Karreebosch Wind Energy Facility

Commissioned Opinion

The requirement for a "grazing area withdrawal agreement" as specified in the Environmental Authorization
DEA Reference: 14/12/16/3/3/2/807

Commissioned by: Trusted Partners

Commissioned for: Karreebosch Wind Farm RF (Pty) Ltd

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Date: 28 July 2022

Background

ENVIRONMENTAL AUTHORISATION HISTORY

Karreebosch Wind Farm RF (Pty) Ltd (the Applicant) applied for Environmental Authorisation (EA) for the proposed Karreebosch WEF in 2015. The original Environmental Impact Assessment (EIA) was undertaken in September of 2015 for up to 71 wind turbines with a hub height of up to 100m and a rotor diameter of up to 140m including associated infrastructure. Environmental authorisation (EA) for 65 turbines was granted on 29 January 2016 (EA Ref: 14/12/16/3/3/2/807). The project underwent subsequent amendments (EA Ref: 14/12/16/3/3/2/807/AM1, 14/12/16/3/3/2/807/AM2, 14/12/16/3/3/2/807/AM3) which included increases in the hub height (up to 125m), rotor diameter (up to 160m), blade length (up to 80m), and minor amendments to the wording of certain conditions of the authorisation, as well as an extension of the validity of the EA to 2026. The associated 132V overhead powerline (OHPL) and onsite 33/132kV substation are currently subject to a separate EA application process.

KARREEBOSCH WEF PROJECT LOCATION

The Karreebosch WEF is located approximately 40km north of Matjiesfontein, and approximately 40 km south of Sutherland. The site falls within the Karoo Hoogland Local Municipality of the Namakwa District Municipality within the Northern Cape Province as well as the Laingsburg Local Municipality of the Central Karoo District Municipality and the Witzenberg Local Municipality of the Cape Winelands District Municipality within the Western Cape Province.

The Karreebosch WEF is currently authorised over seventeen (17) properties as per the original EA (14/12/16/3/3/2/807), however only the properties relevant to the WEF infrastructure are included in this amendment application. The proposed final layout of the Karreebosch WEF is located over thirteen (13) properties as highlighted in blue in the table below.

Table 1: Farm portions included in the Karreebosch WEF EA amendment (as per the original EA: 14/12/16/3/3/2/807).

FARM NAME AND NUMBER	21 DIGIT SG CODE	MUNICIPALITY/PROVINCE
Farm Roode Wal No. 187	C04300000000018700000	Karoo Hoogland LM / Northern Cape
Farm Appels Fontein No. 201	C04300000000020100000	Karoo Hoogland LM / Northern Cape
Portion 1 of Farm Ek Kraal No. 199	C04300000000019900001	Karoo Hoogland LM / Northern Cape
Portion 2 (Nuwe Kraal) of Farm Ek Kraal No. 199	C04300000000019900002	Karoo Hoogland LM / Northern Cape
Portion 1 of Farm Klipbanks Fontein No. 198	C04300000000019800001	Karoo Hoogland LM / Northern Cape
Remainder of Farm Klipbanks Fontein No. 198	C04300000000019800000	Karoo Hoogland LM / Northern Cape
Remainder of Farm Wilgebosch Rivier No. 188	C04300000000018800000	Karoo Hoogland LM / Northern Cape
Farm Rietfontein No. 197	C04300000000019700000	Karoo Hoogland LM / Northern Cape
Remainder of Farm Karreebosch No. 200	C04300000000020000000	Karoo Hoogland LM / Northern Cape
Portion 1 of Farm Karreebosch No. 200[1]	C04300000000020000001	Karoo Hoogland LM / Northern Cape
Farm Oude Huis No. 195	C04300000000019500000	Karoo Hoogland LM / Northern Cape
Portion 1 of Farm Karree Kloof No. 196	C04300000000019600001	Karoo Hoogland LM / Northern Cape
Remainder of Farm Brandvalley No. 75[2]	C04300000000007500000	Laingsburg LM / Western Cape

1 "The existing access road connecting to the R354 which will be used as the main access point for the Karreebosch WEF will require minor road strengthening and modifications on Karreebosch 1/200. Although this main access road was included in the original EIA and layout assessed in 2015, the Karreebosch 1/200 property was omitted from the original application and was therefore not included on the original Environmental Authorisation (14/12/16/3/3/2/807).

