

Witberg Wind Energy Facility and associated infrastructure, Western Cape Province

Final Motivation for amendment of Environmental Authorisation

DEA Ref.: 12/12/20/1966/AM7

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PROJECT DETAILS

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- Report Status** : Final Report for authority review

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TABLE OF CONTENTS

	PAGE
PROJECT DETAILS	i
PURPOSE OF THE REPORT	iv
DEA COMMENTS ON THE ORIGINAL MOTIVATION REPORT	1
1. OVERVIEW OF THE PROJECT	10
2. DETAILS OF THE AMENDMENTS APPLIED FOR	16
2.1. Turbine specifications	16
2.2. Wind Farm Layout	16
2.3. Extension of validity of Environmental Authorisation	17
2.4. Update of the EA and Consolidation of all Conditions of the Environmental Authorisation, Amendments and Appeal Decisions Conditions	18
3. MOTIVATION FOR THE PROPOSED AMENDMENTS	30
3.1. Technical Motivation for the Amendment of Turbine Specifications	30
3.2. Motivation for the Amendment of the Wind Farm Layout	30
3.3. Extend the validity of the EA	30
3.4. Update of the EA and Consolidation of all Conditions of the Environmental Authorisation and Appeal Decisions Conditions	30
4. CONSIDERATIONS IN TERMS OF THE REQUIREMENTS OF THE EIA REGULATIONS	32
5. POTENTIAL FOR CHANGE IN THE SIGNIFICANCE OF IMPACTS AS ASSESSED IN THE EIA AS A RESULT OF THE PROPOSED AMENDMENTS	33
5.1. Collision Risk Modelling on Birds	33
5.1.1. Comparative Assessment.....	36
5.1.2. Conclusion.....	36
5.2. Impacts on Birds	37
5.2.1. Comparative Assessment.....	38
5.2.2. Conclusion.....	42
5.3. Impacts on Bats	44
5.3.1. Comparative Assessment.....	50
5.3.2. Conclusion.....	53
5.4. Ecological Impact	53
5.4.1. Comparative Assessment.....	56
5.4.2. Conclusion.....	56
5.5. Impacts on Heritage	57
5.5.1. Comparative Assessment.....	58
5.5.2. Conclusion.....	60
5.6. Noise Impacts	60
5.6.1. Comparative Assessment.....	62
5.6.2. Conclusion.....	62
5.7. Visual Impact	62
5.7.1. Comparative Assessment.....	66
5.7.2. Conclusion.....	66
5.8. Social Impact	66
5.8.1. Comparative Assessment.....	67
5.8.2. Conclusion.....	67

6.	ADVANTAGES AND DISADVANTAGES OF THE PROPOSED AMENDMENTS	68
7.	REQUIREMENTS FOR ADDITIONAL MITIGATION AS A RESULT OF THE PROPOSED AMENDMENTS.....	71
8.	PUBLIC PARTICIPATION	74
9.	CONCLUSION	76

APPENDICES:

Appendix A:	Avifauna Collision Risk Modelling Amended Report and Letter
Appendix B:	Avifauna Impact Amendment Specialist Report (including Avi-fauna pre-construction monitoring report)
Appendix C:	Bat Specialist Report (including Bat pre-construction monitoring report)
Appendix D:	Ecology Specialist Amendment Letter
Appendix E:	Heritage Specialist Amendment Report
Appendix F:	Noise specialist Amendment Report and Letter
Appendix G:	Visual Specialist Amendment Report and Letter
Appendix H:	Social Specialist Report and Letter
Appendix I:	Public Participation Documentation
Appendix I1:	I&AP Database
Appendix I2:	Consultation with I&APs
Appendix I3:	Consultation with Organs of State
Appendix I4:	Advertisements and Site Notices
Appendix I5:	Comments and Responses Report
Appendix I6:	Comments Received
Appendix J:	A3 Maps
Appendix K:	EMPr
Appendix L:	Other Information

PURPOSE OF THE REPORT

Witberg Wind Power (Pty) Ltd received an Environmental Authorisation (EA) for the construction of Witberg Wind Energy Facility and associated infrastructure in the Western Cape Province (DEA ref: 12/12/20/1966) on 13 October 2011. An appeal decision (Reference: LSA 105-439), dated 13 August 2013, was subsequently issued by the Minister of Environmental Affairs reducing the number of originally authorised wind turbines from 70 to 27 turbines, along with revised turbine specifications. However, a number of amendments to the EA and the authorised turbine specifications according to the appeal decision are now required. Firstly, the project is intended to be bid into future rounds of the Department of Energy's (DoE) Renewable Energy Independent Power Producers Procurement (REIPPP) Programme. There have been advancements to wind turbine technology since the issuing of the EA and the appeal decision. Therefore, the authorised turbines will no longer be most competitive for the project in terms of production and economic viability of the project.

In this regard, Witberg Wind Power (Pty) Ltd is considering an updated turbine model for the project. An amendment to the authorised turbine specifications are required as follows:

- » Range of Hub height: from 92m to a **range from 92m to up to 120m**;
- » Range of Rotor diameter: from 116m to a **range from 116m to up to 136m**; and
- » Range of Wind turbine capacity per wind turbine: from 3MW to a **range from 3MW to up to 5MW**.

In addition, an amendment to the wind farm layout is required to avoid sensitive areas, and to optimise the layout. Therefore, the number of wind turbines will be reduced from 27 wind turbines to **25 wind turbines**, and the wind turbines and associated infrastructure will be re-positioned within the originally assessed site.

In addition to the above amendments of turbine specifications and layout, the following Part 1 amendments are being applied for:

- » The contact person and relevant details are to be updated and added for the holder of the EA.
- » Minor spelling corrections are to be requested for the minor details of two (2) of the authorised listed activities in the EA.
- » An extension of the validity of the EA by a further two (2) years is requested.
- » Update of the EA and consolidation of all conditions of the EA and Appeal Decisions Conditions.

The above requested amendments are proposed for several reasons including:

- » To increase the efficiency of the facility and consequently the economic competitiveness thereof.
- » To allow for avoidance of sensitive areas (bat sensitivities and Verreux's Eagle nest buffers 1.5km including Besterweg Nest, Elandsfontein (Elandkrag) Nest, Bantam Nest 1 and Bantam Nest Alt).
- » For optimisation of the layout.
- » Updating and adding the relevant contact details of the Holder of the EA.
- » Correcting spelling errors contained in two (2) of the activities authorised in the EA.
- » Extension of the validity of the EA such that the project can be bid into future rounds of the REIPPP Programme.
- » Amend Condition 40 to correctly address the Holder of the EA.

» Given that there are a number of amendments and appeal decisions on the environmental authorisation it is also requested that all environmental authorisations and appeal decisions are consolidated into one EA. The reason for this is to have a consolidated EA which contains all the relevant conditions for the proposed development, thereby facilitating compliance monitoring by both the applicant and the DEA during implementation of the project.

The proposed amendments in themselves are not listed activities and do not trigger any new listed activity. Further, no additional properties will be affected by the amendments as the proposed amendments are within the originally authorised development footprint.

In terms of Condition 5 of the Environmental Authorisation and Chapter 5 of the EIA Regulations of December 2014 (as amended, on 07 April 2017), it is possible for an applicant to apply, in writing, to the competent authority for a change or deviation from the project description to be approved. Savannah Environmental has therefore submitted an application for amendment for the above-mentioned amendments, on behalf of Witberg Wind Power (Pty) Ltd, to the Department of Environmental Affairs (DEA).

Savannah Environmental prepared a draft motivation report in support of the amendment application on behalf of Witberg Wind Power (Pty) Ltd in November 2018. The report aimed to provide detail pertaining to the significance and impacts of the proposed change to the wind turbine specifications and the wind farm layout (amongst the other specified amendments listed above) in order for interested and affected parties to be informed of the proposed amendments and to provide an opportunity for comment to the public, and for the competent authority to be able to reach a decision in this regard. The initial motivation report was supported by specialist studies in order to inform the final conclusion regarding the proposed amendments (refer to **Appendix A – H** of the initial motivation report).

The draft motivation report was made available to registered and potential interested and affected parties for a 30-day period from **14 November 2018 to 14 December 2018**. The availability of the report was advertised in the *Wocester Standard* (local newspaper) on **15 November 2018**. The draft Motivation Report was also made available at the Laingsburg Public Library (Van Riebeeck Street, Laingsburg). The draft motivation report was available for download at www.savannahsa.com/projects. CD copies were available on request from the contact person below.

In response to comments received from the first round of public participation, certain changes, which were regarded as significant were required to be made to the draft motivation report, and significant new information was added to a revised motivation report, which changes or information was not contained in the report consulted on during the initial public participation process. This revised motivation report was therefore updated with the new information and was subjected to a second round of public participation of at least 30 days as required by the legislation.

The revised motivation report was made available to registered and potential interested and affected parties for an additional 30-day review and comment period from **20 March 2019 to 23 April 2019**. The availability of the revised motivation report was advertised in the Cape Times on **20 March 2019** and in the *Wocester Standard* (local newspaper) on **21 March 2019**. This revised motivation report was made available at the Laingsburg Public Library (Van Riebeeck Street, Laingsburg), and was available for download at www.savannahsa.com. CD copies were available on request.

All comments received during the initial and second round review period are included within the Comments and Responses (C&R) Report, which is included within Appendix 15.

It must be noted that the information in the final motivation report which has been updated from the draft motivation report, has been underlined.

DEA COMMENTS ON THE ORIGINAL MOTIVATION REPORT

Table 1 below outlines the DEA's comments on the draft motivation report that were received on 13 December 2018, the responses to the various comments, and where in the revised amendment report the requirements have been addressed. Where comments have not been addressed within the report, motivation in this regard is provided.

TABLE 1: DEA Comments on the initial motivation report

DEA Ref	Comments from DEA on the initial Motivation Report	Report Reference and Response from EAP
(a)(i)	Amendment 6, as applied for requests the department to amend the wind monitoring mast from 80m to 120m. It must be noted that the EA does not include the wind monitoring mast. As such, the EAP is to provide the details in the EIAR where the mast was specified, provide confirmation if the mast was constructed or not, the date it was constructed and provide the authorisation for said wind monitoring masts.	Amendment 6 has been removed from the request for amendment. As such, the requested details are not required for the proposed amendment and have not been included in this application.
(a)(ii)	The EAP is requested to consolidate all the conditions from the previous amendments and appeal decisions that needs to be added into the EA.	See Section 2 of the revised motivation report.
(a)(iii)	The EAP is required to submit a revised, signed application form that does not include the proposed amendment number 6.	Amendment 6 has been removed from the request for amendment and has been removed from the updated application form submitted to the DEA.
(b)(i)	Please ensure that comments from all relevant stakeholders are submitted to the Department with the final report. This includes but is not limited to the Western Cape Department of Environmental Affairs and Development Planning, the Department of Forestry and Fisheries (DAFF), the Western Cape Department of Agriculture, the South African Civil Aviation Authority (SACAA), the Department of Transport, the Laingsburg Local Municipality, the Department of Water and Sanitation (DWS), the South African National Roads Agency Limited (SANRAL), the South African Heritage Resources Agency (SAHRA), the Endangered Wildlife Trust (EWT), BirdLife SA, the Department of Mineral Resources, the Department of Rural Development and Land Reform, and the Department of Environmental Affairs: Directorate Biodiversity and Conservation.	<p>It can be confirmed that the Organs of State and Stakeholders mentioned are registered on the project database, and received the initial draft Motivation Report for comment. The <u>Revised</u> Motivation Report will also be released to these Organs of State and stakeholder for comment.</p> <p>Proof of delivery will be included in the Final Revised Motivation Report.</p> <p>The SACAA has provided conditional approval for the 27-wind turbine layout and this is attached to the revised motivation report (see Appendix L of the revised motivation report). However, please note that the Holder of the EA will request the SACAA for an amendment of this conditional approval to refer to the correct layout and updated turbine specifications, once this Part 2 Amendment has been concluded and deemed successful.</p>
(b)(ii)	Please ensure that all issues raised and comments received during the circulation of the draft report from registered I&APs and organs of state which have jurisdiction in respect of the proposed activity	All comments received from stakeholders and RI&APs are captured in the C&RR, and comments received on the Revised Motivation Report will be included in the Final Revised Motivation Report

DEA Ref	Comments from DEA on the initial Motivation Report	Report Reference and Response from EAP
	<p>are adequately addressed in the final report. Proof of correspondence with the various stakeholders must be included in the final report. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments. The Public Participation Process must be conducted in terms of Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations 2014 as amended.</p>	<p>which will be submitted to the DEA for decision-making.</p>
(b)(iii)	<p>A Comments and Response trail report (C&R) must be submitted with the final report. The C&R report must incorporate all comments for this development. The C&R report must be a separate document from the main report and the format must be in the table format as indicated in Annexure 1 of this comments letter. 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 I&AP's comments.</p>	<p>It can be confirmed that the C&RR format complies with the DEA requirements as set out in their letter dated 13 December 2018 and that comments have not been summarized, but captured verbatim.</p>
(b)(iv)	<p>The final report must also indicate that this draft report has been subjected to a public participation process.</p>	<p>Proof of circulation of the draft Motivation Report and the Revised Motivation Report will be included in the Final Revised Motivation Report.</p>
(c)(i)	<p>All preferred turbine positions must be clearly numbered. The turbine position numbers must be consistently used in all maps to be included in the final report.</p>	<p>Refer to the Revised Motivation Report (Figure 2.1 and Figure 7.1).</p>
(c)(ii)	<p>The final report must provide the technical details for the proposed facility in a table format as well as their description and/or dimensions. A sample for the minimum information required is listed under point 2 of the EIA information required for wind energy facilities below.</p>	<p>Refer to Section 2.4 d) of the Revised Motivation Report.</p>
(c)(iii)	<p>A copy of the final layout map must be submitted with the final report. All available biodiversity information must be used in the finalisation of the layout map. Existing infrastructure must be used as far as possible e.g. roads. The layout map must indicate the following:</p> <ul style="list-style-type: none"> • The envisioned area for the wind energy facility; i.e. placing of wind turbines and all associated infrastructure should be mapped at an appropriate scale. • All supporting onsite infrastructure such as laydown area, guard house, control room, and buildings, including accommodation etc. • All necessary details regarding all possible locations and sizes of the proposed satellite 	<p>Refer to Figure 7.1 and Figure 7.2 of the Revised Motivation Report.</p>

DEA Ref	Comments from DEA on the initial Motivation Report	Report Reference and Response from EAP
	<p>substation, the main substation and internal powerlines.</p> <ul style="list-style-type: none"> • All existing infrastructure on the site, especially internal roads infrastructure. • The location of sensitive environmental features on site e.g. CBAs, heritage sites, wetlands, drainage lines etc. that will be affected by the facility and its associated infrastructure. • Buffer areas. • All "no-go" areas. 	
(c)(iv)	<p>The final report must include an environmental sensitivity map indicating environmental sensitive areas and features identified during the assessment process.</p>	<p>Refer to Figure 7.1 and Figure 7.2 of the Revised Motivation Report.</p>
(c)(v)	<p>The final report must include a map combining the final layout map superimposed (overlain) on the environmental sensitivity map.</p>	<p>Refer to Figure 7.1 and Figure 7.2 of the Revised Motivation Report.</p>
(d)(i)	<p>All the attached specialist studies must indicate and make recommendations for 25 wind turbine positions. There seems to be discrepancies between the number of turbines requested for the amendment, and the numbers being assessed in the various studies.</p>	<p>All the attached specialist studies indicate and make recommendations for the 25 wind turbine positions, as requested (see Appendix A – H).</p>
(d)(ii)	<p>The maps used within the specialist studies must comply with comment e(i) of this comments letter.</p>	<p>All the attached specialist studies (see Appendix A – H) contain maps (where relevant) with all turbine positions clearly numbered and are consistently used in all maps within the revised motivation report.</p>
(d)(iii)	<p>The EAP must ensure that the terms of reference for all the identified specialist studies must include the following:</p> <ul style="list-style-type: none"> • A detailed description of the study's methodology; indication of the locations and descriptions of the development footprint, and all other associated infrastructures that they have assessed and are recommending for authorisations. • Provide a detailed description of all limitations to the studies. All specialist studies must be conducted in the right season and providing that as a limitation will not be allowed. • Please note that the Department considers a 'no-go' area, as an area where no development of any infrastructure is allowed; therefore, no development of associated infrastructure including access roads is allowed in the 'no-go' areas. • Should the specialist definition of 'no-go' 	<p>Responses to each bullet point are as follows:</p> <ul style="list-style-type: none"> • Detailed methodologies have been provided for the collision risk modelling (Appendix A), bats, (Appendix C), ecology (Appendix D), heritage (Appendix E), visual (Appendix G) and social (Appendix H) have in the original specialist studies. Therefore, it is not required that these methodologies are repeated in the addendum reports. However, detailed methodologies have been provided for avifauna (Appendix B) and noise (Appendix F) addendum reports as required. • All specialist studies have provided a description of all limitations to the respective studies (Appendix A – H), with the exception of ecology and bats as there were no limitations to the addendum studies. However, the limitations were provided in the original

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	<p>area differ from the Departments definition; this must be Clearly indicated. The specialist must also indicate the 'no-go' areas buffer if applicable.</p> <ul style="list-style-type: none"> • All specialist studies must be final, and provide detailed/practical mitigation measures and recommendations, and must not recommend further studies to be completed post EA. • Should specialist recommend specific mitigation measures for identified turbine positions, these must be clearly indicated. • Clearly defined cumulative impacts and where possible the size of the identified impact must be quantified and indicated, i.e. hectares of cumulatively transformed land. • A detailed process flow to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project. • Identified cumulative impacts associated with the proposed development must be rated with the significance rating methodology used in the process. • The significance rating must also inform the need and desirability of the proposed development. • A cumulative impact environmental statement on whether the proposed development must proceed. 	<p>specialist studies, and therefore did not need to be repeated in the addendum reports. In addition, no limitations in terms of timing of the assessments have been provided in any of the specialist studies (Appendix A – H).</p> <ul style="list-style-type: none"> • This is acknowledged. Please see response below. • The classification of sensitivity areas used by the specialists are as follows: Very High sensitivity – no-go; High sensitivity (including associated buffers) – acceptable with intense mitigation; Medium sensitivity (including associated buffers) – acceptable with mitigation; Low – acceptable. The definition of a no-go area for the avifaunal specialist study differs slightly from the above classification however, in that it considers that no wind farm related development and associated infrastructure are allowed in the “no-go” areas with the exception of the access roads required for the proposed development. Refer to the avifauna specialist addendum report (Appendix B – see Section 5, Table 10). • All specialist studies have provided practical mitigation measures and recommendations where relevant (Appendix A - H). No further addendum specialist studies have been recommended for further study to inform the proposed amendment. The specialist studies submitted are considered final for the amendment application. • No specific mitigation measures have been provided for identified turbine numbers (see Appendix A - H). However, at a general level, the ecological specialist has recommended that the final development footprint should be subject to a pre-construction walk-through to inform the final placement of roads and turbines as well as locate and identify species of conservation concern that are within the development footprint (Appendix D). • Cumulative impacts have been provided for all specialist studies (Appendix A – H),

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		<p>as requested.</p> <ul style="list-style-type: none"> • Please refer to cumulative impact section in all specialist studies (Appendix A – H). • Please refer to cumulative impact section in all specialist studies (Appendix A – H). • Please refer to cumulative impact section in all specialist studies (Appendix A – H). • Please refer to cumulative impact section in all specialist studies (Appendix A – H).
(d)(iv)	Should the appointed specialists specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defensible reasons: and were necessary, include further expertise advice.	No contradicting recommendations have been proposed by the specialists with that of the recommendations of the EAP (see Appendix A - H).
(e)(i)	All recommendations and mitigation measures recorded in the final report and the specialist studies conducted.	All recommendations and mitigation measures recorded in the revised motivation report and associated specialist studies are included in the EMPr (Appendix K).
(e)(ii)	The final site layout map.	Refer to Section 1 of the EMPr (Appendix K).
(e)(iii)	Measures as dictated by the final site layout map and micro-siting.	Refer to Section 1 of the EMPr (Appendix K).
(e)(iv)	An environmental sensitivity map indicating environmental sensitive areas and features identified during the basic assessment process.	Note that an EIA process was undertaken and not a Basic Assessment process for the original application. An amendment application is now being undertaken as submitted herein. For the environmental sensitivity map indicating environmental sensitive areas, please refer to Section 1 of the EMPr (Appendix K).
(e)(v)	A map combining the final layout map superimposed (overlain) on the environmental sensitivity map.	Refer to Section 1 of the EMPr (Appendix K).
(e)(vi)	An alien invasive management plan to be implemented during construction and operation of the facility. The plan must include mitigation measures to reduce the invasion of alien species and ensure that the continuous monitoring and removal of alien species is undertaken.	Refer to Appendix B of the EMPr (Appendix K).
(e)(vii)	A plant rescue and protection plan which allows for the maximum transplant of conservation important species from areas to be transformed. This plan must be compiled by a vegetation specialist familiar with the site and be implemented prior to commencement of the construction phase.	Refer to Appendix D of the EMPr (Appendix K).
(e)(viii)	An avifauna monitoring and management plan to be implemented during the construction and operation of the facility. This plan must be drafted by a suitably qualified avifauna specialist.	Refer to Appendix G of the EMPr (Appendix K). Reputable avifaunal specialists' have formulated the current Birdlife South Africa Best Practice Guidelines for assessing and monitoring the impact of wind energy facilities on birds in South Africa. At this stage, it is premature to compile a

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		<p>detailed avifauna monitoring and management plan for the construction and operation phase of the Witberg WEF, as it is unknown when construction of the facility will commence given the uncertainty of the current REIPPP programme bid process, and where possible updates to the guidelines may have been made at a later stage which will need to be incorporated into the detailed avifauna monitoring and management plan for the construction and operation phase. As such, the Birdlife South Africa Best Practice Guidelines for assessing and monitoring the impact of wind energy facilities on birds in South Africa are provided to which are to be complied with when the detailed avifauna monitoring and management plan is compiled. This must however must be undertaken prior to construction.</p>
(e)(ix)	<p>A re-vegetation and habitat rehabilitation plan to be implemented during the construction and operation of the facility. Restoration must be undertaken as soon as possible after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.</p>	<p>Refer to Appendix C of the EMPr (Appendix K).</p>
(e)(x)	<p>An open space management plan to be implemented during the construction and operation of the facility.</p>	<p>Refer to Appendix E of the EMPr (Appendix K).</p>
(e)(xi)	<p>A traffic management plan for the site access roads to ensure that no hazards would result from the increased truck traffic and that traffic flow would not be adversely impacted. This plan must include measures to minimize impacts on local commuters e.g. limiting construction vehicles travelling on public roadways during the morning and late afternoon commute time and avoid using roads through densely populated built-up areas so as not to disturb existing retail and commercial operations.</p>	<p>Refer to Appendix H of the EMPr (Appendix K).</p>
(e)(xii)	<p>A transportation plan for the transport of components, main assembly cranes and other large pieces of equipment.</p>	<p>Refer to Appendix H of the EMPr (Appendix K).</p>
(e)(xiii)	<p>A storm water management plan to be implemented during the construction and operation of the facility. The plan must ensure compliance with applicable regulations and prevent off-site migration of contaminated storm water or increased soil erosion. The plan must include the construction of appropriate design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. Drainage measures</p>	<p>Refer to Appendix I of the EMPr (Appendix K).</p>

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	must promote the dissipation of storm water run-off.	
(e)(xiv)	A fire management plan to be implemented during the construction and operation of the facility.	Refer to Appendix J of the EMPr (Appendix K).
(e)(xv)	An erosion management plan for monitoring and rehabilitating erosion events associated with the facility. Appropriate erosion mitigation must form part of this plan to prevent and reduce the risk of any potential erosion.	Refer to Appendix F of the EMPr (Appendix K).
(e)(xvi)	An effective monitoring system to detect any leakage or spillage of all hazardous substances during their transportation, handling, use and storage. This must include precautionary measures to limit the possibility of oil and other toxic liquids from entering the soil or storm water systems.	Refer to Appendix K of the EMPr (Appendix K).
(e)(xvii)	Measures to protect hydrological features such as streams, rivers, pans, wetlands, dams and their catchments, and other environmental sensitive areas from construction impacts including the direct or indirect spillage of pollutants.	Refer to Section 4.2 Objective 13 of the EMPr (Appendix K).

