



APPENDIX J AVIATION ADVICE AND OBSTACLE LIGHTING PLAN



APPENDIX J.1 AVIATION ADVICE LETTER

Amanda Antcliff
ERM
Level 1 Watt Street Commercial Centre
45 Watt Street
Newcastle, NSW
2300

By email [REDACTED]

Our ref: 100505-02

Dear Amanda,

Re: Hills of Gold Wind Farm – AIA Response to Submissions and Amendment Report

1.1. Background

Aviation Projects produced an Aviation Impact Assessment for the Hills of Gold Wind Farm (version 1.1 dated 16 November 2020) that has been provided to various agencies for consideration as part of the approvals process.

Submissions from Airservices Australia and Department of Defence are copies of correspondence sent to us during the consultation process and do not raise any unanticipated issues.

The National Parks and Wildlife Service (NPWS) commented on fixed and rotary wing aerial operations and expressed concern about the proximity of wind turbines to park boundaries.

The Civil Aviation Safety Authority's (CASA) submission, published on the relevant page of the NSW Department of Planning, Industry and Environment Major Projects portal, comments on various aspects of the assessment.

ERM expects to require a written response in a letter of advice in relation to the issues raised by these aviation stakeholders.

1.2. Scope

The scope of work is to assist ERM/ Wind Energy Partners in understanding and responding to the issues raised by Airservices Australia, CASA, Department of Defence and NPWS.

The letter of advice will consolidate the analysis relevant to NPWS aerial operations and provide additional analysis of wind turbine locations reference the nominated park boundaries to clarify separation distances and the potential for aerial operators to avoid colliding with a wind turbine.

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Aviation Projects Pty Ltd / ABN 88 127 760 267

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1.3. Modified WTG47 location

Subsequent to the preparation of the final Aviation Impact Assessment, WTG 47 has been moved approximately 200 m to the south west of the location that was assessed. The overall height of WTG 47 was assessed at 1586.8 m Australian Height Datum (AHD). The new location has the same ground elevation (1351.775 m AHD), so the overall height of the WTG obstacle remains the same.

I confirm that the minor modification to the location of WTG47 will not affect the findings and recommendations of the final Aviation Impact Assessment.

The previous location for WTG47 (red) and the modified location (orange) is indicated in Figure 1 (source: ERM).



Figure 1 Previous (red) and modified (orange) location of WTG47

1.4. NSW National Parks and Wildlife Service

The NSW National Parks and Wildlife Service (NPWS) has provided comments on the development application of the Hills of Gold WF as the development will occur on land adjacent to Ben Halls Gap Nature Reserve (BHGNR) and Crawney Pass National Park (CPNP). In its correspondence, NPWS raised several areas of concern.

For the purposes of this study the following points made by NPWS are relevant:

The impact assessment for aviation concentrates on commercial aviation and fails to adequately address potential impacts on NPWS aerial operations using both fixed wing and rotary aircraft over and around the adjoining reserves. This includes firefighting, aerial pest control and survey work. These operational impacts need to be fully assessed by the proponent and adequate setbacks applied between WTGs and the park boundary.

Figure 2 shows the proposed Hills of Gold WF, including site boundary and WTG locations in relation to both BHGNR and CPNP.

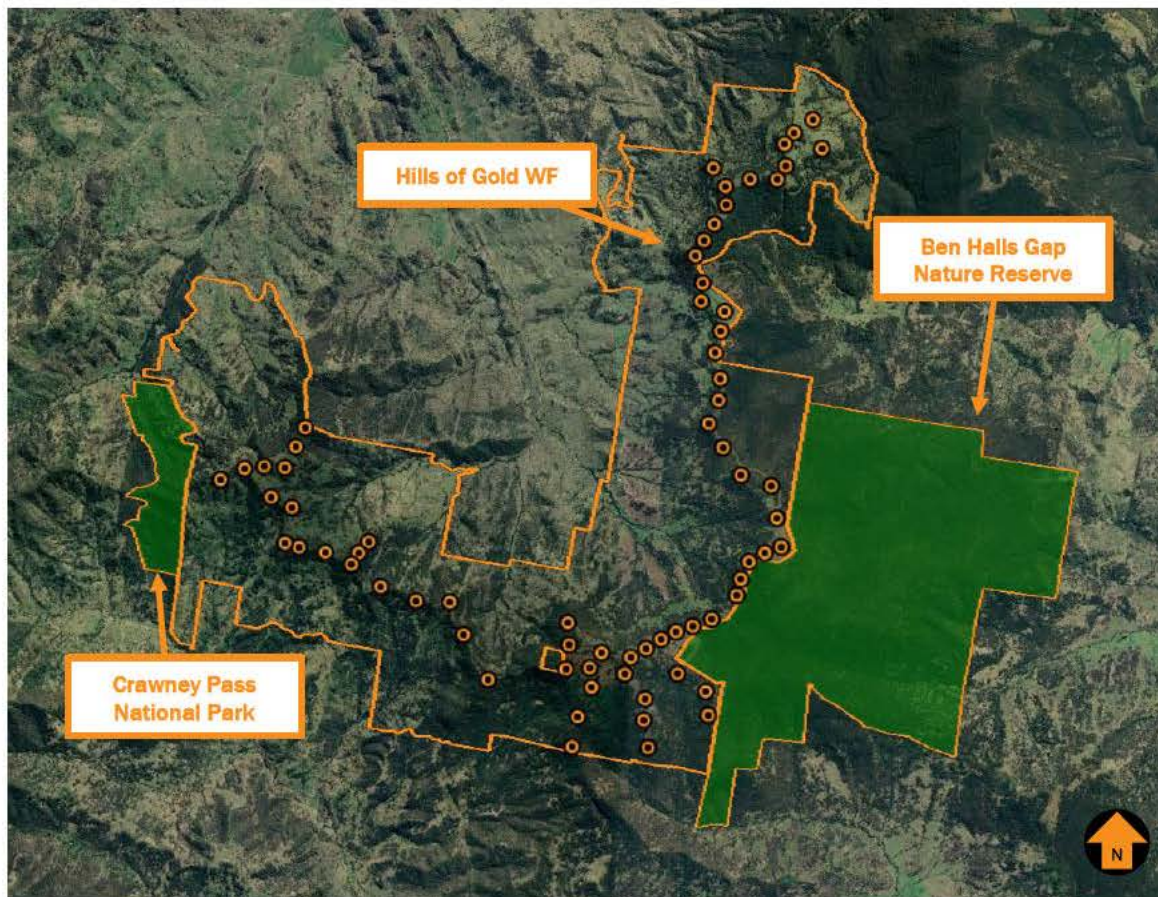


Figure 2 Hills of Gold WF in relation to Ben Halls Gap Nature Reserve and Crawney Pass National Park

1.4.1. Crawney Pass National Park

CPNP is located on the western side of the proposed Hills of Gold WF.

