

10 May 2021

Proposed amendment to the environmental authorisation for the Plan 8 Grahamstown Wind Energy Facility in the Eastern Cape, and the impacts on bats: TURBINE DIMENSIONS, LAYOUT, NUMBER OF TURBINES

Animalia Consultants (Pty) Ltd. undertook the pre-construction bat monitoring and impact assessment for the Grahamstown Wind Energy Facility (WEF) in 2014 and 2015. The Grahamstown WEF wishes to undertake an amendment to expand the turbine envelope and allow for possible use of the newer, larger turbines that are now available to the industry. The original Environmental Authorisation (EA) is founded on a rotor diameter of 100 – 117m and a hub height of up to 91.5m. The current amendment is proposing an increase to a maximum rotor diameter of 163m and a hub height of up to 125m, as well as a reduction in the number of turbines from 22 to 14. These changes are summarized in **Table 1** which also indicates the minimum rotor swept height above ground.

Table 1: Originally authorized as well as proposed amendments.

Specification	Approved	Proposed
Rotor diameter	100m - 117m	Up to 163m
Hub height	Up to 91.5m	Up to 125m
Lowest rotor swept height above ground	33m	43.5m
Number of turbines	22	14

During the preconstruction assessment, bat activity was significantly greater at 10m than at 50m. The advantage of the proposed amendment is that it will increase the rotor swept height above ground and therefore decrease the likelihood of impacts on bats, but the disadvantage is that it will also result in a larger airspace of moving blades, although to an envelope of lower risk.

However, due to more recent insights gained in the industry, the sensitivity map that was used in the EIA phase is deemed insufficient by the specialist and may not adequately minimise the risks of impacts to bats. The revised sensitivity map now includes additional areas that have been recently considered high-risk areas for impacts on bats (**Figure 2**).

The bat pre-construction EIA study was conducted from 2014 – 2015 when the 2014 South African Good Practice Guidelines for Surveying Bats at Wind Energy Facility Developments - Pre-construction (Sowler & Stoffberg, Third Edition 2014) were in force, which did not specify specific buffer requirements. The current 2020 version of the Best Practice Guidelines (MacEwan *et al.* 2020) recommends that the turbine rotor swept area be kept outside high sensitivity buffers, meaning the center of the turbine base must be no closer than 81.5m from any high bat sensitivity buffers, considering the proposed rotor diameter of 163m. However, this is not considering elevation differences between turbine blade tips and the edge of a high sensitivity zone, according to the diagram and formula indicated in **Figure 1**. Therefore, when considering the elevation difference between the high bat sensitivity zone and the turbine blade tip, the current proposed turbine layout is sufficient to keep the turbine blades outside of the high bat sensitivity buffers for all turbines. The minimum allowed distances of turbine base points to high bat sensitivities are indicated in **Table 2** for each turbine, considering the elevation differences and proposed layout.

