The view of the Hills of Gold ridgeline glowing gold at sunset, photograph by CC

HILLS OF GOLD PRESERVATION INC 1800437

SUBMISSION ON DPHI RESPONSE TO IPC QUESTIONS REGARDING HILLS OF GOLD WIND FARM (SD-9679)

JULY 2024

SSD-9679

We acknowledge the Traditional Custodians of the land on which we live, the Kamilaroi people. We recognise their continued connection to the land and waters of this beautiful place and acknowledge that they never ceded sovereignty. We respect all Kamilaroi Elders and Ancestors and extend that respect to all First Nations people.

CONTENTS

1.0 INTRODUCTION

Landowner advocacy group Hills of Gold Preservation Inc provides its public comment on the Department of Planning, Housing and Infrastructure's response to Independent Planning Commission questions regarding Hills of Gold Wind Farm (SD-9679).

The DPHI and Applicant continue to present an incomplete project to the IPC. There is information missing about internal access roads, mitigation of soil erosion, sedimentation and mass movement, and external road upgrades. As a result, the cost of Hills of Gold Wind Farm remains unknown and is a Public Risk, not a Public Benefit.

The DPHI continues to recommend approval of a Hills of Gold Wind Farm concept ignoring dire warnings by Tamworth Regional Council planning team, independent soil scientists, riverine specialist, ecologists and neighbours with microknowledge of the local environment and flagging outstanding information still not received from the proponent.

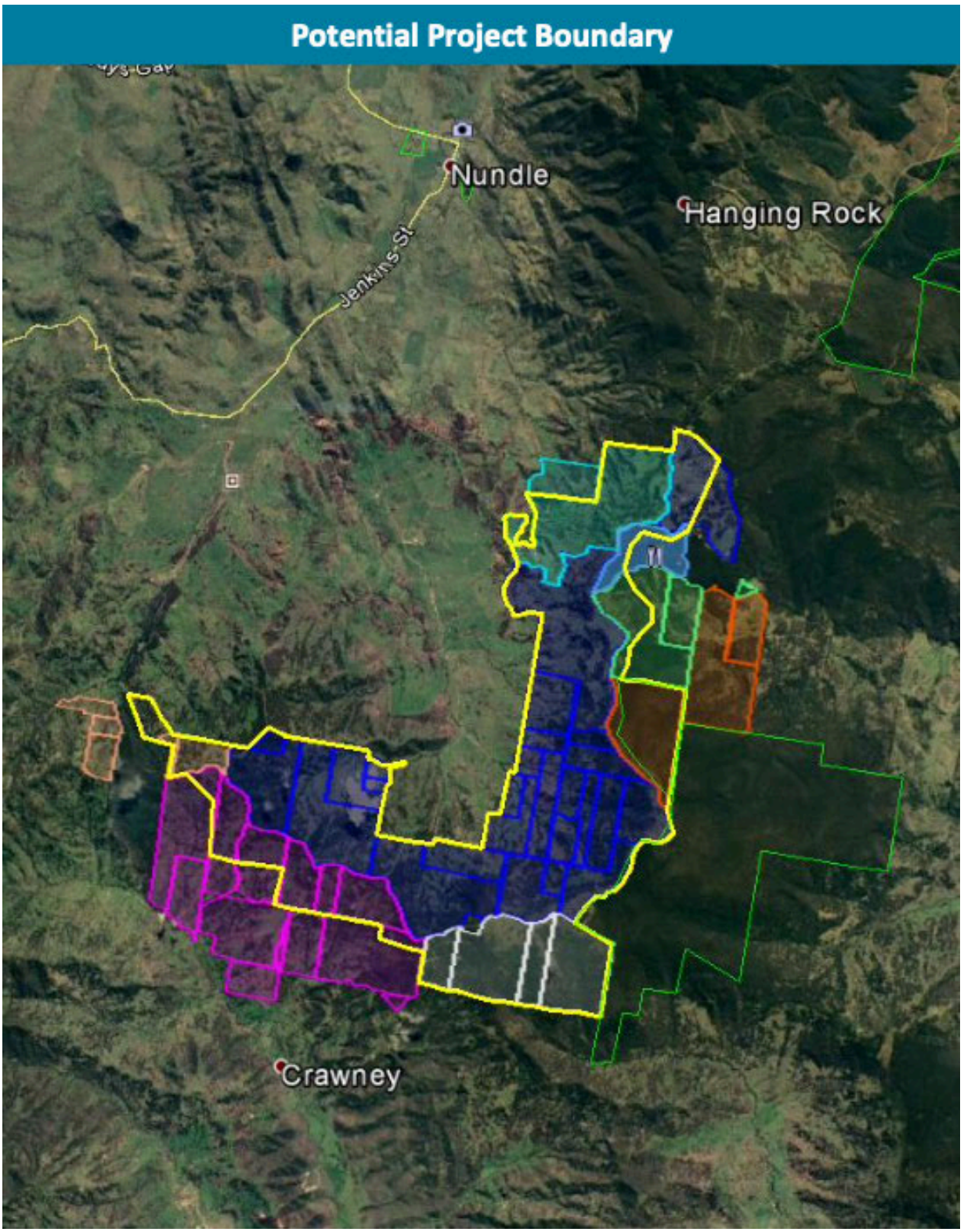
HOGPI members are concerned that the 21-week delay since the IPC written submissions closed compromises the IPC process as Commissioners' memories of meetings, presentations, written submissions, and site inspections fade.

This delay, and drawn out six-year development process, could have been avoided if Hills of Gold Wind Farm underwent a merit-based vetting process before being issued Secretary's Environmental Assessment Requirements and officially entering the assessment pipeline.

HOGPI members have been highlighting the shortfalls of Hills of Gold Wind Farm for six years and five months. The project should not have been allowed to progress without:

1. Neighbouring landowner's participation and agreement, essential for visual and noise compliance of most productive turbines;
2. Neighbouring landowners' agreement to vegetation screening for mitigation of non-compliant visual impact (without agreement, there is no mitigation);
3. Indigenous land claimant identified, Indigenous land use agreement, and transport agreements from affected landowners in place;
4. Detailed design of internal access roads >30% gradient on highly erodible soil with risk of mass movement to demonstrate OH&S and erosion control compliance, and transparent financial and environmental cost.

Hills of Gold Wind Farm does not align with the Recommendations of the Australian Energy Infrastructure Commissioner's Community Consultation Review, 2016 Wind Energy Guideline, or the 2023 Draft Wind Energy Guideline. Hills of Gold Preservation Inc requests that the Independent Planning Commission Determine Rejection of Hills of Gold Wind Farm.



December 2017 Non-associated landowner presentation showing potential project boundary that included private land of a **non-associated neighbour** (lot 47/46 DP 753722) without permission, and land owned by the **NSW Government** (the entirety of Ben Halls Gap State Forest).

2.0 PROPOSAL UNVIABILITY

The DPHI changed its recommendation to approval of 62 turbines based on new information from the Applicant regarding the unviability of fewer turbines.

2.1 Prior knowledge of unviability

In December 2023 media (The Northern Daily Leader and ABC Country Hour) Engie general manager of asset development and delivery Leigh Newbery said that in the worst case scenario the company will accept the removal of 17 turbines. He told the NSW Country Hour (16:58) it was "still a fantastic outcome."
https://www.abc.net.au/listen/programs/nsw-country-hour/nsw-country-hour/103206146

At the time of the acceptance of the DPHI recommendation and media announcements, the proponent was well aware that at 47 turbines the Project was unviable. This is documented in the December 2021 Submissions report, page 40.

Late visual assessments supplied for NAD_11, NAD_8, and NAD_7 were produced in August 2023, three months prior to the recommendation, depicting project layout with only 47 turbines.

Published project documents show that the proponent knew as early as August 2023 of the impending recommendation for 47 turbines, and as early as December 2021 of the unviability of the project with less than 62 turbines in it, yet they publicly accepted the recommendation.

The Applicant knew, prior to requesting SEARS, about the intentions of the owner of lot 47 to exercise their long standing right to a Dwelling Entitlement. The dwelling on lot 47 was approved prior to the lodging of Hills of Gold Wind Farm Development Application in late November 2020. The Applicant knew about the unviability of the project in the absence of the neighbour agreement from the owner of DAD_01.

The Applicant pushed ahead with the assessment and multiple project revisions disregarding the impacts to the approved dwelling and the absence of the neighbour agreement.

In February 2024 IPC applicant transcripts, meetings and written submissions demonstrate the involvement of lawyers arguing for reinstatement of removed turbines. HOGPI members obtained Business Contact Forms from DPHI and Engie showing that law firm Herbert Smith Freehills has been present at two of three meetings since the IPC written submission deadline between 28/2/24 and 22/3/24.

This demonstrates that when applicants enter a community, it is the beginning of an unbalanced legal battle with communities.

2.2 IEAPET advice

The Independent Expert Advisory Panel for Energy Transition (IEAPET) uses its own Levelised Cost Of Energy model that if the LCOE is less than $114, "a project that is in all other respects satisfactory should be considered viable and would be likely to proceed." The IEAPET does not offer commentary on whether Hills of Gold Wind Farm proposal is "in all other respects satisfactory."

The IEAPET also compared rates for power purchasing agreements (PPA) stating:

"The Panel's understanding of the necessary "going rate" for new PPAs for wind in NSW is $85-90, which is 20 to 25% below the $114 benchmark."

The 2023 Draft Guideline states: .."projects *must* also be designed in a cost-effective manner to provide benefits to energy consumers and reduced electricity costs."

Is the Hills of Gold Wind Farm capable of delivering reduced electricity costs when other operating wind farms are already delivering power at a lower price?

HOGPI members remain concerned that the IEAPET cost estimates of the Hills of Gold Wind Farm do not take into account the warnings of soil scientist Greg Chapman. Mr Chapman states that due to the soil, steep terrain and high rainfall of the project area that without detailed design of internal hillside roads and turbine foundations and hardstands on the escarpment the construction footprint, and environmental and financial cost of the proposal remain unknown. Greg Chapman flags that proper erosion control in such a hazardous environment may be impossible.

The following quotes are from Greg Chapman's IPC written submission, pg 2:

1. *'...because aspects of the soil and terrain appear to have been downplayed, a substantial and presumably unallocated budget will be required to ensure slopes are sufficiently stabilised, not only for the life of the development, but for well after it has been decommissioned.'*

2. *'Risk of accelerated slope failure may be catastrophic for the economic viability of the proposed development and also deteriorate water quality and aquatic habitats.'*

3. *'...control of erosion, and sedimentation will require highly specialised and expensive solutions due to slope, hydrological and space constraints. This will in turn increase*

the footprint, and increase other factors such as traffic, as well as the expense of the proposal.'

4. *'Multi-million dollar (eg $38m plus) repair bills to rectify disruption to infrastructure through mass movement are known for public roads, on the same geology, crossing the same mountain range. Just one landslip may jeopardise the financial viability of both the project and cause significant environmental impact.'*

5. *'The proposed development is arguably the most extreme and poorly assessed risk to land and water degradation I have encountered.'*

Greg Chapman and Professor Martin Thoms warn of the risk of phosphorus laden basalt soil sedimentation contributing to blue green algae blooms in significant water bodies like Chaffey Dam and the Murray Darling Basin river system.

Tamworth Regional Council's written submission highlights information gaps in the project, including an unclear and unresolved last mile transport route, and likely 'catastrophic impacts as a result of poor soil, steep gradient and high altitude weather conditions.'

There are two existing landslips already present **within the project footprint** and visible on aerial imagery. One is crossing the proposed wind farm internal access road, currently just a farm track, which is downhill from the midpoint between turbines 12 and 13. The other is below the quarry created between turbines 54 and 56. The location of this quarry is identical to the siting of many turbines and access track sections, with erosion control beneath the infrastructure impossible due to extreme steepness.

Unless the Applicant has provided detailed design of internal roads and turbine foundations, the financial and environmental risk of the proposal remains unknown and unassessed.

DPHI commissioned Constructability Advice failed to identify two important components of the Project: 1) The Western Connector Road - the only blade access option and main OSOM route. This OSOM route from the Site Access (Option B) on Crawney Road to the Development corridor on the ridge near WTG 4 terminates with a 450m section with an average gradient of 40%. The Western Connector Road is not included in the Constructability Advice. This important road was entirely omitted from the Advice content and maps.

The southern end of the Western Connector Road climbs above the shelf housing the substation complex and proceeds diagonally across a slope greater than 40%. The narrow footprint of this section of the OSOM access road, which was excluded from the Constructibility Advice, is completely unrealistic.

There is no exhibited or published design or engineering provided to accommodate vehicles 91 metres long required to transport blades up to 83.5 m (DPHI Assessment Report, pg 47). The lack of detail for the Western Connector Road was raised by HOGPI during the Amendment Report Public Exhibition in December 2022 and there has been no progress to alleviate members' concern.