Table 2 below outlines the DEA's comments on the revised motivation report that were received on 10 April 2019, the responses to the various comments, and where in the revised amendment report the requirements have been addressed.

TABLE 2: DEA Comments on the revised motivation report

DEA Ref	Comments from DEA on the revised Motivation Report	Report Reference and Response from EAP
(a) (i)	Please ensure that comments from all relevant stakeholders are submitted to the Department with the final report. This includes but is not limited to the Western Cape Department of Environmental Affairs and Development Planning, the Department of Forestry and Fisheries (DAFF), the Western Cape Department of Agriculture, the South African Civil Aviation Authority (SACAA), the Department of Transport, the Laingsburg Local Municipality, the Department of Water and Sanitation (DWS), the South African National Roads Agency Limited (SANRAL), the South African Heritage Resources Agency (SAHRA), the Endangered Wildlife Trust (EWT), BirdLife SA, the Department of Mineral Resources, the Department of Rural Development and Land Reform, and the Department of Environmental Affairs: Directorate Biodiversity and Conservation.	Comments received to date from all relevant stakeholders, have been included within this Comments and Responses Report. Proof of correspondence to and from these stakeholders is included in Appendix I3 and Appendix I6 of the Revised Motivation Report.
(a) (ii)	Please ensure that all issues raised and comments received during the circulation of the revised draft report from registered I&APs and organs of state which have jurisdiction in respect of the proposed	Comments received from registered I&APs and organs of state is included in Appendix I6 of the Final Revised Motivation Report.

DEA Ref	Comments from DEA on the revised Motivation Report	Report Reference and Response from EAP
	<p><u>activity are adequately addressed in the final report. Proof of correspondence with the various stakeholders must be included in the final report. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments. The Public Participation Process must be conducted in terms of Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations 2014 as amended.</u></p>	<p><u>Proof of distribution of the Revised is included in Appendix 12 and Appendix 13 including the reminders for submission of written comments.</u></p> <p><u>Savannah Environmental is cognisant of the need to comply with Regulations 39, 40, 41, 42, 43 and 44 of the EIA Regulations, 2014, as amended.</u></p> <ul style="list-style-type: none"> » <u>Regulation 39:</u> <u>It is confirmed that the registered landowner has been part of the consultation process for this application.</u> » <u>Regulation 40:</u> <u>The Revised Motivation Report has been made available to all registered I&APs and State Departments as required. To provide potential I&APs an opportunity to comment on the Revised Motivation Report, an advertisement was placed in a local community newspaper as well as a regional newspaper. Proof of advertisement is included in Appendix 14.</u> » <u>Regulation 41:</u> <u>A site notice was erected at the commencement of the Amendment Application process. Proof of site notice is included in Appendix 14.</u> <p><u>An advertisement was placed in a local community newspaper as well as in a regional newspaper. Proof of the advertisement is included in Appendix 14.</u></p> <ul style="list-style-type: none"> » <u>Regulation 42:</u> <u>A database with the contact details, as provided by I&APs, is included in Appendix 11.</u> » <u>Regulation 43:</u> <u>The Revised Motivation Report was made available for a 30-day public review period from 20 March 2019 to 23 April 2019. The revised Motivation Report was distributed to relevant Organs of State and a copy was made available at the Laingsburg Public Library, Van Riebeeck Street, Laingsburg. The Revised Motivation Report which has been submitted to the DEA, the Northern Cape DENC, and relevant Organs of State was also available for download from Savannah</u>

<u>DEA Ref</u>	<u>Comments from DEA on the revised Motivation Report</u>	<u>Report Reference and Response from EAP</u>
		<p>Environmental's website (https://www.savannahsa.com/public-documents/energy-generation/) or on CD on request from Savannah Environmental (Pty) Ltd.</p> <p>» <u>Regulation 44:</u> <u>Comments from I&APs received throughout the Application process and those submitted during the Revised Motivation Report 30-day review and comment period are included in the C&RR attached as Appendix 15 to this Final Motivation Report.</u></p>
<u>(a)(iii)</u>	<p><u>A Comments and Response trail report (C&R) must be submitted with the final report. The C&R report must incorporate all comments for this development. The C&R report must be a separate document from the main report and the format must be in the table format as indicated in Annexure 1 of this comments letter. 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 I&APs' comments.</u></p>	<p><u>As per Regulation 44, a C&RR has been drafted which includes all the written comments received on the Revised Motivation Report and is included in Appendix 15.</u></p> <p><u>Responses to written comments / concerns / issues raised have been provided and where applicable fully addressed by the project team.</u></p>
	<p><u>General</u> <u>Please ensure that all mitigation recommendations are in line with applicable and most recent guidelines.</u></p>	<p><u>Specialist studies have considered all applicable and most recent guidelines. Recommendations for mitigation have been made in accordance with these.</u></p>
	<p><u>Please ensure that the final amendment assessment report complies with this letter, the comments issued on 13 December 2018 and the requirements of the EIA Regulations, 2014 as amended.</u></p>	<p><u>Comments received from the DEA on 13 December 2018, and where in this report these have been addressed, are detailed in Table 1.</u></p>

1. OVERVIEW OF THE PROJECT

Location:

The authorised Witberg Wind Energy Facility (WEF) is located on a site ~9km west of Matjiesfontein in the Laingsburg Local Municipality, which falls within the jurisdiction of the Central Karoo District Municipality in the Western Cape Province. This development is to be constructed within the project site which comprises the following farm portions:

- » Remainder of the Farm Jantjesfontein 164;
- » Remainder of the Farm Besten Weg 150;
- » Remainder of Portion 1 of the Farm Besten Weg 150;
- » Remainder of the Farm Tweedside 151;
- » Remainder of the Farm Elandskrag 269; and
- » Portion 1 of the Farm Elandskrag 269.

Potential Environmental Impacts as determined during the original EIA Process:

From the specialist investigations undertaken within the Environmental Impact Assessment (EIA) process for the wind energy facility (Final Environmental Impact Report (FEIR), dated July 2011), no environmental fatal flaws were identified. However, several 'no go' areas were identified on the site including areas of sensitivity in respect of birds, fauna and flora, and visual. In addition, the following environmental impacts were identified:

- » Potential impacts on birds;
- » Potential impacts on bats;
- » Potential ecological impacts;
- » Potential impacts on heritage;
- » Potential noise impacts;
- » Areas of visual impact; and
- » Potential socio-economic impacts.

Witberg Wind Power (Pty) Ltd received an EA for the construction of Witberg Wind Energy Facility and associated infrastructure in the Western Cape Province (DEA ref: 12/12/20/1966) on 13 October 2011. An appeal decision (Reference: LSA 105-439), dated 13 August 2013, was subsequently issued by the Minister of Environmental Affairs reducing the number of originally authorised wind turbines from 70 to 27 turbines, along with revised turbine specifications, as guided by the inputs of the Independent Bird Specialist (Dr. Steve Percival – Shoney Renewables Consulting), who conducted a Collision Risk Modelling Report, dated 2013.

Key conclusions and recommendations of the original EIA pertinent to this application:

From the specialist investigations undertaken as part of the original Environmental Impact Assessment (EIA) for the wind energy facility, it was concluded that the majority of impacts were of minor to moderate significance with the implementation of appropriate mitigation measures. Environmental specifications for the management of potential impacts are detailed within the approved Environmental Management Programme (EMPr) which was approved as per Condition 13 of the EA.

The layout assessed during the EIA process undertaken for the project is illustrated in **Figure 1.1**. Areas of sensitivity identified during the EIA process included:

» Birds:

- This is a medium-sized proposed Wind Farm development, for a site with a moderate to high degree of sensitivity with respect to avifauna. There are no regionally or nationally critical populations of impact susceptible species within or close to the development area, and the proposed site does not impinge on any known major avian fly-ways or migration routes. However, it does seriously impinge on an important landscape feature – the Witberg ridge, and may have a significant negative effect on the avifauna of this ridge (including breeding pairs of large eagles and concentrations of localised endemic species) in both the construction and operational phases of the development.

» Bats:

- The higher lying areas on top of the Witberg where the turbines are proposed vary greatly from the lower lying flat areas and the mountain footslopes, where more favourable bat foraging habitat is provided. It has been noted however, that bats may roost in the rocky higher lying areas and move down to the mountain footslopes and lower valley to forage on a nightly basis. Potential roosts on the proposed windfarm site are mainly rock crevices. Additionally, bats may pass over the mountain on a nightly basis to reach foraging habitat on the other side, moving between the mountain peaks.

» Ecology:

- **Flora** – The vegetation of the project site includes the Matjiesfontein Quartzite Fynbos and the Matjiesfontein Shale Renosterveld. The Matjiesfontein Quartzite Fynbos should be viewed as a generally more sensitive vegetation type than the Matjiesfontein Shale Renosterveld.
 - Portions of the site fall within a Critical Biodiversity Area (CBA), as defined in the Central Karoo Biodiversity Assessment (Skownow *et al.*, 2009), located in the south eastern portion and eastern side of the site.
 - In terms of the listed plant species which occur in the area, a number of critically endangered species occur within the general area. These include *Gasteria disticha*, *Gibbaeum nebrownii* and *Protea convexa*. The first two species are associated with more arid environments and are not likely to occur within the area earmarked for development. *Protea convexa* occurs on north-facing slopes within the Matjiesfontein Quartzite Fynbos of the area. Several other listed species such as *Leucadendron teretifolium* and *Leucadendron cadens* were common at the site in areas earmarked for development. *Leucadendron teretifolium* is listed as Near Threatened while *Leucadendron cadens* is listed as Rare and is a narrow Witteberg endemic. Both of these species were very common along the tops of the ridges, and *Leucadendron teretifolium* formed dense populations in some places. Given the abundance and distribution of these species relative to the proposed footprint of the wind farm, it is inevitable that some individuals of these species would be lost should the development proceed. As both of these species are locally abundant, the loss of some individuals should not impact the viability of the local populations.
- **Fauna** – At least 50 mammal species potentially occur at the site. The diversity of habitats available at the site, which includes rocky uplands, densely vegetated kloofs and riparian areas, as well as open plains and low shrublands, a high proportion of the mammal species which potentially occur in the region are likely to be present at the site.
 - The only mammal species of conservation concern which could be perceived to occur at the site is the Riverine Rabbit, *Bunolagus monticularis*, which is listed as Critically Endangered (IUCN

2010) and is regarded as the most threatened mammal in South Africa. It is highly unlikely the Riverine Rabbit occurs on the Witberg site where the turbines are located due to the fact that it has not been recorded in such high rocky ridges, and is generally found in the lower lying valleys and riverine corridors. Additional studies to ascertain the presence of the Riverine Rabbit at the site were not warranted given the marginal nature of the habitat as well as the fact that the development is not likely to significantly impinge on any potential habitat which may occur at the site.

- Approximately 47 reptile species potentially occur at the site, comprising 5 chelonians, 15 snakes, 18 lizards or skinks, 2 chameleons and 7 geckos. Only two of these are listed by the IUCN, namely the Namaqua Plated Lizard which is listed as Near Threatened and Fisk's House Snake which is listed as Vulnerable. Both of these species are widely distributed and the site is not known to be an important area for either of them.
- The semi-arid nature of the site and the paucity of above-ground water render the area generally unfavourable for amphibians.
- Only eight (8) amphibians are likely to occur at the site. There are no threatened amphibian species known to occur on the site, and that the site is generally unfavourable for amphibian habitation (apart from seasonally wet valleys between ridges).

» Heritage (Including Palaeontology):

- Aspects of the Witberg site and surrounds that may be of heritage interest include numerous trace fossils in the Witpoort Formation sandstones, historic dry-packed stone walls, Stone Age artefacts, stone ruins and cairn, heritage cement and stone dams, two historic farm complexes (with four graves found in one of the complexes, and a Victorian house and stone barns, with a cement dam dating back to at least 1944 found in the other complex) and visual cultural landscape aspects associated with the sense of place of the area.
- **Palaeontology** - All the geological horizons in the Study Area are potentially fossiliferous. Consequently, all excavations, whether for road cuttings or foundations, may reveal fresh fossiliferous rock of as-yet unknown significance. The greatest likelihood of new discoveries is in the Kweekvlei, Floriskraal, and Waaipoort Formations of the Witteberg Group, where the significance of any discoveries would be major. Note that if proper palaeontological surveys are conducted during excavation the potential finding of palaeontological resources for furthering scientific knowledge could have a positive impact.

» Noise:

- The ambient noise level of 33 dBA¹ recorded at the Witberg site is considered typical for the area. The predicted LAeq due to the wind turbines would be less than 20 dBA at and beyond the site boundaries except to the west of land parcel Elandskrag RE/269 where the LAeq² would be between 25 dBA and 30 dBA. All levels would be less than the typical LReq.n³ of 35 dBA and there would therefore be no noise impact on land beyond the wind farm site boundaries.
- In terms of the Western Cape NCR the predicted noise levels would be less than the average measured daytime residual level of 33 dBA. The noise levels would not be considered to be a disturbing noise and no noise mitigation would be required.

» Visual:

- The proposed wind farm on the mountain ridgelines would have a low to medium visibility (the latter for a distance of 10 to 12 km), and highly visible for a section of 6km from the N1 National

¹ A-weighted decibels, abbreviated **dBA**, are an expression of the relative loudness of sounds in air as perceived by the human ear. In the A-weighted system, the decibel values of sounds at low frequencies are reduced.

² **LAeq** is the sound level in decibels equivalent to the total A-weighted sound energy measured over a stated period of time.

³ **LReq.n** is the sound rating level for night time.

Road. From the main rail line, the wind farm would be medium or highly visible for a 12 to 15 km stretch, and marginally visible from Matjiesfontein, which is a tourist destination. The general area is otherwise sparsely populated, with only a few scattered farmsteads.

- The physical presence of the proposed Wind Farm may alter the visual character of the landscape, as the proposed infrastructure, particularly the turbines, is in contrast to the rural surrounding landscape.
 - From the view shed analysis of the Final Layout (Alternative 3 – not the currently proposed layout) it can be determined that the Wind Farm would be visible from approximately 75% of the area within a 10 km radius because of the view-shadow effect of the topography.
 - The Witberg Wind Farm would be visible to motorists travelling on all of the above-mentioned roadways to varying degrees (medium to high visibility).
 - The Wind farm would have a high visibility from the secondary roads located on the site.
 - The Wind Farm would be visible from a 10 km distance by the rail line, with visibility ranging from low to high, as the rail line passes close and through a portion of the site.
- » Socio-economic:
- There are no social recommendations for micro-siting of the wind turbines or associated infrastructure.

In terms of the appeal decision dated 13 August 2013 (Reference: LSA 105-439), the reduction of wind turbines from 70 to 27 turbines along with revised turbine specifications was approved due to avifaunal sensitivities. No-go areas were therefore identified and adhered to at the time for the revised wind turbine layout (Layout Revision 7) (**Figure 1.2**).

1.1. **Overview of the Environmental Authorisation history of the project**

The following provides an overview of the Environmental Authorisation history of the project:

- » An EA was issued for the project on 13 October 2011.
- » the original EA dated 2011 was amended on 29 November 2012 due to an activity omitted from the original EA.
- » The EA was extended in 2013 until 26 November 2015.
- » The EA was extended in 2015 until 26 November 2017.
- » The EA was further amended in November 2016 due to an appeal.
- » The EA was extended in 2017 until 26 November 2020.

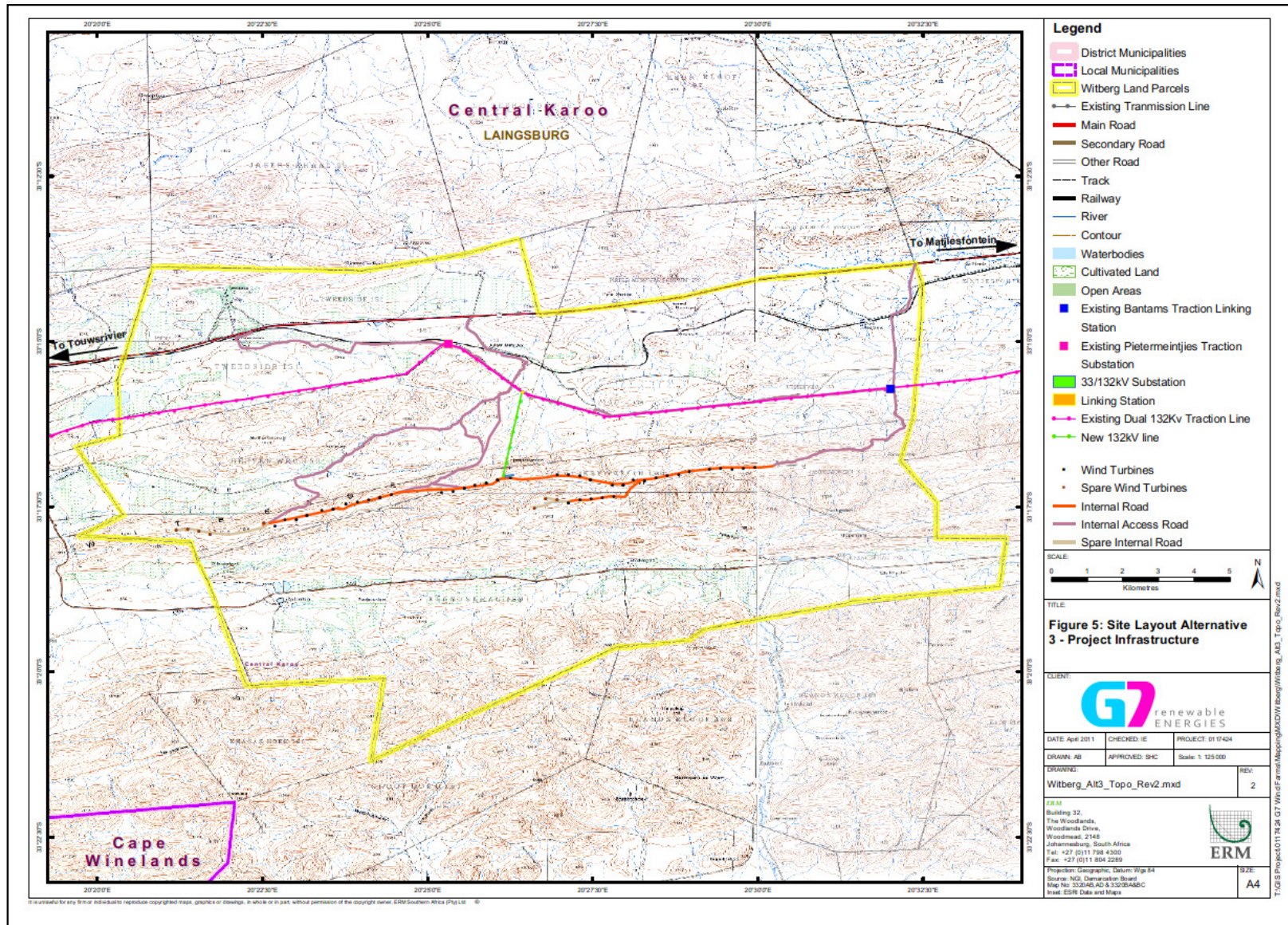


Figure 1.1: The turbine layout approved as part of the EIA process undertaken for the project in 2011 (A3 Map included in **Appendix I**).

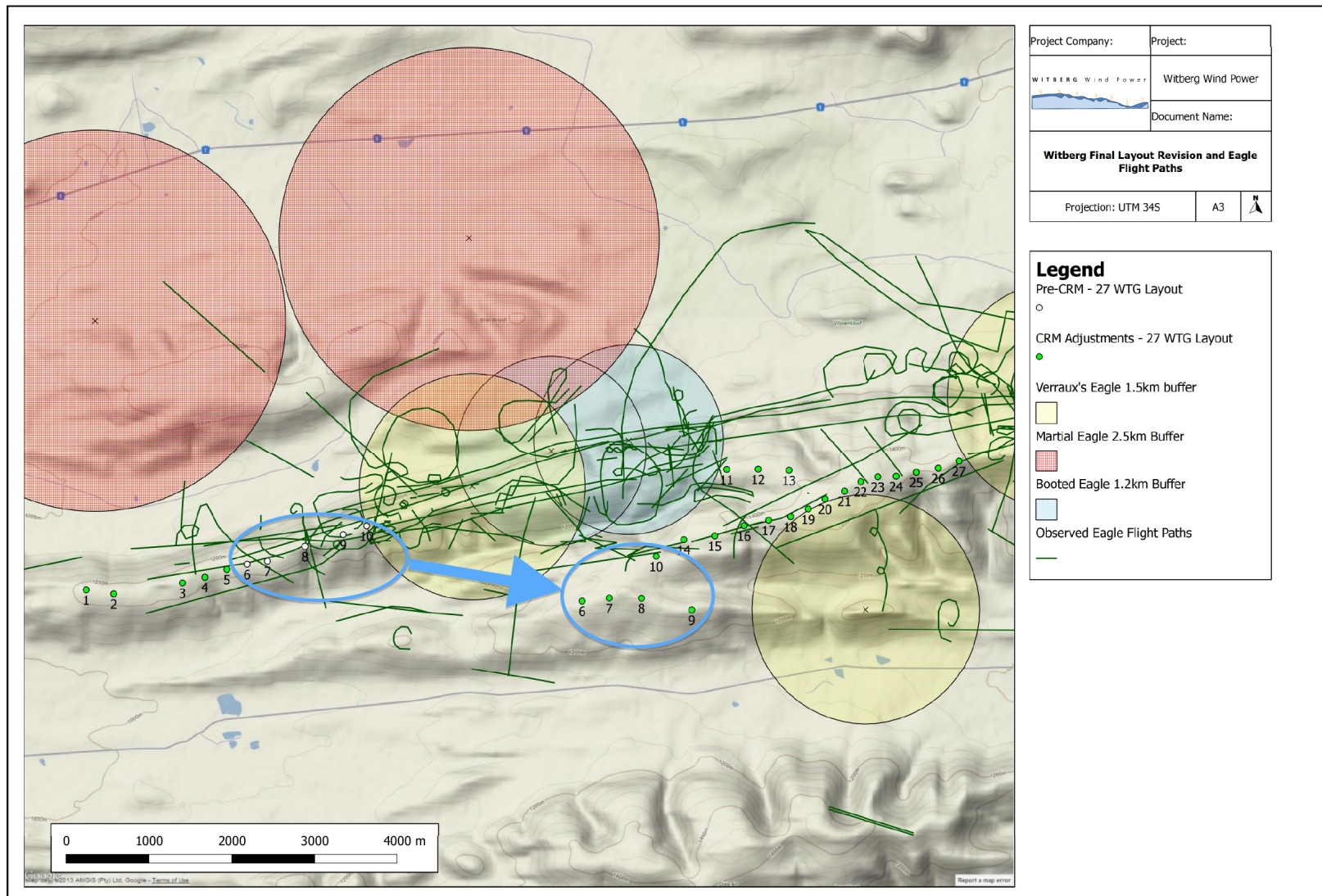


Figure 1.2: The turbine layout authorised as part of the appeal decision dated 2013 – Layout Revision 7 (A3 Map included in **Appendix I**).

2. DETAILS OF THE AMENDMENTS APPLIED FOR

2.1. Turbine specifications

The wind turbine rotor diameter, hub height and output capacity of each wind turbine is not specified in the EA dated 13th of October 2011. It is requested that these be added to the EA. In addition, the applicant is proposing the amendment of the turbine specifications that were authorised in terms of the amended appeal decision dated 13 August 2013. In terms of this decision, additional Condition 35 (to be added after Condition 34 of the original EA) was approved which stipulates 27 wind turbines with the dimensions to be restricted to 92m hub height and 116m rotor diameter. The request to change the wind turbine specifications are shown in **Bold** text as follows:

	Authorised turbine specifications as per the EIA report dated July 2011	Authorised turbine specifications as per appeal decision LSA 105-439 dated 13 August 2013	Proposed Amended turbine specifications
Rotor Diameter	90m	116m	Range from 116m to up to 136m
Hub height	80m	92m	Range from 92m to up to 120m
WTG rating	2 - 3MW	3MW	Range from 3MW to up to 5MW

These **changes in turbine specifications will not have an impact to the contracted capacity of the project** (i.e. 120MW), will fall within the originally authorised development area of the facility and do not trigger any new listed activities.

