved. This is undertaken to find locales where the underlying palaeontology may be exposed and visible which is not always the case in the actual project areas themselves. Almonds conclusions were therefore based on a solid desktop knowledge of the local geology and palaeontology, reinforced by field observation. The palaeontological finds on the three large land parcels that was surveyed are minimal due to the depleted nature of the mountain-top Katberg deposits, and all the finds made have been on the sides of slopes and gullies where mud strata are exposed. It is based on the general geology of the area that Almonds recommendations and conclusions are derived. The geology throughout the original and amended project areas are similar – the same formations are involved. The land parcels have been well-covered and considered in the original project areas and therefore the original conclusions and recommendations for the authorised San Kraal WEF should continue to stand and be adhered to for the amendment process.

Table 6.7: Comparison of graded sites potentially impacted by 2017 and 2019 WEF layouts

Archaeological Site/ Occurrence	Proximity to WEF feature		Potential Impact		Grading
	2017	2019	2017	2019	
JG005 - Cluster of packed stone	Within network cable and WTG46	Approx. 115 m south-west of WTG101	No	No	IIIC
JG006 – Rock cairn	In proximity to WTG46	Approx. 86 m south-west of WTG101.	No	No	IIIC
JG007 – Scatter of MSA lithics in pan	In proximity to WTG48	Approx. 71 m west of cable/ road between WTG101 and WTG201	No	No	IIIC
JG008 – Stone kraal	Within San Kraal 132kV OHL option 2.	Approx. 800 m from cable alignment to WTG203. Will not be affected by WEF.	No	No	IIIC
GEB009 – Stone boundary marker	N/A	Approx. 4 m from cable/ road alignment to WTG304 and 38 m from WTG304	No	Yes	IIIC

It is not expected that the Hartebeesthoek West WEF will have significant impacts on archaeological sites and materials. There is likely to be an impact only one, low significance historical structure (GEB009), and the likelihood of other sites or material being found during earthworks is extremely low. It is also assumed that impacts on sites within 20 m of a cable/ road alignment or WTG location are unavoidable.

Table 6.8: Heritage Impact Assessment (Unchanged from the Original Assessment)

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Construction Phase							

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Impacts to Archaeological Heritage	Low	High	Low	Negative – Neutral	**Low**	Low	High
With Mitigation	Low	High	Low	Negative – Neutral	**Low**	Low	High
Impacts to Colonial Period Heritage	Low	Low	Low	Negative – Neutral	**Low**	Low	High
With Mitigation	Low	Low	Low	Negative – Neutral	**Low**	Low	High
Impacts to cultural landscape and setting	Low	Medium	Medium	Negative	**Medium**	Medium	High
With Mitigation	Low	Medium	Medium	Negative	**Medium**	Medium	High
Palaeontological Heritage Impact							
Impacts to Palaeontology	Low	High	Medium	Negative	**Medium**	Medium	High
With Mitigation	Low	High	Low	Neutral - Pos	**Low**	Low	High
Operation Phase							
Impacts to cultural landscape and setting	Low	Medium	Medium	Negative	**Medium**	Medium	High
With Mitigation	Low	Medium	Medium	Negative	**Medium**	Medium	High

Possible impacts of the proposed WEF on archaeological heritage resources were determined to be of tolerable and generally of low significance and does not change from the original assessment. Based on the comparative assessment of impacts, the cumulative impact assessment made in the 2017 HIA (Hart *et al.*, 2017a) remains valid for the revised Hartebeesthoek West WEF: cumulative impacts will be of low consequence for WEFs and tolerable for solar PV facilities with their more intensive impacts on the land within their footprints.

Provided that the mitigation measures recommended in the amendment report are implemented, the overall impact of the construction of the Hartebeesthoek West WEF is tolerable and generally of low significance and, from a heritage perspective, the proposed amendments are considered acceptable.

6.8 Visual

Baseline information for this amendment report is largely drawn from the original VIA which was based on a desktop-level assessment supported by field-based observation.

Given that the proposed Hartebeesthoek West WEF is located within the project area already assessed for the original Phezukomoya WEF, it was not considered necessary to undertake any additional fieldwork. Fieldwork undertaken for the Phezukomoya WEF VIA has therefore been used to inform this new VIA. This fieldwork involved a four (4) day site visit in September 2017 which served to verify the landscape characteristics identified via desktop means; conduct a photographic survey of the study area; verify, where possible, the sensitivity of visual receptor locations identified via desktop means; eliminate receptor locations that are unlikely to be influenced by the proposed development; identify any additional visually sensitive receptor locations within the study area; and inform the impact rating assessment of visually sensitive receptor locations.