The closest WTG to the CPNP boundary is WP1 as shown in Figure 3. At the nearest point the WTG is located approximately 685 m from the national park. It is therefore unlikely that the proposed WTGs will have any significant adverse impacts on NPWS aerial operations.

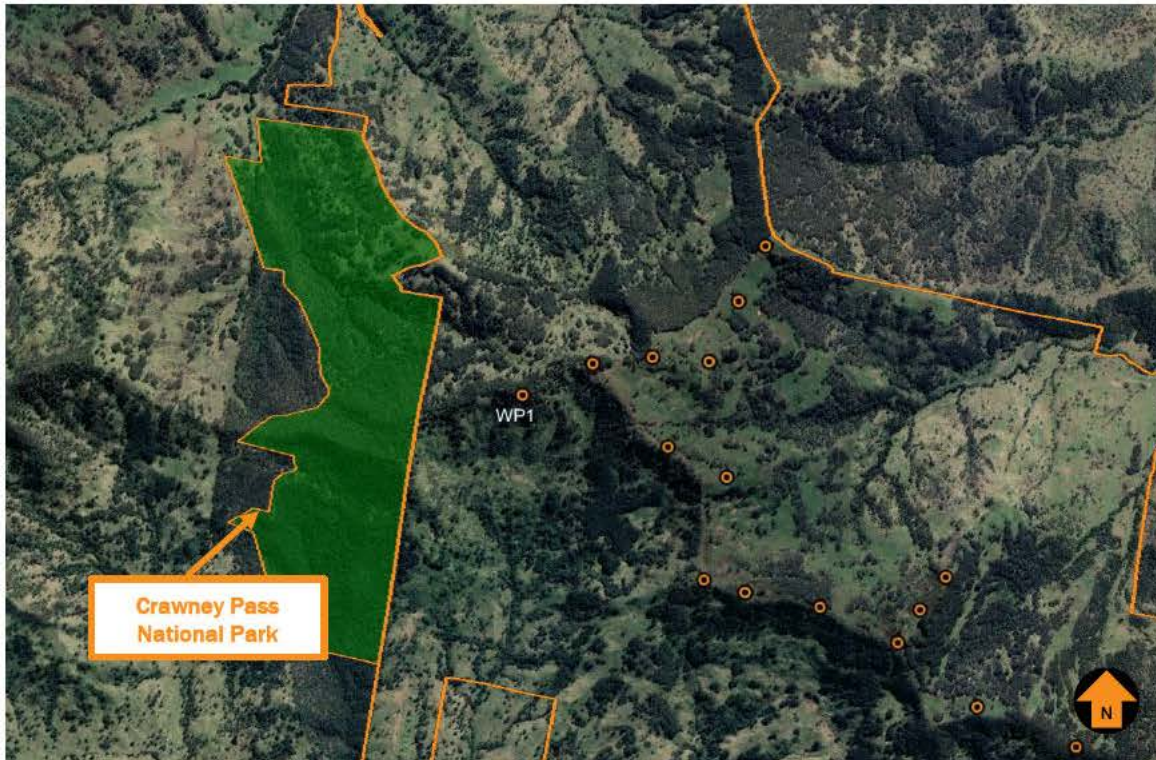


Figure 3 WTG Proximity to Crawney Pass National Park

1.4.2. Ben Halls Gap Nature Reserve

BHGNR and the Hills of Gold WF share a boundary on the eastern side of the Project area. 15 WTGs are planned to be located in close proximity to this shared boundary. Turbines will not be placed closer than 83.5m from the BHGNR boundary. This distance is similar to the extent of the largest rotor blades, therefore the blades will remain clear of BHGNR airspace when in operation. It may, however, affect where aircraft can fly in close proximity to the boundary. Other WTGs located along the site boundary are summarised in

Table 1 and highlighted in white in Figure 4.

Due to the proximity of the WTGs to the BHGMR boundary, there may be an impact on aerial operations within the BHGMR, and particularly when the WTGs are operating.

Aircraft may not be able to manoeuvre with the same freedom available now, and may have to reorient their flight paths to be able to achieve the same results in terms of deploying baits for pest control or surveying.

In terms of impacts on aerial firefighting, NSW Rural Fire Service was consulted during the preparation of the AIA and advised as follows:

We have no comments on the proposed wind farm. Wind farms will be treated like any other potential hazard to aircraft operations.

To minimise the potential adverse impacts and safety concerns on NPWS aerial operations, it is suggested that the Proponent engages with NPWS aerial operators to develop procedures, which may include, for example, stopping the rotation of the wind turbine rotor blades prior to the commencement of aircraft operations in close proximity to the western boundary of BHGMR.

To assist NPWS, the Proponent should provide the location and height of wind turbines and wind monitoring towers so that it may provide aerial application operators with all relevant information. This information, and a description of the infrastructure, should be provided in suitable GIS format prior to construction.