It is requested that these turbine specifications be amended and added into the project description on page 4 of the EA as follows:

- » **Range of Hub height: up to 120m;**
- » **Range of Rotor diameter: up to 136m; and**
- » **Range of Wind turbine capacity per wind turbine: up to 5MW.**

2.2. Wind Farm Layout

As per the appeal decision, Substitute Condition 1 approves Layout Revision 7. This layout illustrates the approved 27 wind turbines that were revised following the said appeal. The applicant is currently requesting that the layout be amended in order to avoid identified sensitive areas and optimise the layout. The approved Layout Revision 7 did not take full account of the Verreux Eagle nest 1.5km buffer and bat sensitivities. As such, the wind turbine layout has been reduced from 27 turbines to 25 wind turbines, and the wind layout and associated infrastructure have also been re-positioned to take into account the sensitivities. Additionally, the construction camp, substation and associated 132kV overhead power line have been re-positioned to optimise the layout. Approval of the amended wind farm layout is therefore requested.

The updated layout considering these amendments is illustrated in **Figure 2.1**. The sensitivity areas shown are classified as follows:

- » Very High Sensitivity – No-Go areas for wind turbines;
- » High Sensitivity – Acceptable with intensive mitigation measures;
- » Medium Sensitivity – Acceptable with mitigation measures; and
- » Low Sensitivity – Suitable for development.

In addition, the co-ordinates of the power line on Page 4 of the original EA dated 13th of October 2011 will need to be amended as follows (amendments are shown in **Bold** text):

From:

Alternative S1	Latitude	Longitude
Starting point of activity	S33° 17' 28.0"	E20° 23' 46.3"
Middle point of activity	S33° 17' 3.34"	E20° 26' 15.4"
End point of activity	S33° 16' 53.6"	E20° 29' 57.9"

To:

Alternative S1	Latitude	Longitude
Starting point of activity	S33°17'16.80"	E20°27'40.22"
Middle point of activity	S33°16'44.51"	E20°27'41.95"
End point of activity	S33°16'8.69"	E20°27'44.59"

2.3. Extension of validity of Environmental Authorisation

Condition 6 of the original EA dated 13 October 2011 states that the proposed activity must commence within a period of three (3) years from the date of issue, which would expire on 13 October 2014. The amended authorisation dated 26 November 2013 extended the validity of the EA by a further two (2) years, of which expiry would be 26 November 2015. Subsequent to this amendment, extension of the validity period was authorised in the amended EA dated 28 September 2015 by a further two (2) years, of which the EA would lapse on the 26 November 2017. Condition 1 of the latest approved amendment of the Environmental Authorisation (EA) which extends the validity of the EA states that the activity must commence within a period of three (3) years from the date of expiry of the amended EA dated 28 September 2015, of which the end of the current validity would be 28 September 2020. Witberg Wind Power (Pty) Ltd requests an extension of the validity of the EA by an additional two (2) years.

Condition 1 of the amended Environmental Authorisation dated 6th December 2017 is requested to be amended. The amendment is shown in **Bold** text as follows:

From:

"The activity must commence within a period of three (03) years from the date of expiry of the amended EA dated 28 September 2015 (i.e. the EA lapses on 28 September 2020)."

To:

"The activity must commence within a period of **five (05) years** from the date of expiry of the amended EA dated 28 September 2015 (i.e. the EA lapses on **28 September 2022**)."

2.4. Update of the EA and Consolidation of all Conditions of the Environmental Authorisation, Amendments and Appeal Decisions Conditions

Given that there are a number of amendments and appeal decisions on the environmental authorisation, it is requested that all relevant conditions for the environmental authorisation and appeal decisions are consolidated into one EA and updated where required. All details and conditions are to remain the same with the exception of the following requested amendments:

a) Update and adding the new contact person and details of the Holder of the EA

The contact person and relevant details of the holder of the environmental authorisation as authorised in EA Amendment 5 (12/12/20/1955/AM5) for the requested consolidated EA (on the relevant pages) need to be amended to reflect the new contact person, current postal address, and relevant cell phone and email contact details. The amendments are shown in **Bold** text as follows:

From:

Mr. Paolo Fagnoli
Witberg Wind Power (Pty) Ltd
Unit B103a Cape Quarter Piazza
72 Waterkant Street
Cape Town
8001

Telephone Number: (021) 418 3940

Email Address: p.fagnoli@buildingenergy.it

To:

Mr. Matteo Brambilla

Witberg Wind Power (Pty) Ltd
Postnet Suite 150
Private Bag X3
Roggebaai
8012

Telephone Number: (021) 418 3940

Cellphone Number: 079 180 3060

Email Address: m.brambilla@buildingenergy.it / s.harris@buildingenergy.it

b) Correct minor spelling errors in the listed activities as authorised in the original EA (12/12/20/1966) dated 13 October 2011

The correction of spelling errors in the listed activities as authorised in the original EA (12/12/20/1966) dated 13 October 2011 are requested for the following two activities as follows (the amendments are shown in **Bold** text):

From:

GN R.386 Item 1(m)

The construction of facilities or infrastructure, including associated structures or infrastructure, for any purpose in the one in ten year flood line of a river or stream, or within 32 metres from the back of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use, but including (i) canals; (ii) channels; (iii) bridges; (iv) dams; and (v) weirs.

GN R.386 Item 7

The above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic metres and less than 1 000 cubic metres at any one location or site.

To:

GN R.386 Item 1(m)

The construction of facilities or infrastructure, including associated structures or infrastructure, for any purpose in the one in ten year flood line of a river or stream, or within 32 metres from the **bank** of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use, but including (i) canals; (ii) channels; (iii) bridges; (iv) dams; and (v) weirs.

GN R.386 Item 7

The above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic metres **but** less than 1 000 cubic metres at any one location or site.

c) Update of all authorised listed activities in line with the current EIA Regulations (2014), as amended for equivalent activities

All approved listed activities as authorised in terms of the EIA Regulations (2006) are requested to be updated to the current EIA Regulations (2014), as amended, equivalent listed activities. The authorised listed activities in terms of the EIA Regulations (2006) and the requested equivalent listed activities to be updated as per the current EIA Regulations (2014), as amended, are shown in **Table 2.1** below. It is important to note that no new activities are being applied for, it is merely the equivalent listed activities that are listed and requested to be included in the amended EA being applied for in this motivation report and associated application.

Table 2.1: Original authorised listed activities in terms of the EIA Regulations (2006) and the requested equivalent listed activities to be updated as per the current EIA Regulations (2014), as amended.

Authorised Listed Activity in terms of the EIA Regulations (2006) as included in the EA	Equivalent Listed Activity in terms of the EIA Regulations (2014), as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
GNR 386 Activity 1(m): <i>The construction of facilities or infrastructure, including associated structures or infrastructure, for any purpose in the one in ten year flood line of a river or stream, or within 32m</i>	GNR 327 Activity 12(ii)(a)(c): <i>The development of – (ii) Infrastructure or structures with a physical footprint of 100 square metres or more</i>	Access roads are required through watercourses within the project site.

Authorised Listed Activity in terms of the EIA Regulations (2006) as included in the EA	Equivalent Listed Activity in terms of the EIA Regulations (2014), as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
<p>from the bank of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use, but including (i) canals; (ii) channels (iii) bridges; (iv) dams; and (v) weirs.</p>	<p>Where such development occurs- (a) within a watercourse (c) within 32 metres of a watercourse.</p>	
<p>GNR 386 Activity 7: The above ground storage or a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic metres at any one location or site.</p>	<p>GNR 327 Activity 14: The development and related operation of facilities and infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.</p> <p>And</p> <p>GNR 324 Activity 10(i)(ii): The development and related operation of facilities or infrastructure for the storage, or handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres in – i) Western Cape ii) All areas outside of urban areas.</p>	<p>The above ground storage or a dangerous good for petrol with a capacity of 45 cubic metres will be required for the proposed development.</p> <p>The above ground storage or a dangerous good for petrol with a capacity of 45 cubic metres will be required for the proposed development in the Western Cape in a area outside of urban areas.</p>
<p>GNR 386 Activity 12: The transformation or removal of indigenous vegetation of 3 hectares or more of any size where the transformation or removal would occur within a critically endangered or endangered ecosystem listed in terms of section 52 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).</p>	<p>GNR 324 Activity 12(i)(ii): The clearance of an area of 300 square metres or more of indigenous vegetation in – i) Western Cape ii) Within critical biodiversity areas identified in bioregional plans.</p>	<p>The construction of the Witberg WEF and associated infrastructure will result in the transformation of an area of up to 50 hectares of indigenous vegetation in the Western Cape in a critical biodiversity area.</p>
<p>GNR 386 Activity 15: The construction of a road that is wider than 4 metres or that has a reserve wider than 6 metres, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30 metres long.</p>	<p>GNR 327 Activity 24(ii): The development of a road – (ii) where no reserve exists where the road is wider than 8m.</p> <p>And</p> <p>GNR 324 Activity 4(i)(ii)(aa):</p>	<p>The Witberg WEF will require roads of 12m width.</p> <p>The Witberg WEF will require the</p>

Authorised Listed Activity in terms of the EIA Regulations (2006) as included in the EA	Equivalent Listed Activity in terms of the EIA Regulations (2014), as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
	<p>The development of a road wider than 4m with a reserve less than 13,5 metres in –</p> <ul style="list-style-type: none"> i) Western Cape ii) Areas outside of urban areas: <ul style="list-style-type: none"> aa) Areas containing indigenous vegetation. <p>And</p> <p>GNR 324 Activity 18(i)(ii)(aa): The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre in –</p> <ul style="list-style-type: none"> i) Western Cape ii) Areas outside of urban areas: <ul style="list-style-type: none"> aa) Areas containing indigenous vegetation. 	<p>development of a road of 12m width in an area in the Western Cape outside an urban area but in an area containing indigenous vegetation.</p> <p>The Witberg WEF will require the widening of a road by more than 4 metres and the lengthening of a road by more than a kilometre in an area in the Western Cape outside an urban area but in an area containing indigenous vegetation</p>
<p>GNR 386 Activity 16(b): The transformation of undeveloped, vacant or derelict land to – (b) residential, mixed, retail, commercial, industrial, or institutional use where such development does not constitute infill and where the total area to be transformed is bigger than 1 hectare.</p>	<p>GNR 325 Activity 15: The clearance of an area of 20 hectares or more of indigenous vegetation.</p>	<p>For the transformation of undeveloped and vacant land of up to 50 hectares for the erection of wind turbine and all associated infrastructure (underground and overhead cabling, access roads, crane pads, lay-down areas, borrow pits, electrical connections, substation etc. Transform the undeveloped and vacant land to industrial use. A power plant will be constructed and operated for 25 years on a site which was previously unused and in its original state, totalling its original character.</p>
<p>GNR 387 Activity 1(a): The construction of facilities or infrastructure, including associated structures or infrastructure, for (a) the generation of electricity where –</p> <ul style="list-style-type: none"> (i) The electricity output is 20 megawatts or more; or (ii) The elements of the facility cover a combined area in excess of 1 hectare. 	<p>GNR 325 Activity 1: The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20MW or more.</p>	<p>The Witberg WEF will be built with a contracted capacity of up to 120MW.</p>
<p>GNR 387 Activity 1(i): The construction of facilities or infrastructure, including associated structures or infrastructure, for the transmission and distribution of above</p>	<p>GNR 327 Activity 11: The development of facilities or infrastructure for the transmission and distribution of electricity –</p> <ul style="list-style-type: none"> (i) outside urban areas or industrial 	<p>The Witberg WEF will require a single or double overhead power line with a capacity of more than 33 but less than 275 kV.</p>

Authorised Listed Activity in terms of the EIA Regulations (2006) as included in the EA	Equivalent Listed Activity in terms of the EIA Regulations (2014), as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
ground electricity with a capacity of 120 kilovolts or more.	complexes with a capacity of more than 33 but less than 275kV or more.	Underground/Aboveground cabling of up to and including 33kV may also be constructed on the site to internally connect the turbines
GNR 387 Activity 2: Any development activity, including associated structures and infrastructure, where the total area of the developed area is, or is intended to be, 20 hectares or more.	GNR 325 Activity 15: The clearance of an area of 20 hectares or more of indigenous vegetation.	The Witberg WEF will require the clearance of an area of up to 50 hectares or more of indigenous vegetation.

d) Updating the project specific details of the EA

Given the requested amendments for the turbine specifications, it is requested that the following technical details are updated in the EA with relation to the information provided in **Table 2.2** below.

Table 2.2: Updated Technical Details to be reflected in the amended EA

Component	Description / Details
Location of the site	Western Cape Province
Facility area	Up to 50ha
SG Codes	<ul style="list-style-type: none"> » Remainder of the Farm Jantjesfontein 164 - C0430000000016400000; » Remainder of the Farm Besten Weg 150 - C0430000000015000000; » Remainder of Portion 1 of the Farm Besten Weg 150 - C0430000000015000001; » Remainder of the Farm Tweedside 151 - C0430000000015100000; » Remainder of the Farm Elandskrag 269 - C0430000000026900000; and » Portion 1 of the Farm Elandskrag 269 - C0430000000026900001.
Site Access	Off the N1
Export capacity	Up to 120MW
Proposed technology	Wind turbines
Number of turbines	25
Hub height from ground level	Range from 92m to up to 120m
Rotor diameter	Range from 116m to up to 136m
Individual turbine capacity	Range from 3MW to up to 5MW
Associated infrastructure	<ul style="list-style-type: none"> • Turbine hardstand area • Substation/s • Overhead powerline/s connecting to the substation and collector substation • Underground powerlines • Access roads • Maintenance and operation buildings • Internal road infrastructure • Laydown area and construction camp

Component	Description / Details
Area occupied by substations	10 000m ² equates to 1ha
Area occupied by individual hardstand area	2100m ² (25 wind turbines – 52500m ²) 5.25ha
Area occupied by both permanent and construction lay-down areas	22 000m ² (2.2ha)
Area occupied by buildings	Within 1ha of the substation
Width and length of internal roads	12m width 28km length total (~33ha)
Proximity to grid connection	2.5km
Type and height of fencing	Not Applicable

e) Consolidation of all Conditions of the Environmental Authorisation and Appeal Decisions Conditions

The requested consolidation of conditions requested as well as relevant updates (in terms of technical specifications, name changes that are specific to the applicant and latest request for extension of the validity period of the EA as requested in this amendment), are shown below in **Table 2.1**. Importantly, recommendations made as part of this amendment application (**Section 9**) for inclusion into the amended EA have not been included in the table below, as these would need to be approved by the DEA, and subsequently added to the EA, should it be granted.

Table 2.1: The requested EA Consolidated Conditions and relevant updates⁴ (where required) to be included in the Amended Environmental Authorisation with reasons for each update included.

#	Requested EA consolidated conditions	Reason for update
1	The <i>25-wind turbine Witberg Wind Energy Facility and associated infrastructure layout</i> is approved.	Wind turbine layout has been reduced to 25 wind turbines
2	Authorisation of the activity is subject to the conditions in this authorisation, which form part of the environmental authorisation and are binding on the holder of the authorisation.	To remain as is.
3	The holder of the authorisation is responsible for ensuring compliance with the conditions contained in this environmental authorisation. This includes any person acting on the holder's behalf, including but not limited to, an agent, servant, contractor, subcontractor, employee, consultant or person rendering a service to the holder of the authorisation.	To remain as is.
4	The activity authorised may only be carried out at the property as described below: <ul style="list-style-type: none"> • <i>Remainder of the Farm Jantjefontein 164</i> • <i>Remainder of the Farm Besten Weg 150</i> • <i>Remainder of Portion 1 of the Farm Besten Weg 150</i> • <i>Remainder of the Farm Tweedside 151</i> • <i>Remainder of the Farm Elandskrag 269</i> • <i>Portion 1 of the Farm Elandskrag 269</i> 	Properties were not included in the original EA. These properties therefore need to be included.
5	Any changes to, or deviations from, the project description set out in this authorisation must be approved, in writing, by the Department before such changes or deviations may be effected. In assessing whether to grant such approval or not, the Department may request such information as it deems necessary to evaluate the significance and impacts of such changes or deviations and it may be necessary for the	To remain as is.

⁴ Updates to the various conditions are shown in *italics*.

#	Requested EA consolidated conditions	Reason for update
	holder of the authorisation to apply for further authorisation in terms of the regulations.	
6	<i>The activity must commence within a period of five (05) years from the date of expiry of the amended EA dated 28 September 2015 (i.e. the EA lapses on 28 September 2022).</i>	This update is as per the requested amendment applied for herein.
7	Commencement with one activity listed in terms of this authorisation constitute commencement of all authorised activities.	To remain as is.
8	This authorisation does not negate the holder of the authorisation's responsibility to comply with any other statutory requirements that may be applicable to the undertaken of the activity.	To remain as is.
9	<p>Relevant legislation that must be complied with by the holder of this authorisation includes, <i>inter alia</i>:</p> <ul style="list-style-type: none"> • Archaeological remains, artificial feature and structures older than 60 years are protected by National Heritage Resources Act, 1999 (Act 25 of 1999). Should any archaeological artefacts be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped immediately. A registered Heritage Specialist must be called to the site for inspection. Under no circumstances shall any heritage material be destroyed or removed from the site and the relevant heritage resource agency must be informed about the finding. Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from the South African Heritage Resources Agency and/or any of their delegated provincial agencies. • Relevant provisions of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) • Relevant provisions of the National Water Act, 1998 (Act 36 of 1998) • Relevant provisions of the National Forest Act, 1998 (Act 84 of 1998) • Relevant provisions of the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) • Relevant provisions of the National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003) and its regulation. • Should fill material be required for any purpose, the use of borrow pits must comply with the provisions of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002) administered by the Department of Mineral Resources. 	To remain as is.
10	The holder of an environmental authorisation has the responsibility to notify the competent authority of any alienation, transfer and change of ownership rights in the property which the activity is to take place.	To remain as is.
NOTIFICATION OF AUTHORISATION		
11	The holder of the authorisation must notify every registered interested and affected part, in writing and within 12 (twelve) calendar days of the date of this environmental authorisation, of the decision to authorise the activity.	To remain as is.
12	The notification referred to must-	
12.1	specify the date on which the authorisation was issued;	To remain as is.

#	Requested EA consolidated conditions	Reason for update
12.2	inform the interested and affected party of the appeal procedure provided in Chapter 7 of the Environmental Impact Assessment (EIA) Regulations, 2010;	To remain as is.
12.3	advise the interested and affected party that a copy of the authorisation will be furnished on requested; and	To remain as is.
12.4	give the reasons for the decision.	To remain as is.
MANAGEMENT OF THE ACTIVITY		
13	The <i>updated</i> Environmental Management Programme (EMPr) for the construction submitted as part of the application for environmental authorisation is hereby approved and must be implemented during the construction, operation and rehabilitation phases of the activity. The EMPr will be seen as a dynamic document. However, any changes to the EMPr must be submitted to the authorities <i>in line with Part 3 and Part 4 of the EIA Regulations (2014), as amended, where required.</i>	Reference to "EMP" is outdated in terms of the current EIA Regulations (2014), as amended. This must be updated to "EMPr" be in line with the current applicable legislation.
14	The EMPr must be included in all contract documentation for the construction phase of the development.	Reference to "EMP" is outdated in terms of the current EIA Regulations (2014), as amended. This must be updated to "EMPr" be in line with the current applicable legislation.
15	The provisions of the EMPr are an extension to the conditions of the EA and therefore non-compliance with the EMPr shall constitute non-compliance with the EA.	Reference to "EMP" is outdated in terms of the current EIA Regulations (2014), as amended. This must be updated to "EMPr" be in line with the current applicable legislation.
16	The recommendations and mitigation measures recorded in the final EIR dated 28 July 2011 <i>and all relevant amendments</i> , must be adhered to.	Inclusion for recommendations and mitigation measures as part of the amendment applications have been included here as these are related to the current project.
MONITORING		
17	The applicant must appoint a suitably experienced Environmental Control Officer (ECO) for the construction phase of the development that will have the responsibility to ensure that the mitigation/rehabilitation measures and the recommendations referred to in this authorisation are implemented and to ensure compliance with provisions of the EMPr.	Reference to "EMP" is outdated in terms of the current EIA Regulations (2014), as amended. This must be updated to "EMPr" be in line with the current applicable legislation.
18	The ECO shall be appointed before commencement of any authorised activity.	To remain as is.
19	Once appointed, the name and contact details of the ECO must be submitted to the Director: Compliance Monitoring of the Department.	To remain as is.
20	The ECO shall keep record of all activities on site, problems identified, transgressions noted and a task schedule of task undertaken by the ECO.	To remain as is.
21	The ECO shall remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is ready for operation.	To remain as is.
22	Records relating to monitoring and auditing must be kept on site and	To remain as is.

#	Requested EA consolidated conditions	Reason for update
	made available for inspection to any relevant and competent authority in respect of this development.	
RECORDING AND REPORTING TO THE DEPARTMENT		
23	All documentation e.g. audit/monitoring/compliance reports and notifications, required to be submitted to the Department in terms of this authorisation, must be submitted to the Director: Compliance Monitoring at the Department.	To remain as is.
24	The holder of the authorisation must submit an environmental audit report upon completion of the construction and rehabilitation activities <i>in line with section 34 of the EIA Regulations (2014), as amended.</i>	To be updated in line with current EIA Regulations (2014), as amended, in terms of auditing requirements.
25	The environmental audit report must be <i>in accordance with the requirements of Appendix 7 of the EIA Regulations (2014), as amended, and indicate the date of the audit, name of the auditor and the outcome of the audit in terms of compliance with the environmental authorisation conditions as well as the requirements of the EMPr.</i>	To be updated in line with current EIA Regulations (2014), as amended, in terms of auditing requirements. Reference to "EMP" is outdated in terms of the current EIA Regulations (2014), as amended. This must be updated to "EMPr" be in line with the current applicable legislation.
COMMENCEMENT OF THE ACTIVITY		
26	The authorised activity shall not commence within twenty (20) days of the date of signature of the authorisation.	To remain as is.
27	<i>In terms of Section 43(7), an appeal under section 43 of the National Environmental Management Act (NEMA), Act 107 of 1998 (as amended), will suspend an environmental authorisation or exemption, or any provision or conditions attached thereto, or any directive, unless the Minister, MEC or delegated organ of state directs otherwise.</i>	To be updated in terms of the current relevant provisions of NEMA.
NOTIFICATION TO AUTHORITIES		
28	Fourteen (14) days written notice must be given to the Department that the activity will commence. Commencement for the purpose of this condition includes site preparation. The notice must include a date on which it is anticipated that the activity will commence.	To remain as is.
OPERATION OF THE ACTIVITY		
29	Fourteen (14) days written notice must be given to the Department that the activity operational phase will commence.	To remain as is.
SITE CLOSURE AND DECOMMISSIONING		
30	Should the activity ever cease or become redundant, the applicant shall undertake the required actions as prescribed by legislation at the time and comply with all relevant legal requirements administered by any relevant and competent authority at that time.	To remain as is.
GENERAL		
31	A copy of this authorisation must be kept at the property where the activity will be undertaken. The authorisation must be produced to any authorised official of the Department who requires to see it and must be made available for inspection by any employee or agent of the holder of the authorisation who works or undertakes work at the property.	To remain as is.
32	Where any of the applicant's contact details change, including the	To remain as is.