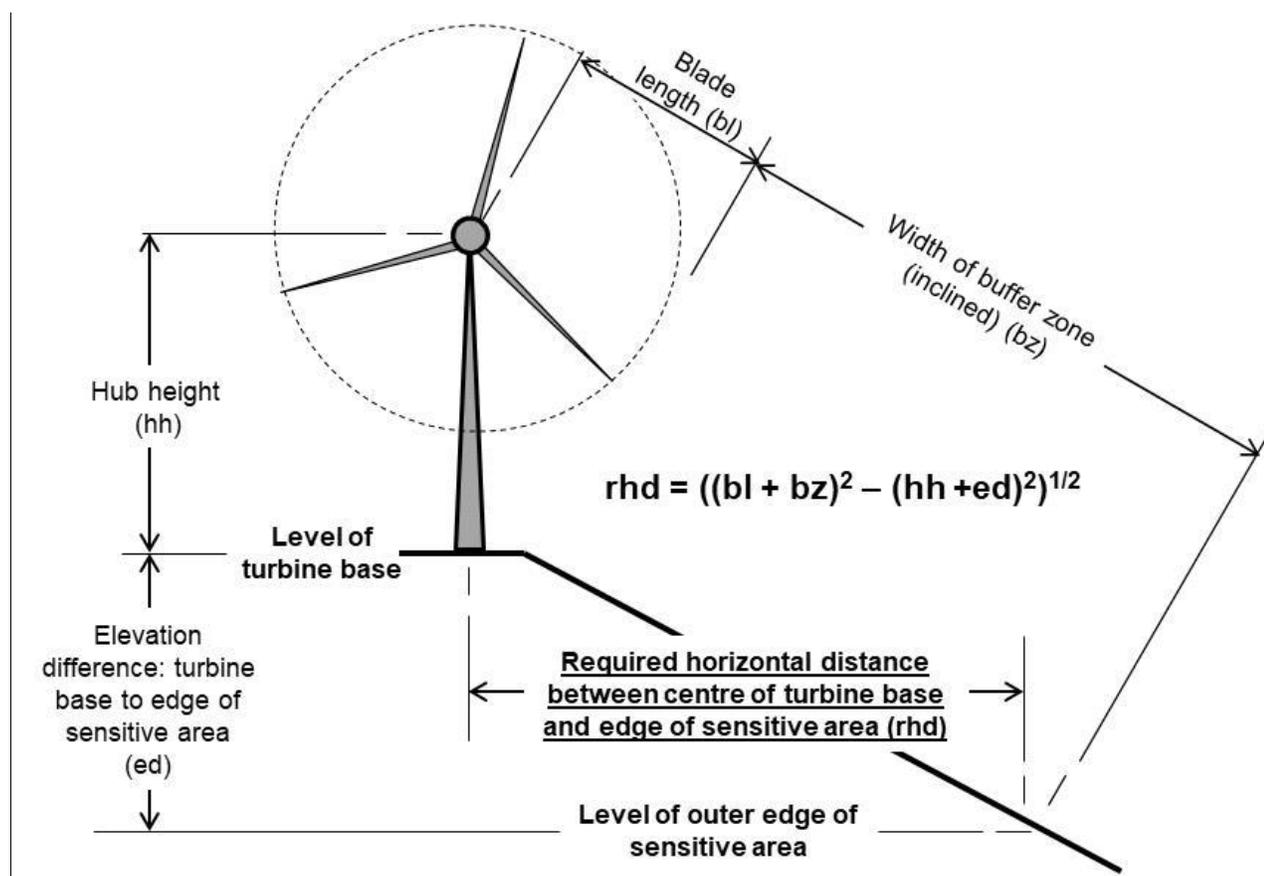


Figure 1: Explanation of the formula used to calculate actual distances from blade tips to high bat sensitivity zones, considering elevation differences between the turbine base point and high bat sensitivity edge.

Turbines may be placed in the moderate bat sensitivity zone as well as in its 100m buffer, but should preferably be avoided wherever feasible.

Table 2: Minimum allowed distances between turbine base points and high bat sensitivity buffer zones.

Turbine #	Minimum allowed distance between turbine base point and high bat sensitivity buffer zone (m)
1	20
2	41
3	50
4	30
5	43
6	30
7	29
8	35
9	41
10	30
11	38
12	20
13	36
14	42