2 A portion of an existing access road that will require minor road strengthening falls on Brandvalley RE/75. This existing access road will only be used as a 4x4 access track and not as the main access route to the WEF. The full length of this access road was included in the original EIA and

FARM NAME AND NUMBER	21 DIGIT SG CODE	MUNICIPALITY/PROVINCE
The Farm Kranskraal 189[3]	C04300000000018900000	Karoo Hoogland LM / Northern Cape
Portion 2 of Standvastigheid 210	C04300000000021000002	Karoo Hoogland LM / Northern Cape
The Farm Aprils Kraal 105	C04300000000010500000	Laingsburg LM / Western Cape
The Remainder of Bon Espirange 73	C04300000000007300000	Laingsburg LM / Western Cape
Portion 1 of Bon Espirange 73	C04300000000007300001	Laingsburg LM / Western Cape

SURROUNDING AREA ENERGY PROJECTS

The South African government gazetted eight (8) areas earmarked for renewable energy development in South Africa. These areas are known as Renewable Energy Development Zones (REDZ) and this project falls within the Komsberg REDZ. The purpose of the REDZ is to cluster development of renewable energy facilities in order to streamline the grid expansion for South Africa, i.e., connect zones to one another as opposed to a wide scatter of projects. Therefore, a number of renewable energy developments within the surrounding area which have submitted applications for environmental authorisation (some of which have been approved). It is important to note that the existence of an approved EA does not directly equate to actual development of the project.

The surrounding projects that have not already been awarded Preferred Bidder (PB) status under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) Bid window 5 or the Risk Mitigation IPP procurement programme (RMIPPPP), are still subject to the REIPPPP bidding process or subject to securing an off taker of electricity through an alternative process. Some of the surrounding proposed WEFs secured EAs several years ago but have not obtained PB status (or a private off taker agreement) and as such have not been developed.

These existing surrounding projects of varying approval status have been detailed in the table and figure below. Given the site's location within the Komsberg REDZ, it is considered to be located within the renewable energy hub that is developing in this focus area.

Table 2: Renewable energy projects (by approval status) within a 30km radius of the Karreebosch WEF.

LABEL	DFFE REFERENCE	PROJECT TITLE	STATUS
1	12/12/20/1782/1/AM5	140MW Rietrug Wind Energy Facility near Sutherland, Northern Cape Province.	Preferred Bidder Round 5
2	12/12/20/1782/2/AM6	140MW Sutherland 1 Wind Energy Facility near Sutherland, Northern Cape and Western Cape Provinces.	Preferred Bidder Round 5
3	12/12/20/1782/3/AM3	140 MW Sutherland 2 Wind Energy Facility near Sutherland, Northern Cape Provinces.	Preferred Bidder Round 5
4	12/12/20/1783/1/AM5	150MW Perdekraal (West)Wind Energy Facility, Western Cape Province.	Approved
5	12/12/20/1783/2/AM5	147MW Perdekraal (East) Wind Energy Facility, Western Cape Province.	Preferred Bidder Round 4, Operational
6	12/12/20/1988/1/AM6	140MW Roggeveld Phase 1 Wind Farm, North of Matjiesfontein, Northern Cape and Western Cape Provinces.	Preferred Bidder Round 4, Operational

layout assessed in 2015. However, Brandvalley RE/75 was omitted from the original application and was therefore not included on the original Environmental Authorisation (14/12/16/3/3/2/807).

[3] No infrastructure associated with the Karreebosch WEF is located on Kranskraal 189 as indicated in the final layout. This property will therefore be removed from the EA.