#	Requested EA consolidated conditions	Reason for update
	name of the responsible person where the applicant is juristic person, the physical or postal address and/or telephonic details, the applicant must notify the Department as soon as the details become to the applicant.	
33	The holder of the authorisation must notify the Department, in writing and within 48 (forty-eight) hours, if any condition of this authorisation cannot be or is not adhered to. Any notification in terms of this condition must be accompanied by reasons for the non-compliance with a condition of this authorisation may result in criminal prosecution or other actions provided for in the National Environmental Management Act, 1998 and the regulation.	To remain as is.
34	National government, provincial government, local authorities or communities appointed in terms of the conditions of this authorisation or any other public authority shall not be held responsible for any damages or losses suffered by the applicant or his successor in title in any instance where construction or operation subsequent to construction be temporarily or permanently stopped for reasons of non-compliance by the applicant with the conditions authorisation as set out in this document or any subsequent document emanating from these conditions of authorisation.	To remain as is.
35	The number of wind turbines for the proposed wind farm to be restricted to 25 and their dimensions to be restricted to a range from 92m up to 120m hub height and a range of 116m up to 136m rotor diameter.	To be updated in line with requested project specifications amendment requested herein.
36	Remove all mounds of aggregate or rocks created during construction within 200m of each wind turbine which could serve as a hyrax habitat, which removal shall occur before commencement of operation of each turbine.	To remain as is.
37	<i>Pre-construction (if required), post-construction and operation phase monitoring must be undertaken, taking into consideration Verreaux's-Eagles (including juveniles) and Booted Eagle, and the monitoring of breeding / nesting sites.</i>	Pre-construction monitoring has already been undertaken in 2014/2015. However, in line with the latest bird monitoring guidelines, there may be a need for repeated pre-construction monitoring if construction only commences three years after the initial pre-construction monitoring. This condition has been updated to refer the applicant to the required avifaunal pre-construction (if required), post-construction and operation phase monitoring.
38	Monitoring reports and data to be made publicly available and sent to the Department of Environmental Affairs and BirdLife South Africa within three months of the monitoring cycle being completed (i.e. every year).	To remain as is.
39	Monitoring is subjected to annual audits by an independent reviewer.	To remain as is.
40	Should any unanticipated negative impacts be recorded, <i>Witberg Wind Power (Pty) Ltd</i> commits to reducing these impacts. Mitigation measures to achieve this include shutting down problematic turbines, if this is deemed necessary.	To be updated in line with requested amendment to update the details of the Holder of the EA to Witberg Wind Power (Pty) Ltd.

#	Requested EA consolidated conditions	Reason for update
41	After discussion with the Department and prior to the commencement of construction, the applicant must develop and implement a monitoring programme for the Verreaux's Eagles, to the satisfaction of the Department and to Birdlife South Africa by the applicant within 30 days of being developed.	To remain as is.

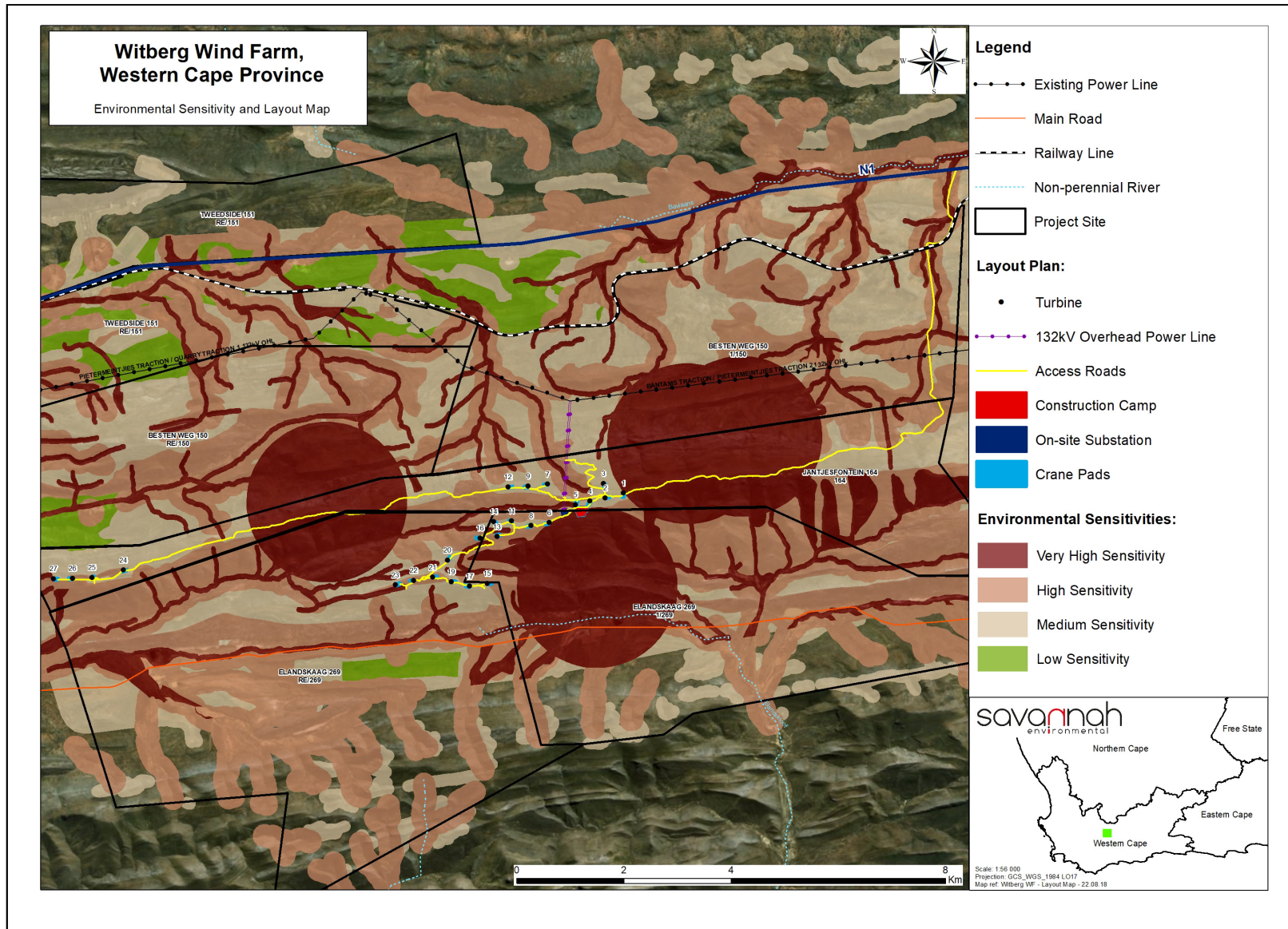


Figure 2.1: The updated 25 wind turbine wind farm layout for the Witberg Wind Energy Facility (A3 Map included in **Appendix J**).

3. MOTIVATION FOR THE PROPOSED AMENDMENTS

3.1. Technical Motivation for the Amendment of Turbine Specifications

The project is intended to be bid into future rounds of the Department of Energy's (DoE) Renewable Energy Independent Power Producers Procurement (REIPPP) Programme.

Wind turbine generators are constantly under development to increase the potential energy output per wind turbine. The more energy one turbine can produce, the less turbines are required. Following developments in technology after the issuing of the original EA, and in finalising the site development plan on the basis of the wind monitoring results from the site, as well as economic efficiency considerations, the applicant is proposing to install a turbine technology which is best suited to the conditions on the site. These amendments are proposed in order to increase the efficiency of the facility and consequently, the economic competitiveness thereof.

By potentially installing wind turbine generators with a larger rotor diameter, hub height and energy generation capacity, it will increase the energy output per turbine thereby reducing the number of turbines required and increasing the efficiency of the wind farm. The applicant proposes to amend the EA to allow for the use of such larger wind turbines before the site development plan is optimised so that the larger turbines can be considered, should DEA wish to authorise the amendment of the EA. Importantly, the overall output capacity of the wind energy facility will remain within the authorised capacity of 120MW.

3.2. Motivation for the Amendment of the Wind Farm Layout

The proposed amended of the wind farm layout is required to avoid identified sensitive areas (bat sensitivity areas and Verreaux's Eagle nest 1.5km buffer). The wind turbines in very high sensitivity areas have therefore been removed where required, and re-positioned resulting in a reduction in wind turbine numbers from 27 wind turbines to a 25-wind turbine layout. Additionally, the construction camp, substation, linking station and associated 132kV overhead power line have been re-positioned to optimise the layout.

3.3. Extend the validity of the EA

The project is intended to be bid in future rounds of the Department of Energy's (DoE) Renewable Energy Independent Power Producers Procurement (REIPPP) Programme. A valid EA is required for future project development and bid submission purposes. Therefore, the validity of the EA is requested to be extended in order to remain valid should the Project become a Preferred Bidder in the next bidding round. The EA for the wind energy facility is therefore requested to be extended by an additional two (02) years from the date of validity.

3.4. Update of the EA and Consolidation of all Conditions of the Environmental Authorisation and Appeal Decisions Conditions

Given that there are a number of amendments and appeal decisions on the environmental authorisation, it is requested that all relevant conditions for the environmental authorisation and appeal decisions are consolidated into one EA and updated where required.

The overall reason for this is to have a consolidated EA which contains all the relevant conditions for the proposed development, thereby facilitating compliance monitoring by both the applicant and the DEA during implementation of the project.

a) Update and adding the new contact person and details of the Holder of the EA

The contact person and relevant details for the Holder of the EA has changed and therefore is requested to be updated in the EA.

b) Correct minor spelling errors in the listed activities as authorised in the original EA (12/12/20/1966) dated 13 October 2011

The correct wording for listed activities GN R.386 Item 1(m) and GN R.386 Item 7 is requested to be in accordance with the relevant Regulations. Therefore, the amendments to correct spelling errors are requested.

c) Update of all authorised listed activities in line with the current EIA Regulations (2014), as amended for equivalent activities

The original EA was issued under the EIA Regulations 2006, which have since been replaced with the EIA Regulations (2014), as amended. Therefore, the relevant listed activities are required to be updated in line with the current applicable legislation.

d) Updating the project specific details of the EA

The requested consolidated EA will need to include the project specific details of the proposed development, which will include the requested technical project specification amendments for the proposed development. In addition to this, it has been requested by the DEA in the comments letter on the draft motivation report (dated 13 December 2018) – comment (c) (ii) - that the final report must provide the technical details for the proposed facility in a table format as well as their description and/or dimensions. The table included in the requested amendment herein is provided in response to this requirement.

e) Consolidation of all Conditions of the Environmental Authorisation and Appeal Decisions Conditions

The reason for this requested amendment is to have a consolidated EA which contains all the relevant and updated applicable conditions for the proposed development, thereby facilitating compliance monitoring by both the applicant and the DEA during implementation of the project.

4. CONSIDERATIONS IN TERMS OF THE REQUIREMENTS OF THE EIA REGULATIONS

In terms of Regulation 31 of the EIA Regulations 2014, as amended, an EA may be amended by following the process in this Part (i.e. a Part 2 amendment) if it is expected that the amendment may 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 authorisation.

In this instance, the proposed amended turbine specifications and amended layout were not assessed in the initial authorisation and subsequent amendments. The change does not however, on its own, constitute a listed or specified activity. Therefore, the application is made in terms of Regulation 31(a). As required, the following is considered for the proposed amendments:

- (i) an assessment of all impacts related to the proposed change;
- (ii) advantages and disadvantages associated with the proposed change;
- (iii) measures to ensure avoidance, management and mitigation of impacts associated with such proposed change; and
- (iv) any changes to the EMPr.

5. POTENTIAL FOR CHANGE IN THE SIGNIFICANCE OF IMPACTS AS ASSESSED IN THE EIA AS A RESULT OF THE PROPOSED AMENDMENTS

An amendment application for the requested amendments has been submitted to the DEA. The DEA has advised that this application is considered to be a Part 2 amendment as contemplated in terms of Regulation 31 of the EIA Regulations (2014), as amended. In terms of Regulation 32(1)(i), the following section provides an assessment of the impacts related to the Part 2 amendment, i.e. the proposed change in turbine specifications and amended layout. Understanding the nature of the proposed amendments and the impacts associated with the project (as assessed within the EIA and monitoring), the following have been considered:

- » Impacts on birds;
- » Impacts on bats;
- » Ecological Impacts;
- » Heritage Impacts;
- » Visual impacts;
- » Noise impacts; and
- » Social impacts.

The potential for change in the significance and/or nature of impacts based on the proposed amendments as described within this motivation report is discussed below. Specialist's assessment addendum reports are contained in **Appendix A-H**. Additional mitigation measures recommended by the specialists have been included in *italics* within this report for ease of reference. These have been included within the EMPr for the project (refer to **Appendix K**). This section of the main report must be read together with these specialist studies in order to obtain a complete understanding of the proposed amendments and the implications thereof.

5.1. Collision Risk Modelling on Birds

A 25-wind turbine layout along with the requested turbine specifications amendments was assessed by Dr. Percival whom undertook the Collision Risk Modelling for this amendment application, as per the update report dated January 2019 (**Appendix A**). The collision risk modelling was undertaken for the proposed Witberg wind farm in which a 25-turbine layout was considered, with a larger (136m) rotor diameter and various hub height alternatives (92m, 105m and 120m). The layout revision included moving turbines to ensure that there are none located within 1.5km of any Verreux's Eagle nest (as recommended by Birds Unlimited, 2015 – refer to **Appendix B**). The collision risk modelling report provides a comparison of the predicted collision risk to key bird species for the updated 25-wind turbine layout with the authorised 27-turbine scheme reported previously. The scope specifically included:

- » An update of the collision risk modelling using a 136m diameter rotor, for hub heights from 92-120m and an updated 25-turbine layout; and
- » A re-assessment of the likely impacts of the updated 25-turbine layout on birds.

The updated 25-turbine layout considered a larger rotor diameter (136m). Three different hub height options are also being considered as follows:

- » Scenario 1: 136m rotor diameter, 92m hub height;
- » Scenario 2: 136m rotor diameter, 105m hub height; and
- » Scenario 3: 136m rotor diameter, 120m hub height.

The wind turbine data used in the collision risk modelling is shown in **Table 5.1** below.

Table 5.1: Wind turbine data used in the January 2019 collision risk modelling

Specification	Value used in previous collision risk modelling (authorised 27-turbine scheme)	Scenario 1	Scenario 2	Scenario 3
Hub height	92m	92m	105m	120m
Rotor diameter	116m	136m	136m	136m
Height to blade tip	150m	160m	173m	188m
Minimum height of blade above ground	34m	24m	37m	52m
Rotational speed (variable – mean value)	11.9 (eastern turbine block), 11.68 (western turbine block)	9.8 (mean overall)	9.8 (mean overall)	9.8 (mean overall)
Blade maximum chord	3.28m	4.1m	4.1m	4.1m
Blade pitch (variable – mean value calculated from local wind speed data measured by WWP)	4.13° (eastern turbine block), 3.34° (western turbine block)	4.13° (eastern turbine block), 3.34° (western turbine block)	4.13° (eastern turbine block), 3.34° (western turbine block)	4.13° (eastern turbine block), 3.34° (western turbine block)
Turbine operation time (when not constrained by high/low wind speed or maintenance activity)	92% (eastern turbine block), 90% (western turbine block)	92% (eastern turbine block), 90% (western turbine block)	92% (eastern turbine block), 90% (western turbine block)	92% (eastern turbine block), 90% (western turbine block)

Two key species, Verreaux's Eagle and Booted Eagle were modelled for each of the three scenarios. The collision risks for Martial Eagle and Black Harrier were not modelled as the collision risk associated with both the authorized and the revised layouts would be zero (no flights of either species were recorded flying through the collision risk zone of either layout). No other key species were recorded flying through the collision risk zone at rotor height during the baseline surveys.

There were three key differences in relation to the collision risk modelling compared with the authorized 27-turbine layout: (a) a revised site layout and hence an updated collision risk zone; (b) updated minimum heights of blades above the ground resulting in a difference in proportion of flights at rotor height, for three different hub heights; and (c) a larger rotor swept area resulting in an increased collision risk volume but reduced rotational speed.

Table 5.2 shows the predicted collision risks for each of the two key species that were recorded flying through the collision risk zone, for each of the three wind turbine scenarios. This Table also gives the context of their background mortality and the percentage increase over the baseline that each risk represents, for each scenario and for the authorized 27-turbine layout. For Verreaux's Eagle, the assessment summarised in the table below assesses the collision risk against the adult population, as the large majority of records from the site relate to adult birds. Juveniles are assessed separately below.

Table 5.2: Collision risk for Verreaux's Eagle and Booted Eagle for each of the three wind turbine scenarios, and the increases that these represent over baseline mortality, and comparison with the authorised 27-turbine layout shown in *italics*.

Species	Scenario	Rotor diameter (m)	Hub height (m)	Predicted collision risk (98% avoidance rate)	% increase over baseline mortality	Magnitude of effect	Likely significant effect?
Verreaux's Eagle	Revised 25-turbine layout: scenario 1	136	92	0.33	0.35%	Negligible	No
	Revised 25-turbine layout: scenario 2	136	105	0.29	0.31%	Negligible	No
	Revised 25-turbine layout: scenario 3	136	120	0.26	0.28%	Negligible	No
	<i>Authorized 27-turbine layout</i>	<i>116</i>	<i>92</i>	0.86	<i>0.92%</i>	<i>Negligible</i>	<i>No</i>
Booted Eagle	Revised 25-turbine layout: scenario 1	136	92	0.040	0.008%	Negligible	No
	Revised 25-turbine layout: scenario 2	136	105	0.039	0.008%	Negligible	No
	Revised 25-turbine layout: scenario 3	136	120	0.037	0.008%	Negligible	No
	<i>Authorized 27-turbine layout</i>	<i>116</i>	<i>92</i>	0.031	<i>0.006%</i>	<i>Negligible</i>	<i>No</i>

Collision risks for the revised 25-turbine layout were lower than for Verreaux's Eagle, but slightly higher for Booted Eagle to those presented previously in the 2013 report for the authorised 27-turbine layout, with the higher hub height scenarios giving a reduced risk.

For Booted Eagle, the predicted collision risk of all three scenarios was very small both numerically and in a population context (though was marginally higher for the revised 25-turbine layout than the authorised 27-turbine layout). It represented considerably less than a 1% increase over the existing baseline mortality of the regional population (and was therefore classed as being of negligible magnitude). With such a negligible magnitude risk, there would not be likely to be any regionally significant population impact for this species for any of the scenarios assessed.

For Verreaux's Eagle, the authorised 27-turbine layout using a 116m rotor diameter turbine and 92m hub height, had a collision risk of 0.86 adult Verreaux's Eagle per year. It was concluded that this would be a negligible magnitude effect, less than a 1% increase over the baseline mortality, which would be of very low significance and not result in a significant impact.

The three scenarios currently investigated produced predictions of 0.33, 0.29 and 0.26 Verreaux's Eagle collisions per year, equivalent to increases over the baseline mortality of 0.35%, 0.31% and 0.28% respectively. All three were lower risk for this species than the authorised 27-turbine layout, with lower risks for the higher hub height scenarios. All of the risks would be negligible magnitude, and not significant, giving no material change to the conclusion reached previously.

The assessment of the collision risk for juvenile Verreaux's Eagle, expressed in the context of their background mortality and the % increase over the baseline that each risk represents is shown in **Table 5.3**.

For all of the layouts and turbine specification scenarios the predicted juvenile mortality, even applying a highly precautionary 95% avoidance rate, would be a negligible magnitude impact, being less than a 1% increase over the regional baseline mortality.

Table 5.3: Additional collision risk assessment for Verreaux's Eagle juveniles and the increases that these represent over baseline mortality, with previous results for the authorized 27-turbine layout shown in *italics*

Scenario	Rotor diameter (m)	Hub height (m)	Predicted collision risk (95% avoidance rate)	% increase over baseline mortality	Magnitude of effect	Likely significant effect?
Revised 25-turbine layout: scenario 1	136	92	0.08	0.03%	Negligible	No
Revised 25-turbine layout: scenario 2	136	105	0.07	0.03%	Negligible	No
Revised 25-turbine layout: scenario 3	136	120	0.06	0.02%	Negligible	No
<i>Authorized 27-turbine layout</i>	<i>116</i>	<i>92</i>	<i>0.21</i>	<i>0.08%</i>	<i>Negligible</i>	<i>No</i>

As in the previous collision risk assessments for this site, consideration was also given to the consequences of increasing the juvenile flight activity, assessing the risk on a precautionary theoretical basis rather than using field data. Even if flight activity were increased 10-fold over the observed adult rate, the collision risk would still be a negligible magnitude effect for all of the three scenarios (and would be lower risk than the authorized 27-turbine layout).

5.1.1. Comparative Assessment

No comparative assessment was provided as no impact assessment was undertaken for the collision risk modelling assessment which was undertaken for the purposes of informing an appeal process. The potential impact rating significance on avifauna was however accounted for in the avifauna impact assessment report undertaken by Rob Simmons. The findings of this report are provided in **Section 5.2** below.

5.1.2. Conclusion

Overall the assessment update of the collision risk for three turbine scenarios (all with the revised 25-turbine layout) found a reduced collision risk for Verreaux's Eagle in comparison with the authorized 27-turbine layout with a 116m rotor diameter turbine and 92m hub height. For Booted Eagle a small increase in risk was found. Collision risk to both species was lowest for the highest hub height (reflecting a lower proportion of flights at rotor height for that scenario). This did not, however, make any material difference to the conclusions reached. There would be negligible magnitude collision risks to all of the key species assessed, which would not result in any significant ornithological impacts. All three of the new scenarios tested yielded negligible magnitude collision risks across the range of 92m-120m hub height which would not be significant, and the same conclusion would be valid for any hub height between those values. In other words, should Witberg Wind Power (Pty) Ltd in the future consider an alternative turbine with a hub height between 92m and 120m, no additional collision risk assessments would be required as the results included in this report would remain valid.

5.2. Impacts on Birds

The bird (avifauna) impact assessment (**Appendix B**) contains an appraisal of the amendments made for the proposed Witberg Wind Energy Facility, and their likely impacts on the avian community, particularly the eagles. The avian component was previously reported on in 2012, following six site visits (Anchor Environmental, refer to **Appendix B**) and the use of the area by juvenile Verreaux's Eagles, specifically in 2014 over four site visits (Simmons and Martins 2015, refer to **Appendix B**), including Collision-Risk Modelling (CRM: Percival 2013, refer to **Appendix A**). The original 70 turbines of 80-m hub height (HH) proposed by the developer, Witberg Wind Power (Pty) Ltd, in 2012, was reduced on appeal to the minister to 27 turbines of 92-m HH following the CRM and public comment. The following changes are requested and their impacts on the avifauna assessed: (i) a decrease in the number of turbines to 25; (ii) a 30% increase in hub height of the turbines from 92-m to 120-m; and (iii) a 17% increase in rotor diameter from 116-m to 136-m.

Literature surveys suggest that the effect of the changes proposed on the authorised project are expected to be mainly negative because of the statistically significant increase in collisions for higher turbines (Loss et al. 2013, Simmons et al. MS). However, the Collision-Risk model (CRM) based on site-specific avifaunal data suggested lower eagle fatalities (Percival, 2018). This was reported to potentially affect a suite of collision-prone birds, highlighted by Turpie et al. (2012), Simmons and Martins (2015), particularly the Verreaux's Eagles *Aquila verreauxii* that breed in the area. Thus, impacts with the blades of the wind turbines, and the associated power line network, were identified as the biggest potential risks with turbines placed on the upland ridges or near foraging areas. Theoretically, if the rotor blade length is doubled, a four-fold greater risk area is assumed to be created if the turbines are placed in areas used by the species of concern. If hub height is also increased, then it was determined that birds flying higher could be impacted. A meta-analysis from North America reported a strongly significant effect of increased hub height on proportionately more avian fatalities, in a large sample of wind farms with turbines up to 80-m hub height. The statistical modelling used in the avifauna impact assessment, using data from North America and including South African turbines (not Witberg wind farm data) with hub heights up to 92-m found that avian fatalities are forecast to double for turbines increasing from 92-m to 120-m hub height. However, to consider site specific data, a CRM was prepared by Dr S. Percival (2019) using the Band et al (2007) method (refer to Section 5.1 above). To implement the precautionary principle and since the CRM estimated 0.28 Verreaux's Eagle adult and juvenile fatalities annually (Percival 2018, 2019) with taller turbines, it was concluded that by combining the two models it can be estimated that, on average, 0.56 Verreaux's Eagles *Aquila verreauxii* and 0.08 Booted Eagle *Aquila hieraetus* fatalities will occur per year. Further mitigations are required if the recorded level of eagle fatalities exceeds 1.0 Verreaux's Eagle per year to reach acceptable levels. **Potential** mitigations recommended for risky turbines include black-blade painting and shut-down-on-demand.