During the site visit, it was observed that a few of the farmsteads / residential dwellings identified via desktop means (i.e. Google Earth) had been abandoned. As such, these were

eliminated from the list of potentially sensitive receptor locations for the purpose of the original EIA phase study. Although several turbines, within the areas of 'medium-high sensitivity', the development is still regarded as acceptable from a visual perspective.

Table 6.9: Visual Impact Assessment of the Original Assessment

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Construction Phase							
Impact on access roads	Medium	Low	Medium	Negative	**Medium**	Medium	Medium
With Mitigation	Medium	Low	Medium	Negative	**Medium**	Medium	Medium
Impact on cabling	Medium	Low	Medium	Negative	**Medium**	Medium	Medium
With Mitigation	Medium	Low	Medium	Negative	**Medium**	Medium	Medium
Operation Phase							
Impact on access roads	Medium	Medium	High	Negative	**Medium**	High	Medium
With Mitigation	Medium	Medium	Medium	Negative	**Medium**	High	Medium
Impact on cabling	Medium	Medium	Medium	Negative	**Medium**	High	Medium
With Mitigation	Medium	Medium	Medium	Negative	**Medium**	High	Medium
Cumulative Phase							
Construction Phase	Medium	Medium	High	Negative	**Medium**	High	Medium
With Mitigation	Medium	Medium	Medium	Negative	**Medium**	Medium	Medium
Operation Phase	Medium	Medium	Medium	Negative	**Medium**	High	Medium
With Mitigation	Medium	Medium	Medium	Negative	**Medium**	High	Medium

Table 6.10: Updated Visual Impact Assessment based on the Amendments

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Construction Phase							
Impact on access roads	Medium	Low	Medium	Negative	**Medium**	Medium	Medium
With Mitigation	Medium	Low	Low	Negative	**Low**	Medium	Medium
Impact on cabling	Medium	Low	Medium	Negative	**Medium**	Medium	Medium
With Mitigation	Medium	Low	Low	Negative	**Low**	Medium	Medium
Operation Phase							
Impact on cabling	Low	Medium	Low	Negative	**Low**	Low	Medium
With Mitigation	Low	Medium	Low	Negative	**Low**	Low	Medium

The assessment revealed that impacts associated with the proposed Hartebeesthoek West WEF would be of moderate significance during both construction and decommissioning phases. This could, however, be reduced to low with the implementation of mitigation measures. During operation, visual impacts from the WEF would be of moderate significance with relatively few mitigation measures available to reduce the visual impact. Visual impacts associated with the WEF on-site infrastructure during operation would be of low significance, and cumulative impacts have been rated as medium.

Visual impacts associated with the proposed Hartebeesthoek West WEF is of moderate significance. Proposed changes to the authorised WEF development do not give rise to additional visual impacts or exacerbate the impacts previously identified in respect of the original Phezukomoya WEF.

6.9 Social

From a social perspective, the only material change to the previous project design is the reduction in the number of wind turbines from 55 to 12 and the changes in the technical specifications of the wind turbines. The relocation of some wind turbines to ensure that they fall outside of the constraints areas **will not impact** on the findings of the SIA undertaken in 2017-2018.

The wind turbines are located on properties owned by three landowners, namely:

- Umsobomvu Local Municipality - 10 wind turbines;
- Mr Pieter Erasmus - 1 wind turbine; and
- Mr Jean Gilmer - 1 wind turbine.

The findings of the 2018 SIA indicated that the development of the proposed Phezukomoya WEF would create employment and business opportunities for locals during both the construction and operational phase of the project. The establishment of a Community Trust will also benefit the local community. The potential negative social impacts could also be effectively mitigated. The proposed development also represented an investment in clean, renewable energy infrastructure, which, given the negative environmental and socio-economic impacts associated with a coal-based energy economy and the challenges created by climate change, represents a significant positive social benefit for the society as a whole. The findings of the SIA also indicated that the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) has resulted in significant socio-economic benefits, both at a national level and a local, community level. These benefits are linked to Foreign Direct Investment, local employment and procurement and investment in local community initiatives.