In the IPC Hills of Gold Wind Farm Public Meeting Transcript Day 2, pg 51, Mr Mead indicates that the transport contractor and engineers have contributed to preliminary modelling of the Western Connector Road.

From the IPC Hills of Gold Wind Farm Case Public Meeting Transcript, Day 2
MR MEAD: …we also had to engage with both engineers and the transport contractor about the suitability of the internal western access route up to the ridge line… So we spent quite a lot of time with the civil engineers … in proposing a design that will work, and we discussed that in consultation with the transport contractor …

In February 2023 Engie announced the appointment of AusNet Services, together with Consolidated Power Projects Australia Pty Ltd, to begin early planning of infrastructure works including designs of access routes across the site.

Why wasn't this information exhibited in the Amendment Report, Revised RJA Route Survey or WGA Technical Memo? Why wasn't it mapped in the Appendix N Soils and Water Addendum Report, or included in the Constructibility Advice?

Measuring against whether Hills of Gold Wind Farm is "in all other respects satisfactory" the IPC must consider:

- Outstanding determination of legal claimant of Crown Land access B
- Outstanding Indigenous Land Use Agreement with successful claimant of Crown Land access B
- Muswellbrook Shire Council demands that no construction commence before Muswellbrook Bypass is completed, estimated 2027.
- Applicant's and DPHI incorrect classification of Barry Rd (from Forest Rd to Morrisons Gap Rd) and Morrison's Gap Rd as sub-arterial, not local and inaccurate measurement of distances from some houses to the road, impacting transport noise compliance.
- Applicant's omission to assess transport noise on non-associated Jenkins Street and Crawney Rd houses.
- Applicant's omission to exhibit new intersection of Barry Rd and Morrison's Gap Rd and the degree of proposed clearing to account for the biodiversity offsets.

- Applicant's omission to establish the load limits of Pearly Gates Bridge and Nundle Creek Bridge to disclose replacement.
- Applicant's omission to include new intersection and new bridge required at site Access B in the Table 7-2 of road works.
- Noise Peer Review by Les Huson & Associates states that the 'EIS significantly underestimates the noise impact in the community surrounding the proposed wind farm by at least 5 dB due to an optimistic SWL suggestion for an unnamed contemporary wind turbine.' Does the IEAPET advice take into account the turbine curtailment necessary for noise compliance and its impact on viability?
- Potential impact of triggering turbine curtailment to mitigate bird and bat strike affecting turbines' productivity.

In the **2020** EIS for a 70 turbine 420 MW Hills of Gold Wind Farm had a Capital Investment Value of $826 million.
https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-9679%2120201118T023046.877%20GMT

Even then there were assumptions such as:

- Assumed construction in material other than rock
- Assumed existing ground levels for crane hardstand areas are level
- Assumed existing road pavement on all other roads on the route from the port to site is in sufficient condition and does not require significant upgrades.

There were 33 exclusions, just seven listed below:

- GST
- Delay costs;
- Land/property acquisition;
- Groundwater control;
- Excavation in rock;
- De-watering;
- Roadwork for the existing roads used for the route from port to site.

There is no published 2024 or 2025/26 comparable Capital Investment Value. The best HOGPI can estimate from the data provided in the IEAPET advice is a Total Build Cost of $978.36 million (based on Applicant estimated cost 2,630 $/kW = 2.63million $ / MW x 372 MW project capacity). Even this is likely to be understated based on solid in-market feedback from real time developers. Exclusions from estimated cost are unknown.

Engie Chief Executive Officer Rik De Buyserie cited inflationary pressures affecting the economics of projects in his Australian Energy Week Speech, June 2024.

The IEAPET advice (pg 12) states that the applicant would need to spend a further $7 million on detailed assessments to 'reach readiness for consideration of an investment commitment.'

If only a 62 turbine project is considered commercially viable, is there any room for error at all? Is Hills of Gold Wind Farm viable at all?

Is it a public benefit to approve such a marginal project partly proposed on unauthorised cleared land, between two national parks, with a history of delay, poor community consultation, and repeated objections from Tamworth Regional Council?

2.3 National Electricity Market

From the Department's information that 'there are a significant number of wind farm projects proposed, with over 20,000 MW nameplate capacity in the planning assessment pipeline in NSW' HOGPI extrapolates that IPC refusal of Hills of Gold Wind Farm will not jeopardise transition of the grid.

When considered from a national perspective a Minister for Climate Change and Energy Chris Bowen media release from May 24th, 2024 points to broader renewables developments contributing to the National Electricity Market:

- Record investment in batteries and large-scale energy storage, and over 330,000 rooftop solar installations last year alone.
- 280,000 MW of proposed generation and storage projects in the development pipeline, 4.5 times today's National Electricity Market capacity.

Engie has its own renewables projects operating, approved, and in development with a 3,000 MW identified pipeline of solar, wind and large scale batteries (Source: Engie ANZ website). Instead of imposing a 384 MW marginal to unviable development on a sensitive ecological environment and local majority objecting community, Engie could expand its approved and in development renewables in less complex locations.

Hills of Gold Wind Farm represents just 1.92% of the NSW planning assessment pipeline, and 12% of Engie's Australian operating and developing renewables pipeline.

An article in Renew Economy published 12th July, 2024 reads:

"...[AEMO] data for the 2023/24 financial year that ended on Sunday highlight what's working and what's not in Australia's green energy transition. The healthiest part of the green energy transition remains rooftop solar, underlying the fact that this remains a transition that is driven as much by the community as it is by big business.
Australian households and businesses are still adding around 3 gigawatts of solar capacity to their rooftops each year, and in the last 12 months the output from these solar cells rose nearly 25 per cent to 24.2 terawatt hours, or 11.4 per cent of total generation on the country's main grid.."

"...One of the things to note in the last financial year is the price of generation. Rooftop solar, because it eats away at market demand during the daylight hours, had the lowest average price of $26 a megawatt hour (MWh) in the last 12 months, according to Open NEM.
Utility scale solar, similarly affected by the midday demand reduction, had an average price of $42.34/MWh, while **wind averaged $61.55/MWh**. Brown coal achieved an average price of $72/MWh, black coal an average $106/MWh, and hydro an average $126/MWh."
https://reneweconomy.com.au/australia-inches-towards-renewable-targets-as-most-advanced-wind-and-solar-state-goes-backwards/

With wind power averaging $61.55/MWh, how can Hills of Gold expect to compete with the LCOE of $114?

2.3 Public vs Corporate Benefit

If Hills of Gold Wind Farm is marginal to unviable then the IPC must question the Public Benefit motivation presented by the Applicant, its lawyers, and the DPHI. There is no Public Benefit if the wind farm is not built.

The IEAPET advice presents a list of variables that would potentially make Hills of Gold Wind Farm unviable. The Applicant states it would need to spend a further $7 m on detailed assessments before reaching investment commitment.

Some 14 years after the first wind monitoring mast was installed, there remains uncertainty regarding investment commitment and the IPC has been put in the position of Determining whether it is a Public Benefit to approve the project.

Approval of a marginal to unviable wind farm has a major private beneficiary, Engie ANZ and the Australian Renewable Energy Trust, an Approval becoming a financial asset even if it is never built.

An Approved **unviable** zombie wind farm is a Corporate Benefit, not a Public Benefit at all, but a major cost to Biodiversity, Water Security, and Community.

https://www.herbertsmithfreehills.com/news/2020-10/herbert-smith-freehills-advises-engie-australia-new-zealand-on-establishment-of-the-australian

3.0 APPLICATION OF DRAFT WIND ENERGY GUIDELINES 2023

When the 2023 Draft Wind Energy Guideline was exhibited from November 2023 to January 2024 HOGPI members asked the DPHI whether they applied to Hills of Gold Wind Farm. Members were told, including an online meeting on November 22nd 2023, that Hills of Gold Wind Farm would be assessed under the 2016 Wind Energy Guideline.

The DPHI Hills of Gold Wind Farm Assessment Report, pg 8, states that *'The draft Framework, including the Wind Energy Guideline, does not apply to the assessment of this project.'*

Yet in this assessment the Department has adopted the approach prescribed in the Draft Guideline 2023

HOGPI members welcome the application of the new, improved 2023 Draft Wind Energy guideline, but disagree with the Department's selective application of the new Guideline to a few dwellings only.

If the 2023 guideline **CAN** be applied to the Hills of Gold Wind Farm, the new assessment methodology **MUST** be applied to the entire project, including:

- assessment of the additional 35 dwellings between 5 km and 6.5 km radius from the project, most of which were not previously assessed and some remain unidentified on Applicant maps;
- re-assessment of identified dwelling, including where assessments are still missing;
- the introduction of the 500 metres setback from the National Park boundaries to facilitate fixed wing aerial operations;
- the mandatory requirement to consult with the affected neighbours regarding the proposed vegetation screening as mitigation measure, and document all feedback;
- the requirement to produce new types of photomontages with the grid overlay;
- exclusion of Taralga case and reliance on voluntary acquisition.
- deletion of all turbines within 1.88 km setback from DAD1

The 2023 Draft Guideline states that 'wind energy projects will be subject to a rigorous, merit-based assessment that includes extensive community consultation and a detailed consideration of any environmental, social and economic impacts.' However, in the case of Hills of Gold Wind Farm community consultation and consideration of environmental, social and economic impacts has been meaningless, deferring to a legal argument of Public Benefit being given greater weight than Individual or community Disbenefit.

3.1 Inconsistent use of 2016 and 2023 Draft Guidelines

Turbines 9-11. A quantitative cell count approach presented in the Draft Guideline 2023 is used at these locations removing the need to delete them and benefit NAD72 and NAD98 (reducing dominance of turbines and minimising key feature disruption).

It is not consistent to cherry pick from both sets of guidelines when it suits to justify reinstatement of wind turbines when they would have otherwise been non-compliant and removed. Hills of Gold Wind Farm should be assessed against the 2016 **or** 2023 Draft Guidelines, not both.

One of the Objectives of the 2023 Draft Wind Energy Guideline is to *'encourage industry to select suitable sites for projects and locations for turbines to avoid or reduce the likelihood of land use conflicts and environmental and social impacts.'*

Application of the 2023 Draft Guideline to the Hills of Gold Wind Farm would result in a complete revision of the visual impact assessments. The 2023 Draft Guideline requires an assessment of affected dwellings out to 6.5 km and sensitive public viewpoints out to 8.75 km from the project. Under the 2016 guideline, the visual assessments extended to 5 km. This would mean visual assessment of 35 residences between 5-6.5 km from the project.

As an example, an approved DA is under construction on a property in Hanging Rock. The elevated position of the dwelling ensures the visibility of the ENTIRE project. Being 5.2 kms from the project it was not assessed under the 2016 guideline, but it would have to be assessed under the 2023 guideline.

If the 2023 Draft Wind Energy Guideline is used, Hills of Gold Wind Farm does not comply with the following:

- At least 100m buffer from blade tip to nearest national park/nature reserve canopy.
- Any projects proposed within 500 m of a national park boundary will also be required to consider potential interference with management activities, such as feral animal, weed and fire control, or search and rescue operations reliant on low flight operations and radio communications.

- NSW map identifies areas desirable for wind development, avoiding areas of high biodiversity value, including national parks and nature reserves. HOGWF project area not identified as "desirable."
- setbacks of 1.88 km from homes with visibility of wind turbines (in the 230 m tall turbine scenario). This effectively means only Associated Dwellings can be located within 1.88 km visibility of wind turbines. HOGWF has nine Non-Associated Dwellings and approved DAs within two kilometres and visibility of turbines.
- Preference for projects that demonstrate benefits to energy consumers. The Capital Investment Value of HOGWF is not complete or transparent. Consequently, value for NSW consumers cannot be compared against other wind projects.
- Transport and Infrastructure SEPP applicable to Tamworth details that consent authority must not grant development consent unless satisfied development is "unlikely to have adverse impacts on the regional city's capacity for growth or scenic quality or landscape character." Nundle is the jewel in the crown of Tamworth Regional Council.
- Preference for projects that avoid crossing waterways and low lying areas, and reduce cut and fill. This project is already committed to four (4) new bridges and the replacement of additional two is unknown. It also proposes to cross floodplains.

Other relevant notes:

- Turbines remain a prominent feature in the landscape between 2-8 km.
- Average NSW wind farm bird strike is 1-3 birds/turbine/year (HOGWF at 62 turbines could be up to 186 birds/year and a similar number of bats).
- Draft guidelines would apply to any HOGWF Modification to State Significant Development Consent.
- Decommissioning calculator, estimated at $480,000/turbine.

If screening is proposed to mitigate an impact, a photomontage must be prepared to visualise the effectiveness of the vegetation. This should be presented with and without an overlay of the Visual Magnitude Grid Tool. In the case of NAD_5, the screening trees are proposed to be planted into the septic tank and absorption trench, and the feedback from the property owners has been disregarded.