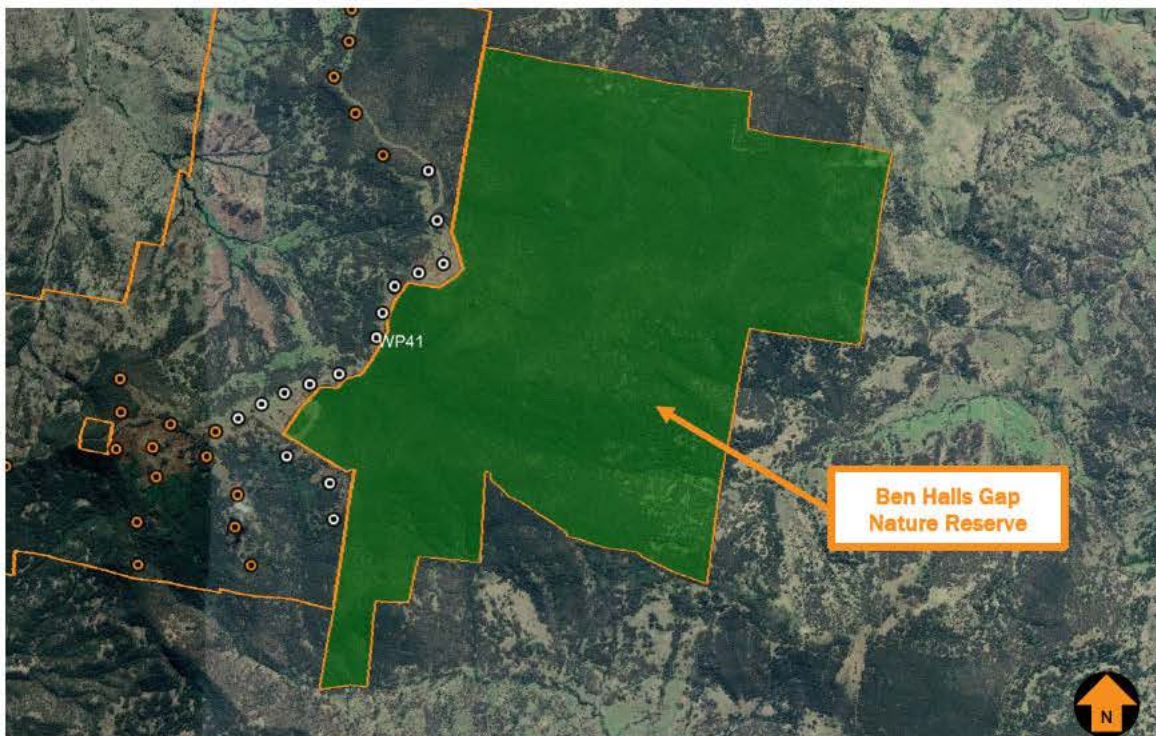


Figure 4 WTG Proximity to Ben Halls Gap Nature Reserve

Table 1 WTG Approximate distance to BHGMR boundary

<i>WTG</i>	<i>Distance to BHGMR</i>	<i>WTG</i>	<i>Distance to BHGMR</i>	<i>WTG</i>	<i>Distance to BHGMR</i>
WP31	160 m	WP38	285 m	WP43	110 m
WP32	225 m	WP39	120 m	WP44	160 m
WP33	210 m	WP40	100 m	WP45	210 m
WP36	600 m	WP41	83.5 m	WP46	195 m
WP37	445 m	WP42	83.6 m	WP47	410 m

1.5. Department of Defence

During preparation of the Aviation Impact Assessment, Aviation Projects contacted Department of Defence as part of the consultation process.

The Department of Defence response dated 16 September 2020 was referenced in the final AIA.

The submission provided to DPIE was the same as the one provided to us during the consultation process.

1.6. Airservices Australia

During preparation of the Aviation Impact Assessment, Aviation Projects contacted Airservices Australia as part of the consultation process. Airservices Australia shared its findings with Aviation Projects on 16 October 2020.

The submission provided to DPIE was the same as the one provided to us during the consultation process.

1.7. Civil Aviation Safety Authority

During the consultation process the Civil Aviation Safety Authority (CASA) was invited to comment on the proposal. CASA provided the following comments:

<i>Comment (CASA)</i>	<i>Response</i>
<i>CASA has reviewed the information provided and the recommendations at Section 11 of the Aviation Impact Statement (AIS) are sound and should be adopted. In addition, the Airservices Australia recommendations of 16 October 2020 included in AIS Section 9.2 Table 2 and section 10.5 must be implemented.</i>	<p>It is assumed that CASA is referring to this recommendation:</p> <p><i>If this proposal is to proceed, Airservices recommends that both aviation operators and the airport are consulted to ensure that all stakeholders fully understand the extent of the impact of these proposed changes. Furthermore, any Airservices work associated with amending the flight procedures will be undertaken on a commercial basis and require further consultation.</i></p> <p>Extensive consultation has already been undertaken with aviation operators and the airport, resulting in an agreement in principle to the proposed changes.</p>
<i>CASA considers the proposed wind farm to be a hazard to aviation safety and does not agree with recommendation 10 Lighting of Turbines. CASA recommends that the wind farm is obstacle lit with steady medium intensity red lighting in accordance with the National Airports Safeguarding Framework Guideline D Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation National Airports Safeguarding Framework Principles and Guidelines (infrastructure.gov.au) and section 9.31 of Part 139 Aerodromes Manual of Standards Part 139 (Aerodromes) Manual of Standards 2019 (legislation.gov.au).</i>	<p>It is acknowledged that CASA has “Recommended” aviation lighting but Aviation Projects maintains its view these are not required in accordance with the assessment and notes that CASA does not have the regulatory authority to require obstacle lighting in the circumstances, hence it has provided a recommendation, rather than a requirement.</p>
<i>CASA is prepared to review a lighting plan that indicates which turbines are proposed to be lit. CASA does not consider the effect of lighting on neighbours, however notes there are recommended treatments listed in Section 9.2 Table 17 of the AIS.</i>	<p>If obstacle lights are required to be installed, a lighting plan would be developed according to the relevant requirements published in Manual of Standards Part 139—Aerodromes. Section 9.31 (8) specifies that medium-intensity obstacle lights must be provided on a sufficient number of individual wind turbines to indicate the general definition and extent of the wind farm, but such that intervals between lit turbines do not exceed 900 m.</p>