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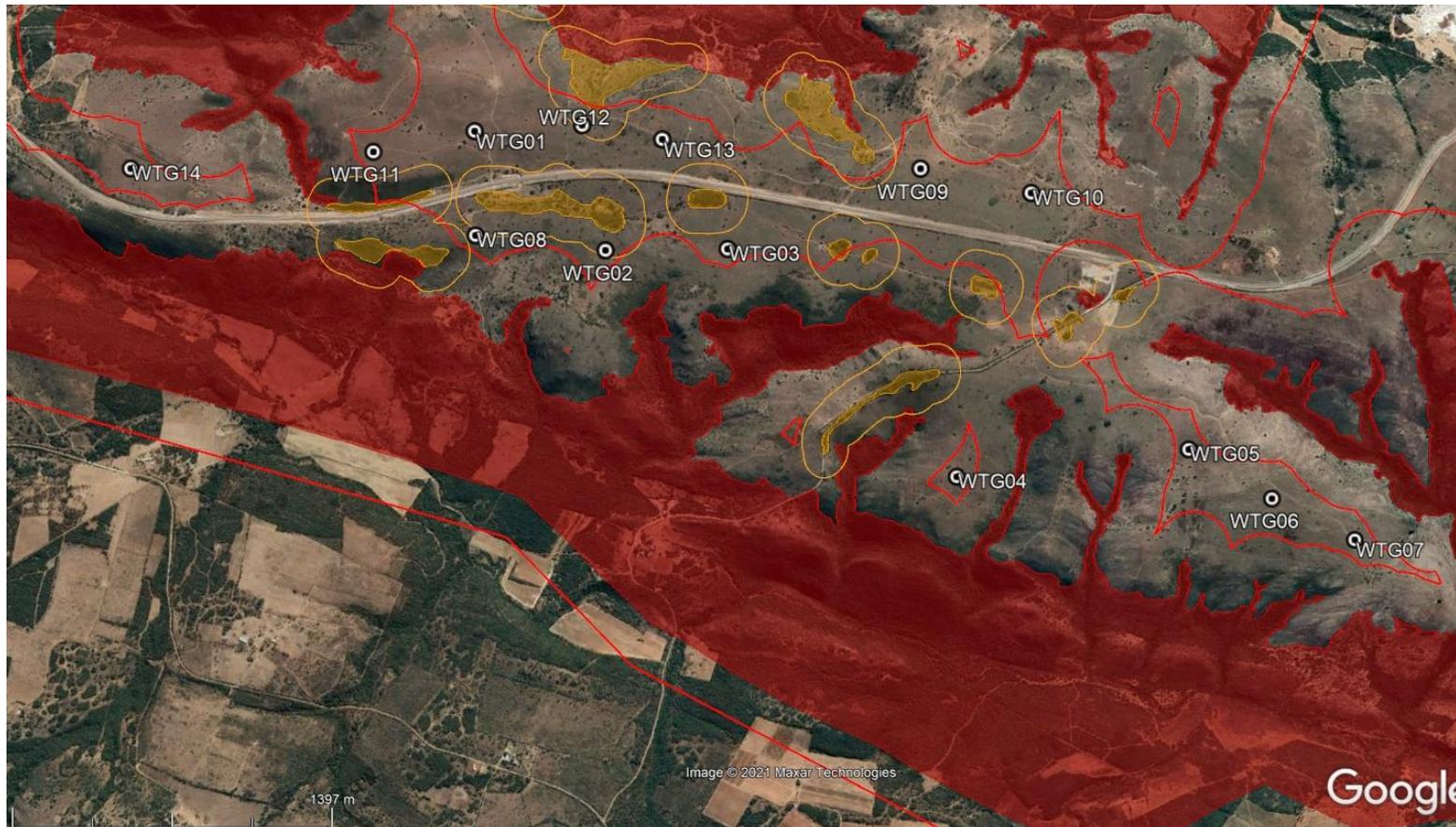


Figure 2: Revised bat sensitivity map. White dots = proposed turbine base locations; Solid red = high bat sensitivity zones; Red line = 200m high bat sensitivity buffer; Solid orange = moderate bat sensitivity zones; Orange line = 100m moderate bat sensitivity buffer.

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The mitigation and management measures specified in the EIA are sufficient and remain unchanged. However, they should not be limited to specific turbines only, but rather apply to whichever turbines are identified to cause unsustainable numbers of bat mortalities during the operational monitoring study.

In summary, the proposed amendment is acceptable from a bat sensitivity perspective, since the revised bat sensitivity map is adhered to. The recommended adaptive mitigation measures should be adhered to, and a bat mortality monitoring study should be conducted for a minimum duration of 2 years during the operational phase.

If there are any queries, please do not hesitate to contact me.



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