7	12/12/20/2370/1/AM6	140 MW Karusa Wind Energy Facility, Phase 1, Karoo Hoogland Municipality, Northern Cape Province.	Preferred Bidder Round 4, Operational
8	12/12/20/2370/2/AM6	140MW Soetwater Wind Farm Phase 2, Karoo Hoogland Municipality, Northern Cape Province.	Preferred Bidder Round 4, Operational
9	12/12/20/2370/3/AM5	140MW Great Karoo Wind Energy Facility Phase 3, Karoo Hoogland Municipality, Northern Cape Province.	Approved
10	14/1/1/16/3/3/1/2318	310MW Pienaarspoort Wind Energy Facility Phase 1, Witzenberg local Municipality, Western Cape Province.	Approved
11	14/12/16/3/3/1/2441	360MW Pienaarspoort Wind Energy Facility Phase 1, Witzenberg local Municipality, Western Cape Province.	Approved
12	14/12/16/3/3/1/1976/1/AM3	226MW Kudusberg Wind Energy Facility between Matjiesfontein and Sutherland in Western and Northern Cape Provinces.	Approved
13	14/12/16/3/3/1115	325WM Rondekop Wind Energy Facility between Matjiesfontein and Sutherland in Western and Northern Cape Provinces	Approved
14	14/12/16/3/3/1/1977/AM3	183MW Rietkloof Wind Energy Facility near Matjiesfontein in the Western Cape Province.	Preferred Bidder Round 5
15	14/12/16/3/3/1/2542	200 MW Esizayo Wind Energy Facility Expansion near Laingsburg, Western Cape.	In Process
16	14/12/16/3/3/2/2009/AM1	Oya Energy Facility, between Matjiesfontein and Sutherland in Western and Northern Cape Provinces.	Preferred Bidder Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP)
17	14/12/16/3/3/2/826	140MW Gunsfontein Wind Energy Facility Karoo Hoogland Municipality, Northern Cape Province.	Approved
18	14/12/16/3/3/2/856 /AM4	275MW Komsberg West near Laingsburg, Western Cape Provinces	Approved
19	14/12/16/3/3/2/857/AM4	275 Komsberg East near Laingsburg, Western Cape Provinces.	Approved
20	14/12/16/3/3/2/900/AM2	140MW Brandvalley Wind Energy Facility, WITHIN THE Laingsburg and Witzenberg Local Municipalities in the Western and Northern Cape Province.	Preferred Bidder Round 5
21	14/12/16/3/3/2/962/AM1	140MW Maralla East Wind Energy Facility, Namakwa and Central Karoo District Municipalities, Western and Northern Cape Provinces.	Approved
22	14/12/16/3/3/2/963/AM1	140Maralla West Wind Energy Facility, Karoo Hoogland local Municipality, Northern Cape Province.	Approved
23	14/12/16/3/3/2/967/AM3	140MW Esizayo Wind Farm, Laingsburg Local Municipality Western Cape Province.	Approved
24	12/12/20/2235	10MW Inca Photovoltaic Facility near Sutherland, Northern Cape Province.	Approved