5.2.1. Comparative Assessment

Direct Mortality, Disturbance and Avoidance (Construction Phase):

Nature: Direct mortality, disturbance or avoidance of area around the wind farm for the raptors identified as “at risk” above due to human disturbance, heavy machinery, or overhead lines, during construction.				
	Authorised		Proposed Amendment	
	Without mitigation	With mitigation	Without mitigation	With mitigation
Extent	Local (1)	Local (1)	Local (1)	Local (1)
Duration	Short Term (2)	Short Term (2)	Short Term (2)	Short Term (2)
Magnitude	Moderate (6)	Low (4)	Moderate (6)	Low (4)
Probability	Highly Probable (4)	Distinct Probability (3)	Highly Probable (4)	Distinct Probability (3)
Significance	36 (Medium)	21 (Low)	36 (Medium)	21 (Low)
Status (positive or negative)	Negative	Negative to Neutral	Negative	Negative to Neutral
Reversibility	High	High	High	High
Irreplaceable loss of resources?	No (Both Verreaux's and Booted Eagles may suffer short term disturbance, displacement, and loss of breeding but return after construction)	Reduced	No (Both Verreaux's and Booted Eagles may suffer short term disturbance, displacement, and loss of breeding but return after construction)	Reduced
Can impacts be mitigated?			Partially, yes	
Mitigation:				
» Disturbance during wind farm construction was found to have greater impacts on birds in the UK than post-construction impacts (Pearce-Higgins et al. 2012). There are generally two classes of mitigation to avoid disturbing Red Data birds around wind farms during construction: (i) limit construction activities (building, blasting etc.) to seasons when birds are not breeding – to reduce disturbance causing nest failure; (ii) limit construction activities (building, worker-presence, power-line-stringing) from areas within 1000-m of known Red Data species' nests at times when eagles or other Red Data species are incubating/feeding small nestlings. Verreaux's Eagles start breeding in April-July and have a small nestling on the nest from June – August (Simmons 2005).				
» We therefore, recommend as mitigations: (i) not constructing within 1000-m of Verreaux's Eagle nests or Booted Eagle nest during their early breeding season (May – June) or small-chick rearing season (June – July). For breeding Booted Eagles, the seasons to avoid are August – September; (ii) avoid blasting or causing noise disturbance in the same seasons anywhere within 3-km of active nests for all Red Data species.				

Direct Mortality, Disturbance and Avoidance (Operation Phase):

Nature: Direct mortality, disturbance or avoidance of area around the wind farm for the raptors identified as “at risk” above due to human disturbance, heavy machinery, or overhead lines, during construction.				
	Authorised		Proposed Amendment	
	Without mitigation	With mitigation	Without mitigation	With mitigation
Extent	Local (1)	Local (1)	Local (1)	Local (1)
Duration	Long Term (5)	Long Term (5)	Long Term (5)	Long Term (5)
Magnitude	High (8)	Moderate (6)	High (8)	Moderate (6)

Probability	Highly Probable (4)	Distinct Probability (3)	Highly Probable (4)	Distinct Probability (3)
Significance	56 (Medium-High)	36 (Medium)	56 (Medium-High)	36 (Medium)
Status (positive or negative)	Negative	Negative to Neutral	Negative	Negative to Neutral
Reversibility	Low	High	Low	High
Irreplaceable loss of resources?	No (Verreaux's Eagles are not uncommon, and the rarer Booted Eagles may be less susceptible to collision and displacement)	Reduced	No (Verreaux's Eagles are not uncommon, and the rarer Booted Eagles may be less susceptible to collision and displacement)	Reduced
Can impacts be mitigated?	Yes		Partially, yes	

Mitigation:

There are generally five classes of mitigation for birds around wind farms: (i) re-position the turbines to avoid impacts or disturbance for the birds; (ii) redesign the turbines to alter the present pattern/shape/size of the turbines so birds see them more readily and avoid contact; (iii) curtail or shut-down-on-demand the turbines when collision-prone birds approach; (iv) manipulate the habitat to reduce the attractiveness of the site to collision-prone raptors; (v) reduce the overall number/height of turbines.

Because the combination of the CRM (Percival 2018) and the Loss model forecasts that the taller turbines are predicted to increase fatalities to 0.72 adult + juvenile Verreaux's Eagles per year (for 120-m turbines at 98% avoidance rates), this is judged to be an acceptable level of mortality because it reduces the number below one eagle per year, and it reduces the fatalities to below that for the already authorized turbine layout (0.92 adult + juvenile Verreaux's Eagles for 92-m turbines). If the fatality rate is higher than these two models predict (i.e. >1.0 eagle per year) then mitigations will be required.

The following mitigations are recommended:

- » The turbines closest to the known eagle nests are moved to at least 1.5-km (the distance at which significant Verreaux's Eagle flight activity falls away: Percival 2013);
- » Birdlife South Africa Verreaux's Eagle guidelines recommend a 3-km buffer around all active nest and a 1.5-km no-go buffer (Ralston-Paton 2017). Since only seven eagle flights in 333 hours (a Passage Rate of 0.021 eagles/hour) were recorded we feel the 3-km buffer is not necessary and 1.5-km is recommended.
- » Post-construction, all turbines killing one or more Red Data bird per year will need to be fitted either with (a) the highly effective black-blade mitigation, or (b) automated deterrent or shut-down-on-demand; (this follows the Minister's recommendation too).

Operational phase monitoring is essential to determine the actual impacts on birds and therefore, the required mitigation measures and thresholds. This was also a stipulation of the EA. Such an approach requires a flexible Adaptive Management Plan to be implemented during operation. Such an Adaptive Management Plan must allow for changes to be implemented within a maximum time-frame of 3-4 weeks.

The Wind Farm must agree to follow the mitigation measures that may result from the operational monitoring and Adaptive Management Plan.

- (i) In accordance with the Adaptive Management Plan, appropriate mitigation measures, such as curtailment at specific environmental conditions or during high-risk periods (i.e. post construction monitoring shows 1 Red Data species killed at these turbines per year, then the use of appropriate automatic shut down or deterrent technology will have to be implemented in the case of mortality of Red Data species [defined as: 1 Red Data species killed per year]).

The operational monitoring study design must determine the turbines that require appropriate mitigation measures. Through such monitoring, we have found at other operational wind farms that 25% of the turbines are responsible for 75% of the fatalities, allowing specific risky turbines to be targeted (Simmons and Martins 2019).

Two adaptive management mitigations are recommended if Red Data species are found to be killed:

- (i) investigate painting half a blade black to deter raptors, as undertaken by Norwegian wind farms to reduce white-tailed Eagle deaths with great success (Stokke et al. 2017).
- (ii) Implement the automated "Multi-sensor" video system, presently under test by J Avni, which deters incoming birds or feathers the blades, or turns off turbines as collision-prone species approach within 500-m of these turbines;

All new overhead power lines must be fitted with diurnal and nocturnal bird diverters to reduce collisions and burying all internal power lines in the WEF, wherever that is possible. The shortest possible route from the wind farm to the existing power line be taken to reduce fatalities.

Fatality of Red Data birds and possible Displacement:

Nature: Negative: Fatality of Red Data birds on site. Possible displacement of same species

	Authorised Project (27 turbines 92-m HH)	Proposed Amendment (25 turbines 92 -120-m HH)
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	High (8)	Moderate (6)
Probability	Highly probable (4)	Distinct probability (3)
Significance	56 (Medium)	36 (Medium)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Medium
Irreplaceable loss of resources?	No (Verreaux's Eagles are not uncommon and rarer Booted Eagles may be less susceptible to collision and displacement) Combination	No (Verreaux's Eagles are not uncommon and rarer Booted Eagles may be less susceptible to collision and displacement)
Quantified loss of eagles per year (CRM x Loss model)	0.94 Verreaux's Eagles 0.06 Booted Eagles	0.56 Verreaux's Eagles 0.08 Booted Eagles
Can impacts be mitigated?	Yes	

Mitigation:

There are generally five classes of mitigation for birds around wind farms: (i) re-position the turbines to reduce impacts or disturbance for the birds; (ii) redesign the turbines to alter the present colour/shape/size of the turbines so birds see them more readily and avoid contact; (iii) curtail or shut-down-on-demand the turbines when collision-prone birds approach; (iv) manipulate the habitat to reduce the attractiveness of the site to collision-prone raptors; (v) reduce the overall number/height of turbines.

Because the combination of the CRM (Percival 2019) and the Loss model (Appendix 1) forecasts that the taller turbines are predicted to increase fatalities to 0.56 adult and juvenile Verreaux's Eagles per year (at 98% avoidance rates: Table 4) this is judged to be an acceptable level of mortality because it reduces the number well below one eagle per year, and it reduces the fatalities to below that for the already authorized turbine layout (0.94 adult + juvenile Verreaux's Eagles). If the fatality rate is higher than these two models predict (i.e. >1.0 eagle per year) then mitigations will be required.

The following is recommended:

- (i) The turbines closest to the known eagle nests are moved to at least 1.5-km (the distance at which significant Verreaux's Eagle flight activity falls away: Percival 2013);
- (ii) Birdlife South Africa Verreaux's Eagle guidelines recommend a 3-km buffer around all active nest and a 1.5-km no-go buffer (Ralston-Paton 2017). Since only seven eagle flights in 333 hours (a Passage Rate of 0.021 eagles/hour) were recorded we feel the 3-km buffer is not necessary and 1.5-km is recommended.
- (iii) Post-construction, all turbines killing one or more Red Data bird per year will need to be fitted either with (a) the highly effective black-blade mitigation, or (b) automated deterrent or shut-down-on-demand; (this follows the Minister's recommendation too).

Cumulative Impact of the Witberg Wind Farm relative to other Renewable Energy Facilities within 30km of the Site:

Nature: The impact of the wind energy facilities proposed in the Western Cape is expected to be negative and arise from disturbance, displacement and collision for birds around the wind turbines. The associated infrastructure will also impact species in the form of impacts with un-marked power lines.

The direct impact of the wind farms (Table 8) was gauged using data released by Birdlife South Africa for fatalities at seven wind farms in South Africa (Ralston-Paton et al. 2017). About 4.1 birds/turbine/year, or ~2.43 birds/MW/year are killed annually. If a total of 700 MW is generated per year from these renewable energy farms, then we estimate <1700 (all) birds killed per year there (includes larks, swifts etc).

About 4% of the total of the wind farm fatalities are expected to be threatened Red Data raptors (Ralston-Paton et al. 2017). Thus, we can predict a maximum of 68 threatened raptors may be included in this total per year without mitigation. Thus, the likely impact varies from medium to high without mitigation. Careful mitigation can reduce this to acceptable levels.

	Cumulative Impact with Authorised project*	Cumulative Impact with Proposed Amended Project**
Extent	Regional (3)	Regional (3)
Duration	Long-term (5)	Long-term (5)
Magnitude	Moderate (5)	Moderate (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (39)	Medium (36)
Status (positive/negative)	Negative	Negative
Reversibility	Medium	Medium
Loss of resources/species?	Possible	Possible
Can impacts be mitigated?	Probably, Yes	Yes

Confidence in findings:

Medium: The mortality data released by Birdlife South Africa for wind farms allows us to estimate the probable mortality, but the mitigation measures suggested to avoid major raptor fatalities are unknown for the other wind farms. Without mitigation measures (i.e. the avoidance of high-use and high-risk avian areas by turbines, or black-blade or curtailment mitigations) chances of mortality increase greatly. The rate of avian fatalities is likely to vary across years with different rainfall events.

Because individual wind farms in South Africa rarely release data, it is difficult to gain accurate data without specific studies in these areas. Thus, these cumulative impact assessments will remain of low confidence until all specialist studies are made public.

Mitigation:

Reducing avian impacts at wind energy facilities is in its infancy in South Africa. Recommended measures specifically for the proposed Witberg facility include:

- *Avoiding all nest areas and foraging/roosting areas of Red Data species in the siting of said facilities, guided by the CRM and known flight paths. Given the increased likelihood of eagle fatalities due to the taller turbines (Appendix 1) buffers around nests must be maintained at the 1.5-km no-go buffer recommended in the Verreaux's Eagles guidelines (Ralston-Paton 2017); this means no wind farm-related development can take place within this buffer with the exception of access roads;*
- *If operational-phase monitoring indicates that one or more Red Data bird is killed at any turbine per year, then we recommend that black-blade mitigation as the first method used to reduce eagle mortalities;*
- *Multi-sensor deterrent/shut down systems can be tried as a second-tier mitigation;*
- *Intense short-wave radiation (Foss et al. 2017) should also be tested as a deterrent;*
- *If audible or visual deterrence is ineffective then selective stopping of turbines should be tried;*
- *Marking all new overhead power lines with bird diverters and staggering pylons of adjacent lines to reduce large birds colliding with them.*

5.2.2. Conclusion

The presence of breeding collision-prone and Red Data bird species in the Witberg Wind Farm area (in the form of Verreaux's and Booted Eagles) and the presence of other collision-prone species requires careful siting of the proposed turbines. This was undertaken by Witberg Wind Power (Pty) Ltd for the authorised project, based on the original avian impact assessment (Avisense 2010, Turpie et al. 2012, Simmons and Martins 2015), and in discussions with the specialists and following Collision-Risk Modelling (Percival 2013, 2018, 2019). The suggested amendments of increasing the hub height (and power output) and reducing the number of turbines and relocation of turbines (including associated infrastructure) was considered in the study for the effect it may have on the large collision-prone eagles.

In general, the change in hub height of the proposed turbines is expected to have a negative influence on the mortality experienced by sensitive birds in the study area. This arises from an analysis of 53 wind farms in the USA by Loss et al. (2013). That indicates a significant effect of hub height on avian fatalities (the higher the turbine the greater the chance of avian fatality). To forecast how many fatalities 120-m high turbines may incur, we modelled the USA data, and incorporated South African data. This does not include Witberg site-specific data because these data are for operational wind farms only. Fatalities of 6.2 birds/turbine/year for 80-m turbines were predicted to increase 2.6-fold to 16 fatalities/turbine/year (95% confidence limits 9-28) at 120-m hub heights. For 92-m (authorised) turbines the fatalities of 8.0 birds/turbine/year is forecast to rise 2.0-fold to 16.0 birds/turbine/year.

An independent specialist also undertook a Collision-Risk Model (Percival 2013, 2018, 2019) using site specific eagle data to determine mortality rates of between 0.26 and 0.13 adults and between 0.02 and 0.01 juvenile Verreaux's Eagles for 98% and 99% avoidance rates respectively, for the proposed 25 turbine layout and 120-m turbines.

By combining these different modelling approaches, we calculate the following is likely in terms of potential eagle fatalities:

- » Authorised 27 turbines of 92-m hub height (0.92 adult + juvenile Verreaux's Eagles/year) will have higher avian (eagle) costs, than;
- » 25 turbines of between 105-m and 120-m hub height between 0.62 and 0.56 adult + juvenile Verreaux's Eagle fatalities/year, respectively.

Therefore, the proposed amendments (increased hub height and fewer turbines) will result in a change to the significance of the impact(s) assessed for birds in the original EIA. **The expected decrease in eagle fatalities arises because (i) the CRM predicted fewer eagle fatalities at higher hub heights (Percival 2018, 2019), but (ii) the area swept by the blades increases exponentially (blade-length) with an increase in blade length, increasing the likelihood that birds will impact the blades. The rotational speed of larger turbine blades is slower and this may assist in reducing fatalities for the larger turbines.**

The significance will change in a positive manner (lower impact) if the turbine height is increased (to between 105m and 120-m). However, if the models incorrectly forecast the predicted fatalities, the significance of the impact can be reduced to acceptable levels (<1 eagle per year) through the mitigation suggested. On present evidence, few flights (7 in 333 hours) took place through the 3-km buffers on the wind farm; thus, the impact of turbines within 1.5-km will be of low significance.

If there are fatalities, it is recommended: (i) black-blade painting is undertaken, which was found to be highly effective for White-tailed Eagles in Norway (Stokke et al. 2017), subject to obtaining approval from the South African Civil Aviation Authority. Curtailment, as previously proposed (Simmons and Martins 2015) which includes shut-down-on-demand by automatic systems such as the Multi-sensor systems can also be used. New deterrent systems such as intense shortwave LED lighting (Foss et al. 2017) should also be considered if turbines are found to kill one or more Red Data birds per year from the post-construction monitoring. Mitigations during construction should include: (i) avoiding construction within 1000-m of active nests of Red Data species during the early breeding season and chick-rearing times (May-July).

It was also previously recommended that a written-agreement must be included in the Environmental Authorization with the land owners that they not persecute the Vulnerable red data eagles breeding on their property (Simmons and Martins 2015). This recommendation arose out of the finding that an active Verreaux's Eagle nest was removed from the Elandsfontein property and burned at the base of the cliff. Similarly, 2 of the 3 nests at VE nest area 2 had been removed in February 2019. This rate of nest removal at the Witberg site (3 nests in 24 nest-years) is 15-fold higher than the nest removal rate (1 nest in 112 nest-years) from two other study sites in the Western Cape (M. Murgatroyd Unpubl. Data). It is recommended that the eagle-persecution agreement must state that:

- » Verreaux's Eagles, (or Martial Eagles) as threatened Red data species, cannot be persecuted on the Witberg wind farm, because it is illegal to do so anywhere in South Africa (http://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S1727-37812013000400006.);
- » This means that eagles (adults, juveniles, chicks or eggs) on the wind farm cannot be shot, poisoned, trapped, their nests removed or the nest contents taken or in any way interfered with.

All overhead power lines should be marked with bird diverters. Where possible, on-site power lines should be buried, as typical within wind farms. Where that's not possible new lines should be aligned with existing lines where possible and the pylons staggered to reduce bustard deaths (Simmons, Pallett and Brown in prep). With all these mitigations considered, and the marking of the overhead lines, the risks to collision-prone birds on the WEF site can be reduced to minimal acceptable levels.

The cumulative impacts for the five renewable energy facilities within 30-km of the Witberg site are expected to be medium as gauged by an estimated 1700 birds (including species such as larks and swifts) and 68 (range 27-165) Red Data raptors per year. The lower end of the range (27 red data raptors per year) is expected given that many early wind farms did not have stringent mitigation measures. If all wind

and solar farms enact suitable mitigation measures, these impacts, too, can be reduced to acceptable levels.

Overall, **the currently proposed amendments (i.e. 25 turbines with hub heights of 92m up to 120-m) is likely to incur fewer eagle fatalities than the authorised 27 turbines of 92-m HH, with all turbines outside the 1.5 km buffer for all eagle nests.** This is calculated to be 0.52 eagles per year (worst case). If this rate is exceeded suitable mitigations, including (i) all turbines killing one or more Red Data bird per year must be black-blade painted; or (ii) fitted with automated deterrent or shut-down-on-demand, then Witberg Wind Power (Pty) Ltd can reduce their environmental/avian footprint to acceptable levels.

Birdlife South Africa (Ralston 2017) recommend during-construction monitoring and a minimum of 24 months post-construction monitoring at wind farms where impacts to Verreux's Eagles are expected. This will determine the effects of the wind farm on the Red Data species identified as at risk. With these mitigations, we can recommend that the Witberg wind farm, as amended, can be allowed to proceed.

Overall, the potential avifaunal impacts identified with regards to direct mortality, disturbance and avoidance during both the construction and operation phase remained the same in terms of impact significance ratings. However, additional mitigation measures have been recommended to minimise potential impacts to avifauna. Ultimately, if these recommendations, and those of BLSA are followed, there is no reason why the Witberg wind farm cannot be developed.

5.3. Impacts on Bats

A bat addendum report (**Appendix C**) to the most recent bat pre-construction monitoring report dated June 2015 (refer to **Appendix C**), was compiled for the currently proposed amendments for the Witberg Wind Energy Facility (WEF).

The currently authorised turbine dimensions with a hub height of 92m and a rotor diameter of 116m, will result in a lowest rotor swept height above ground of 34m. Whereas, the proposed increased turbine dimensions of up to 120m hub height and up to 136m rotor diameter, will result in an increase of the lowest rotor swept height above ground to 52m. This will result in a total increase in lowest rotor swept height above ground level of 18m from the authorised wind turbine specifications in comparison to the proposed amended turbine specifications.

During the pre-construction study, the two stations with microphones at 60m recorded 1.8 and 6.5 times less bats, than at 10m height. This indicates a clear negative correlation between bat activity and height above ground, meaning the probability of impacts on bats is less at 52m than at 34m. However, the larger **rotor diameter of the proposed dimensions will also result in a larger airspace that poses a risk to bats. Thus, considering the decreased risk of 52m at the lowest rotor swept height, and the increased risk of the larger airspace occupied by a larger rotor diameter, the proposed turbine dimension change will have a negligible effect on the significance of impacts** identified in the most recent bat pre-construction monitoring report dated June 2015.

The increase in the actual wind turbine generation output capacity per turbine is not relevant to impacts on bats, and was therefore not assessed.

The pre-construction data was gathered from May 2011 to May 2012. Six bat monitoring stations were used to monitor bat activity levels, with two having microphones at height. During the study time frame, the South African Good Practice Guidelines for Surveying Bats in Wind Farm Developments 2nd edition (April 2011) was in use, and was undergoing refinement to the 3rd edition (Sowler and Stoffberg, 2012). The study was conducted in accordance with the guidelines that were current at that time. The study design differs from the 3rd edition guidelines (Sowler and Stoffberg, 2014) in that monitoring was carried out for only 15-25% of the likely bat activity periods over the year. This limitation was factored in to the re-analysis of the study data in 2015, on which the EIA was based and authorisation granted. The site environment has not changed significantly since the EIA assessment in 2015, extension of the validity of the authorisation by an additional 2 years will have a negligible effect on the significance of impacts identified in the EIA report.

Changes in the layout of the associated infrastructure will have a negligible effect on the significance of impacts identified in the original EIA bat report dated 2011. However, the proposed change in the turbine layout will decrease the significance of impacts originally identified in the EIA bat report dated 2011 for the operational phase. The currently authorised layout (Layout Revision 7 as per appeal decision LSA 105-439, dated 13 August 2013) has 1 turbine inside a high bat sensitivity buffer and 1 turbine in a moderate sensitivity buffer. The proposed layout has no turbines in high sensitivity buffers and 5 turbines inside moderate sensitivity buffers (**Table 5.4** and **Figures 5.1 – 5.4.**). Due to the high significance and importance of high bat sensitivity areas and their buffers, they are prioritised over moderate sensitivity buffers.

Table 5.4: Turbines located within bat sensitive areas, authorised layout compared to the proposed layout.

Bat sensitivity area	Authorised layout (as per appeal decision LSA 105-439) dated 13 August 2013	Proposed layout
High	None	None
High buffer	Turbine 4	None
Moderate	None	None
Moderate buffer	Turbine 8	Turbines 11, 14, 21, 22 and 23

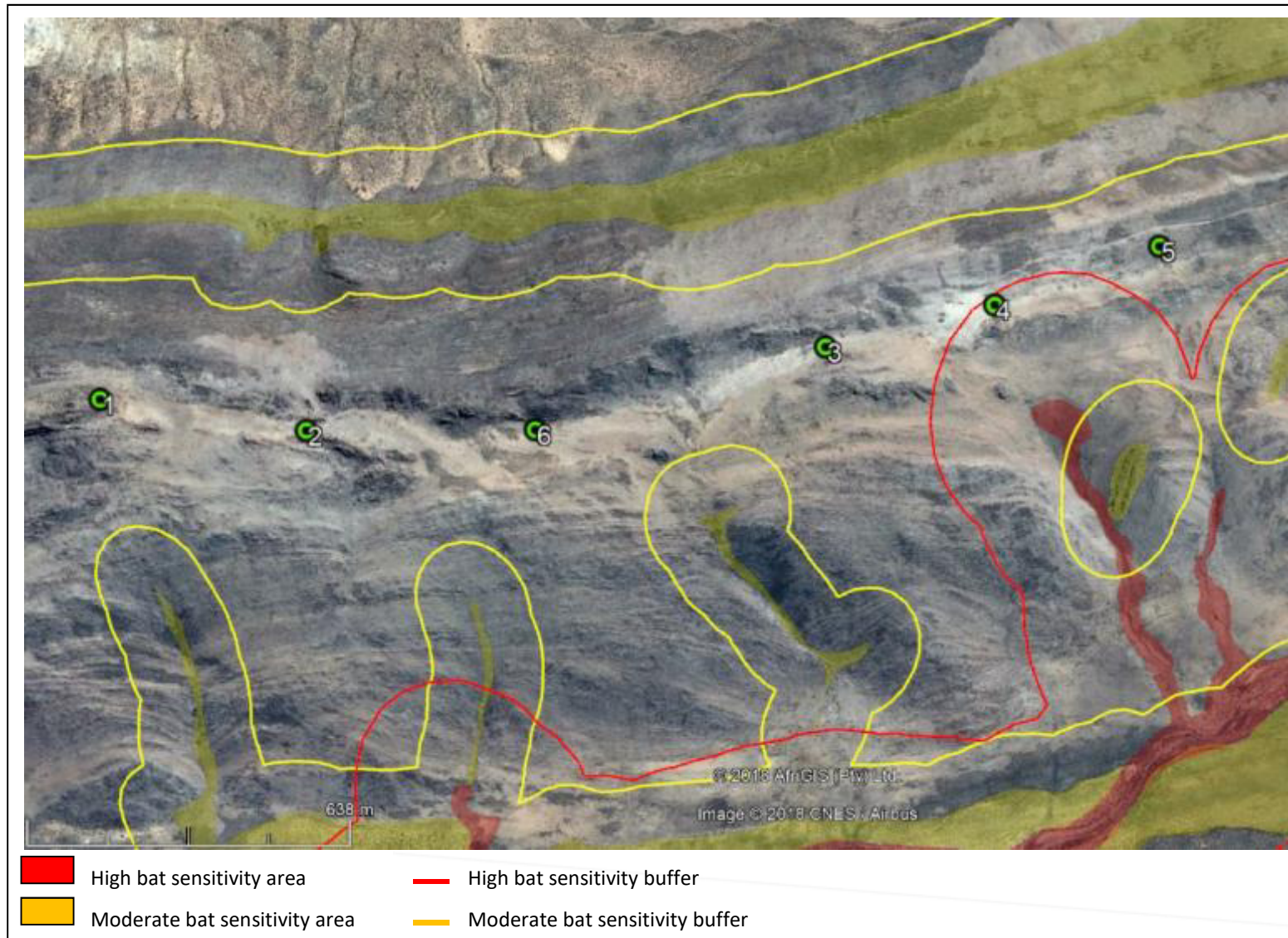


Figure 5.1: Bat sensitivity map in relation to the currently authorised layout, western cluster of turbines (turbine 4 in high sensitivity buffer).