The significance ratings for the cumulative impacts associated with the Part 2 Amendment Hartebeesthoek West are the same as those for the original Phezukomoya WEF (SIA January 2018), namely:

- Cumulative impact on sense of place - Medium Negative;
- Cumulative impact on services - Low Negative; and
- Cumulative impact on local economies - High Positive.

The project will create significant socio-economic opportunities for the area and have limited potential negative social impacts. The Hartebeesthoek West WEF is located in a proven high wind resource area. The project is needed and desirable for the following reasons:

- Positive impact on climate change;
- Overcoming the country's energy constraints;
- Diversification and decentralisation of supply;
- Reduced costs of energy; and
- Positive economic development, including job creation.

Based on the findings of the SIA, the establishment of the proposed Hartebeesthoek West WEF is supported.

Table 6.11: Social Impact Assessment of the Original Assessment

	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Construction Phase							
Creation of local employment, training and business opportunities	Medium	Low	Medium	Positive	**Medium**	Medium	High
With Enhancements	High	Low	High	Positive	**High**	High	High

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Impact of construction workers on local communities	Medium	Low	Medium	Negative	**Medium**	Medium	High
With Mitigation	Medium	Low	Low	Negative	**Low**	Medium	High
Influx of job seekers	Medium	Low	Low	Negative	**Low**	Medium	Medium
With Mitigation	Medium	Low	Low	Negative	**Low**	Medium	Medium
Risk to safety, livestock, farm infrastructure and farming operations	Medium	Low	Medium	Negative	**Medium**	Medium	High
With Mitigation	Medium	Low	Low	Negative	**Low**	Medium	High
Increased fire risk	Medium	Low	Medium	Negative	**Medium**	Medium	High
With Mitigation	Medium	Low	Low	Negative	**Low**	Medium	High
Impacts associated with construction vehicles	Medium	Low	Medium	Negative	**Medium**	Medium	High
With Mitigation	Medium	Low	Low	Negative	**Low**	Medium	High
Impact associated with loss of farmland	Medium	Low	Low	Negative	**Medium**	Medium	High
With Mitigation	Medium	Low	Low	Negative	**Medium**	Medium	High
Operation Phase							
Development of renewable energy infrastructure	Medium	High	Medium	Positive	**Medium**	Medium	High
With Enhancements	Medium	High	High	Positive	**High**	High	High
Creation of employment and business opportunities and support for local economic development	Medium	Medium	Low	Positive	**Low**	Medium	High
With Enhancements	Medium	Medium	Medium	Positive	**Medium**	High	High
Benefits associated with the establishment of a Community Trust	Medium	High	Medium	Positive	**Medium**	Medium	High
With Enhancements	Medium	High	High	Positive	**High**	High	High
Generate income for affected landowners	Medium	Medium	Low	Positive	**Low**	Medium	High
With Enhancements	Medium	Medium	Medium	Positive	**Medium**	High	High
Impact on sense of place and rural character of the landscape based on findings of VIA	Medium	Medium	Medium	Negative	**Medium**	Medium	Medium
With Mitigation	Medium	Medium	Medium – Low	Negative	**Medium – Low**	Medium	Medium

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Potential impact on property values	Medium	Medium	Medium	Negative	**Medium**	Medium	Medium
With Mitigation	Medium	Medium	Low	Negative	**Low**	Medium	Medium
Potential impact on tourism	Medium	Medium	Low	Negative	**Low**	Medium	High
With Mitigation	Medium	Medium	Low	Negative	**Low**	Medium	High
Decommission Phase							
Loss of jobs and associated income	Medium	Medium	Medium	Negative	**Medium**	Medium	High
With Mitigation	Medium	Low	Low	Negative	**Low**	Medium	High

Table 6.12: Updated Social Impact Assessment based on the Amendments

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Construction Phase							
Creation of local employment, training and business opportunities	Medium	Low	Medium	Positive	**Medium**	Medium	High
With Enhancements	High	Low	High	Positive	**Medium**	High	High
Operation Phase							
Creation of employment and business opportunities and support for local economic development	Medium	Medium	Low	Positive	**Low**	Medium	High
With Enhancements	Medium	Medium	Medium	Positive	**Low**	High	High
Benefits associated with the establishment of a Community Trust	Medium	High	Medium	Positive	**Medium**	Medium	High
With Enhancements	Medium	High	High	Positive	**Medium**	High	High

6.10 Traffic

The amendment report was produced to assess the proposed amendments and their potential to have a significant change in impact on the traffic and surrounding transportation network. The proposed changes that have the most impact on traffic generated are the number of wind turbines. This will decrease and increase trips generated to the site, respectively. The extent of impact caused by this amendment will be quantified in the capacity and safety analysis.