<i>Comment (CASA)</i>	<i>Response</i>
	In our experience, this generally results in approximately half of the turbines having lights installed on them.
The EIS Section 3.2.3 Wind Turbine Generators 'Obstacle Lighting' advises that two flashing red medium intensity lights per turbine may be required. CASA expects that flashing lights would be excessively environmentally severe. The remainder of the section on obstacle lighting is accurate. CASA has no issues with Section 11.4.3 Night Lighting.	Obstacle lights, if required to be installed, could be set to 'steady' to reduce the visual impact on neighbouring properties.
AIS section 3.7 Rules of Flight advises that aircraft are restricted to a height of 500ft above ground level (AGL) and 1,000ft at night. The turbines will reach a height of 230m (755ft) above ground level. While pilots are required to fly no lower than 500ft above the ground or any object on the ground, a pilot could be off track or at a low level due to weather related events, navigation difficulties or other circumstances including controllability issues. The charting of a wind farm is one mitigator but does not eliminate the risk of an aircraft colliding with a turbine.	<p>This statement is correct but does not accord with the way in which CASA engages in safety oversight.</p> <p>CASA does not regulate to the point of eliminating risk.</p> <p>It seeks to achieve an acceptable level of safety according to the ALARP principle.</p> <p>And the risk assessment in the AIA clearly shows that there is a very low (ALARP) risk of an aircraft colliding with a turbine.</p>
Further to Recommendation 1, on commencement of the installation of the first turbine or 155m high Wind Monitoring Tower if preceding the turbines, Airservices Australia should be requested to publish a NOTAM advising pilots that construction of tall structures is imminent. Details can be reported to the Airservices Australia Vertical Obstacle Database (VOD) by email at: yod@airservicesaustralia.com .	Agreed.
Further to Recommendation 6, AIS section 3.15 advises that aerial firefighting operations are conducted in day Visual Flight Rules. CASA recommends additional consultation with the NSW Rural Fire Service regarding the possibility of night aerial firefighting operations using night vision apparatus as there is a trend towards night aerial firefighting.	<p>NSW Rural Fire Service was consulted during the preparation of the AIA and advised as follows:</p> <p>We have no comments on the proposed wind farm. Wind farms will be treated like any other potential hazard to aircraft operations.</p>

<i>Comment (CASA)</i>	<i>Response</i>
<p>Further to Recommendation 9, CASA recommends that the following Australian Standards be considered regarding the overhead transmission lines:</p> <ul style="list-style-type: none"> • AS 3891.1, Air navigation – Cables and their supporting structures – Marking and safety requirements, Part 1: Marking of overhead cables and supporting structures • AS 3891.2, Air navigation – Cables and their supporting structures – Marking and safety requirements, Part 2: Low-level aviation operations. <p>A copy of the standards are available on the Standards Australia website: Standards Australia - Standard Organisation in Australia.</p>	<p>Acknowledged</p>
<p>Further to Recommendation 11, the five Wind Monitoring Towers in the order of 155m AGL must be marked to some extent, depending on the proximity to the surrounding turbines. If the Wind Monitoring Towers are to be installed before the turbines, then they should incorporate a medium intensity red obstacle light at night.</p>	<p>Regarding marking – agreed.</p> <p>Regarding lighting - CASA does not have the regulatory authority to require obstacle lighting in the circumstances, hence it has provided a recommendation by using the word 'should', rather than a requirement by using the word 'must'. This recommendation is not controversial, although consideration could be given to setting the obstacle lights to 'steady', and removing them when wind turbines are erected in the vicinity of the WMTs.</p>

If you wish to clarify or discuss of the contents of this correspondence, please contact me on 0417 631 681.

Kind regards



Keith Tonkin

Managing Director

08 June 2021

Amanda Antcliff

From: Keith Tonkin [REDACTED]@aviationprojects.com.au>
Sent: Friday, 10 September 2021 8:58 AM
To: Amanda Antcliff
Cc: Murray Curtis
Subject: RE: Hills of Gold WF update

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Morning Amanda

The most recent reference file for WTG coords I have is: *70 WTG Coordinates V3_17Mar2021*.
Based on these coords, and your notes below:

1. The relocated turbines retain their previously assessed site elevations, so their relocation will not affect the results of the analysis
2. The removed turbines will not affect the results of the analysis. WP20 remains the critical obstacle.
3. Additional temporary WMTs will not affect the results of the analysis. Recommendations regarding marking remain applicable.
4. Minor realignment of the transmission line will not affect the results of the analysis.

Regards

Keith Tonkin MBA (Aviation Management), CPRM
Managing Director

[REDACTED]
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Street 19/200 Moggill Rd Taringa QLD 4068
Web www.aviationprojects.com.au

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AVIATION PROJECTS Pty Ltd / ABN 88 127 760 267



From: Amanda Antcliff [REDACTED]
Sent: Thursday, 9 September 2021 4:24 PM
To: Keith Tonkin [REDACTED]

Cc: Murray Curtis [REDACTED]

Subject: Hills of Gold WF update

Hi Keith,

An update on Hills of Gold Wind Farm for you.

I understand that ENGIE and Someva have engaged a consultant to complete an additional visual night lighting assessment. Once that is completed, the intention is for this to be provided to Aviation Projects to prepare the obstacle lighting plan. I'll advise when this information is available.

ERM is currently finalising the Response to Submissions and Amendment Reports. The Amendment report addresses various project changes that have been made in response to submissions from agencies and the community.

You may recall that you provided the attached response to us previously, which identified the project changes that had been decided at that time. Since then, the project has been subject to additional changes, the ones of relevance to aviation matters being:

1. Relocation of turbines:
 - a. WTG 47 by approx. 250 m.
 - b. WTG 50 by approx. 137m
 - c. WTG 12 by approx. 50mNew coordinates are:

WP50	325872.1500	6504011.0169	1329.437
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WP47	327034.8232	6502705.0191	1351.775
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WP12	319126.2648	6501524.1736	1131.467
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2. Removal of WTGs 19, 23, 1, 27, 31
3. Five additional wind monitoring masts to be located on the same location as a WTG prior to its installation and removed shortly before WTG installation (locations TBC) – max height of 150m (same as WTG hub height)
4. Mine realignment of Transmission line between WTG 2 and 12

Just wondering if you are able to advise if these changes would require any further assessment, or whether given their minor nature, no further assessment would be required and the impacts assessed and mitigation measures proposed in the Aviation Impact Assessment and in your advice letter, are sufficient.

Thanks
Amanda

Amanda Antcliff

Consultant Director

ERM

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W www.erm.com



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APPENDIX J.2 OBSTACLE LIGHTING AND CASA CONSULTATION

Mr Matthew Windebank
Aerodrome Engineer
Air Navigation, Airspace & Aerodromes Branch
Civil Aviation Safety Authority

By email [REDACTED]

Our ref: 100505-03

Dear Matthew

Re: Review of CASA submission on obstacle lighting at Hills of Gold Wind Farm – obstacle lighting intensity

I write in relation to the Hills of Gold Wind Farm and specifically to request consideration of the Civil Aviation Safety Authority's recommendation regarding obstacle lighting in its submission to the NSW Department of Planning, Industry and Environment (DPIE) under the Major Projects approval process.

1.1. Background

Hills of Gold Wind Farm and associated infrastructure (the Project) is proposed to be located 50 km south-east of Tamworth and 8 km south of Nundle, comprising up to 70 wind turbines, battery storage and grid connection.