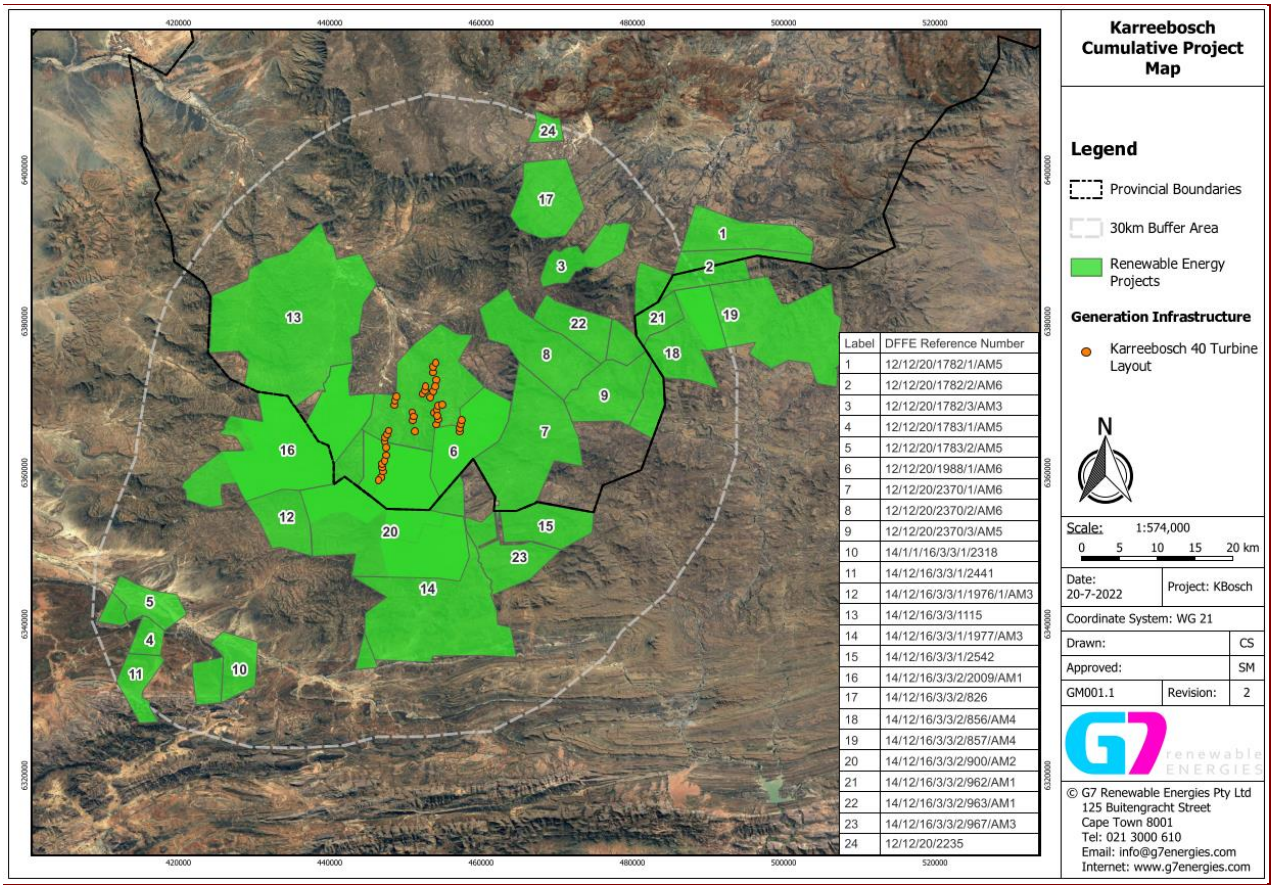

Figure 1: Renewable energy projects (by approval status) within a 30km radius of the Karreebosch WEF.

The Brief

The Department of Department of Forestry, Fisheries and Environment (DFFE) issued an Environmental Authorisation[4] (EA, Ref: 14/12/16/3/3/2/807 and subsequent amendments 14/12/16/3/3/2/807/AM1, 14/12/16/3/3/2/807/AM2 & 14/12/16/3/3/2/807/AM3) in response to the Karreebosch Wind Farm and its associated infrastructure[5]. The site falls within the Karoo Hoogland Local Municipality and the Laingsburg Local Municipality in the Northern and Western Cape Provinces of South Africa respectively.

Conditions 19.2 and 37 of the EA[6] stipulates that a "grazing withdrawal area" of at least 1,300 ha must be set aside and that this area must be fenced and kept free of grazing by livestock for at least 20 years. The origins of this recommended action is the Fauna and Flora Specialist[7] report (FFSR) dated in 2014 and prepared to inform the Environmental Impact Assessment Report (EIAR).

[4] Environmental Authorisation issued in terms of the National Environmental Management Act, 1998: GN R. 9831984 and 985, date 29/01/2022.
[5] The first EA was granted on 29 January 2016 (14/12/16/3/3/2/807), with amendments to the EA issued on the 15 November 2018 (14/12/16/3/3/2/807/AM2) and 30 October 2019 ((14/12/16/3/3/2/807/AM3).
[6] Recommendation 37 on page 18 of the EA.
[7] Also termed the Ecology and Biodiversity Report

Selected text from the Conclusions and Recommendations section of the FFSR report (Todd, 2014)reads as follows:

> *Although off-site mitigation or offsets can be invoked to offset the impact of development, […] on-site mitigation is viewed as the most practical and appropriate option for the current situation. As there is little scope for avoidance due to the limited extent of the ridges, improving the quality of the remaining habitat is a potential mitigation mechanism.*
>
> *The priority high-elevation section of the ridges are identified below in Figure 13. Three different ridge sections have been identified as potential priority areas, but it is the larger centra ridge that is considered the most important. The extent of the central ridge is approximately 3,000ha and the protection of this area from grazing would significantly improve the quality of the remaining habitat and is deemed to be the most suitable mitigation measure to address the likely impacts of the development on the ridgeline habitats. As this requires the co-operation of the landowners, it may not be possible to secure the entire area and a minimum of 1,300ha is identified as a minimum area required to "offset" the impact of the development. […].*
>
> *The rationale for setting these areas aside from grazing is that the ridgelines are currently grazed by livestock, and this has a visible impact on vegetation condition of these areas and also introduces alien species in sheep's wool and dung. Setting these areas aside from grazing would release the vegetation from grazing pressure and improve the quality of the habitat for fauna as well as grazing sensitive species.*