Draft Energy Guideline 2023. Technical Supplement for Landscape and Visual Impact Assessment states:

Where screening is proposed, the EIS **must** also include a draft landscaping plan to provide details about the proposed landscape treatments. This plan **must**:

- be prepared by a suitable qualified landscape expert;
- **be developed in consultation** with the community, including affected landowners, and **include evidence** of how any feedback has been addressed;

- include a map of the project site that identifies important features, including roads (including access roads), infrastructure (turbines, substations, inverters, transmission lines, building areas, hardstands, site fencing), site boundaries, landscape features (rivers, dams), existing vegetation and tree cover and adjacent receivers;
- **include details** of the proposed landscaping including an indicative planting schedule which specifies the type, species and location of any trees, shrubs and/or grasses and groundcovers to be used, the mature height of the species (in metres) and the mature spread of the species (in metres);
- include indicative timeframes for the establishment of vegetation, including an estimate of vegetation, including an estimate for when desired level of mitigation would be achieved;
- **include evidence** that any landscaping would be consistent with the general native vegetation profile of the local area and can be supported by local landform, geology and soil type;
- **verify** that the proposed planting can achieve the mitigation outcomes within a reasonable timeframe.

The above information was not supplied by the Proponent or assessed by the Department. The use of the word “must” indicates that none of the above is optional.

The department instead **speculated** that theoretical unknown species of trees, planted at unknown distance from the dwelling, in unknown soil conditions, will grow at theoretical rate and achieve a theoretical height, width and density and will theoretically sufficiently screen turbine components. The **compulsory requirement** to hold consultation with affected property owners was again abandoned.

2016 Wind Energy Guideline states:

“The conditions may also require additional mitigation measures to be implemented, amendments to the project (such as deletion or re-siting of turbines), and / or as a last resort ‘voluntary acquisition’ for significantly affected landholders. ***Any voluntary acquisition process can only be initiated by the land owner*** *and not the proponent.*

Development consent conditions relating to acquisition requirements will only be imposed where all other reasonable and feasible mitigation measures have been considered, and the consent authority is satisfied that the economic, social and environmental benefits of the project outweigh its adverse impacts.

Alternatively, the consent authority may conclude that the benefits of the project do not outweigh its impacts, and the project will be refused.”

HOGPI members do not believe there is sufficient information to suggest that the benefits of Hills of Gold Wind Farm outweigh its impacts and the IPC should Determine refusal.

4.0 LANDOWNER IMPACTS

There is documented evidence that the past and present owners of Lot 46/47 have refused to be associated with Hills of Gold Wind Farm since its inception. The late owner of the property repeatedly told the Developer to remove her land from the Project. The developers have known that the wind turbines on the boundary of Lot 47 are very productive since the wind data became available from the monitoring masts installed in 2010. The engagement with the owner of lot 47/46 did not commence until late 2017, a matter of months before the project was made public in March 2018. The engagement was in the format of pressure to either participate in the project, or accept the impacts to their property.

At no point did the Developer make **any attempts** to alleviate the impacts to this property even with the removal of a single turbine.

Hills of Gold Wind Farm Environmental Assessment Requirements correspondence between the developer and the Department from as early as **22/11/18** clearly outlines the requirement to consider existing dwellings, dwellings that are approved but yet to be constructed, or are under construction, dwellings for which a development application has been lodged, but a determination is yet to be made, and existing dwelling entitlements on land within the vicinity of the wind energy project.

> The Department would like to draw your attention to the requirement in the guideline to consider impacts on existing dwellings, dwellings that are approved but are yet to be constructed or are under construction, dwellings for which a development application has been lodged, but a determination is yet to be made and existing dwelling entitlements on land within the vicinity of the wind energy project.

The first record of Engie representatives attending meetings between Someva and the Department is 31/7/2019 and again on 30/9/2020 (Source: Business Contact Forms via GIPA). Despite the knowledge that the immediate neighbour did not want to be associated, the developer has persisted to propose non-compliant turbines instead of acknowledging a poorly sited project prior to submitting the DA.

The DPHI recognises that this is not the behaviour of a model developer. If the IPC approves Hills of Gold Wind Farm it is complicit in this behaviour and sends a message to the renewables industry that this behaviour will be rewarded with project approval.

HOGPI supports the DPHI statement that 'the CDC is an accrued right benefiting the property, and the Department has weighed it as such in its assessment of the project.' In its case referral documents the DPHI notes that 'the landowner lodged a development application with TRC in August 2018' before Hills of Gold Wind Farm SEARS was issued. The landowner subsequently obtained a CDC approval for a single storey dwelling in November 2020, before the Hills Of Gold Wind Farm was submitted for assessment.

HOGPI again points out that the owner of Lot 46/47 is not the only landowner impacted by reinstatement of turbines 53-63. The DPHI case referral states that turbines T53-T63 also have visual impacts to NAD_67, NAD_05, NAD_33 (in addition to removal of turbines T9 to T11), its dwelling entitlements and development applications, as well as the broader Nundle Crawney Valley cluster and Nundle Village.

In its December 2023 recommendation, DPHI stated that in its 64-turbine format, the project was unapprovable.

HOGPI members object to the following amended conditions:

- Condition B1 ACQUISITION UPON REQUEST;
- Condition B5 "*The Applicant must ensure that shadow flicker associated with wind turbines does not exceed 30 hours per annum at any non-associated residence* ***(excluding DAD01)***;
- Condition B7. The following activities may be carried outside the hours specified in condition B6 above:
  (a) activities that are inaudible at non-associated residences **(excluding DAD01)**;
- Condition B13. The Applicant must ensure that the noise generated by the operation of wind turbines does not exceed the higher of 35 dB(A) or the existing background noise level (LA90 (10-minute)) plus 5 dB(A) for each integer wind speed, measured at hub height, from cut-in to rated wind turbine generator power, at any non-associated residence **(excluding DAD01)**;
- Condition B14. The noise generated by the operation of ancillary infrastructure must not exceed 35 dB(A) LAeq(15 minute) at any non-associated residence **(excluding DAD01).**

The above conditions amount to deliberate creation of nuisance and the interference with the landholder's right to a quiet enjoyment of their property.

4.1 Indigenous Consultation

The Hills of Gold Wind Farm Assessment Report, pg 11, states the following:

'As the project access route traverses Crown land, authority to use Crown land is required separately under the Crown Land Management Act 2016 prior to its use. Because the Crown land is also subject to a native title claim, the Applicant will need to negotiate an Indigenous Land Use Agreement with the native title claimants under the federal Native Title Act 1993.'

Nungaroo Local Aboriginal Land Council (LALC) has passed a motion that it does not support the Hills of Gold Wind Farm due to the significant impact on both heritage and culture. The DPHI has outlined that there must be an agreement with Nungaroo LALC. There is no agreement.

Nungaroo LALC believes that the Aboriginal Heritage Study that was completed is inadequate. Only a small portion of the proposed site was viewed, including a potential transport route now not included. There have been significant changes to the entire DA which have not been accounted for in the study. Nungaroo LALC believes a new study must be completed that must involve walking the entire site and note the micro locations of each turbine.

The Gomeroi claimant group is in the process of organising an independent heritage study. Members of Nungaroo LALC will be involved in this.

Nungaroo LALC wrote to the IPC outlining that there is no agreement, that a speaker at the IPC public meeting misrepresented its members, and that the heritage study was lacking and needed to be redone with all the amended locations and full transport routes included.

An IPC Determination should respectfully wait for completion of the independent heritage study to comprehensively understand heritage and culture impacts to the satisfaction of traditional landowners, and potential impacts on project viability.

4.2 Transport

Please note that the DPHI has clarified by email that the 141 light and heavy vehicle movements referred to on pg 53 of the Hills of Gold Wind Farm Assessment Report refer to return trips. Consequently, there would be an additional 282 light and heavy vehicle movements per day for the 6-14 month peak construction period through Nundle Village. This is in addition to a maximum of six Oversize Overmass vehicles requiring escort daily for nine months.

5.0 PRECEDENCE FOR NSW PLANNING LAW

DPHI states that it does not want the acquisition of private land to become a precedent for other projects, but if Hills of Gold Wind Farm is approved by the IPC, it **becomes a precedent**.

The concern for NSW landowners is:

- that wind visual and noise guidelines, and community consultation are redundant when public benefit is given greater weighting than individual disbenefit;
- dwelling entitlements and approved development applications are not respected;
- the Department alternates between 2016 and 2023 Draft Guidelines to reinstate turbines, but not assess impacts or remove non-compliant turbines;
- land use conflict will always be resolved in the wind industry's favour with other *permissible* development in the area halted.

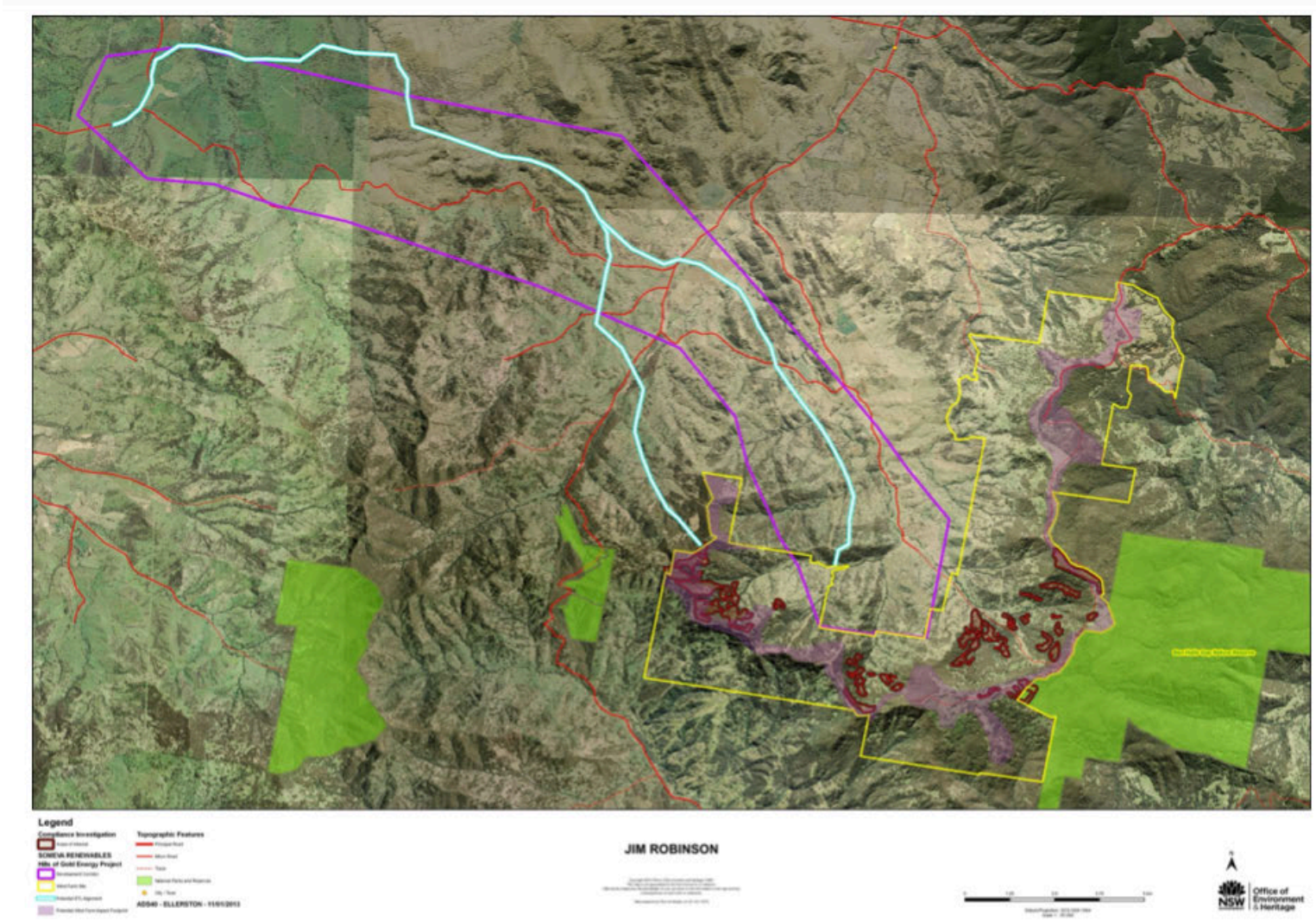
This is a dangerous precedent for the energy transition, providing evidence of the futility of DPHI guidelines, community consultation, and lack of social licence. It contributes to loss of trust of rural communities, delay of projects, Renewable Energy Zones, and new transmission.