An Aviation Impact Assessment (AIA) for the Project was prepared by Aviation Projects (v1.1, dated 16 November 2020) and submitted as Appendix H of the Environmental Impact Statement (EIS) for the Project.

Recommendation 10 of the AIA pertains to obstacle lighting of wind turbines:

Aviation Projects has assessed that the Project will not require obstacle lighting to maintain an acceptable level of safety to aircraft, once the proposed mitigation solutions outlined in Section 6.24 are implemented.

The Civil Aviation Safety Authority (CASA) was requested by DPIE to comment on the proposal and in particular the AIA, and in its submission, responded in part as follows:

CASA considers the proposed wind farm to be a hazard to aviation safety and does not agree with recommendation 10 Lighting of Turbines. CASA recommends that the wind farm is obstacle lit with steady medium intensity red lighting in accordance with the National Airports Safeguarding Framework Guideline D Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation National Airports Safeguarding Framework Principles and Guidelines (infrastructure.gov.au) and section 9.31 of Part 139 Aerodromes Manual of Standards Part 139 (Aerodromes) Manual of Standards 2019 (legislation.gov.au).

CASA is prepared to review a lighting plan that indicates which turbines are proposed to be lit. CASA does not consider the effect of lighting on neighbours, however notes there are recommended treatments listed in Section 9.2 Table 17 of the AIS.

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Aviation Projects Pty Ltd / ABN 88 127 760 267

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19/200 Moggill Road, Taringa Qld 4068

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The EIS and CASA's submission can be found on DPIE's Major Projects planning portal website:

<https://www.planningportal.nsw.gov.au/major-projects/project/9701>.

1.2. Option to use 200 cd intensity low intensity lighting

The AIA specified various treatments to limit the visual impact of obstacle lighting, if it was required.

Although it is not agreed that obstacle lighting must be provided on wind turbines of the wind farm, and the Project has not been approved, our client has requested that we investigate other opportunities to limit the visual impact that obstacle lighting, if required, would have on the surrounding community.

In its submission, CASA recommended medium intensity obstacle lighting, which, according to Manual of Standards Part 139—*Aerodromes*, must have a peak effective intensity of 2000 +/- 25% candela (cd).

We note that the area in which the wind farm will be located has limited background illumination, particularly to the west (Crawney Pass National Park) and east (Ben Halls Gap Nature Reserve), but also because the general area is relatively unpopulated.

I recall that CASA representatives conducted an onsite review of a wind farm site location in a remote setting where there was little to no surrounding light sources. In that particular case, a decision was made to allow a reduction from the previously recommended 2000 cd medium intensity steady red aviation hazard lighting, to 200 cd low intensity steady red lighting primarily because of the lack of backlighting making 200 cd lighting easier to see at night.

As a result of this outcome, I am aware that CASA accepted a similar lighting solution for another wind farm in a setting where there was little to no surrounding light sources.

Would you please advise if 200 cd low intensity steady red lighting would be acceptable to CASA, if lighting was required, for the Hills of Gold Wind Farm.

If you wish to clarify or discuss of the contents of this correspondence, please contact me on 0417 631 681.

Kind regards



Keith Tonkin

Managing Director

29 June 2021

Amanda Antcliff

From: Windebank, Matthew [REDACTED]
Sent: Monday, 19 July 2021 10:06 AM
To: Keith Tonkin
Cc: Murray Curtis; Amanda Antcliff
Subject: RE: 100505-03_Hills_of_Gold_WF-Obstacle_lighting_intensity_v1.0_210629
[SEC=OFFICIAL]

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OFFICIAL

Good morning Keith,

On the basis of the information supplied in the Request for Review as supplied by yourself and after reviewing the general environment around the site of the proposed Hills of Gold Wind Farm, CASA would accept low intensity steady red lighting of no lower than 200cd as a suitable aviation mitigator.

Regards

Matthew Windebank
Aerodrome Engineer | Airport Development and Airspace Protection
Air Navigation, Airspace & Aerodromes Branch
CASA Aviation Group
[REDACTED]
[REDACTED]



Australian Government
Civil Aviation Safety Authority



From: Keith Tonkin [REDACTED]
Sent: Tuesday, 29 June 2021 1:39 PM
To: Windebank, Matthew [REDACTED]
Cc: Murray Curtis [REDACTED] Amanda Antcliff [REDACTED]
Subject: 100505-03_Hills_of_Gold_WF-Obstacle_lighting_intensity_v1.0_210629

Hi Matthew

Please see attached some correspondence for your attention.

We'd appreciate your thoughts please on whether 200 cd low intensity steady red lighting would be acceptable to CASA, if lighting was required, for the Hills of Gold Wind Farm.

Best regards

Keith Tonkin MBA (Aviation Management), CPRM
Managing Director



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Amanda Antcliff

From: Keith Tonkin [REDACTED]
Sent: Thursday, 16 September 2021 4:43 PM
To: Windebank, Matthew
Cc: Murray Curtis; Amanda Antcliff; Tim Mead; Jamie Chivers; Liam Edgeworth
Subject: RE: 100505-03_Hills_of_Gold_WF-Obstacle_lighting_intensity_v1.0_210629 [SEC=OFFICIAL]
Attachments: 100505-03_Hills_of_Gold_WF_Lighting Design Plan_v1.0_210916.pdf; MLA Hub Visibility Analysis.kmz; Proposed HOG Aviation lighting - 15092021.kmz

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Dear Matthew

Further to our previous correspondence, I am writing on behalf of the project proponent (Someva) to take up CASA's offer to review a lighting plan that indicates which turbines are proposed to be lit (should they be required by NSW Department of Planning, Industry and Environment).

The attached indicative lighting layout has been prepared generally in accordance with NASF Guideline D and MOS 139 s9.31(8).

Please note the following considerations:

- 5 turbines have now been removed from the 70 turbine layout presented in the EIS.
- Visual impact of night time aviation obstruction lighting on the surrounding community is an important consideration for wind farms and is required to be assessed by NSW DPIE. The proposed lighting plan has sought to reduce these impacts as much as practicable whilst still providing an acceptable level of project lighting to the aviation industry. Turbines in the northern part of the project (T50 -> T70) have the highest potential for night lighting impact and thus the obstruction lights are fewer and have slightly greater spacing on these turbines.
- Despite the generally linear nature of the project, turbines on the extremities have been lit where possible.
- The lighting fixtures are nominated as low intensity with a minimum 200 cd intensity as per your earlier correspondence.