Three site access point options and 3 intersections have been identified to provide access to the Hartebeesthoek West WEF. Through site visits and desktop studies, each access point was evaluated for its suitability to serve the WEF, taking into consideration site distance lines, intersection/access spacing requirements, speed limits and road surface conditions. Based on the analysis, Access D is preferred to provide access to the site.

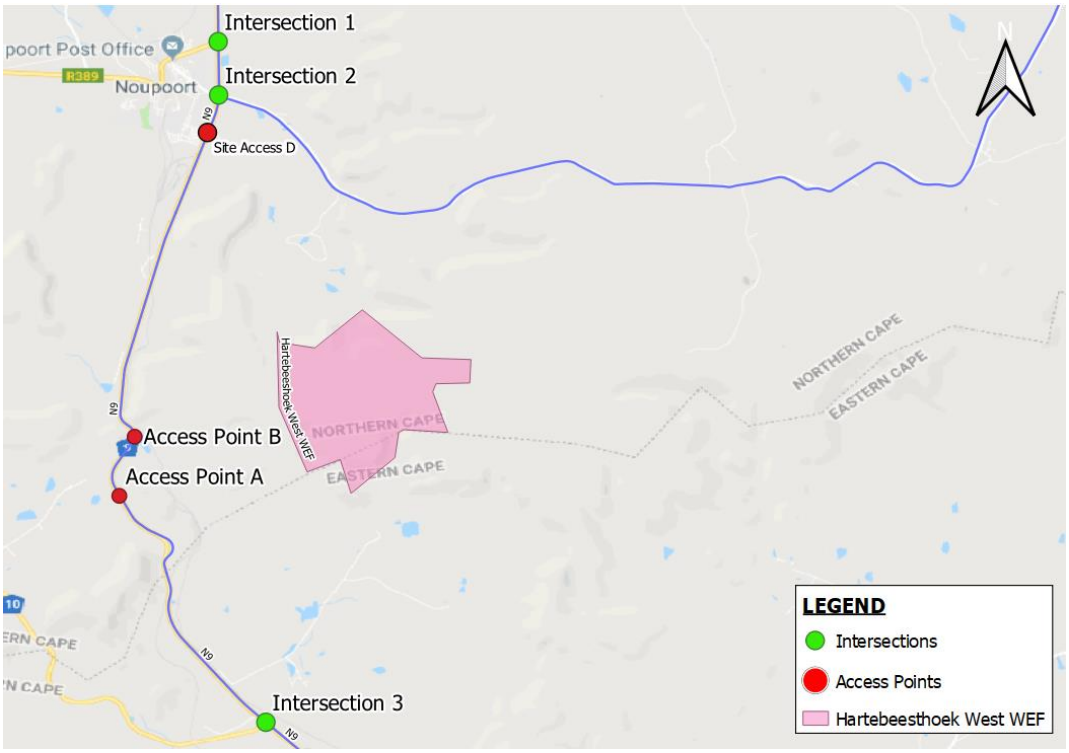

Figure 6.2 Site Access Points and Intersections

Table 6.13: Traffic impact Assessment based on the Amendments

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Construction / Decommissioning Phase							
Impact on increased traffic on the route and access points to the site	Low	Low	Medium	Negative	**Low**	High	High
With Mitigation	Low	Low	Low	Negative	**Very Low**	High	High

Based on the information detailed in the TIA report, the base year and forecast year road capacity has indicated that the proposed development and proposed amendments will have no significant change in impact on the existing road network capacity and the project will maintain acceptable levels of service. Further, the safety assessment has indicated that the proposed development will have some impact at proposed access points. Providing access from national roads will impact the mobility of the road. Therefore, adequate traffic control and clear road markings and warnings signs must be provided. Given the findings of the report, it is recommended that the proposed construction be considered favourably from a traffic engineering point of view as the intended construction will have no significant negative impact on the surrounding road network.