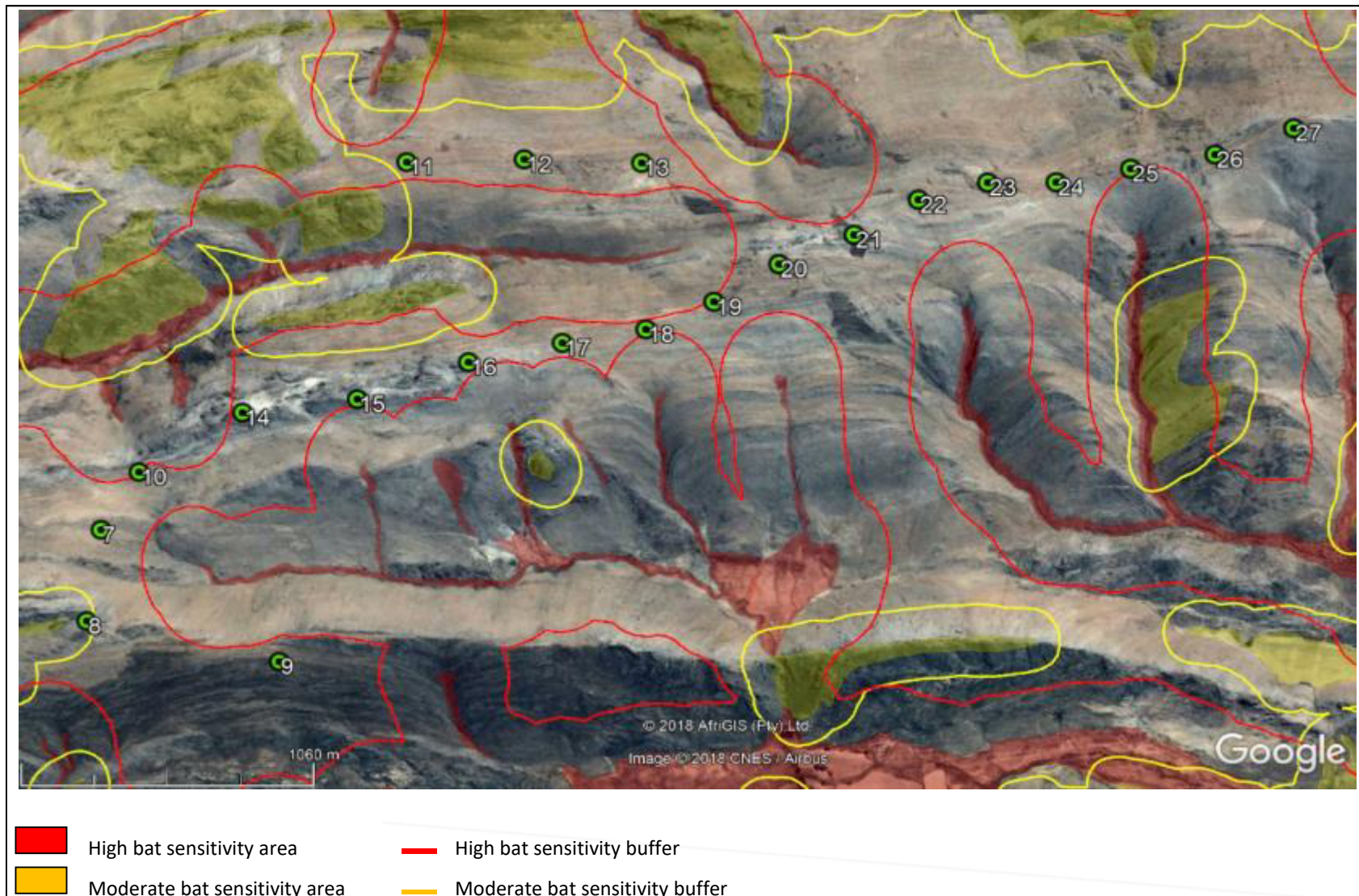


Figure 5.2: Bat sensitivity map in relation to the currently authorised layout, eastern part of site (turbines 10 and 25 on the border of the high sensitivity buffer, and turbine 8 in moderate sensitivity buffer).

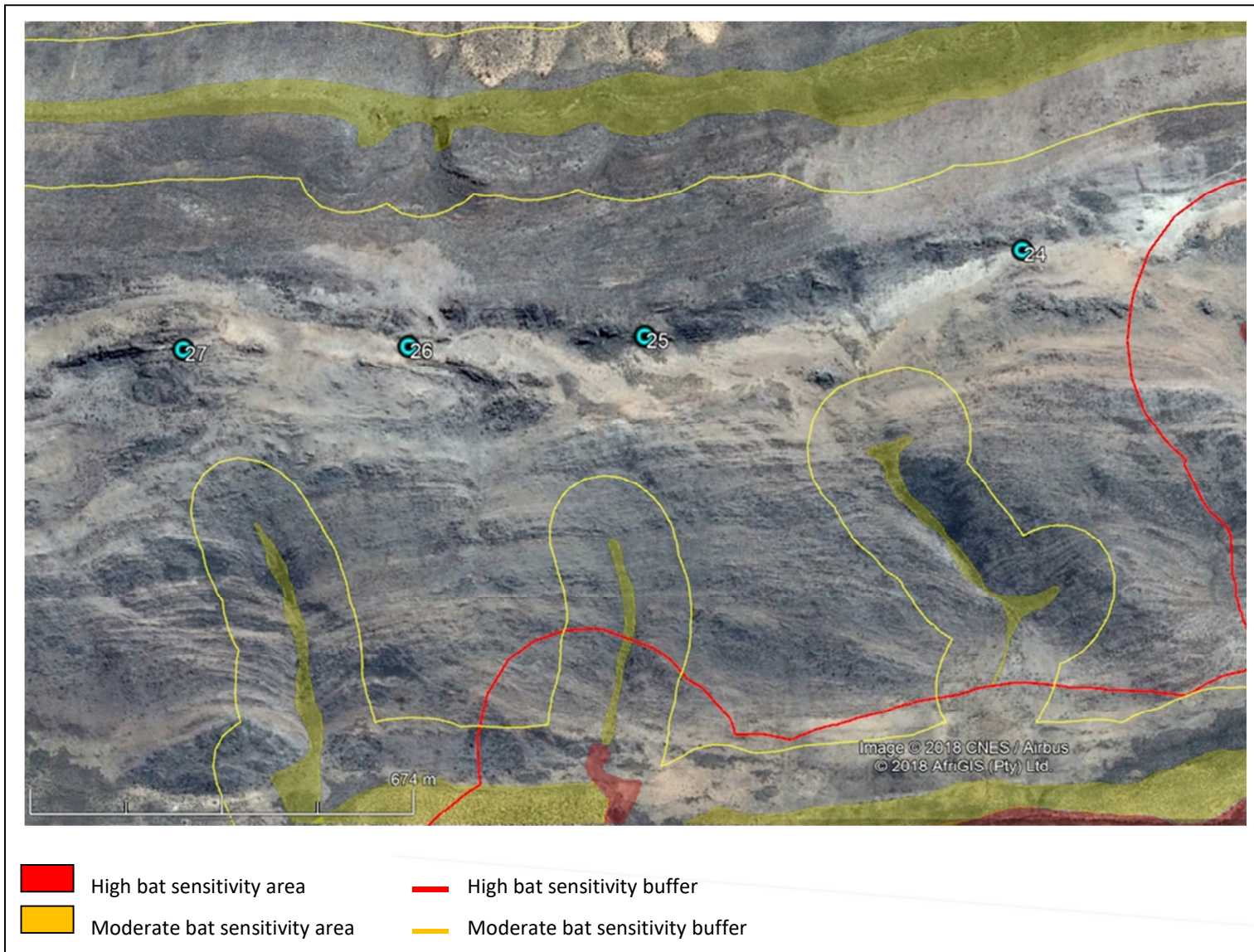


Figure 5.3: Bat sensitivity map in relation to the currently proposed layout, western cluster of turbines. No Turbines are in any sensitive areas or their buffers.

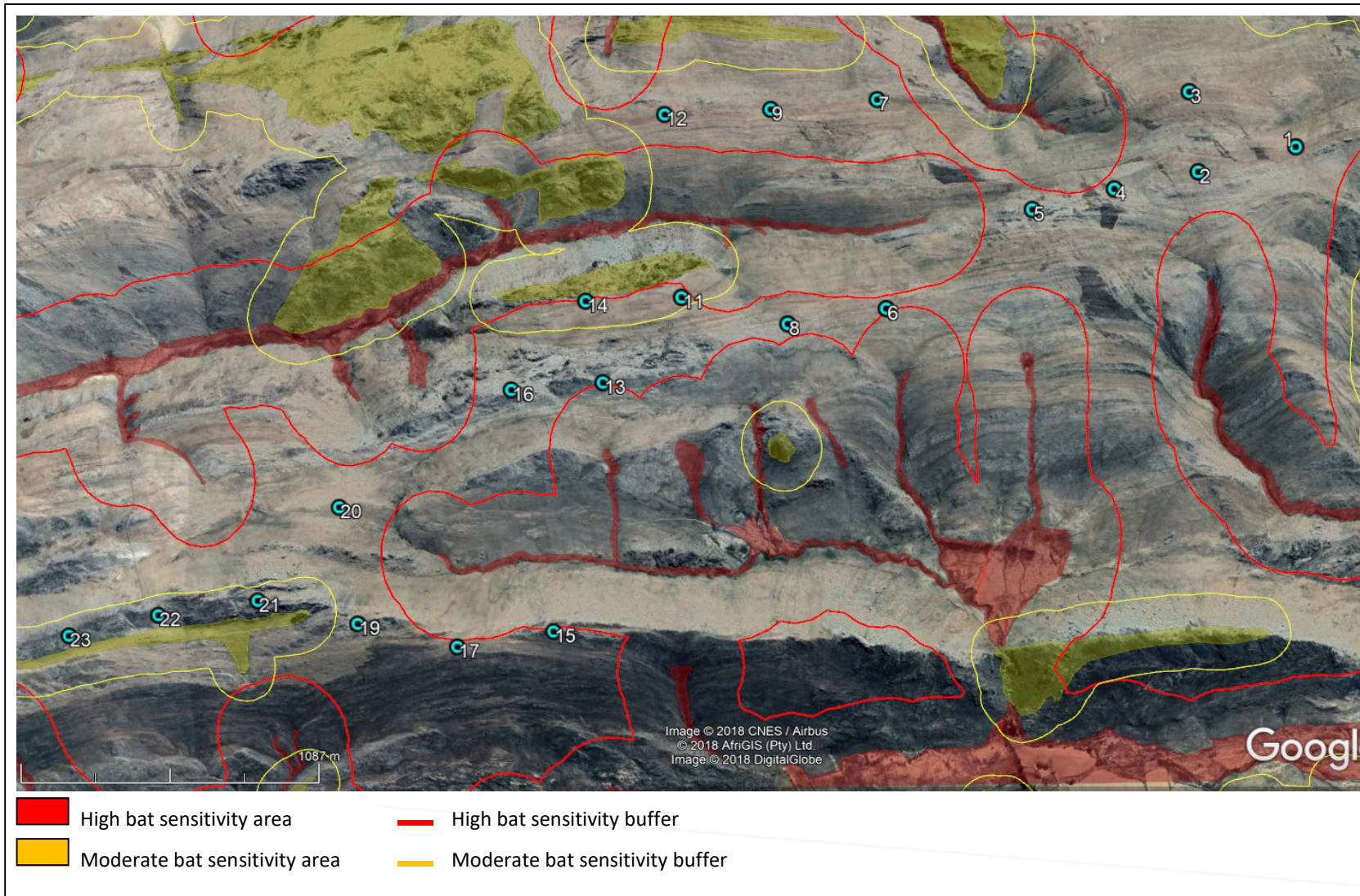


Figure 5.4: Bat sensitivity map in relation to the currently proposed layout, eastern part of site (no turbines in the high sensitivity buffer, and turbines 11, 14, 21, 22 and 23 in moderate sensitivity buffer).

5.3.1. Comparative Assessment

Change in Turbine Layout (Operation Phase):

Nature: Foraging and/or migrating bats can be killed by moving turbine blades, this happens either by direct impact or due to barotrauma.

	Authorised		Proposed Amendment	
	Without mitigation	With mitigation	Without mitigation	With mitigation
Extent	Local (1)	Local (1)	Local (1)	Local (1)
Duration	Long term (4)	Long term (4)	Long term (4)	Long term (4)
Magnitude	High (8)	Low (4)	High (8)	Low (4)
Probability	Highly probable (4)	Improbable (2)	Probable (3)	Improbable (2)
Significance	52 (Medium)	18 (Low)	39 (Medium)	18 (Low)
Status (positive or negative)	Negative	Negative	Negative	Negative
Reversibility	Low	Medium	Low	Medium
Irreplaceable loss of resources?	No	No	No	No
Can impacts be mitigated?	Yes	N/a	Yes	N/a

Additional Mitigation:

Correct turbine placement out of high sensitivity buffers, and it's also preferable to avoid moderate sensitivity buffers where possible. Where needed curtailment or acoustic deterrents may also be implemented.

Specific mitigations are as follows:

The mitigations are based on the passive data collected over the 12-month pre-construction monitoring study (June 2015). They infer mitigation be applied during the peak activity periods and times, and when the advised wind speed and temperature ranges are prevailing (considering conditions in which 80% of bat activity occurred). Both the temperature and wind speed parameters indicated in the pre-construction monitoring report must be present simultaneously to infer mitigation. This is due to the fact that they have synergistic or otherwise contradictory influences on bat activity and are never considered in isolation. In general, bat activity is negatively correlated to wind speed and positively correlated to temperature.

Currently the most effective method of mitigation, after correct turbine placement, is alteration of blade speeds and cut-in speeds in environmental conditions favourable to bats.

A basic "6 levels of mitigation" (by blade manipulation or curtailment), from light to aggressive mitigation is presented below:

1. No curtailment (free-wheeling is unhindered below manufacturer's cut-in speed so all momentum is retained, thus normal operation).
2. Partial feathering (45-degree angle) of blades below manufacturer's cut-in speed in order to allow the free-wheeling blades half the speed it would have had without feathering (some momentum is retained below the cut-in speed).
3. Ninety-degree feathering of blades below manufacturer's cut-in speed so it is exactly parallel to the wind direction as to minimize free-wheeling blade rotation as much as possible without locking the blades.
4. Ninety-degree feathering of blades below manufacturer's cut-in speed, with partial feathering (45-degree angle) between the manufacturer's cut-in speed and mitigation cut-in conditions.
5. Ninety-degree feathering of blades below mitigation cut-in conditions.
6. Ninety-degree feathering throughout the entire night.

It is recommended that curtailment initially start off at Level 3 during the dates, times and environmental conditions

set out in the Table below. Then depending on the results of the post construction mortality monitoring the curtailment can be either relaxed or intensified (moving down or up in the levels) up to a maximum intensity of Level 5. This is an adaptive mitigation management approach that will require changes in the mitigation plan to be implemented immediately and in real time during the post construction monitoring.

The times and date periods when mitigations should be applied initially at the start of the facility operational life:

	Authorised layout: Applies to Turbines 4, 8, 10, 25	Proposed layout: Applies to Turbines 11, 14, 15, 23
Spring peak activity (times to implement curtailment/ mitigation)	Based on monitoring station W2 60m data: 15 September - 15 October Sunset – 00:00; and 5:00 – sunrise	Based on monitoring station W2 60m data: 15 September - 15 October Sunset – 00:00; and 5:00 – sunrise
Environmental conditions in which to implement curtailment/ mitigation	Below 5.5m/s measured at 60 height Above 15.5°C measured at 60m height	Below 5.5m/s measured at 60 height Above 15.5°C measured at 60m height
Autumn peak activity (times to implement curtailment/ mitigation)	Based on monitoring stations W3 10m and W4 60m data: 01 February to 15 May Sunset – 00:00; and 5:00 – sunrise	Based on monitoring stations W3 10m and W4 60m data: 01 February to 15 May Sunset – 00:00; and 5:00 – sunrise
Environmental conditions in which to implement curtailment/ mitigation	Below 8.5m/s measured at 60m Above 18.5°C measured at 60m	Below 8.5m/s measured at 60m Above 18.5°C measured at 60m

»

Residual Risks:

Even with the correct turbine placement and curtailment implemented, the possibility remains for bats to be impacted by turbine blades.

Bat Mortalities due to moving Turbine Blades (Cumulative):

Nature:

Foraging and/or migrating bats can be killed by moving turbine blades, this happens either by direct impact or due to barotrauma. Mortalities of bats due to wind turbines during foraging and migration can have significant ecological consequences, as the bat species at risk are insectivorous and thereby contribute significantly to the control of flying insects at night. On a project specific level insect numbers in a certain habitat can increase if significant numbers of bats are killed off. But if such an impact is present on multiple projects in close vicinity of each other, insect numbers can increase regionally and possibly cause outbreaks of colonies of certain insect species.

Additionally, if migrating bats are killed off it can have detrimental effects on the cave ecology of the caves that a specific colony utilises. This is due to the fact that bat guano is the primary form of energy input into a cave ecology system, given that no sunshine that allows photosynthesis exists in cave ecosystems.

	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (4)

Probability	Probable (3)	Improbable (2)
Significance	39 (Medium)	22 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Medium
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	N/A

Mitigation:

Adhere to the sensitivity maps by avoiding areas of High bat sensitivity and their buffers as well as preferably avoid areas of moderate bat sensitivity and their buffers.

The high sensitivity valley areas can serve as commuting corridors for bats in the larger area, potentially lowering the cumulative effects of several WEF's in an area, if all facilities adhere to their sensitivity maps. It is essential that project specific mitigations be applied and adhered to for each project, as overarching regional mitigation measures are more complex and less feasible due to habitat and ecological differences between project sites.

The project specific mitigations for this project is as follows:

The mitigations are based on the passive data collected over the 12-month pre-construction monitoring study (June 2015). They infer mitigation be applied during the peak activity periods and times, and when the advised wind speed and temperature ranges are prevailing (considering conditions in which 80% of bat activity occurred). Both the temperature and wind speed parameters indicated in **Table 5.4** must be present simultaneously to infer mitigation. This is due to the fact that they have synergistic or otherwise contradictory influences on bat activity and are never considered in isolation. In general, bat activity is negatively correlated to wind speed and positively correlated to temperature.

Currently the most effective method of mitigation, after correct turbine placement, is alteration of blade speeds and cut-in speeds in environmental conditions favourable to bats.

A basic "6 levels of mitigation" (by blade manipulation or curtailment), from light to aggressive mitigation is presented below:

1. No curtailment (free-wheeling is unhindered below manufacturer's cut-in speed so all momentum is retained, thus normal operation).
2. Partial feathering (45-degree angle) of blades below manufacturer's cut-in speed in order to allow the free-wheeling blades half the speed it would have had without feathering (some momentum is retained below the cut-in speed).
3. Ninety-degree feathering of blades below manufacturer's cut-in speed so it is exactly parallel to the wind direction as to minimize free-wheeling blade rotation as much as possible without locking the blades.
4. Ninety-degree feathering of blades below manufacturer's cut-in speed, with partial feathering (45-degree angle) between the manufacturer's cut-in speed and mitigation cut-in conditions.
5. Ninety-degree feathering of blades below mitigation cut-in conditions.
6. Ninety-degree feathering throughout the entire night.

It is recommended that curtailment initially start off at Level 3 during the dates, times and environmental conditions set out in **Table 5.4**. Then depending on the results of the post construction mortality monitoring the curtailment can be either relaxed or intensified (moving down or up in the levels) up to a maximum intensity of Level 5. This is an adaptive mitigation management approach that will require changes in the mitigation plan to be implemented immediately and in real time during the post construction monitoring.

Table 5.4: The times and date periods when mitigations should be applied initially at the start of the facility operational life.

	Authorised layout: Applies to Turbines 4, 8, 10, 25	Proposed layout: Applies to Turbines 11, 14, 15, 23
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Spring peak activity (times to implement curtailment/ mitigation)	Based on monitoring station W2 60m data: 15 September - 15 October Sunset – 00:00; and 5:00 – sunrise	Based on monitoring station W2 60m data: 15 September - 15 October Sunset – 00:00; and 5:00 – sunrise
Environmental conditions in which to implement curtailment/ mitigation	Below 5.5m/s measured at 60 height Above 15.5°C measured at 60m height	Below 5.5m/s measured at 60 height Above 15.5°C measured at 60m height
Autumn peak activity (times to implement curtailment/ mitigation)	Based on monitoring stations W3 10m and W4 60m data: 01 February to 15 May Sunset – 00:00; and 5:00 – sunrise	Based on monitoring stations W3 10m and W4 60m data: 01 February to 15 May Sunset – 00:00; and 5:00 – sunrise
Environmental conditions in which to implement curtailment/ mitigation	Below 8.5m/s measured at 60m Above 18.5°C measured at 60m	Below 8.5m/s measured at 60m Above 18.5°C measured at 60m
Residual Risks: Even with the correct turbine placement and curtailment implemented, the possibility remains for bats to be impacted by turbine blades.		

5.3.2. Conclusion

Considering the decreased risk of 52m at the lowest rotor swept height, and the increased risk of the larger airspace occupied by a larger rotor diameter, the proposed turbine dimension change will have a negligible effect on the significance of impacts identified in the most recent bat pre-construction monitoring report dated June 2015. The proposed changes in output capacity per turbine is not applicable to impacts on bats. However, the proposed change in the turbine layout will decrease the significance of impacts originally identified in the EIA report for the operational phase. This is primarily since the proposed layout has no turbines located in high bat sensitivity buffers, and respects the sensitivity map better. **Therefore, the proposed turbine layout is preferable above the authorised layout, and the recommended mitigation measures need to be adhered to for both layout options. The specialist has no objection to the proposed changes of turbine dimensions, output capacity and the extension of the validity period.**

5.4. Ecological Impact

A statement letter was prepared by the ecologist (**Appendix D**) in reference to the authorized Witberg Wind Energy Facility (WEF), for comment on the ecological implications of the proposed changes to the layout and turbine specifications that would be included in the Amendment.

The specialist confirmed review of the amended layout in reference to both the previously amended and approved layout as well as the ecological sensitivity of the site. The previous layout consisted of 27 turbines while the current proposed amended layout has been reduced to 25 turbines. The amendment includes increasing the size and output of the turbines and in terms of impacts on terrestrial ecology, this would not

be likely to generate any additional impacts or noticeably increase any previously assessed impacts. The increase in the size of the turbines is offset by the reduction in the number of turbines. As such, the change in the turbine number and specifications is not considered to have material additional or reduced impact on terrestrial ecology and as such, no changes to the previously assessed impacts are recommended as a result of the changes to the turbines.