The final EIAR[8] recommends that:

> *Feasible mitigation measures as recommended by the fauna and flora specialist should be implemented. This includes releasing grazing pressure along priority ridgelines in an effort to improve habitat quality and species diversity and reduce the long-term impact of the development on listed and protected plant species.*

The brief was to review and critically analyse available and relevant documentation, undertake a site assessment and to express an opinion on:

a) The merits and scientific integrity of the recommendation as expressed by the Fauna and Flora Specialist (Todd, 2014) which were included as Conditions 19.2 and 37 of the EA via the EIAR;
b) The logical relationship (or lack thereof) between the described concern and the proposed remedy;
c) The likely efficacy of the proposed remedy to achieve the desired outcome; and
d) The practical implications of implementing the proposed remedy.

Approach

The documents provided were reviewed and a site visit to each of the three ridges identified for wind turbine placement were undertaken. From this the opinions in relation to the four points (a-d) detailed above were developed.

[8] Titled the "Final Impact Assessment Report".

Opinion

Point a)

The FFSR (Todd, 2014) does not provide a) ecological evidence (e.g., species plot data or site based observations), b) reputable ecological referencing, or c) logical ecological reasoning as to why the ridgetops in general and specified ridgetops in particular are considered to be priority areas within the project site. In essence the text that establishes the ridges as important (not priorities) is contained in Section 3.2 (bottom of page 18):

> *''The ridges are the most important habitats at the site since the turbines will be located on the ridges and the majority of the footprint would be along the ridges''.*

There is thus no clear ecological reason presented for the assertion that ridges should be seen as priorities. The logic is that the ridges will be impacted most as they will be used most, and for this reason they are priorities. The above quote continues:

> *''[…]. In general, the eastern ridges can be considered more sensitive than the western ridges as [they] contain a significantly higher abundance of species of conservation concern as well as sensitive plant communities''.*

Referring to the above quote, it appears that the presence of species of conservation concern determines if a ridge should be classed as "sensitive". There is little indication of the levels of congruence between the extent of "sensitive" plant communities and priority areas on the ridges. From the information provided the eastern ridges are identified as being more "sensitive" than the western ridges, as they have "significantly" greater numbers of species of conservation concern, although only 3 are listed as having been seen on site. At the same time, approximately 35% or more species are listed for the western ridges than for the eastern ridges (see pages 18, 19 and 20) and the final recommendations (fourth paragraph under heading 5. Conclusions and Recommendations[9]) suggest that the central ridge is the priority ridge. This information is not interpreted further for the reader, but it is clearly inconsistent and thus difficult to understand.

Other points are unclear or confusing, e.g., Appendix 1 lists plant species of conservation concern that are "known to occur in the vicinity of the Karreebosch project site". What is meant by vicinity is not stated and although 35 species are listed in Appendix 1, only 4 are labelled as having been confirmed as being present at the project site[10] although not necessarily within the development footprint. How should one interpret this information, particularly when in the "Ridges Section" eight species of conservation concern are listed.

Lastly, new concepts, not previously mentioned are introduced in Section 5. Conclusions and recommendations. This is not good practice – the logic should have been established in the text and synthesized and summarized in the last section. This adds to a sense of unstructured thinking on the part of the specialist.

[9] It is not useful to give a page number as the numbering has become inconsistent in the document at this point.
[10] Puzzlingly on page 24 (3.3 Listed and protected plant species) 8 species of conservation concern are listed.

In summary

Ultimately, there is little to no substantiation for the assertion that the ridges are more sensitive than other areas and their claimed status as priority areas is also not substantiated (with the exception of some rocky outcrop areas), and the merits of the arguments and the scientific integrity of the recommendation, as expressed by the Fauna and Flora Specialist (Todd, 2014), based on the text of the report are highly questionable.

Point b)

The land that is being considered for the proposed Karreebosch WEF and associated infrastructure is small livestock farmland that has likely been used for this purpose for 150 years or more. In the absence of a windfarm, it is likely that the land will continue being used for this purpose for the near to medium term (5 to 20 years). The impact of grazing on the vegetation is clearly independent of the proposed development.