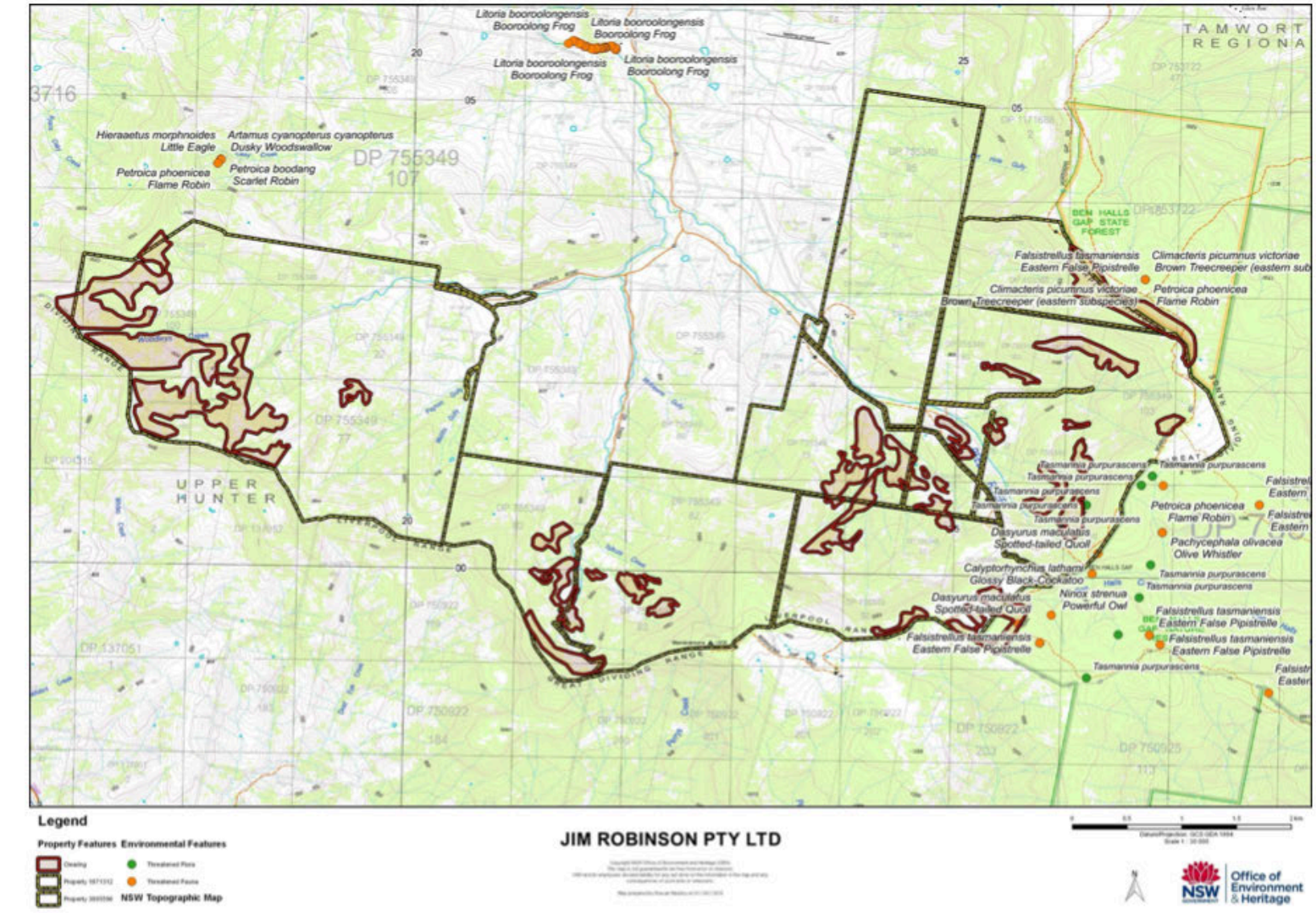
NSW Farmers' Association Tamworth Branch has the following motions submitted to the NSWFA Annual Conference next week (July 23-24):

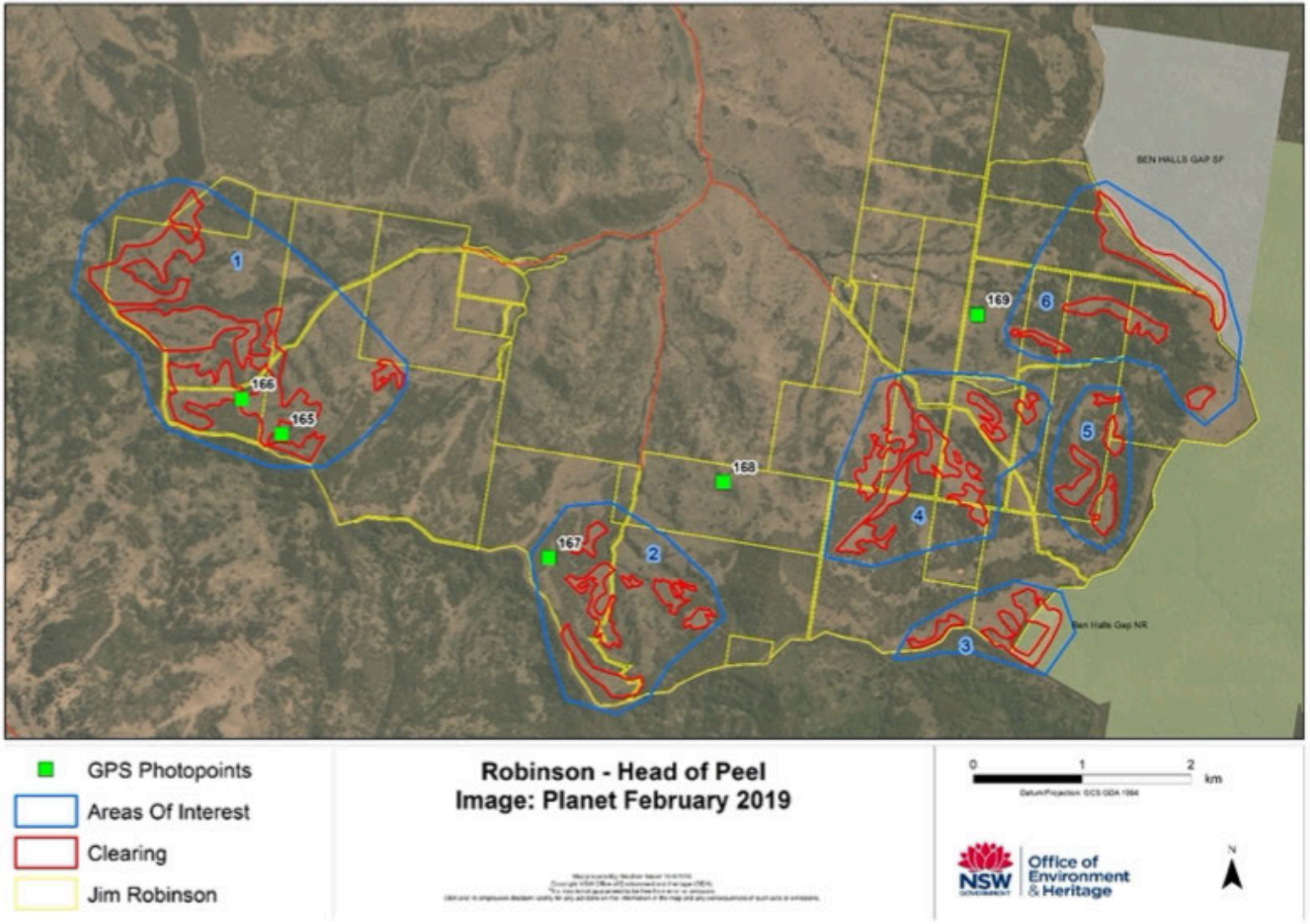
'NSWFA advocate for the state government to respect and uphold landholders' dwelling entitlements and approved development applications with regards to renewables assessment, which must comply with wind, solar and transmission visual impact and noise guidelines.'

'NSWFA endorses the recommendations of Australian Energy Infrastructure Commissioner, Andrew Dyer's Review of Community Engagement practices.'

6.0 UNAUTHORISED CLEARING




Litoria booroolongensis
Booroolong Frog
Litoria booroolongensis
Booroolong Frog
Litoria booroolongensis
Booroolong Frog
Litoria booroolongensis
Booroolong Frog
Hieraaetus morphnoides
Little Eagle
Artamus cyanopterus cyanopterus
Dusky Woodswallow
Petroica phoenicea
Flame Robin
Petroica boodang
Scarlet Robin
DP 755349
107
TAMWORT
REGIONA
BEN HALLS GAP STATE FOREST
Falsistrellus tasmaniensis
Eastern False Pipistrelle
Climacteris picumnus victoriae
Brown Treecreeper (eastern sub
Climacteris picumnus victoriae
Brown Treecreeper (eastern subspecies)
Petroica phoenicea
Flame Robin
UPPER
HUNTER
Tasmania purpurascens
Tasmania purpurascens
Tasmania purpurascens
Tasmania purpurascens
Tasmania purpurascens
Tasmania purpurascens
Petroica phoenicea
Flame Robin
Dasyurus maculatus
Spotted-tailed Quoll
Pachycephala olivacea
Olive Whistler
Calyptorhynchus lathami
Glossy Black-Cockatoo
Tasmania purpurascens
Tasmania purpurascens
Dasyurus maculatus
Spotted-tailed Quoll
Ninox strenua
Powerful Owl
Falsistrellus tasmaniensis
Eastern False Pipistrelle
Falsistrellus tasmaniensis
Eastern False Pipistrelle
Falsistrellus tasmaniensis
Eastern False Pipistrelle
Tasmania purpurascens
Legend
Property Features Environmental Features
NSW Topographic Map
JIM ROBINSON PTY LTD
NSW
Office of Environment & Heritage



Map from Ecologist Report from field inspection.

6.1 Unauthorised clearing

It is not HOGPI's intention to imply that the Applicant was involved in unauthorised clearing.

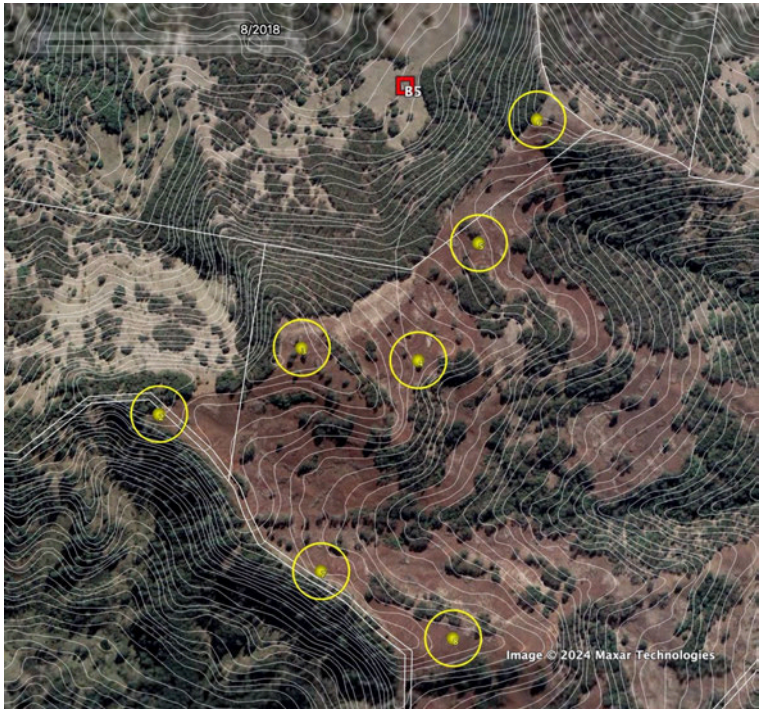
DPHI's Closing Comments state that unlawful clearing by the major turbine host landholder has been an issue for members of the community throughout the development and assessment process.

HOGPI has previously pointed out that alleged unauthorised land clearing by the major host landholder was raised with the developer at a public meeting in March 2018 and has been an issue ever since. It is among the major obstacles to social licence. HOGPI members will not be complicit in the siting of wind farm infrastructure partly on previously unauthorised cleared land. And neither should the state or federal government or Applicant. It sends a message to landowners across the state that they can clear land without authorisation, accept a penalty such as a Set Aside Conservation Agreement, and subsequently partly site State Significant Development infrastructure on unauthorised cleared land.

Images SD-004 and SD-007 above have been provided to the IPC in large format. They are documents from the NSW government unauthorised clearing investigation obtained by HOGPI under GIPA and show significant areas of native vegetation that were investigated and some of which are partly proposed to host Hills of Gold Wind Farm infrastructure. Biodiversity costs are not paid for wind farm infrastructure partly proposed on unauthorised cleared land.

It was found that between 2005 and 2018, there were multiple instances of major clearing of remnant vegetation by the main host land owner, some of this vegetation being within the wind farm development footprint.

The Applicant and the NSW Government have the opportunity to site renewables on land elsewhere in NSW that has not been unlawfully cleared.