The amendment includes some changes to the layout including the repositioning of some of the turbines (**Figure 5.5**). While the majority of turbines are in close proximity to their original positions, with minimal potential change in impact, three turbines have been lost from the east of the site and repositioned on ridges to the west. The revised positions have been interrogated and found to be within acceptable positions where their impact is likely to be similar as the previous wind turbine positions, and no additional impact can be anticipated as a result of the changes. Consequently, there is no change to the assessed impacts as a result of the change in turbine positions. The additional changes to the layout such as access roads, power line, construction camp and substation position, have also been reviewed and no changes to the impact of the development on terrestrial ecological features were found to have occurred. As such, it was concluded that the change to the layout of the development has not had an impact on the previously assessed impacts associated with the development.

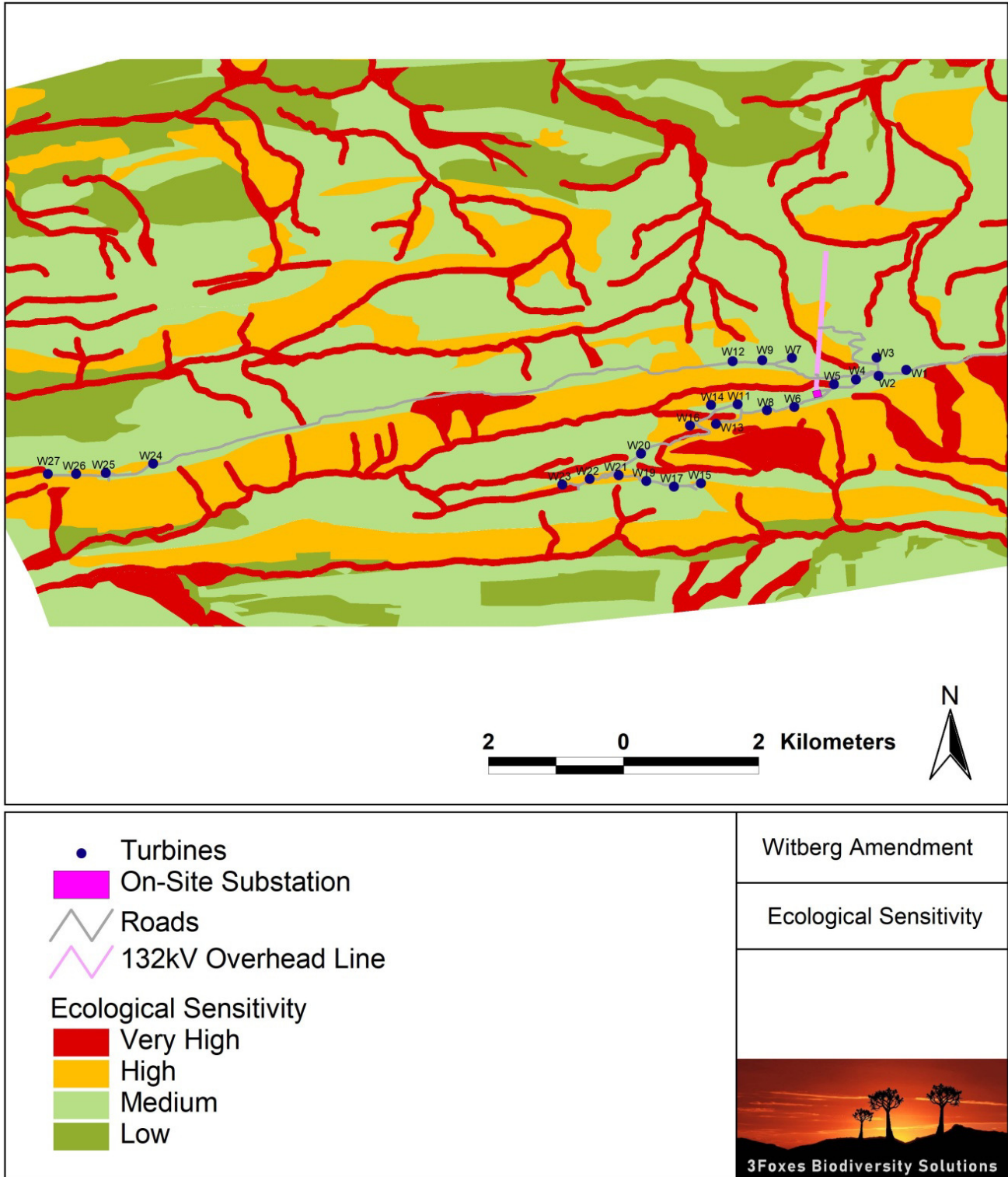


Figure 5.5: The ecological sensitivity map of the Witberg site and the 25-turbine layout as provided for the amendment assessment.

Although, no additional impacts are likely to occur as a result of the amendment, it should be noted that the effected environment is considered sensitive and a variety of plant species of high conservation concern are known from the immediate area. As previously noted, and reiterated, the need for a pre-construction walk-through of the entire development footprint with local adjustment to the routing of

access roads and micro-siting of turbines where deemed necessary should occur should the development proceed to construction. A pre-construction walk-through of the facility would also be required in order to comply with the permit conditions for the development as a variety of protected species may be impacted and a permit from CapeNature would thus be required.

Since the original study was conducted in 2010, there is some potential for the receiving environment to have changed in the intervening period till now. However, conditions at the time of the original assessment were very favourable and the fynbos vegetation in the development area was mature and well-developed. As a result, the original assessment is considered to provide a good characterization of the receiving environment, which would not have changed significantly since the original sample period. In addition, there has not been significant additional transformation or habitat loss in the immediate environment of the wind farm, with the result that cumulative impacts associated with the development are not likely to have changed significantly since the original assessment.

In terms of cumulative impact, the amendment would not increase cumulative impacts as compared to the original assessment as the footprint has decreased from the original assessed footprint. In addition, there are not any new renewable energy facilities in the immediate area and the wind energy facilities in the wider area, which includes those facilities both in the Tanqua Karoo near Touwsrivier as well as the facilities in the Roggeveld are within a different receiving environment from the current facility, and are not considered to occupy the same environment and hence do not significantly contribute to cumulative impact on the Witberg system. As such, the amendment is considered acceptable in terms of cumulative impact.

5.4.1. Comparative Assessment

It was concluded that the change to the layout of the development has not had an impact on the previously assessed impacts associated with the development. Therefore, no comparative assessment was required. All original mitigation measures proposed will remain the same, and must be included in the EMPr, and implemented accordingly. In addition, however, Western Cape Department of Environmental Affairs and Development Planning (WC DEA&DP) provided several suggested amendments to the EMPr (refer to Appendix 15). These are also supported, and the suggested mitigation and vegetation clearing protocols suggested by WC DEA&DP should be included into the EMPr as far as possible.

5.4.2. Conclusion

The findings of the ecological statement are contingent on the layout, as provided for the assessment. There are a variety of sensitive and threatened species at the site which are vulnerable to impact and which can be affected by changes to the development layout. Should the development proceed to construction, the final development footprint should be subject to a pre-construction walk-through to inform the final placement of roads and turbines as well as locate and identify species of conservation concern that are within the development footprint. Some search and rescue of plant species of conservation concern may also be required, which is to be determined as part of the pre-construction walk-through.

Overall, there has been no change or increase in potential impacts from an ecological perspective. The Witberg Amended layout is therefore supported in terms of terrestrial ecology impacts as it will not result in

an increase in the significance in any of the assessed ecological impacts and is not considered substantially different from the previous 27 turbine layout. As such the proposed amendments to the turbine specifications and layout are regarded as acceptable from an ecological perspective.

5.5. Impacts on Heritage

ACO Associates CC have been appointed by Savannah Pty Ltd to provide an assessment (**Appendix E**) of an amended layout for the Proposed Witberg Wind Energy Facility (Witberg Wind Energy Facility DEA ref. 12/12/20/1966) to be situated on the Witberg Ridge in the Laingsburg Municipality of the Western Cape Province. The proposed amendments also include a number of non-spatial amendments which have been assessed accordingly, where relevant.

During the original EIA heritage impact assessment (2011), it was determined that the main heritage impacts related to possible impacts to palaeontology and the setting or cultural landscape. Impacts to archaeology, built environment and graves were of low significance.

The proposed new layout will not change the impacts to palaeontology which relates to the construction of the turbines bases in potentially sensitive rock formations, and particularly the access road where deep cuttings and incline changes will cause impacts. The significance of these impacts is moderate and negative without mitigation, however scientific benefit can be obtained if suitable mitigation is carried out (Hart 2011).

In terms of impacts to the cultural landscape or setting, the 2011 study found that there would be a high negative impact that could not be easily mitigated without reducing the number of turbines and placing them as far from Matjiesfontein as possible. The reduction of the number of turbines is likely to be an improvement with the significance of the impact shifting from high negative to medium negative. The Visual Impact Assessment (VIA) suggests (refer to **Section 5.7** below and **Appendix G**) that the overall impact of the turbines will remain largely unchanged from that already authorized. In heritage terms, an advantage of the amended layout, which now sees turbines less dominantly placed 11 km from Matjiesfontein as opposed to 9 km in the original proposal, will help alleviate visual impacts from the heritage town. From this perspective the amendment is supported.

The numerical reduction in wind turbines compared with the 13 October 2011 authorisation and amendments thereto, show a progression of improvement in terms of negative impacts to heritage. There has been general confinement of the turbines to the western side of the Witberg which is of benefit to the highly sensitive town of Matjiesfontein. The size of the turbines which will be increased in height, however the visual density of the facility will decrease which is desirable as far less of the landmark Witberg range will be utilised.

The power lines, access road and substation sites are all situated within the already Heritage Western Cape (HWC) approved envelope of land that was comprehensively surveyed in 2011. This survey, which in fact exceeded the study area of the 2018 amendment, established that the heritage sensitivity was related to palaeontology. The significance ratings and mitigation recommended remains unchanged for this component in terms of the proposed amended layout.

5.5.1. Comparative Assessment

Setting and Cultural Landscape (Operation Phase):

Nature of impact: Setting and cultural landscape				
The impact relates to the affect the proposal will have on the setting around the site, especially with respect to important heritage sites such as Matjiesfontein that has a remote sense of place on the edge of the great Karoo. The industrialising of the surrounding rural and remote areas will have an impact on the sense of place. This impact related mostly to the operational phase of the project.				
	Authorised		Proposed amendment	
	Without mitigation	With mitigation	Without mitigation	With mitigation
Extent	Low (1)	Low (1)	Low (1)	Low (1)
Duration	Permanent (5)	Permanent (5)	Permanent (5)	Permanent (5)
Magnitude	High (8)	High (8)	Medium (5)	Medium (5)
Probability	Definite (5)	Definite (5)	Probable (3)	Probable (3)
Significance	70 (high)	70 (high)	33 (Medium)	33 (Medium)
Status (positive or negative)	Negative	Negative	Negative	Negative
Reversibility	Very low	Very low	Very low	Very low
Irreplaceable loss of resources?	No	No	No	No
Can impacts be mitigated?	No	No	No	No
Mitigation: No mitigation possible. Please refer to original visual impact assessment (Section 4.7).				
Cumulative impacts:				
Since 2012 when the first EIA was completed, the amount of Wind Energy Facilities has increased. In particular on the Sutherland Escarpment and Moordenaars Karoo and Tanqua Karoo has seen a number of proposals. While these are not directly in sight of Witberg, there is a regional change of character in terms of loss of wilderness qualities and sense of place.				
Residual Risks:				
Residual risks are few and relate to chance encounters of archaeological and palaeontological material after the proposed development is in place.				

Nature: <i>Impact to overall landscape and setting of the proposed August 2018 amendment.</i>		
	Without mitigation	With mitigation
Extent	Medium (3)	Medium (3)
Duration	Long-term (4)	Long-term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	36 (Medium)	36 (Medium)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No	No
Mitigation: As per VIA.		
Cumulative impacts: <i>Since 2011 when the first EIA was completed, the amount of Wind Energy Facilities has increased. In particular on the Sutherland Escarpment and Moordenaars Karoo and Tanqua Karoo has seen a number of proposals. While these are not directly in sight of Witberg, there is a regional change of character in terms of loss of wilderness qualities and sense of place. Particular reference is made to the experience of driving between the popular tourism and heritage towns of Sutherland and Matjiesfontein, mostly situated within a REDZ area.</i>		
Residual Impacts: Residual Impacts could involve post-demolition landscape scarring.		

Overall contribution of the Witberg WEF to Cumulative Impacts (Cumulative):

Nature: <i>Contribution to cumulative impacts</i>		
	Without mitigation	With mitigation
Extent	Medium (3)	Medium (3)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	33 (Medium)	33 (Medium)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No	No
Mitigation: No mitigation.		
Cumulative impacts: <i>Since 2011 when the first EIA was completed, the amount of Wind Energy Facilities has increased. In particular on the Sutherland Escarpment and Moordenaars Karoo and Tanqua Karoo has seen a number of proposals. While these are not directly in sight of Witberg, there is a regional change of character in terms of loss of wilderness qualities and sense of place. Particular reference is made to the experience of driving between the popular tourism and heritage towns of Sutherland and Matjiesfontein, mostly situated within a REDZ area.</i>		
Residual Impacts: Residual Impacts could involve post-demolition landscape scarring.		

5.5.2. Conclusion

With the proposed amendment of the layout, the result is a decrease in the impacts to setting and landscape. The potential impact in terms of setting and cultural landscape has decreased in significance from a High significance rating to a Medium significance rating.

From a cumulative perspective, no impacts are expected to human generated heritage and therefore there will be no contribution to cumulative impacts. The palaeontology of the site, and the region is not well known enough to make a statement on the cumulative impacts. The population of fossils is not known and therefore the degree of cumulative impacts cannot be judged. There is a possibility of a positive impact to knowledge base, as the more opportunities that are presented to collect scientific specimens from below surface strata offer the opportunity to increase the accumulated knowledge of the area. Palaeontologists rely greatly on quarries and excavations to make new observations. Wind energy facilities have the potential to contribute to cumulative impacts on a regional and sub-regional scale. If all applications in the Sutherland REDZ zone are authorized there will be a tangible change to the regional scenery and landscape value. This will affect the experience of both visitors and resident in the area. The contribution of the Witberg WEF to such regional changes is decreased by the overall reduction in the amount of turbines – significant improvement on the original 70 turbines proposed.

The heritage assessment therefore finds that the amended layout and turbine specifications along with the non-spatial amendments proposed should be supported. No other potential impacts identified have changed and no new potential impacts have been identified. In addition, the mitigation measures remain unchanged. From a heritage perspective, the proposed amendments are considered acceptable.

5.6. Noise Impacts

A noise report was compiled by Dr. Brett of Safetech (**Appendix F**) as an addendum to the original Noise Impact Report that was issued by Jongens Keet Associates (March 2011). The purpose of this addendum report is to determine if the 25-turbine project layout with proposed amended turbine layout and specifications will comply with the noise emission limits as contained in the Department of Environmental Affairs - Environmental Authorisation (12/12/20/1966) issued in 2011.

The following noise sensitive areas have been used in the remodelling as identified in **Figure 5.6** below.

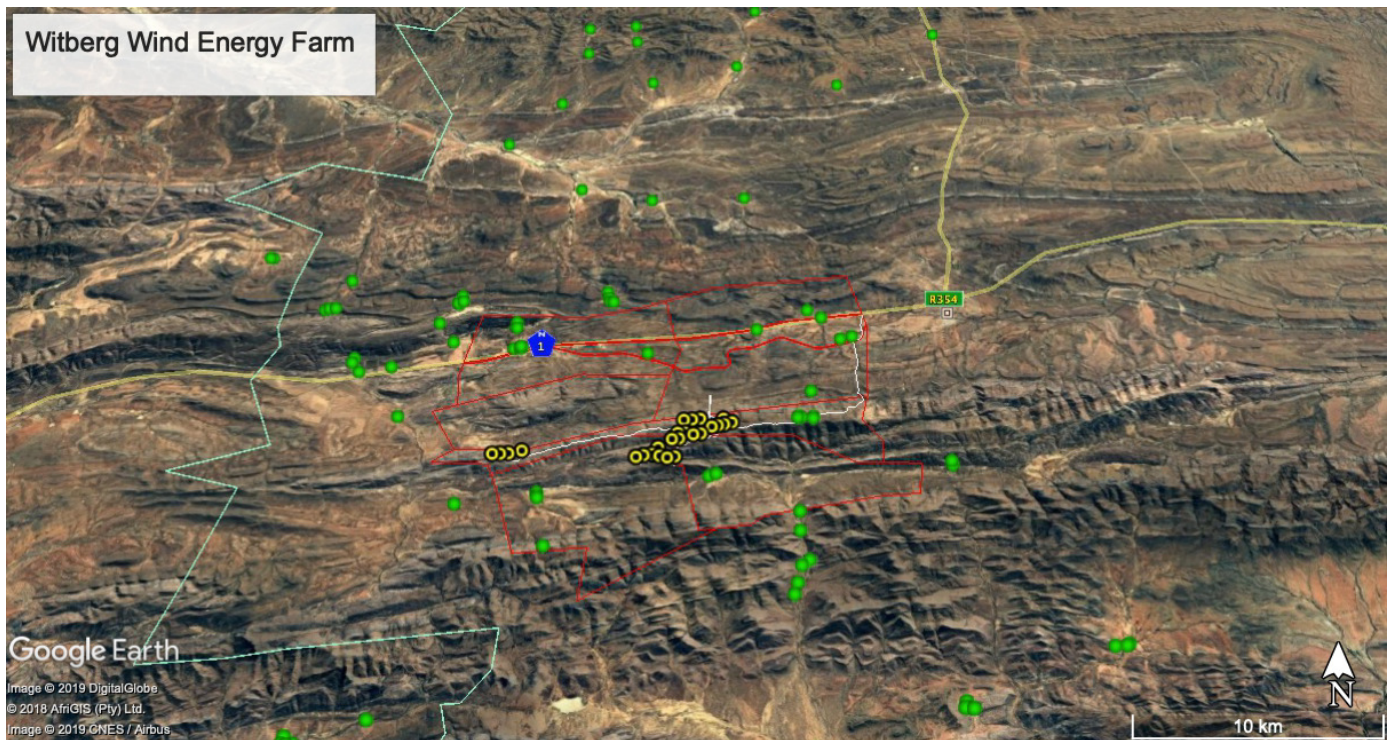


Figure 5.6: Noise Sensitive Areas

Wind Turbines (yellow dots), Noise Sensitive Areas (green dots), Wind Farm Boundary in red are shown above.

The masking effect of the wind noise will mitigate the noise impact. The results are however based on no wind noise masking, which in reality rarely occurs when the turbines are operational. The maximum noise rating limit (24 hour day/night) for rural areas in SANS 10103:2008 is 45 dB(A). The modelling results indicate that the SANS 10103:2008 limit of 45 dB(A) will not be exceeded at any of the noise sensitive areas. This includes the cumulative impacts from the other windfarms. The Witberg Wind Farm along with any of the alternatives currently proposed may therefore proceed and the proposed amendment is acceptable and can be authorised by the Competent Authority.

The cumulative impact modelling results indicate that the SANS 10103:2008 day/night limit of 45 dB(A) will not be exceeded at any of the noise sensitive areas. This includes the cumulative impacts from the other seven windfarms that were modelled. The cumulative impact is such that the Witberg Wind Farm along with any of the alternatives currently proposed may therefore proceed and the proposed amendment is acceptable and can be authorised by the Competent Authority

It is highly likely that the wind noise will provide a masking effect. Furthermore, the modelling assumes the receiver is outdoors at all times.

If the final number of turbines is reduced or the layout changed such that no turbine is moved closer to a noise sensitive area, then remodelling will not be required, provided the final turbine choice sound power level is not greater than that, that was used in this report (108.1 dBA).

The overall environmental impact of the changes made to the project scope is rated as low and has not changed from the original noise impact assessment. No additional mitigation measures are required. In

addition, there are no additional advantages or disadvantages in relation to the project impacts. The entire site as proposed may be developed with no constraints. The above statement is also applicable to the cumulative impact of other windfarms in the area.

5.6.1. Comparative Assessment

It was concluded that the change to the wind turbine specifications and the layout of the proposed development has not had an impact on the previously assessed impacts associated with the development. Therefore, no comparative assessment was required. In addition, all original mitigation measures proposed will remain the same, and must be included in the EMPr, and implemented accordingly.

5.6.2. Conclusion

The overall environmental noise impact significance remains low taking into account the changes to the turbine specifications and layout. The amended project description does not exceed the SANS 10103:2008 limit of 45 dB(A) at any of the noise sensitive receptors using the data that was modelled. It was recommended that based on the results presented, the granting of an Amended Environmental Authorisation with respect to the noise impacts is deemed acceptable and recommended. The overall environmental impact of the changes made to the project scope is rated as low and has not changed from the original noise impact assessment. No additional mitigation measures are required. **The entire site as proposed may be developed with no constraints. The above statement is also applicable to the cumulative impact of other windfarms in the area.**

5.7. Visual Impact

An amendment report was prepared jointly by Quinton Lawson of QARC and Bernard Oberholzer BOLA (**Appendix G**) to provide a comparison between the previous authorised 27 turbine layout and the proposed amended 25 turbine layout.

The analysis indicated that the proposed amendments would result in a negligible change to the viewshed (zone of visual exposure) as indicated in **Figure 5.7**. Photomontages have also been prepared to indicate the visibility of the amended proposals from selected viewpoints, (**Figures 5.8 to Figure 5.10**).

The visual analysis indicates that the current amendments will have a zero or a negligible effect on the significance of impacts identified in the original VIA Report and subsequent authorised amendment.

From a cumulative perspective, there are a number of renewable energy projects, either existing or proposed, in the region of the Witberg site. These include an existing solar energy facility near Touwsrivier, which, although visible from the N1 Route, is in a low-lying area with a very limited viewshed. Another wind and solar facility is proposed just west of the Witberg site, but the status of this is not known. The remaining renewable energy projects are mainly more than 25 km north of the site, and being separated by mountain ranges, will not result in cumulative visual impacts within the local area. Although the current project will be visible from the N1 Route, cumulative visual impacts are expected to be low, given the distances to other renewable energy projects and the screening effect of the mountainous topography.

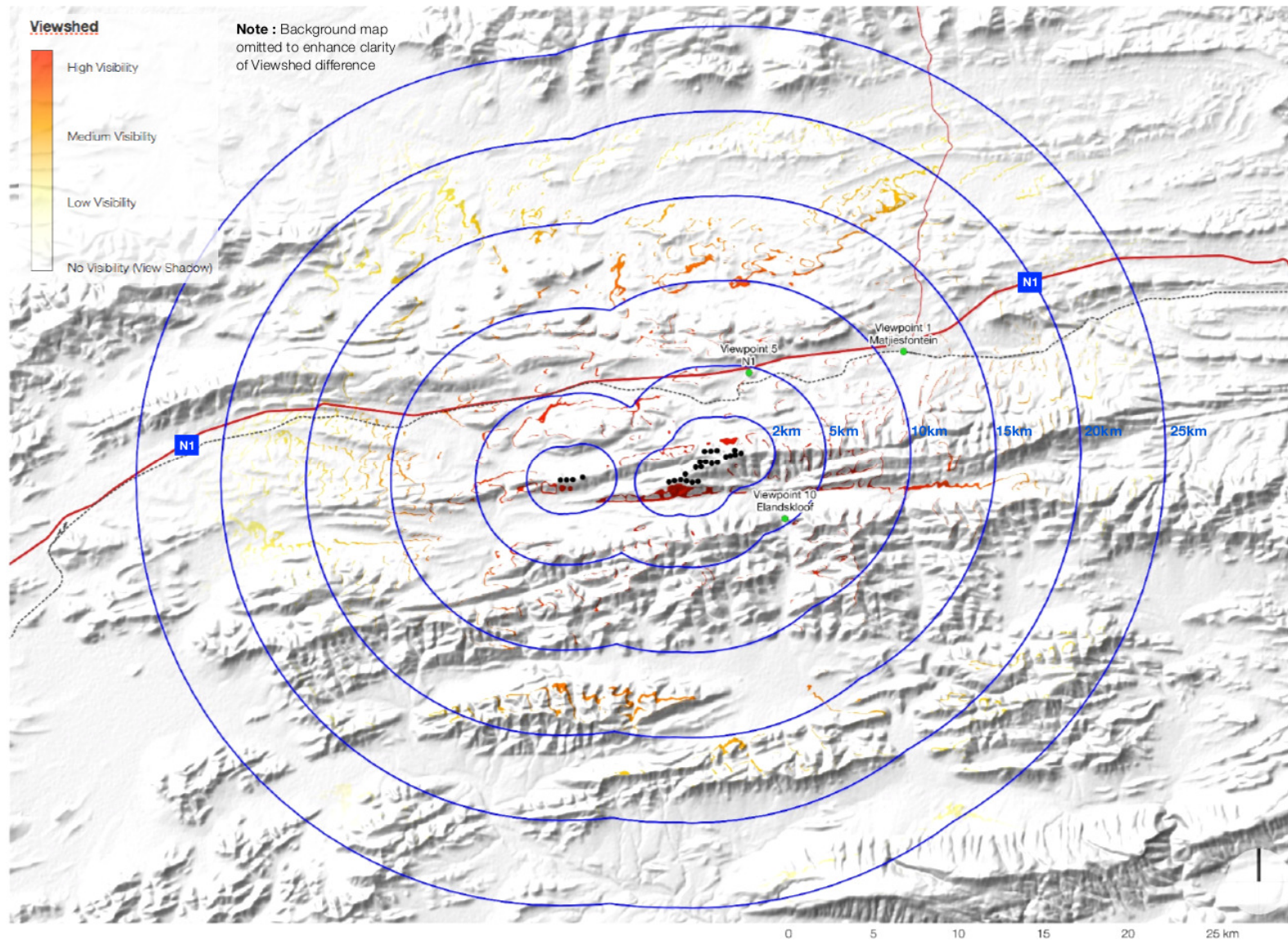


Figure 5.7: Witberg difference in increased viewshed between previously authorised turbine specifications and layout, and the amended 25 turbine specifications and layout.