6.11 Wake Effect

As part of its EIA application Phezukomoya Wind Power commissioned 3E to compile a wake effect impact assessment in 2018, a to determine, what effect, if any, the proposed Phezukomoya development will have on the operational Noupoort Wind Farm. The study concluded that the operation of the Phezukomoya WEF will result in a 0.15 % loss of production for the Noupoort Wind Farm

An updated Wake Effect Impact Assessment was undertaken by 3E on 01 July 2020, in order to assess and quantify the potential loss of production the Amended Phezukomoya

and Hartebeesthoek West wind farms would cause to the operational Noupoort wind farm. The updated Wake Effect Impact Analysis has been appended to this amendment report in Volume II.

The updated wake effect report concludes that:

- the combined impact of the amended Phezukomoya and Hartebeesthoek West projects on the Noupoort wind farm is a 0.21% loss of production.
- the impact the amended Hartebeesthoek Wesy project would have on Noupoort without including Phezukomoya in the assessment. Under this scenario Hartebeesthoek West would cause a 0.08% loss of production to Noupoort.

As indicated by 3E, the study used 29.5 months and 29.8 months of data from two respective 120m measurement masts installed at the site. The configuration of this measurement device complies with best practices. The terrain at the site was modelled and a wind flow model was used to extrapolate the wind regime to the location and hub heigh of each wind turbine proposed for this amendment.

The updated Wake Effect Impact Assessment concluded that due to the large distance between the existing Noupoort Wind Farm and the Hartebeesthoek West WEF, the frequency of the wind being rather limited from the sectors of south-south-west and west-south-west, the additional wake impact is quite small – in other words, very low. It is thus not anticipated that the wake effect would result in adverse socio-economic impacts on the Noupoort wind farm.

As the wake effect impacts are insignificant, no mitigation measures are proposed which relate to the sustainable operation of the Noupoort Wind Farm.

Before construction can commence, Hartebeesthoek Wind Power will be required to secure final layout approval from DFFE. Prior to submitting its application for final layout approval to the Department, Hartebeesthoek Wind Power will re-update the wake effect impact assessment report based on the final wind turbine layout and model, in order to revise the anticipated loss of production that will be experienced by the Noupoort Wind farm. The updated wake effect report will once again be subjected to a 30 days Public Participation Process, before a decision can be made by the Department on the final layout approval application.

Table 6.13: Wake Effect Impact Assessment based on the Amendments

	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Construction / Decommissioning Phase							
Wake Effect Impacts on the Noupoort Wind Farm	Low	Low	Medium	Negative	**Very Low**	High	High
With Mitigation	Low	Low	Low	Negative	**Very Low**	High	High

7 ADVANTAGES AND DISADVANTAGES OF THE PROPOSED AMENDMENT

Specialists were requested to provide an opinion on the advantages and disadvantages of the proposed amendment application. Table 7.1 below provides a comparative assessment of the advantages and disadvantages of the proposed amendment to the authorised Hartebeesthoek West WEF.

Table 7.1 Advantages and Disadvantages of the Amendment

Advantages	Disadvantages
A reduction in the number of turbines means a smaller footprint is required and therefore less vegetation clearance and habitat loss.	It is possible that some bat species, particularly those not adapted to use open-air spaces, are being killed at the lower sweep of the turbine blades so increasing the blade length and having a shorter distance between the ground and the lowest rotor point may have a negative impact and potentially place a greater diversity of species at risk.
The original layout had a total of 12 turbines within CBA 2 areas and 19 turbines within CBA 1 areas. This compares to 11 turbines in CBA 2 areas 14 turbines in CBA 1 areas in the amendment.	A marginal disadvantage could possibly arise from the split of the authorised Phezukomoya WEF if the two projects are not constructed concurrently as prolonged construction periods would exacerbate visual impacts associated with construction.
It is likely that splitting the authorised Phezukomoya WEF into two WEFs, will lead to long term job opportunities, especially if the construction of the WEFs are phased.	The reduced number of turbines and the associated implications in terms of capital expenditure, employment (construction and operational phase), and the impact of construction workers.
All turbines are located away from highly sensitive areas, and no turbines are located in no–go areas or buffers.	In terms of the Community Trust, the potential changes would be linked to the reduced revenue associated with the lower generation capacity (MWs).
Bat activity and species diversity are greater at ground level than at height. Therefore, even though bats are recorded at heights that would put them at risk from taller turbines, the proportion of bats that would be at risk might be less.	Although quite small (0.08%), the proposed amendment could result in potential operational losses for the Noupoort Wind Farm in terms of a cumulative and direct Wake Effect
The number of bat species that might be impacted would decrease because not all bat species use the airspace congruent with the rotor swept area of modern turbines owing to morphological adaptations related to flight and echolocation.	
The reduction in the number of WTGs from that proposed for this portion of the authorised Phezukomoya WEF is an advantage of the Hartebeesthoek West layout as it reduces the potential for impacts on archaeological sites and material.	
The revised layout of the WEF also has the advantage of increasing the distance between the identified heritage sites and WEF infrastructure, thereby ensuring that no impacts will occur.	
Fewer larger turbines are preferable from an avifaunal perspective.	
A reduction in the number of turbines will reduce the overall visual impact to identified sensitive receptors.	
A reduction in the number of trips to site, therefore decrease in the impacts to traffic.	