Location of turbines 2, 3, 4, 5, 6, 7 and 8 prior to clearing. Image March 2014	Location of turbines 2, 3, 4, 5, 6, 7 and 8 post clearing. Image August 2018
	

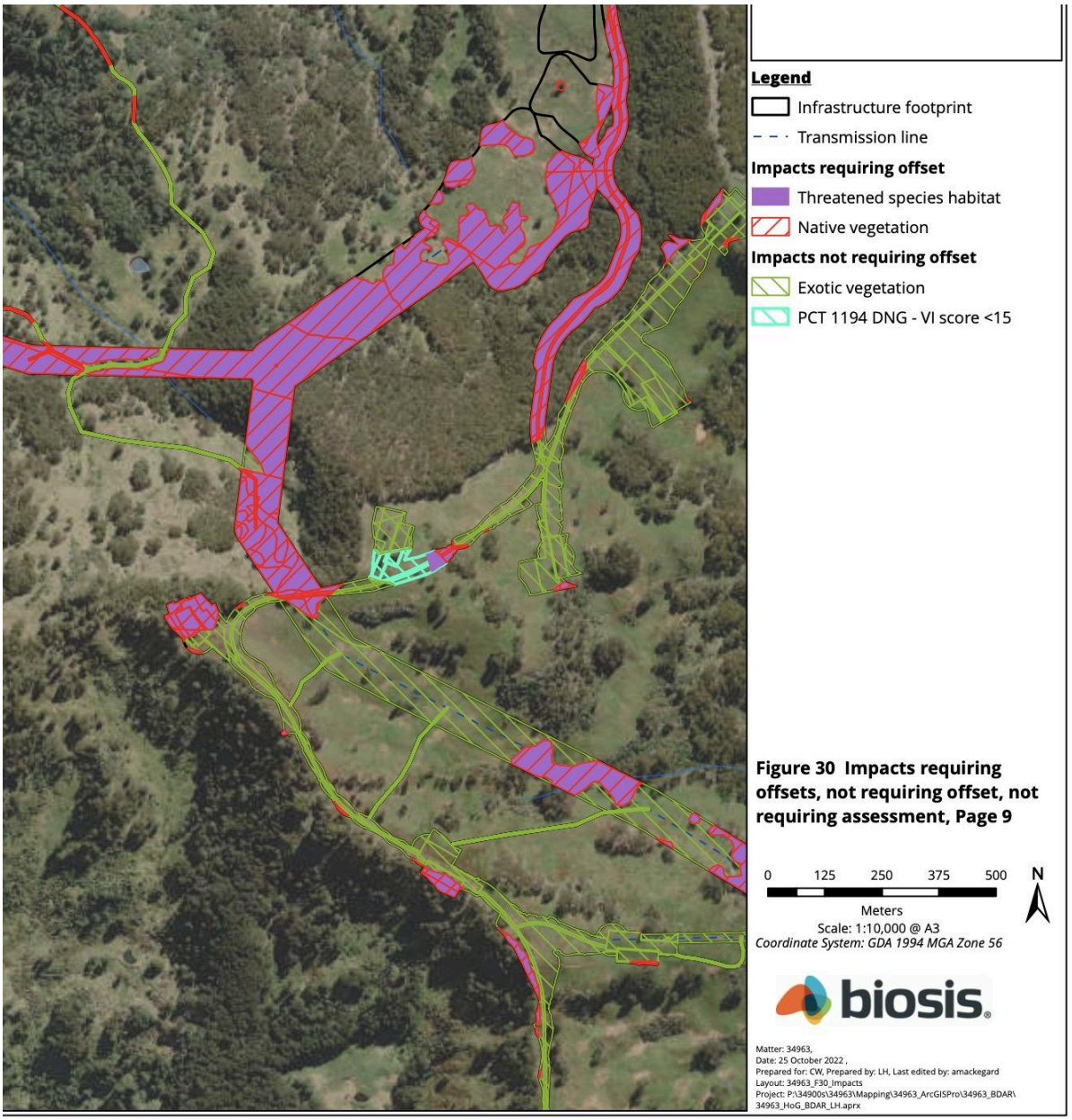
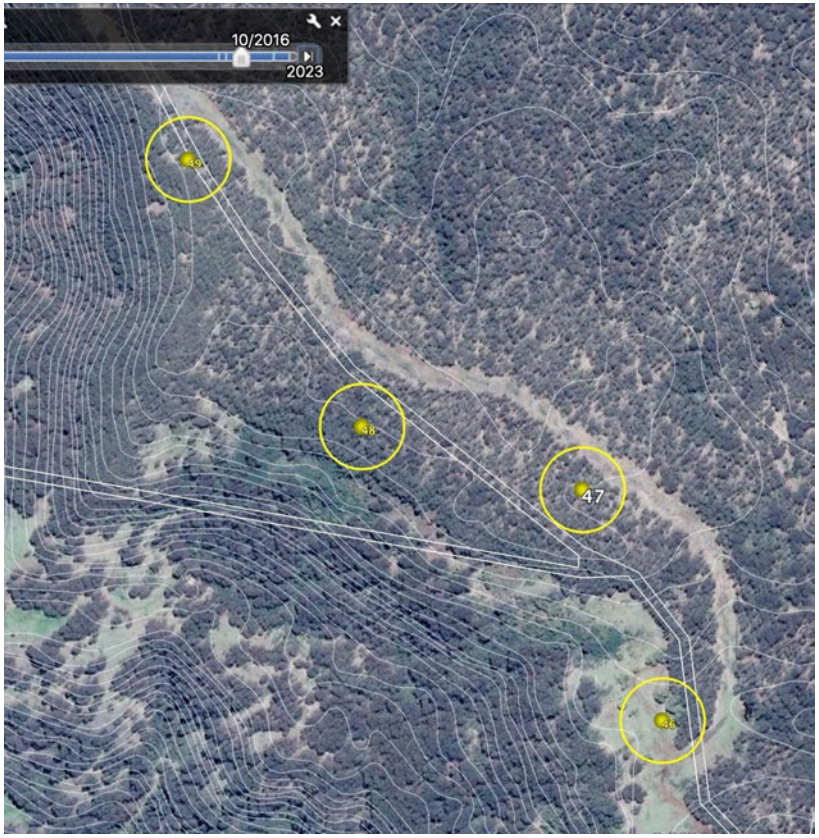
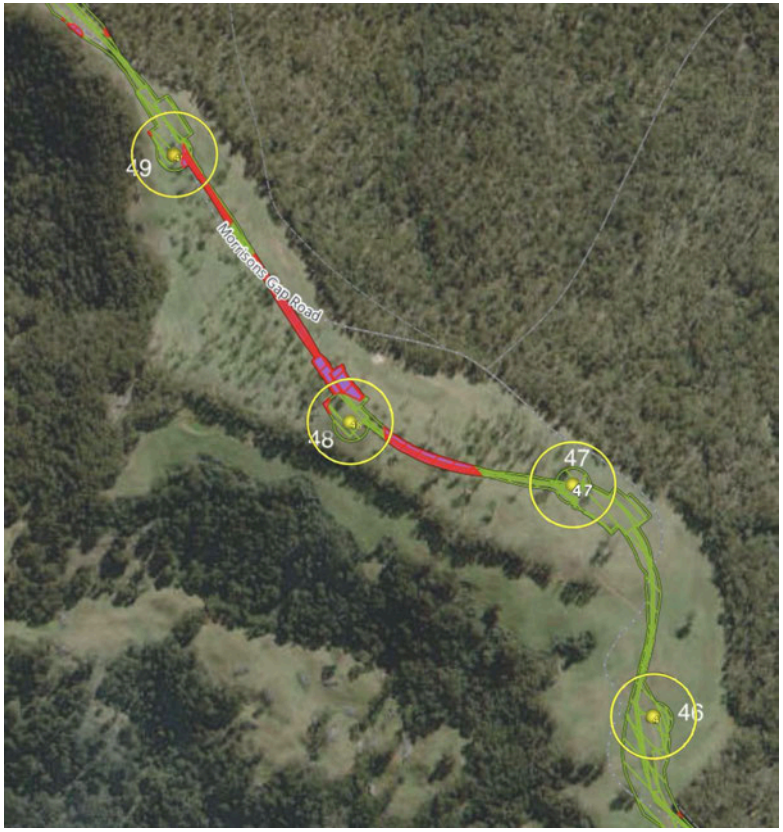


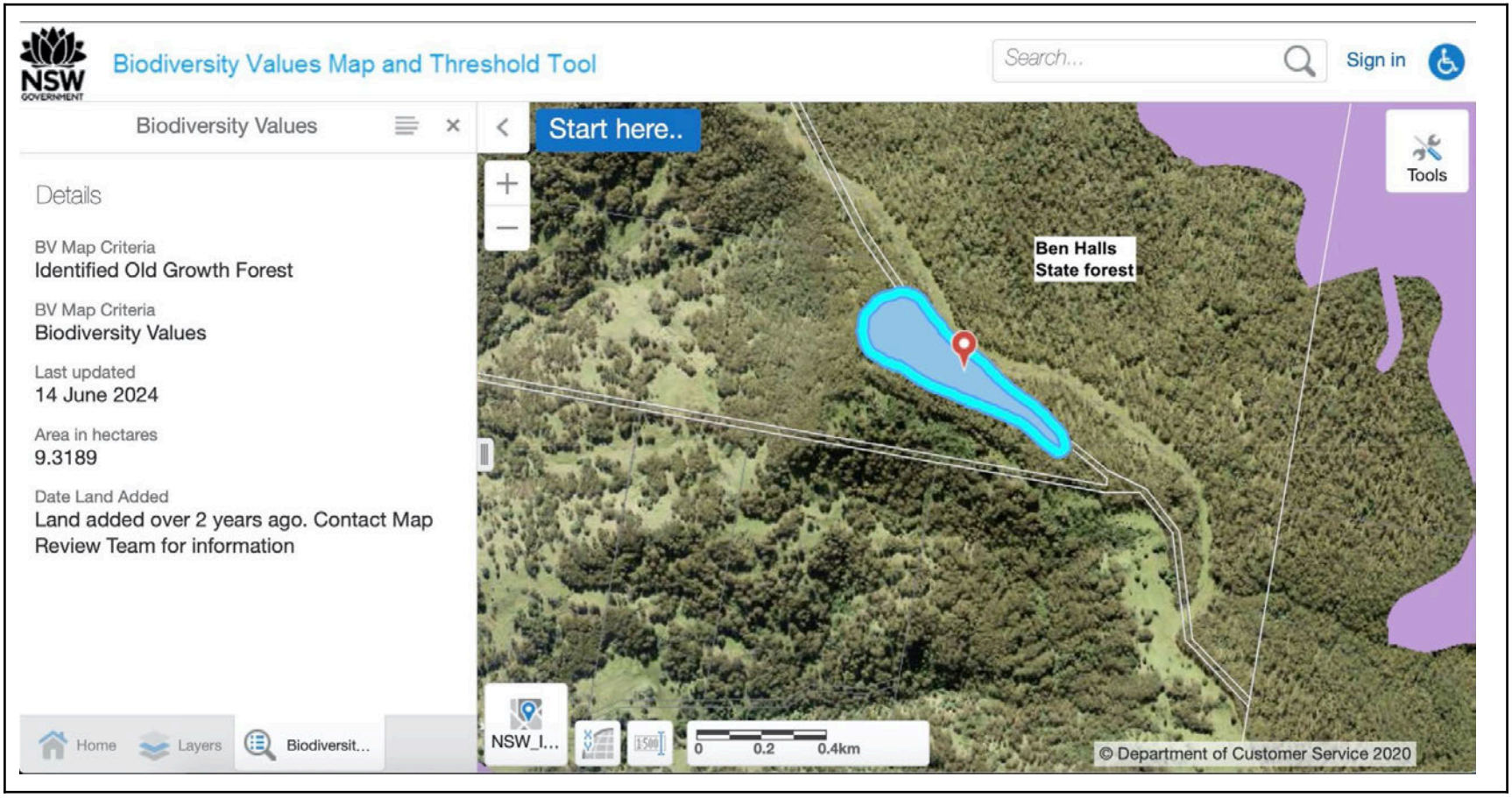
Figure 30 Impacts requiring offsets, not requiring offset, not requiring assessment, Page 9

The map above indicates the location of turbines 6, 5, 4, 3, 7 and 8, and associated hard stands, connecting roads, and sections of the power line corridor as **Impacts not requiring offset - Exotic vegetation**. This is an example of infrastructure partly proposed on unauthorised cleared land.

Location of turbines 46, 47, 48 and 49 prior to the clearing performed during the summer 2016-2017. Image October 2016.	Location of turbines 46, 47, 48 and 49 and infrastructure post clearing. Image source: HOGWF BDAR, rotor swept areas added by HOGPI.
	