The recommended intervention, that of establishing a livestock grazing free area, possibly spread over three ridges, that functions for 20 years aims to remedy a perceived environmental harm that has no link to the proposed development. Neighbouring farms with no development have no similar obligation.

In summary

The only relationship between the described concern and the proposed remedy is that the potential impact of the development footprint is being used to trigger the implementation of an action (the implementation of the grazing free area for 20 years) which is perceived to serve the conservation interests of portions of the ridgetop vegetation.

Point c)

The annual precipitation for the broad project area historically ranges between 200 and 400 mm per annum i.e., ecologically it is an arid landscape. Arid systems typically display episodic plant recruitment, survival and growth dynamics that remain poorly understood other than to say that all four dynamics are dependent on site-level rainfall events and their timing, volume and seasonality, as well as on post rainfall conditions such as temperature and grazing pressure. Site-level habitat recovery, which is reliant on individual plant recovery, also generally plays out over considerably longer time periods than one would experience in a mesic rainfall area. The reversal of 150 years of grazing of unknown historical intensity, is impossible to foresee but under current and past climatic regimes it is likely to require upwards of 50 years as opposed to 20 years to achieve. How this will play out under known climate change scenarios which suggest that the proposed development site is likely to gradually receive less and less mean annual rainfall over the next 50 years is unknown, but it is very unlikely that the process will speed up.

The purpose of implementing the zero grazing areas is stated to be to "*release the vegetation from grazing pressure and improve the quality of the habitat for fauna as well as grazing sensitive*

species". No target is set or metric for success mentioned, suggesting that holding a 1,300ha area free of sheep for 20 years could be an end in its own right – which is unsubstantiated.

What complicates the question further is that the recommended stocking density for the landscape by the Department of Agriculture, Land Reform and Rural Development ranges between 45 and 55 hectares per Large Stock Unit (LSU; or a cow equivalent). If this figure is conservatively converted to a density for sheep by multiplying by 4 (a factor of six is commonly used) that results in a stocking density for sheep of 11 to 14ha per sheep or 7 to 9 sheep per km^2. The Karreebosch WEF site is 320km^2 which means that at currently recommended agricultural densities there could be between approximately 2,240 and 2,880 sheep on the project site. During the one-day site assessment, approximately 50-60% of the site was observed/visible, between 100 and 150 sheep were counted. It was noted that all sheep observed were all grazing on the lowlands the landscape, and not the upper mountain slopes or mountain ridges. Although this figure likely changes over time as animals are introduced and removed, it is clear that current stocking rates are already lower than recommended and potentially substantially so. When walking on the ridges more signs of baboon scat than sheep droppings were observed. This places a question mark over the need to reduce densities to zero.

In summary

As no measurable target is set for the intervention, it is not possible to evaluate the value of the intervention in numerical terms. Will the intervention contribute in some undefined manner to the conservation of the vegetation? The above information suggests that this is far from certain and that more insight into what is actually happening at a stocking rate and an ecological level is required before such a recommendation is adopted and implemented. However, this is separate to the expected impacts of the development of the WEF.

Point d)

With the underlying information and understanding for the proposed intervention i.e., constructing and maintaining a 1,300ha fenced grazing exclusion site (or set of exclusion sites) for 20 years being so thin, the implementation of such a recommendation will be impractical and challenging. The guidance is too thin. Additionally, upwards of eight farms will need to be involved to implement the grazing withdrawal area and that will complicate matters to some extent.

In summary

The recommendation to establish a 1,300h sheep fenced exclusion area and to maintain it for 20 years is a weakly justified and impractical intervention and that it should be removed from the Environmental Authorisation. The recommendation is based on weak evidence and scientific logic.

As such it the opinion of the specialist that the requirement for a non-grazing plan should not form part of the Environmental Authorisation (EA - 14/12/16/3/3/2/807) and that the following conditions should be removed from said Environmental Authorisation in their totality:

Condition 19.2: "*The grazing withdrawal area agreement as per condition 37"*; and

Condition 37: "*The grazing withdrawal area recommended by the Ecological Specialist must form part of the Lease Agreement between the holder of this authorization and the landowners. A minimum of 1300 ha must be set aside for the grazing withdrawal area; this area must be fenced and not grazed by livestock for at least 20 years. A copy of this agreement must be included in the EMPr".*

If you have any queries with regards to the above opinion, please contact me directly.

D. Balfour