Figure 5.8: Viewpoint 1 – 2019 amendment looking south-west from Matjiesfontein Rail Crossing.



Figure 5.9: Viewpoint 5 – 2019 amendment looking east from N1 Memorial.



Figure 5.10: Viewpoint 10 – 2019 amendment looking north from Elandskloof Gate.

5.7.1. Comparative Assessment

The increased hub height, rotor diameter and blade tip height would result in similar overall visual impact significance ratings to that determined in the original VIA and subsequent authorised amendment, as indicated above. The proposed amendments to the wind turbines and related infrastructure would therefore result in no change in the overall visual impact significance ratings in relation to those of the previous authorised proposals, and no comparative assessment was required. In addition, the layout of the wind farm has already been through a number of iterations based on the specialist studies and engineering considerations. The visual mitigations contained in the original VIA of 2011 would still have relevance, and no new visual mitigations are deemed necessary.

5.7.2. Conclusion

The **proposed amendments to the 25 wind turbines and related infrastructure would result in no change in the overall visual impact significance ratings in relation to those of the previous authorised proposals.** As the baseline visual environment has not changed since the previous authorisation, the extension of the validity of the Environmental Assessment by two years will have no bearing on the visual environment. Provided that the visual mitigations listed in the original visual impact study (including post-construction rehabilitation of the site) are adhered to, the existing Environmental Authorisation for the Witberg WEF should still be valid. **The opinion from a visual perspective is that the proposed amendments should be approved.**

5.8. Social Impact

The proposed amendments to the turbine specifications and the amended 25 turbine wind farm layout were considered within the social amendment assessment (**Appendix H**). The core findings are presented below.

In 2011, the area had a dependency ratio of 52,6 and, between 2001 and 2011, a population growth rate of 1,79%. There was an official unemployment rate of 17,9% and an official youth unemployment rate of 22% in the area in 2011.

Considering the nature of the proposed amendments in association with the original Social Impact Assessment (SIA) undertaken for the project, it is unlikely that the proposed amendments will have any significant effect in respect of the social impacts associate with the project. The only areas of some relevance would be associated with:

- » Noise;
- » Visual;
- » Shadow flicker;
- » Blade throw and; and
- » Fire linked.

Although these issues could result in social impacts in the sense that they may overlap with the social in respect of health and safety and a sense of place, they actual fall with the domain of other areas of specialisation and would best be addressed by the relevant specialist.

As the proposed amendments to the project are largely of a technical nature, apart from the proposal to extend the validity period of the environmental authorisation by an additional 2 years, it is unlikely that these amendments will result in any socially based advantages and disadvantages and therefore the impact assessment undertaken during the EIA phase remains valid.

In respect of the proposed site-specific technical amendments to the wind farm layout and the wind turbine specifications as outlined above, no obvious social cumulative impacts are identified.

5.8.1. Comparative Assessment

The proposed amendments to the wind turbines and related infrastructure would result in no change in the overall social impact significance ratings in relation to those of the previous authorised proposals, and no comparative assessment was therefore required. The social mitigations contained in the original SIA report (2011) would still have relevance, and no new social mitigations are deemed necessary.

5.8.2. Conclusion

On this basis it is feasible to accept that if there are any health hazards and/or visual effects associated with the proposed amendments to the project that these can be acceptably mitigated in terms of the recommendations of the appropriate specialist. **From a social perspective, no changes to the originally identified social impacts have been identified as a result of the proposed amendments. Moreover, no new or additional impacts have been identified. The proposed changes will therefore result in no (zero) changes to the significance rating within the original SIA report (2011) that was used to inform the approved EIA.** In addition to this, no new mitigation measures are required. Lastly, the proposed amendments will not have any socially based advantages or disadvantages. **The proposed amendments can therefore be supported provided that the recommended mitigation measures as per the original social impact report (dated 2011) are adhered to.**

6. ADVANTAGES AND DISADVANTAGES OF THE PROPOSED AMENDMENTS

In terms of Regulation 32(1)(a)(ii), this section provides details of the advantages and disadvantages of the proposed amendment.

General

Advantages of the amendment	Disadvantages of the amendment
The increase in rotor diameter, hub height and generation capacity for each wind turbine will increase the efficiency of the facility and consequently the economic viability thereof. Increased efficiency of a facility is considered to be beneficial to the environment as this will reduce the need for additional facilities to generate additional electricity.	None
The proposed amendments are beneficial from a macro-economic perspective as it results in the lower cost per unit of energy, ultimately benefiting the South African public.	None

Birds

Advantages of the amendment	Disadvantages of the amendment
The proposed amendments (increased hub height and fewer turbines) will result in a change (decrease) to the significance of the impact(s) assessed for birds in the original EIA. The significance will change in a positive manner (lower impact) if the turbine height is increased (to between 105m and 120-m). However, if the models incorrectly forecast the predicted fatalities the significance of the impact can be reduced to acceptable levels (<1 eagle per year) through the mitigation suggested.	In general, the change in hub height of the proposed turbines is expected to have a negative influence on the mortality experienced by sensitive birds in the study area, although this is decreased to 0.62 (adult) and 0.56 (juvenile) Verreux's Eagle fatalities/year, respectively.
The amended layout is more beneficial as wind turbines have been removed and re-positioned outside of very high sensitivity areas.	None
With all mitigations considered, and the marking of the overhead lines, the risks to collision-prone birds on the WEF site can be reduced to minimal acceptable levels.	None
Overall, the currently proposed amendments (i.e. 25 turbines with hub heights of between 92m and 120-m) is likely to incur fewer eagle fatalities than the authorised 27 turbines of 92-m HH, with all turbines outside the 1.5 km buffer for all eagle nests.	None

Bats

Advantages of the amendment	Disadvantages of the amendment
In terms of the proposed amendments to the turbine dimensions, lowest rotor swept height increased from 32m to 52m which means the probability of impacts to bats is less at 52m than at 34m.	The amendment to the turbine dimensions will also however have a larger rotor airspace occupied which could result in increased risk of bat impacts.

Decreased risk of impacts to bats as wind turbines have been re-positioned out of high sensitivity areas into moderate sensitivity areas.

None.

Ecology

Advantages of the amendment

Disadvantages of the amendment

The revised positions have been interrogated and found to be within acceptable positions where their impact is likely to be similar as the previous positions and no additional impact can be anticipated as a result of the changes. Consequently, there is no change to the assessed impacts as a result of the change in turbine positions.

None

The additional changes to the layout such as access roads, power line, construction camp and substation position, have also been reviewed and no changes to the impact of the development on terrestrial ecological features were found to have occurred.

None

Heritage

Advantages of the amendment

Disadvantages of the amendment

The amendment has resulted in a decrease in the impacts to setting and landscape.

None

Visual

Advantages of the amendment

Disadvantages of the amendment

In terms of wind turbine layout amendments, the relocation of three turbines further west (further from Matjiesfontein) could be seen as an advantage.

None

The relocation of the substation on the same ridge as the turbines could also be seen as an advantage. The relatively low height of the substation and 4,5km distance from the N1 means that visibility would not be a major issue. Nevertheless, the substation should be micro-sited to be as far south on the flattish ridge as possible to reduce its visibility from the north.

None

The powerline connection further east means that it will be slightly further away from the N1 National Road, which could be seen as an advantage in visual terms.

None

The increase in height of the wind measuring mast from 80 to 120m would have little or no visual effect, given the slender nature of the mast and the distance to any visual receptors.

None

Noise

Advantages of the amendment

Disadvantages of the amendment

None

None

Social

Advantages of the amendment

Disadvantages of the amendment

None

None

Based on the above, it can be concluded that the advantages of the proposed amendments outweigh the disadvantages from an environmental and technical perspective.

7. REQUIREMENTS FOR ADDITIONAL MITIGATION AS A RESULT OF THE PROPOSED AMENDMENTS

As required in terms of Regulation 32(1)(a)(iii), consideration was given to the requirement for additional measures to ensure avoidance, management and mitigation of impacts associated with the proposed change. From the specialist inputs provided into this amendment motivation, it is concluded that the mitigation measures proposed within the EIA would largely be sufficient to manage potential impacts within acceptable levels. Additional mitigation measures have however been recommended by the Avifaunal and Bat specialists for inclusion in an updated EMPr in **Appendix K**. These have been included accordingly.

It must be noted that, as an additional mitigation measure, the location of the following components has been further relocated in order to maintain no wind farm project components in the 1.5km buffer as recommended by Simmons (2019) and to be outside the bat buffer to reduce potential impacts:

- » Substation to be outside the 1.5km buffer;
- » Lay-down area to be outside the 1.5km buffer;
- » Crane stand 5 and 6 to be outside the 1.5km buffer;
- » Crane stand 15 and part of this road has been moved (outside bat buffer);
- » Partial road alignment within the 1.5km buffer re-aligned outside of 1.5km buffer; and
- » Lay-down area moved to between wind turbines 2 and 3 to be outside the 1.5km buffer;

The additional relocation of the above components is shown in **Figure 7.1** below. The associated environmental sensitivities overlaid by the proposed layout is shown in **Figure 7.2** below. The proposed layouts below are the final proposal layout for consideration in this amendment application.

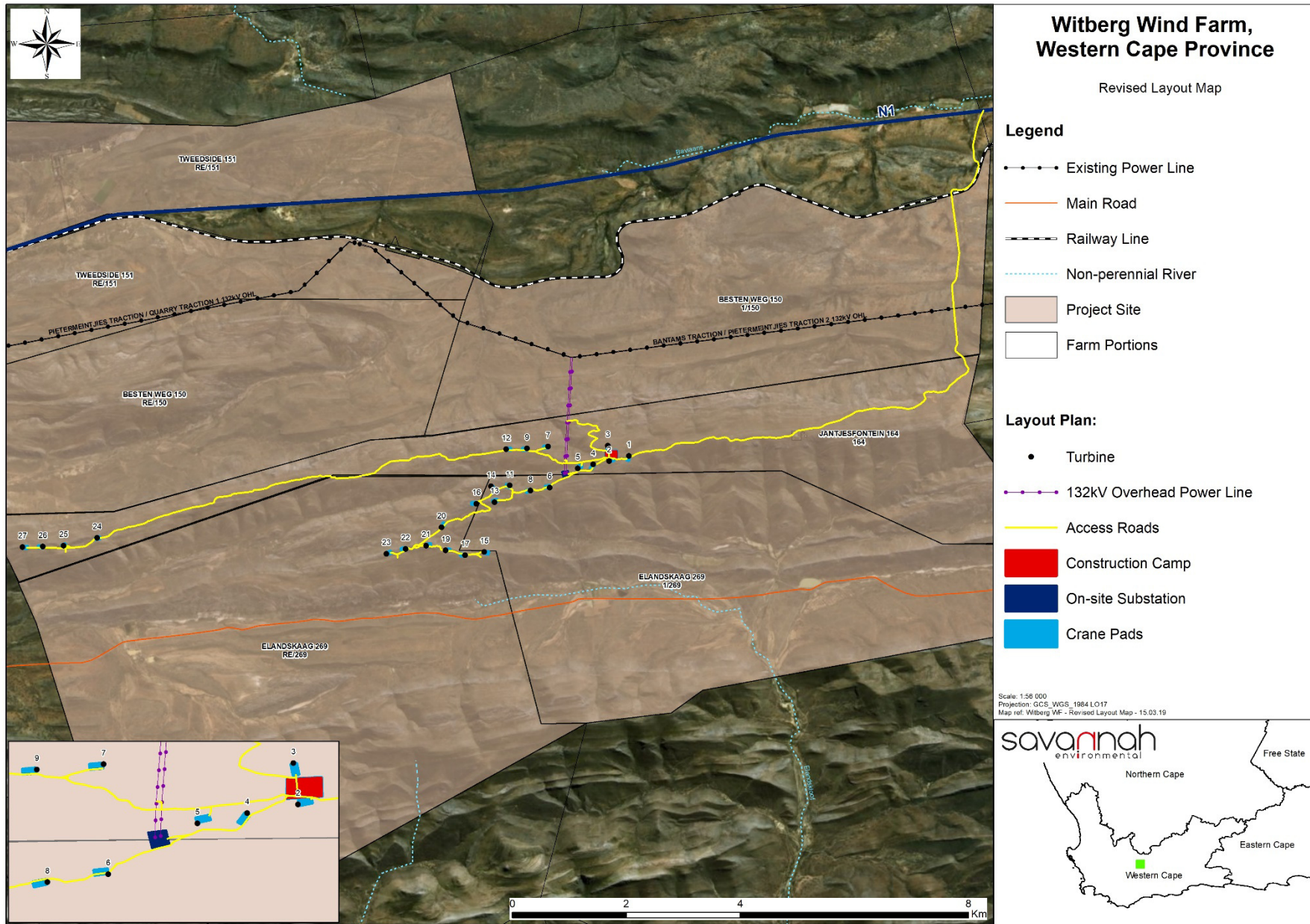


Figure 7.1: Final Updated Layout for the Proposed Amendment
 Motivation Report

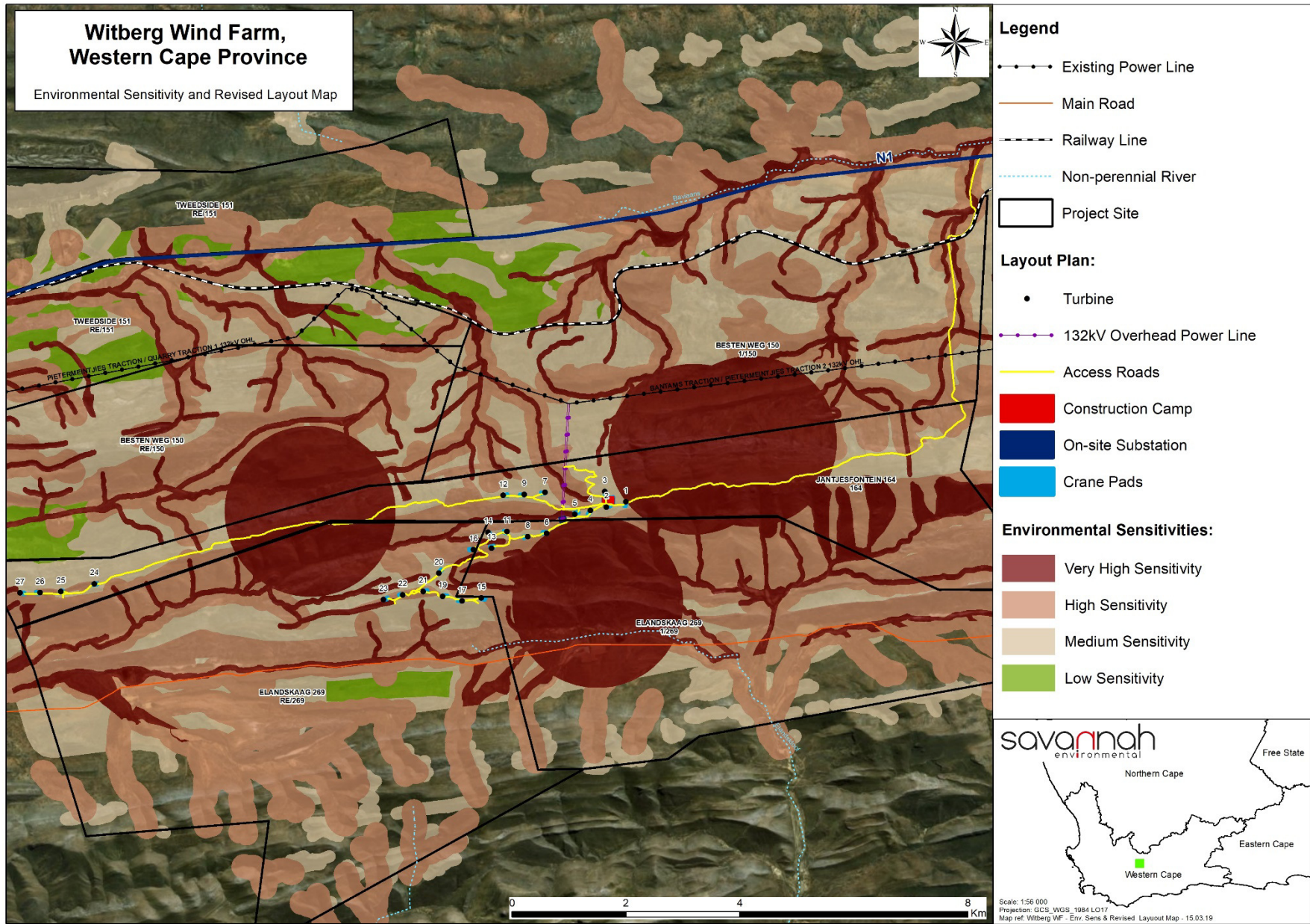


Figure 7.2: Final Updated Layout for the Proposed Amendment with Environmental Sensitivities

8. PUBLIC PARTICIPATION

A public participation process is being conducted in support of the Part 2 amendment application for the amendment of the Environmental Authorisation for the Witberg Wind Farm and associated infrastructure in the Western Cape Province.

A full Interested and Affected Party (I&AP) database is included in **Appendix I1**. It must be noted that the project is to be developed on the same farm portions as originally authorised, all of which, are privately owned. The amendment to the EA will therefore not result in impacts on any additional interested and affected parties.

The initial public participation for the proposed amendment process included:

- » The draft motivation report being made available for public review on www.savannahsa.com from **14 November 2018 until 14 December 2018**.
- » Written notification to registered I&APs regarding the availability of the draft motivation report were distributed on **14 November 2018** (refer to **Appendix I2**).
- » Written notification to Organs of State regarding the availability of the draft motivation report were distributed on **14 November 2018** (refer to **Appendix I3**).
- » An advertisement was placed in the Worcester Standard (local newspaper) on **15 November 2018** (refer to **Appendix I4**).
- » A hard copy of the draft motivation report was placed at the Laingsburg Public Library (Van Riebeeck Street, Laingsburg) on **14 November 2018**.
- » Site notices were placed at the site on **26 July 2018** (refer to **Appendix I4**).

All comments received during the initial public review period are included in the in this revised motivation report (refer to **Appendix I5**). Proof of requests made to obtain comments in the initial public participation process are included in **Appendix I6**.

With the release of the revised motivation report, a second round of public participation for the proposed amendment process was included. This included a further 30-day public review and comment period, as well as the following:

- » The revised motivation report was made available for public review on www.savannahsa.com from **20 March 2019 until 23 April 2019**.
- » Written notification to registered I&APs regarding the availability of the revised motivation report was distributed on **20 March 2019** (refer to **Appendix I2**).
- » Written notification to Organs of State regarding were notified of the availability of the revised motivation report distributed on **20 March 2019** (refer to **Appendix I3**).
- » An advertisement was placed in the Cape Times (daily newspaper) on **20 March 2019** (refer to **Appendix I4**).
- » An advertisement was placed in the Worcester Standard (local newspaper) on **21 March 2019** (refer to **Appendix I4**).
- » A hard copy of the revised motivation report was placed at the Laingsburg Public Library (Van Riebeeck Street, Laingsburg) on **20 March 2019**.

All comments received during the initial and second round of public review period have been included in this final submission to the DEA for consideration in the decision-making process. Comments have been responded to and included in the Comments and Responses Report (refer to **Appendix 15**). Proof of requests made to obtain comments have been included in **Appendix 16**.

9. CONCLUSION

Based on the specialist findings (**Appendix A to H**), it is concluded that the proposed amendments to the turbine specifications and wind farm layout are not expected to result in any additional impacts or an increase to the significance ratings for the identified potential impacts. The amended wind turbine positions currently considered avoids all identified very high sensitivity areas (refer to **Figure 2.1**). Several specialist studies show that the potential impacts will remain the same as per the EIA studies. These include avifauna, ecology, noise, visual and social. It must be noted that in the case of avifauna impacts, whilst the potential impact on eagle fatalities during the operation phase based on the amendments of the wind turbine specifications and layout are expected to be reduced, there is no quantitative or qualitative change in the significance ratings. In the case of bats, a decrease in operation phase bat mortality was found in which the potential impact decreased from a Medium significance to a Low significance post-mitigation. Finally, the potential impact was assessed to be decreased based on the proposed wind farm layout and wind turbine specification amendments from a heritage perspective, with regards to the setting and cultural landscape. The potential impacts decreased from a High significance rating to a Medium significance rating.

The proposed amendments in themselves are not listed activities and do not trigger any new listed activity. No additional properties will be affected by the amendments as the proposed amendments are within the original authorised development footprint.

The mitigation measures described in the original EIA document are adequate to manage the expected impacts for the project in terms of ecology, noise, visual, social and heritage. **Additional mitigation measures have however been recommended by the avifauna and bat specialists and, as a result of this proposed amendment, have been included within the project EMPr provided herein.**

Given the above, Witberg Wind Farm (Pty) Ltd requests the following:

- » An amendment to the authorised turbine specifications are required as follows:
 - Range of Hub height: from 92m, to a **range from 92m to up to 120m**;
 - Range of Rotor diameter: from 116m, to a **range from 116m to up to 136m**; and
 - Range of Wind turbine capacity per wind turbine: from 3MW to a **range from 3MW to up to 5MW**.
- » In addition, an amendment to the wind farm layout is required to avoid sensitive areas, and to optimise the layout. Therefore, the number of wind turbines will be reduced from 27 wind turbines to **25 wind turbines**, and the wind turbined and associated infrastructure will be re-positioned.
- » The contact person and relevant details are to be updated and added for the holder of the EA.
- » Minor spelling corrections are to be requested for the minor details of two (2) of the authorised listed activities in the EA.
- » An extension of the validity of the EA by a further two (2) years is requested.
- » Update of the EA and consolidation of all conditions of the EA and Appeal Decisions Conditions

Taking into consideration the conclusions of the studies undertaken for the proposed amendments associated, with the revised turbine specifications and updated layout (as detailed in **Appendix A – H**), **it is concluded that these amendments are considered acceptable from an environmental perspective, provided that the original and additional mitigation measures stipulated herein are implemented.**

It is furthermore recommended that an ecological pre-construction walk-through is undertaken prior to construction to inform the final placement of roads and turbines, as well as locate and identify species of conservation concern that are within the development footprint. This recommendation should be included in the updated EA.

Lastly, a written-agreement must be included in the Environmental Authorization with the land owners that they not persecute the Vulnerable red data eagles breeding on their property (Simmons and Martins 2015). The following is to be included:

- » **Verreaux's Eagles, (or Martial Eagles) as threatened Red data species, cannot be persecuted on the Witberg wind farm, because it is illegal to do so anywhere in South Africa (http://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S1727-37812013000400006.);**
- » **This means that eagles (adults, juveniles, chicks or eggs) on the wind farm cannot be shot, poisoned, trapped, their nests removed or the nest contents taken or in any way interfered with.**