8 PUBLIC PARTICIPATION PROCESS

The I&AP database of the authorised Phezukomoya WEF EIA (Arcus, 2018) process was used as a baseline for this amendment application and the updated 2020 database was used for this Revised Final Amendment Report. The Socio-economic specialist study for this amendment included consultation and interviews with Interested and Affected Parties

(I&APs) and other key informants and stakeholders as necessary in order to assess social impacts.

All I&APs were notified of the intention to submit the original Amendment Report via the placement of adverts in the same newspapers utilised during the previous EIA, i.e. The Herald and Graaff Reinet Advertiser in 2019. Site notices were placed along the boundary of the site to inform I&APs of the amendment application (Appendix C).

Notification letters via email and registered mail will be sent to all I&APs informing them of the availability of the amendment report for review and comment, from 11 June 2021 to 12 July 2021. The report is made available at the Noupoort Library as a hard copy and digitally on the Arcus website (www.arcusconsulting.co.za/projects).

All comments received for the comment period of the Revised Final Amendment Report will be included in the Comments and Responses Table, and responded to and addressed by the project team, i.e. EAP, Applicant and Specialists as applicable. The Comments and Responses Report with comments received to date is provided with this Revised Final EA Amendment Report (Volume I: Appendix H).

9 CHANGES TO THE DRAFT EMPR

The EMPr for the original Phezukomoya WEF prepared by Arcus in 2018 was amended in respect of the assessment of impacts on archaeological sites and materials within the Hartebeesthoek West WEF.

10 RECOMMENDATIONS AND CONCLUSION

Hartebeesthoek Wind Power (Pty) Ltd is proposing the amendment to the already authorised Phezukomoya Wind Energy Facility (WEF). The proposed amendments to the turbine specifications and layout, and the proposed Hartebeesthoek West study area, falls within the originally assessed area. The split enables a similar amount of energy yield with fewer turbines. Corresponding to this reduction in the number of turbines was a decrease in hub height - from 150 m to up to 137 m, and an increase in rotor diameter - from 150 m to up to 175 m.

The use of renewable energy to provide power to South Africa is supported at International, National, Provincial and Local Government Levels. Further, given South Africa's need for additional electricity generation and the need to decrease the country's dependence on coal-based power, renewable energy has been identified as a national priority, with wind energy identified as one of the most readily available, technically viable and commercially cost-effective sources of renewable energy.

Taking into consideration the findings of this amendment process for the proposed development and the fact that recommended mitigation measures have been used to inform the project design, it is the opinion of the Environmental Assessment Practitioner (EAP) that the negative impacts associated with the implementation of the proposed project have been mitigated to acceptable levels. Figure 10.1 reflects the environmental sensitivity of the proposed development. While the residual impacts of the project will have an impact on the local environment, the extent of the benefits associated with the implementation of the projects will benefit a much larger group of people, in terms of renewable energy supply and positive local and regional economic impact.

The study has concluded that there are no negative high residual impacts, including potential cumulative impacts associated with the proposed amendment application, and the amendment can be authorised.

FIGURES

APPENDIX A: EAP CV AND DECLARATION OF INDEPENDENCE

APPENDIX B: ENVIRONMENTAL MANAGEMENT PROGRAMME

APPENDIX C: PUBLIC PARTICIPATION REPORT