Unauthorised clearing

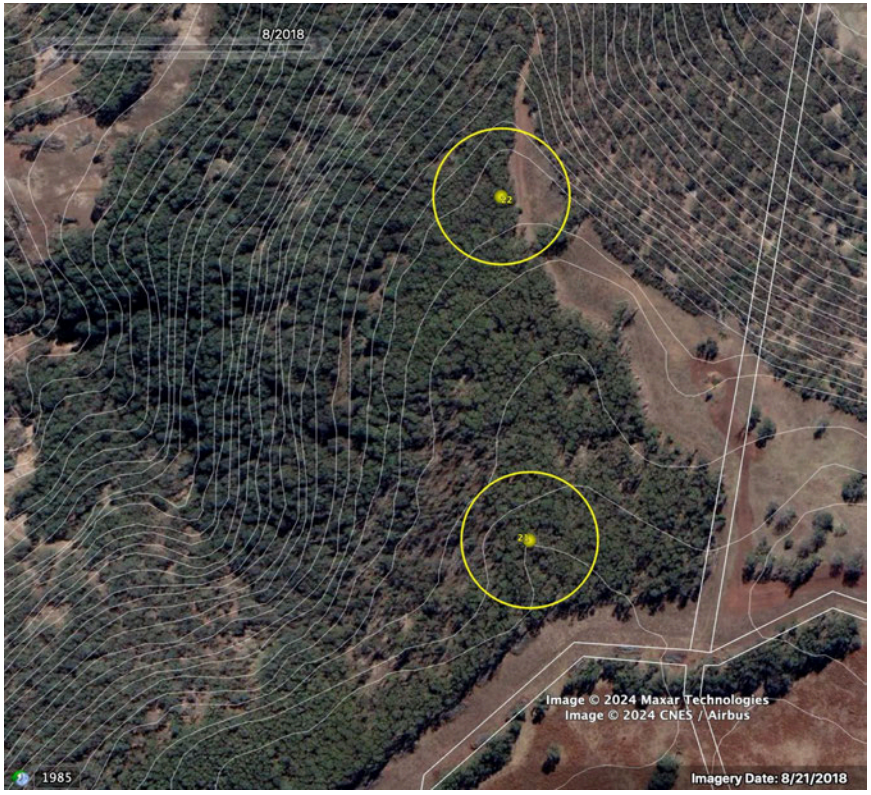
The Applicant's BDAR report identifies the locations of these turbines and the connecting tracks as 'exotic vegetation.'
The NSW Biodiversity Values Map continues to identify 9.3 hectares of Old Growth Forest which no longer exists. Turbine 48 is proposed in the middle of the phantom 'Old Growth Forest.'



6.2 LLS approved clearing

The DPHI's Closing Comments also reference approval by North West Local Land Services for clearing of 27.5 ha of land that subsequently hosts wind farm infrastructure (see approved clearing of Wombramurra Mountain below). Again HOGPI notes the Inquiry into the Integrity of the NSW Biodiversity Offsets Scheme, February 2023, Recommendation 11: 'That the Department of Planning and the Environment and Local Land Services, in consultation with landholders, develop and implement a plan to prevent land clearing on rural land regulated by the Local Land Services Act 2013 that would have otherwise triggered or increased obligations under the Biodiversity Offsets Scheme'. The approved clearing within the project area does not align with the Inquiry's Recommendation.

Turbines 21, 22, Substation, BESS and powerline are partly proposed on an area of approved clearing on landmark Wombrumurra Mountain.

Location of turbines 21 and 22 prior to clearing on Wombrumurra Mountain authorised by LLS. Image August 2018.	Location of turbines 21 and 22 post clearing on Wombrumurra Mountain authorised by LLS. Image February 2023.
	

The approved clearing within the project area.

7.0 BIODIVERSITY COST

7.1 Reduction in setback from Ben Halls Gap Nature Reserve

Proposing to locate turbine blades within 50 m of Ben Halls Gap Nature Reserve canopy, would significantly compromise aerial fire fighting in the Reserve. Ben Halls Nature Reserve is a scientific reference park classed IUCN 1a (strict nature reserve) and is closed to the general public.

The 2023 Draft Wind Energy Guideline page 22 requires any projects proposed within 500 m of a national park boundary to consider potential interference with management activities, such as feral animal, weed and fire control, or search and rescue operations reliant on low flight operations and radio communications. The 2023 draft guideline setback should be applied.

Responding to the Winterbourne Wind Farm EIS the Department of Planning and Environment Biodiversity and Conservation North East Branch specified a 120 m buffer between rotor blade tips and treed areas, and that 'No turbines be located within at least 500 m of the national park boundary (noting that as recommended for safe fixed wing aircraft operation, this buffer should be at least 600 m).'

Application of the 2023 Draft Energy Guideline and the 500 m setback would make 8 turbines next to Ben Halls Gap Nature Reserve non-compliant and they should be removed from the project, making it unviable.

In February 2022 the NSW National Parks and WIldlife Service requested the removal of all turbines next to Ben Halls Gap Nature Reserve, questioning whether a moderate level of risk to threatened species is acceptable adjacent to high quality habitat or national park?

The Biodiversity, Conservation and Science Directorate raises residual concerns about retaining moderate risk turbines close to tree canopies and Ben Halls Gap Nature Reserve. BCS says non relocatable moderate risk turbines should be prioritised for removal.

In a 62-turbine marginal to unviable scenario 19 Moderate risk turbines remain, including reinstatement of five Moderate risk turbines (WTG 9, 28, 58, 59, and 61) that were previously removed in the 47-turbine recommendation. Eight turbines remain proposed immediately neighbouring Ben Halls Gap Nature Reserve.

HOGPI requests removal of all turbines next to the Ben Halls Gap Nature Reserve, having no confidence in the Applicant's capacity for self-monitoring of bird and bat carcasses by sniffer dogs and ecologists to inform potential curtailment of turbines, or the risk of scavenging by foxes, cats, dogs, pigs, and raptors.

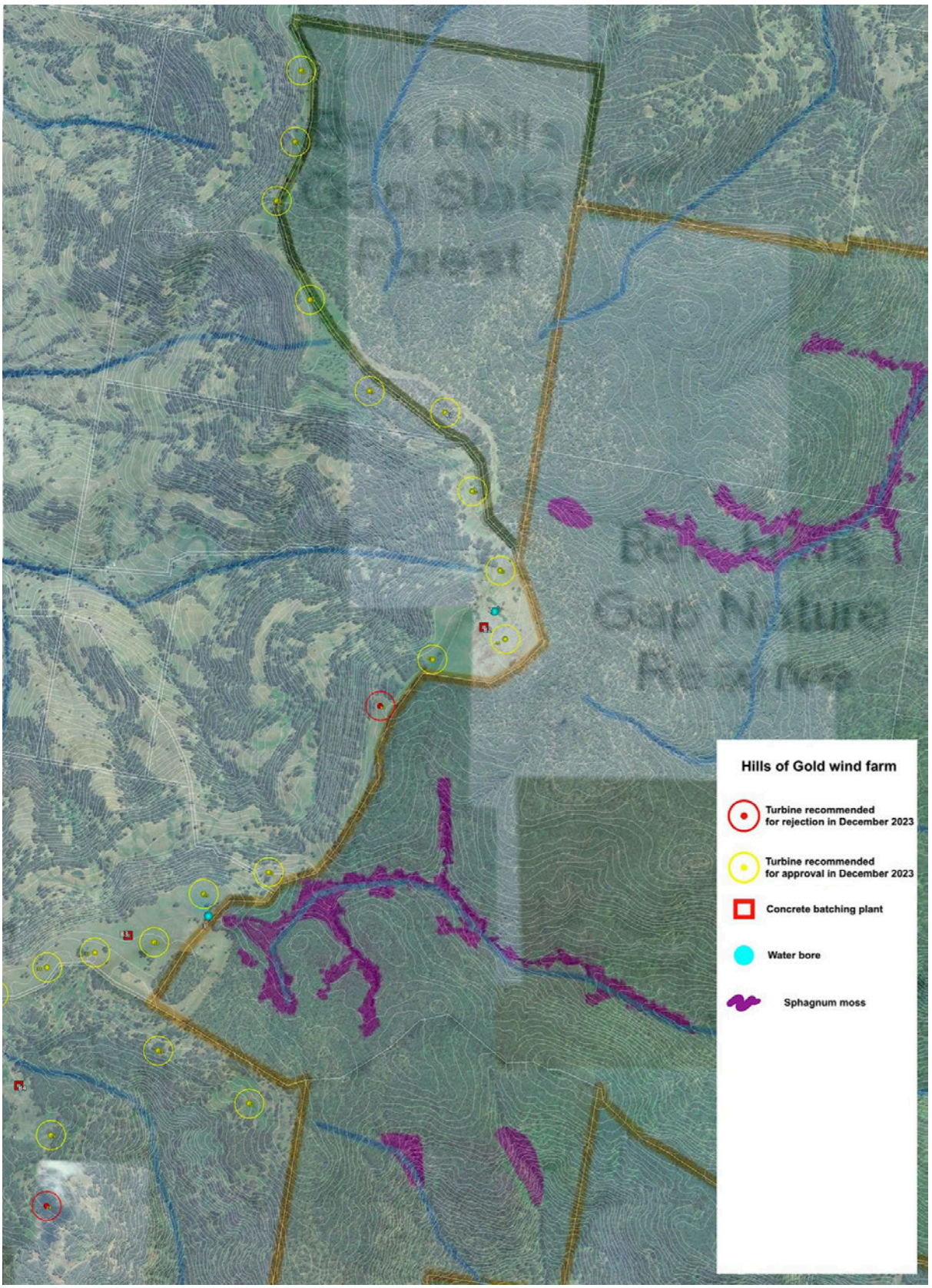
The Northern Daily Leader, 17/6/24 reported on University of Tasmania research showing that turbine blade collisions are underestimated by about half because some birds are injured and die off-site from injuries sustained.

Location of the turbines from the boundary of Ben Halls Gap Nature Reserve in metres:

WTG 32	206 m
WTG 33	218 m
WTG 38	178 m
WTG 39	138 m
WTG 40	121 m unable to move further due to steep terrain
WTG 42	88m REMOVED
WTG 43	140 m
WTG 44	159 m
WTG 45	137 m

Draft Conditions of Consent indicate new locations for turbines 40, 43, 44 and 45 to reflect the 130 m setback. Consequently, turbines 40 and 43 moved into the steeper terrain than assessed by the PSM Constructability Advice for DPHI, which is dated 7th December 2023, but references November 2022 turbine locations.

HOGPI members object to the amended conditions A7 and A10 and request the removal of all turbines unable to achieve the 500 m setback from Ben Halls Gap Nature Reserve.



A HOGPI member created the map above (provided in large format) indicative of contour lines, proposed location of turbines, concrete batching plant, and major host landowner's bore drilled in 2019, in close proximity to unique Critically Endangered Ben Halls Gap Sphagnum Moss Cool Temperate Rainforest, listed in 2022 to prevent its extinction.

7.2 Potential impacts on Ben Halls Gap Sphagnum Moss Cool Temperate Rainforest

In Attachment E - Recommended Instrument of Consent the DPHI continues to recommend approval of eight wind turbines and infrastructure on the Ben Halls Gap Nature Reserve boundary and close to Critically Endangered Ben Halls Gap Sphagnum Moss Cool Temperate Rainforest.

When Minister for the Environment and Water the Hon. Tanya Plibersek MP launched the Threatened Species Action Plan: Toward Zero Extinctions on 4th October 2022 she described the Ben Halls Gap Sphagnum Moss Cool Temperate Rainforest as 'a unique type of rainforest … only known to be found at Ben Halls Gap in the New England tablelands of NSW.'

Minister Plibersek said "I will not shy away from difficult problems or accept environmental decline and extinction as inevitable."
:https://minister.dcceew.gov.au/plibersek/media-releases/minister-launches-threatened-species-action-plan-toward-zero-extinctions

Hills of Gold Wind Farm proposes wind farm infrastructure, including concrete batching plant co-located with major host landowners' bore drilled in 2019, internal tracks, eight wind turbine foundations and hardstands near Critically Endangered Ben Halls Gap Sphagnum Moss Cool Temperate Rainforest.

In its written submission the Applicant asked the IPC to reduce the buffer from Ben Halls Gap Nature Reserve from the recommended 135 m to 50 m. This would place wind farm infrastructure and the area of disturbance in close proximity to the nature reserve boundary, canopy and unique Critically Endangered Ben Halls Gap Sphagnum Moss Cool Temperate Rainforest.

Land clearance for road construction, water quality and quantity disturbance, groundwater drawdown, weed and soil pathogen invasion, and bushfire risk associated with Hills of Gold Wind Farm are ongoing major threats to Ben Halls Gap Sphagnum Moss Cool Temperate Rainforest. They do not support the Comprehensive Statutory Conservation Advice in place to protect this Threatened Ecological Community and stop its extinction.

All existing bores within the vicinity of Ben Halls Gap Sphagnum Moss Cool Temperate Rainforest should be scrutinised for potential impacts on this groundwater dependent, unique Critically Endangered Threatened Ecological Community.