For the purposes of informing your consideration, I have also attached kmz files of the proposed lighting plan and an analysis of wind turbine hub visibility from the surrounding residences.

We would appreciate CASA's consideration and feedback regarding whether the proposed lighting plan in terms of those wind turbines identified for the installation of obstacle lighting would be acceptable.

Kind regards

Keith Tonkin MBA (Aviation Management), CPRM
Managing Director

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OFFICIAL

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Regards

Matthew Windebank
Aerodrome Engineer | Airport Development and Airspace Protection
Air Navigation, Airspace & Aerodromes Branch
CASA Aviation Group



Australian Government
Civil Aviation Safety Authority



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Cc: Murray Curtis [REDACTED] Amanda Antcliff [REDACTED]
Subject: 100505-03_Hills_of_Gold_WF-Obstacle_lighting_intensity_v1.0_210629

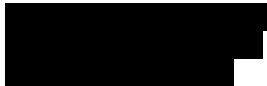
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Keith Tonkin MBA (Aviation Management), CPRM
Managing Director



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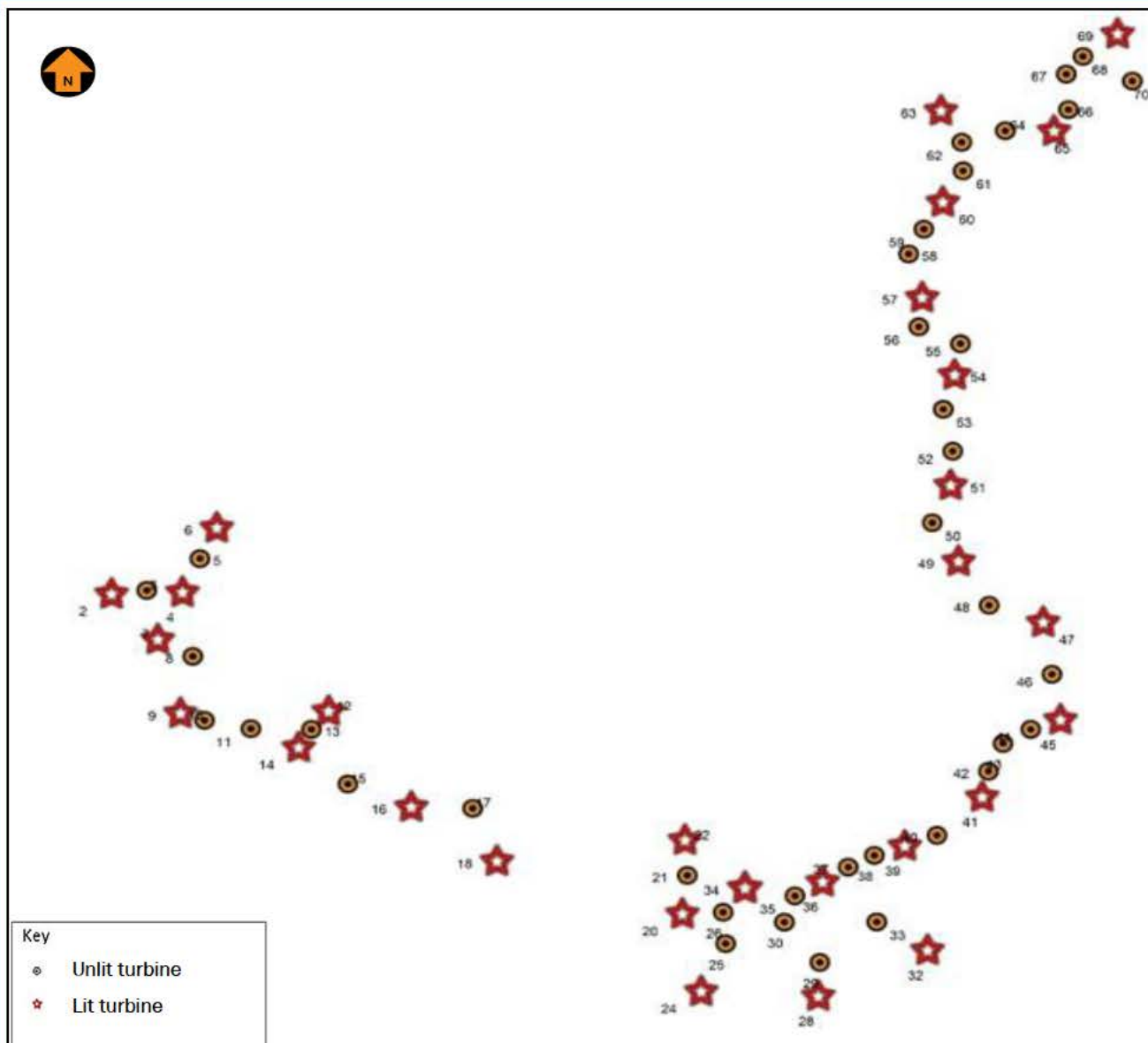
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1. Light and Shielding Specification:

Lights:

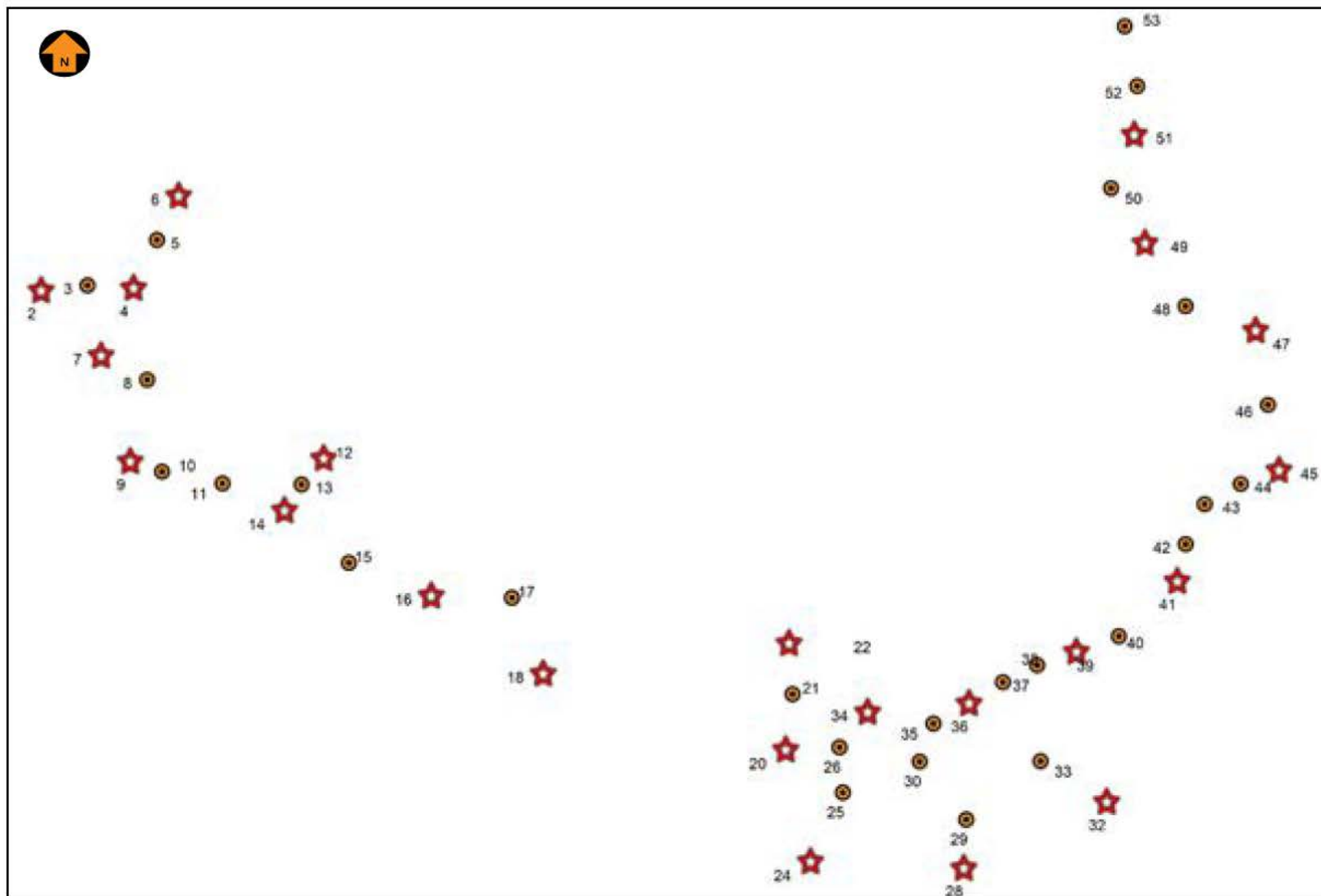
 - **2 low intensity steady red lights:**
 - fixed lights showing red
 - a horizontal beam spread that results in 360° coverage around the obstacle
 - a minimum intensity of 200 candela (cd)
 - a vertical beam spread (to 50% of peak intensity) of 10°
 - a vertical distribution with 50 cd minimum at +6° and +10° above the horizontal
 - not less than 10 cd at all elevation angles between -3° and +90° above the horizontal.

Shielding:

 - shielding of the downward component of obstacle lighting is permitted, and if used must be such that:
 - (a) no more than 5% of the nominal light intensity is emitted at or below 5° below horizontal
 - (b) no light is emitted at or below 10° below horizontal
 - two lights must be provided on top of the generator housing in a way that allows at least one of the lights to be seen from every angle in azimuth.

Department of Defence obstacle lighting requirement:

 - the frequency range of the LED light emitted must fall within the range of wavelengths 655 to 930 nanometers.
2. References
 - Civil Aviation Safety Authority, *Part 139 (Aerodromes) Manual of Standards 2019*, dated 13 August 2020; Chapter 9 Division 4 Obstacle lighting (Sections 9.31, 9.32 and 9.33)
 - Department of Infrastructure and Regional Development, Australian Government, *National Airport Safeguarding Framework, Guideline D Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation*, v4.1.3, 15 July 2012, paragraphs 35, 36 and 37