Ben Halls Gap Sphagnum Moss Cool Temperate Rainforest © Doug Beckers

Sphagnum cristatum hummock pictured in the rare Ben Halls Gap Sphagnum Moss Cool Temperate Rainforest in NSW. (Doug Beckers / DCCEEW)

7.3 Clearing of an Endangered Ecological Community for turbine 28

The marginal viability of Hills of Gold Wind Farm resulted in the Department recommending reinstatement of turbine 28, which requires clearing 1.5 ha of endangered ecological community Ribbon Gum Mountain Gum Snow Gum which is habitat for threatened species including Koala, Barking Owl and Large eared Pied Bat and is in good condition. Reinstating Turbine 28 increases the moderate impact risk of blade strike to avifauna.

7.4 Access A & B

DPHI Draft Conditions of Consent specify the use of Access B. HOGPI members ask that Conditions of Consent include disuse and rehabilitation of Access A.

8.0 DRAFT CONDITIONS OF CONSENT LACK FINALITY

HOGPI members share Tamworth Regional Council's concerns about the lack of finality of the DPHI Draft Conditions of Consent. The wording allows for unspecified road modifications to enable Oversize Overmass vehicle access at the northern and southern ends of the project. It also enables subsequent approvals by the Planning Secretary, without consultation. This is unacceptable to HOGPI members. It does not comply with the Department's own Guideline for drafting conditions for State significant projects (June 2023) and 'Certain and final' guiding principles below.

The Guideline states that *'Conditions must be certain and final. They … must not defer consideration of any significant matters.'*

It goes further to instruct, *'uncertainties must be identified in the EIS along with actions that will be undertaken to address those uncertainties.'*

Where possible, the department will avoid expressions like 'generally in accordance with' or 'the applicant should take all reasonable steps', as this allows some variance in compliance.

The Hills of Gold Wind Farm draft Conditions of Consent are littered with *'generally in accordance with*' potentially allowing the use of any versions of the EIS.

3.1.2 Certain and final

Conditions must be certain and final. They should consider and address all issues raised through the assessment of the application and must not defer consideration of any significant matters.

Avoid deferral of decisions to another time or a third party

The decision-maker has a duty to consider the likely impacts of a development. The department will work with the applicant and key stakeholders, such as the local council or other government agencies, to resolve key matters during the assessment of the application.

As required in the State Significant Development and State Significant Infrastructure Guidelines,[8] any residual uncertainties associated with the project's impacts must be identified in the environmental impact statement (EIS). For example, there may be:

- a lack of baseline data
- uncertainty about the effectiveness of the proposed mitigation measures
- a lack of agreed criteria for evaluating impacts.

These uncertainties must be identified in the EIS along with actions that will be undertaken to address those uncertainties. In some cases, resolving uncertainties may need to be deferred to a condition. In such cases, the condition should require the uncertainty to be resolved as early as possible in project delivery.

Hills of Gold Wind Farm, even at this late stage, has unacceptable unresolved uncertainties relating to road, bridges and intersection upgrades, outstanding indigenous land use agreement for site access, steep internal hillside track and escarpment turbine foundation design, and erosion mitigation. Despite the community raising these concerns in three public exhibition periods they remain unresolved and are potentially unresolvable. The responsible action is to determine rejection of Hills of Gold Wind Farm because of its poor site selection, and poor community consultation. It is not a public benefit to reward poor practice.

"In relation to the transport route, the original proposal included an access road cutting through a Crown reserve with significant historic value and potential issues with native title claim. This issue was not resolved until an amendment was submitted in November 2022" (Department's response 24th June 2024)

The project has now morphed into a proposal with the **transport route cutting through another Crown reserve with significant biodiversity values and potential issues with native title claim.** The issue is **still not resolved.**

HOGPI members request that the draft Conditions of Consent include Limits of Approval relating to Approval lapsing within three (3) years after the date if an Approval is given unless work has been completed on the site before the date of the Approval lapsing. Cullerin Wind Farm Project Approval shown below.

Lapsing of Approval

8. This Approval lapses 3 years after the date of this Approval unless the Proponent has confirmed to the satisfaction of the Director-General that orders have been placed for wind turbines, or demonstrated that work subject of this Approval has been completed on the Site before the date on which the Approval would otherwise lapse under this condition. Work, for the purpose of this condition includes at least one of the following:
   (a) internal track construction;
   (b) civil works associated with the construction of the foundations for the wind turbine footings;
   (c) control room construction;
   (d) electrical substation construction;
   (e) underground cabling; or
   (f) internal overhead transmission line construction.

9.0 UNRESOLVED AND UNADDRESSED ISSUES RAISED IN PREVIOUS SUBMISSIONS

The marginal to unviable economic projection of Hills of Gold Wind Farm is just one unresolvable issue that the Applicant has failed to address in six-and-a-half-years. The following issues remain unresolved and the uncertainty and lack of finality of the project presented must result in rejection of Hills of Gold Wind Farm by the IPC.

1. Underestimated land clearing, biodiversity decline, habitat loss and overall constructability of the proposed project. Unacceptable setback from Ben Halls Gap Nature Reserve.

2. Underestimated negative visual and noise impacts, soil and water preservation impacts, unknown risks of flooding, and no assurance of safety of the people using public infrastructure.

3. The Applicant failed to provide photomontages of turbines for NAD_18, NAD_11 and photomontages of infrastructure, including the Transverse Track on the face of Wombramurra Mountain, substation/BESS/car park/batching plant/O&M building complex on Governor's Shelf, Western Connector Rd, 'Nundle Bypass' road, and commuter car park.

4. The Applicant and DPHI underestimate visual impact to residents and the tourism economy on the approach to Nundle from turbines and private road construction impacts. The Applicant failed to provide required visual impact material. The Independent Visual Advice by O'Hanlon failed to identify missing information. DPHI proceeded to project recommendation without this visual information being provided to, or assessed by the DPHI. The

assessment process has failed to accurately determine the extent of the visual impacts of this project and it does not meet the EP&A Object of promoting good design and amenity by the imposition of these negative visual impacts.

5. The Applicant failed to provide complete, accurate, or at times any information at all, related to transport routes. The classification of Barry Rd and Morrisons Gap Rd as local roads does not support the use by heavy vehicles or heavy vehicles requiring escort. DPHI failed to ensure accuracy or completeness of the information and advanced the project to the recommendation stage.

6. DPHI has commissioned the Constructability Advice to assist in determination of the Project's feasibility. DPHI subsequently proceeded to the Project's Recommendation for Approval with the Assessment based on an INCOMPLETE report. Constructability Advice failed to identify two major components of the Project. It has identified important omissions, lack of information and need for further detail regarding the assessed part of the Project. The project fails to meet the EP&A Object of delivering good design & amenity of the built environment with the proposal of un-constructible infrastructure such as the access roads. The Applicant failed to investigate a feasible access to the wind farm development corridor prior to submitting EIS. The Department progressed the Project to the recommendation stage without demonstrated constructible or legal access in place.

10. CONCLUSION

The Australian Energy Infrastructure Commissioner's Community Engagement Review states that, 'Poor engagement practices experienced by landholders and community members have led to a material distrust of project developers…' HOGPI members' would add that a material distrust in the NSW Government and DPHI having experienced reinstatement of 15 wind turbines, alternating between 2016 and 2023 guidelines, and imposing Voluntary Land Acquisition as mitigation of last resort. HOGPI members have extensively engaged with the DPHI for six years 'trusting the process'. The process has failed them, rewarding unauthorised clearing by the major host landholder, poor site selection, and a developer that is not a model proponent. Tamworth Regional Council, HOGPI members, and science professionals have provided hard evidence of the flaws of this poorly sited project, from its highly erodible soil, prone to mass movement and sedimentation, gaps in information such as unresolved site access and internal tracks, poor indigenous consultation and ignoring whole communities in the Upper Hunter and Wallabadah, and underestimated environmental and financial costs. Custodians of the land are stakeholders in protecting

generational legacies, succession planning of farm and off-farm businesses, intergenerational living on rural properties, rural tourism, European and Indigenous culture and heritage, and world biodiversity, soil, and water assets. We ask the Independent Planning Commission to consider the Public Benefit and prioritise Biodiversity, Renewables Industry Best Practice, and Good Planning Governance by rejecting Hills of Gold Wind Farm.

PO Box 290
WOODEND
VIC 3442

Email: [redacted]

Mob: **0416 143 716**

L HUSON & ASSOCIATES

Consultant Scientists in Acoustics

Megan Trousdale
Hills of Gold Preservation Inc.

(by email to: [redacted]
Our Reference: L452/Let1/WLH

4 February 2023

Dear Megan

Re: Hills of Gold Wind Farm Noise Assessment – Peer Review

L Huson & Associates Pty Ltd has been commissioned by the Hills of Gold Preservation Inc. (HGPI) to peer review the Amendment Report, Hills of Gold Wind Farm Environmental Impact Statement (EIS) dated 7 November 2022 that was prepared by Environmental Resources Management Australia Pty Ltd.

This peer review considers the assessment of predicted operational wind farm noise and compliance with the NSW Secretary's Environmental Assessment Requirements (SEAR) in this regard for the EIS.

In the absence of a peer review being included in the EIS then this independent peer review of the noise assessment reports within the EIS may be considered in lieu.

The SEAR for Application Number SSD 9679 lists the following that are relevant to this review:

> • an assessment of the likely impacts of the development on the environment, focusing on the specific issues identified below, including:
>
> – a description of the existing environment likely to be affected by the development using sufficient baseline data;
>
> – an assessment of the likely impacts of all stages of the development, taking into consideration any relevant legislation, environmental planning instruments, guidelines, policies, plans and industry codes of practice and including the NSW Wind Energy Guideline for State Significant Wind Energy Development (2016);
>
> – a description of the measures that would be implemented to avoid, mitigate and/or offset residual impacts of the development and the likely effectiveness of these measures, including details of consultation with any affected non-associated landowners in relation to the development of mitigation measures, and any negotiated agreements with these landowners; and
>
> – a description of the measures that would be implemented to monitor and report on the environmental performance of the development, including adaptive management strategies and contingency measures to address residual impacts

In particular for **Noise and Vibration** – the EIS must:

- assess wind turbine noise in accordance with the NSW Wind Energy: Noise Assessment Bulletin (EPA/DPE, 2016);
- assess noise generated by ancillary infrastructure in accordance with the NSW Noise Policy for Industry (EPA, 2017);
- assess construction noise under the Interim Construction Noise Guideline (DECC, 2009);

- assess traffic noise under the NSW Road Noise Policy (DECCW, 2011); and
- assess vibration under the Assessing Vibration: A Technical Guideline (DECC, 2006);

The NSW Wind Energy Guideline for State Significant Wind Energy Development (2016) refers to the guideline Bulletin (EPA/DPE, 2016);, as follows:

> 'To ensure an adequate assessment of potential noise impacts, the Department has developed a Noise Assessment Bulletin' and notes that the EIS must include 'completed technical studies, including an accurate noise impact assessment for relevant dwellings undertaken consistent with the requirements of the Noise Assessment Bulletin'.

The Noise Bulletin (EPA/DPE, 2016), in turn, refers to a South Australia EPA Guideline, as follows:

> 'The NSW Government has adopted the 2009 South Australian document *Wind farms – environmental noise guidelines* (SA 2009)1. SA 2009 will form the basis of the regulatory noise standard and assessment methodology that will apply when SSD wind energy proponents are assessed and determined in NSW. Adopting SA 2009 will facilitate increased regulatory consistency between states and result in consistent standards applying to significant areas of Australia with high quality accessible wind resources.'

The SA 2009 guideline had an update in November 2021, yet the document has retained the same ISBN number, and the original guideline has been withdrawn. The most recent SA 2009 of November 2021 was issued before the two amended Noise and Vibration Assessment reports prepared by Sonus, dated January 2022 and November 2022, the first amended EIS dated December 2021 and EIS Amendment 2 dated November 2022; each of these reports should have reflected the requirements of the updated SA 2009.

In summary, an accurate noise impact assessment in accordance with the Noise Bulletin is required for an EIS and detail is required of any negotiated agreements. SA 2009 is the regulatory noise standard and assessment methodology that will apply when SSD wind energy proponents are assessed and determined in NSW.

Negotiated Agreements

SA 2009 has a section dealing with negotiated agreements with wind farm developers and notes that:

> 'The criteria have been developed to minimise the impact on the amenity of premises that do not have an agreement with wind farm developers. Notwithstanding this, the EPA cannot ignore noise impacts on the basis that an agreement has been made between the developer and the landowner. Developers cannot absolve themselves of their obligations under the EP Act by entering into an agreement with a landowner.
>
> If it can be demonstrated that a development is having an 'adverse effect on an amenity value of an area that … unreasonably interferes with the enjoyment of the area', then appropriate action can be taken under the EP Act.'

In a recent decision of the Victorian Supreme Court in *Uren v Bald Hills Wind Farm Pty Ltd* [2022] VSC 145 (**Uren**) it was found that noise nuisance (unreasonable interference) could still apply even if a wind farm development complied with noise limits imposed through the planning process.

There are no examples of negotiated agreements for noise in the EIS that would inform the consideration of adequate noise protection for associated landowners.