**HILLS OF GOLD WIND FARM –
SOUTHERN PORTION
OBSTACLE LIGHTING PLAN**

Project:
100505-03

Scale:
Not to scale

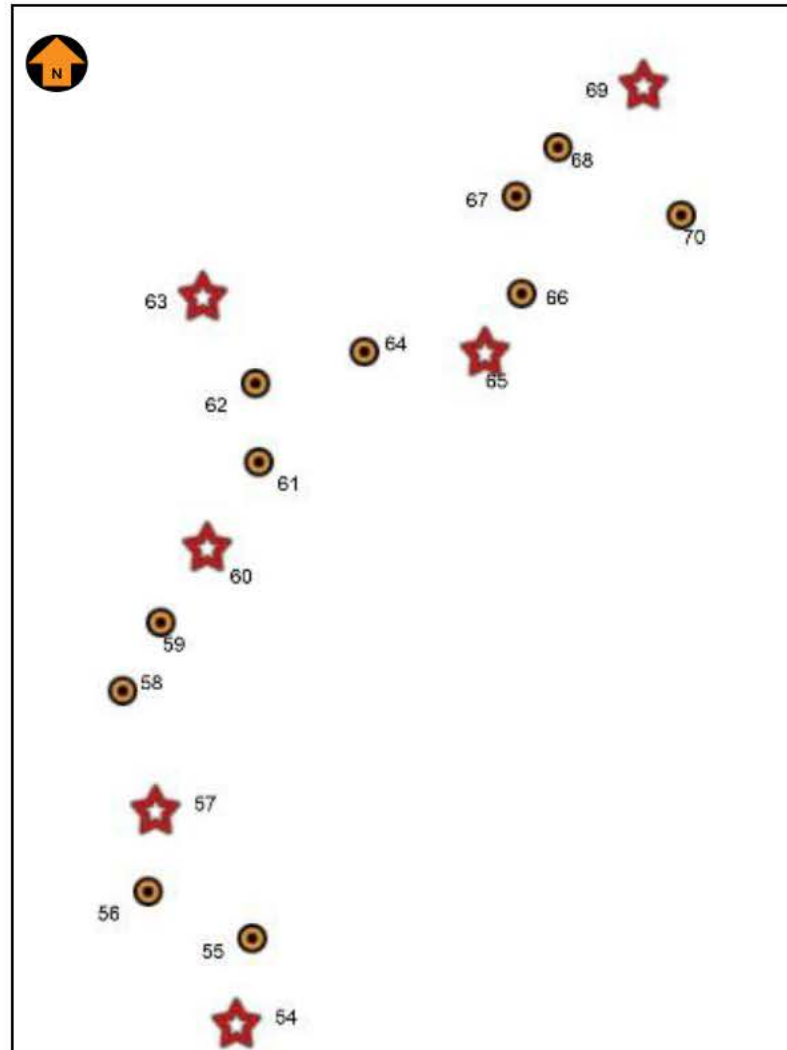
Prepared by:
K Tonkin



Date:
16/09/21

Version:
1.0_210916

Page: 2 of 3





Key	
	Unlit turbine
	Lit turbine

**HILLS OF GOLD WIND FARM –
NORTHERN PORTION
OBSTACLE LIGHTING PLAN**

**Project:
100505-03**

**Scale:
Not to scale**

**Prepared by:
K Tonkin**

**Date:
16/09/21**

**Version:
1.0_210916**

Page: 3 of 3



Amanda Antcliff

From: Keith Tonkin [REDACTED]
Sent: Wednesday, 22 September 2021 3:01 PM
To: Tim Mead
Cc: Murray Curtis; Amanda Antcliff; Jamie Chivers; Liam Edgeworth; Craig Abela
Subject: FW: F18/7778-2 - 100505-03_Hills_of_Gold_WF-Obstacle_lighting_intensity_v1.0_210629 [SEC=OFFICIAL]

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Tim

Please see CASA's response below, accepting the proposed obstacle lighting plan.

Regards

Keith Tonkin MBA (Aviation Management), CPRM
Managing Director

[REDACTED]
Post PO Box 116 Toowong DC QLD 4066
Street 19/200 Moggill Rd Taringa QLD 4068
Web www.aviationprojects.com.au

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AVIATION. FROM THE GROUND UP.

AVIATION PROJECTS Pty Ltd / ABN 88 127 760 267



From: Airspace Protection [REDACTED]
Sent: Wednesday, 22 September 2021 1:26 PM
To: Keith Tonkin [REDACTED]
Subject: F18/7778-2 - 100505-03_Hills_of_Gold_WF-Obstacle_lighting_intensity_v1.0_210629 [SEC=OFFICIAL]

OFFICIAL

Good afternoon Keith,

After review, CASA accepts the lighting design and presented. I acknowledge that the spacings have been stretched marginally beyond those recommended in the NASF guidelines but agree that the final design will meet the intended outcome.

Regards

Matt

Matthew Windebank
Aerodrome Engineer | Aerodrome Developments and Airspace Protection
Air Navigation, Airspace & Aerodromes Branch
CASA\ Aviation Group



From: Keith Tonkin [REDACTED]
Sent: Thursday, 16 September 2021 4:43 PM
To: Windebank, Matthew [REDACTED]
Cc: Murray Curtis [REDACTED]; Amanda Antcliff [REDACTED]; Tim Mead [REDACTED]
[REDACTED] Jamie Chivers [REDACTED] Liam Edgeworth [REDACTED]
Subject: [WARNING: UNSCANNABLE EXTRACTION FAILED]RE: 100505-03_Hills_of_Gold_WF-Obstacle_lighting_intensity_v1.0_210629 [SEC=OFFICIAL]

Dear Matthew

Further to our previous correspondence, I am writing on behalf of the project proponent (Someva) to take up CASA's offer to review a lighting plan that indicates which turbines are proposed to be lit (should they be required by NSW Department of Planning, Industry and Environment).

The attached indicative lighting layout has been prepared generally in accordance with NASF Guideline D and MOS 139 s9.31(8).

Please note the following considerations:

- 5 turbines have now been removed from the 70 turbine layout presented in the EIS.
- Visual impact of night time aviation obstruction lighting on the surrounding community is an important consideration for wind farms and is required to be assessed by NSW DPIE. The proposed lighting plan has sought to reduce these impacts as much as practicable whilst still providing an acceptable level of project lighting to the aviation industry. Turbines in the northern part of the project (T50 -> T70) have the highest potential for night lighting impact and thus the obstruction lights are fewer and have slightly greater spacing on these turbines.
- Despite the generally linear nature of the project, turbines on the extremities have been lit where possible.
- The lighting fixtures are nominated as low intensity with a minimum 200 cd intensity as per your earlier correspondence.

For the purposes of informing your consideration, I have also attached kmz files of the proposed lighting plan and an analysis of wind turbine hub visibility from the surrounding residences.

We would appreciate CASA's consideration and feedback regarding whether the proposed lighting plan in terms of those wind turbines identified for the installation of obstacle lighting would be acceptable.

Kind regards

Keith Tonkin MBA (Aviation Management), CPRM
Managing Director



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AVIATION. FROM THE GROUND UP.

AVIATION PROJECTS Pty Ltd / ABN 88 127 760 267



From: Windebank, Matthew [REDACTED]
Sent: Monday, 19 July 2021 10:06 AM
To: Keith Tonkin [REDACTED]
Cc: Murray Curtis [REDACTED] Amanda Antcliff [REDACTED]
Subject: RE: 100505-03_Hills_of_Gold_WF-Obstacle_lighting_intensity_v1.0_210629 [SEC=OFFICIAL]

OFFICIAL

Good morning Keith,

On the basis of the information supplied in the Request for Review as supplied by yourself and after reviewing the general environment around the site of the proposed Hills of Gold Wind Farm, CASA would accept low intensity steady red lighting of no lower than 200cd as a suitable aviation mitigator.

Regards

Matthew Windebank
Aerodrome Engineer | Airport Development and Airspace Protection
Air Navigation, Airspace & Aerodromes Branch
CASA Aviation Group
[REDACTED]



Australian Government
Civil Aviation Safety Authority



From: Keith Tonkin [REDACTED]
Sent: Tuesday, 29 June 2021 1:39 PM
To: Windebank, Matthew [REDACTED]
Cc: Murray Curtis [REDACTED] Amanda Antcliff [REDACTED]
Subject: 100505-03_Hills_of_Gold_WF-Obstacle_lighting_intensity_v1.0_210629

Hi Matthew

Please see attached some correspondence for your attention.

We'd appreciate your thoughts please on whether 200 cd low intensity steady red lighting would be acceptable to CASA, if lighting was required, for the Hills of Gold Wind Farm.

Best regards

Keith Tonkin MBA (Aviation Management), CPRM
Managing Director



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