The original EIS of 2020 refers to the negotiated agreements as being "subject to confidentiality considerations' which may explain why no such agreements are provided.

The EIS does not explain how any adverse noise impacts have been addressed in the agreements or if there is adequate protection from, for example, adverse health effects that can be caused by noise.

The EIS relies upon the Amended Hills of Gold Wind Farm Noise and Vibration Assessment, November 2022 referenced as report S6400C33 prepared by Sonus Pty Ltd (NVA) in regard to negotiated agreements, as follows:

> 'The dwellings located in the vicinity of the wind farm site are listed in Table 3, as well as their status as either associated (having an agreement with the developer), non-associated or being a location where a development application has been submitted/approved, but a dwelling is not currently constructed (development application dwelling).'

It is apparent that negotiated agreements are in place and could be supplied to the EPA for consideration. Confidentiality considerations should not prevent proper evaluation because the names of property owners can be redacted.

A particular example that would assist in the evaluation of the EIS would be the Negotiated Agreement with DAD_2.

A report by Sonus dated 13 December 2021 was included in the first Amended EIS Report, Appendix F (Noise and Vibration Advice Letter) which detailed layout changes that would be necessary to account for three additional dwelling applications that had been approved but not considered in the original EIS. The three approved dwelling sites are identified as DAD_1, DAD_2 and DAD_3 and were assessed in Sonus report S6400C22, August 2021.

Sonus concluded that for DAD_1 'a total of nine wind turbines would need to be removed from the layout to achieve the noise criteria'. The nine wind turbines requiring removal were WP53, WP54, WP55, WP56, WP57, WP58, WP59, WP60 and WP61. The removal of the same nine wind turbines is also recommended in the EIS Amendment 2 report (Appendix F), however, reference is made to a noise curtailment strategy, rather than removal, when assessing dwellings NAD_5, NAD_8, NAD_11 and NAD_67.

The EIS Amendment 2 does not implement the removal of nine wind turbines for the benefit of DAD_1 and the predicted noise levels for DAD_1 remain some 13 dB above the noise criteria.

Sonus also concluded that three additional wind turbines (WP69, WP68 and WP67) would require removal from the layout to achieve compliance with the noise criteria at DAD_2. The EIS Amendment 2 does not now include DAD_2 as a location on any of the figures or in the Sonus Noise and Vibration Assessment report S6400C33, November 2022 (NVA).

HGPI advise that the owners of the DAD_2 have entered into a Negotiated Agreement with the Hills of Gold Wind Farm so this agreement is worthy of review to ascertain how noise mitigations can be implemented to alleviate adverse health effects that can be caused by noise

Other Negotiated Agreements with the numerous Associated Dwellings (AD_xx), suitably redacted for commercial or privacy reasons should also be available for review.

Wind Farm Proposed Layout and Candidate Wind Turbine

The NVA states that the turbine layout and wind turbine model may be changed:

> 'Given that the noise assessment has been made based on the currently proposed turbine layout, an assessed representative WTG and that both the project layout and WTG model selection may change during the detailed design of the Project, the need for curtailment and the final operating strategy will be determined during a pre-construction noise assessment.'

It would be expected that a Scoping Study could advise that the wind turbine layout, turbine type, consideration of other matters such as tonality, low frequency noise and sound power levels can all change and are issues that will be considered prior to preparing an EIS. However, it is not appropriate to suggest such substantive changes can occur *after* approval of the EIS.

It is a requirement of the EIS that a detailed design has already been made.

The planning assessment process adds a 5 dB penalty to noise model predictions if there are tonal emissions from the wind turbine type proposed. However, the Bulletin only consider particular 10-minute intervals within a compliance survey period that are weighted by the 5 dB penalty. This approach to noise compliance testing for tonal penalty is much less stringent than the approach intended at the planning stage.

No tonal audibility test results have been provided in the EIS. The lack of tonal audibility test results effectively undermines the community protection objectives within the planning process.

The candidate wind turbine has not been named in the NVA. A total sound power level of 104 dBA has been assumed for an unnamed wind turbine that would comply with the dimensional constraints in the EIS. The electrical power generation of the candidate wind turbine model has also not been provided.

The SEAR outlines the development application to be for a wind farm with: "a maximum of 97 turbines, a maximum of 410 megawatts (MW) and maximum height of 220 metres (to blade tip)"

EIS Amendment 2, Table 3-1, states that the maximum wind turbine tip height is 230m. This is contrary to the SEAR.

For a wind farm containing 64 wind turbines the maximum power generation per turbine is 6.4 MW. This will meet the maximum development application limit of 410 MW. Alternatively, a mixture of smaller and larger electrical power generating capacity wind turbines could be installed.

If the number of wind turbines is reduced below 64 then wind turbines such as the Vestas V172 – 7.2MW could be installed that can remain within the maximum 410 MW limit. This could apply if the recommended removal of nine wind turbines to protect DAD_1 is implemented.

The SEAR requires that the EIS *must* assess wind turbine noise in accordance with the NSW Wind Energy: Noise Assessment Bulletin (EPA/DPE, 2016). The Bulletin requires; "As a minimum, the noise assessment report must include the following information: make and model of the representative wind turbine(s) along with the positions of the wind turbines;".

The make and model of the candidate wind turbine has not been provided and the layout is subject to change after the EIS is approved.

If the changes suggested are not considered in the EIS, perhaps with a sensitivity analysis or confirmation that any wind turbine chosen will not exceed a particular sound power level based upon test results, then the EIS is deficient.

The NVA in the EIS can best be described as a report suitable for the Scoping and Pre-lodgement phase of a project similar to that produced by SLR in the Preliminary Noise Assessment dated 11 September 2018, report reference 640.11759-R01v1.1 (SLR report).

The NVA in the EIS lacks detailed design information that may be used to set appropriate noise conditions if the wind farm is approved.

NVA noise predictions

The SLR report used a candidate wind turbine of 4.4 MW capacity and a maximum sound power level of 106.8 dBA that SLR considered to be representative for this wind turbine generating capacity. No wind turbine model was identified and SLR used the ISO9613-2 noise model with parameters required in SA 2009 (with G=0 hard ground).

The NVA prepared by Sonus has assumed a sound power of 104 dBA for a wind turbine of unspecified nameplate or capacity. Tonal audibility or test uncertainty results have not been offered for the candidate turbine.

The UK Institute of Acoustics' "*A good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise, 2014'* explains that individual wind turbine IEC61400-11 test results can vary for the same turbine model and that if manufacturer's specifications are to be used in a noise prediction that a penalty of +2dB should be used. The UK IoA guidelines are now referenced in the updated SA 2009.

With no reference to the source of the sound power level data in the NVA, an uncertainty value of +2dB should have been applied to the sound power values used as input to the noise prediction model.

It is also recognised that a 104 dBA sound power level for a candidate wind turbine used in the NVA is optimistic. Vestas currently offer wind turbines that comply with the development application SEAR dimension limits that have manufacturer specified sound power levels of up to 106.9 dBA. Other manufacturers offer candidate wind turbines with sound power levels (SWL) specified similarly up to 107 dBA, for example: GE Cypress 6.3MW wind turbine
https://www.ge.com/renewableenergy/wind-energy/onshore-wind/cypress-platform

Cypress wind turbine technical specifications

Cypress Platform	GE-158	GE-164
Power Output	4.8 MW to 6.3 MW variable rating	6.3 MW
Rotor diameter	158 m	164 m
Hub heights	From 101 m to 161 m (and site specific)	From 112 m to 167 m (and site specific)
Frequency	50 to 60 Hz	50 Hz
IEC Class	S	
Noise-Reduced Operation	From 107 dB to 98 dB	
IEC Certification	Available	In Progress

For noise modelling purposes the sound power to be used for the NVA should be increased by 2 dB as per SA 2009 if no test results are supplied with a ground factor G=0 when using either the ISO9613-2 or CONCAWE noise models.

A more realistic SWL for a contemporary candidate wind turbine would be 107 dBA with an uncertainty value of 2 dB increase for noise model purposes.

A representative SWL that should have been used in the NVA noise model is 109 dBA. This is 5 dB higher than the SWL used in the NVA.

It is well understood that site effects can alter sound power levels from a wind turbine. IEC61400-11 test measurements are taken in optimal controlled conditions advising minimal inflow turbulence to the rotor due to increased noise caused by inflow turbulence. This requirement is found in IEC61400-11.

Proximity considerations of wind turbines to each other, locations near ridges and general topography are considered to be 'site effects' that can increase noise emissions above those measured using IEC61400-11 or those predicted in manufacturer specifications.

A full assessment of the effect of all detailed design changes that may be considered by the proponent should be addressed in the EIS. A noise model should be prepared to do this using a sound power level input of 109 dBA for each wind turbine in the current layout with the ground effect of G=0 (as required in SA 2009) as an input parameter with a receiver height of 1.5m.

With only the increase in SWL by 5 dB, that represents a more realistic candidate wind turbine option, the noise predictions in the NVA would similarly all also rise by 5 dB causing additional non-associated dwellings such as NAD_12 and Associated Dwellings such as AD_5 to exceed required noise limits.

However, the NVA used a ground attenuation influence value of G=1 contrary to the requirements of SA 2009 that requires G=0 to be used.

When G=0 is used in the CONCAWE noise model instead of G=1 the predicted sound levels in the community increase.

CONCAWE calculates the amount of ground attenuation correction based upon the percentage of soft (absorptive ground according to an empirical table of values) to hard ground (fully reflective) in the separation distance between the wind turbine and the dwelling. For example, if G=0.5 (50%) then over a distance of 2000 m, 1000 m will be considered 'soft'. For G=1 then all 2000 m of intervening ground is considered 'soft'.

The predicted sound level increase caused by using G=0 instead of G=1, as implemented in CONCAWE is complicated with the association to other correcting values such as K_5 (Source and/or Receiver Height Correction) but, for the candidate wind turbine sound power spectrum at a distance of 2 km the predicted sound pressure level will increase by approximately 6 dB.

It should be noted that computer programs that implement the CONCAWE noise model may not truly reflect the method in all respects. For example, CONCAWE is only applicable over the octave band frequency range from 63 Hz to 4 kHz. Any extension beyond these frequency limits has not been empirically validated in CONCAWE. Other software implementations of CONCAWE include barrier effects caused by topographical features, despite this being unnecessary according to the CONCAWE method.

Detailed review of EIS Appendix F (Sonus NVA Report)

Background Noise Measurements

Documentation

The latest version of SA 2009, section 5.2 lists eleven items to include in the documentation detailing the assessment of background noise. The original version of SA 2009 listed twelve items to include in a report but the first item was split into two separate items in the current SA 2009.

The current version of SA 2009 stipulates the method to use in data analysis and this made two of the documentation requirements (items j and l) obsolete.

Background noise measurements and data analysis were provided in Sonus report reference S6400C10 dated October 2020.

The report was prepared under the original SA 2009 but the following items were not supplied in the documentation:

a description of noise measuring equipment used, including make, model and type and including type and model of windscreen used for the microphone, data demonstrating valid calibration for all equipment at the time of measurements

d angle direction between the line connecting the noise measurement point and the nearest WTG and North (measured clockwise)

e atmospheric conditions at the wind farm including wind speed and direction, description of wind speed and direction measuring equipment used

Documentation to reflect the requirements of the current SA 2009

The method of analysing background noise data has changed in the current SA 2009.

The Sonus Background noise report should have been re-issued following the current 'BIN analysis' methodology described in SA 2009. A revised Background noise report would also allow Sonus to address the deficiencies in the documentation requirements described in section 5.2 of SA 2009.

The Sonus Background noise report describes the removal of data above a hub height wind speed of 12 m/s. This data removal is not compliant with SA 2009 and a revised report can correct this error and address other omissions.

Wind Speed

Accurate determination of background noise levels is fundamental to setting target noise limits that the developed wind farm must meet.

Background noise measurements must be correlated to wind speed across the wind farm site. SA 2009 notes that wind speed measurement locations must be determined, as follows:

> **Measurement location**
> Preferably, the same location should be used for measuring wind speed and direction for all of the following procedures:
> • background noise measurements,

- noise predictions,
- compliance checking.

The wind speed measurement location at the wind farm site should not:

- be significantly affected by the operation of the WTGs in their final location,
- provide lower wind speed results than other locations on the wind farm site, where those locations will house WTGs that affect the noise level at a relevant receiver.
- be less representative for noise propagation from the wind farm than other available locations, ie.wind sensor from more distant locations should not be referenced instead of wind speed measurements performed at a closer location.

For large or topographically diverse wind farm sites, the suitability of the wind speed measurement location may need to be confirmed as part of the development assessment process.

The two wind measurement locations Lidar 4 and Mast 4 used in the Background analysis report are close to the location of proposed wind turbines (214m from WP56 and 120m from WP9).

Wind speed data from these locations is unsuitable for background measurement purposes since the location will subsequently be affected by operation of the proposed nearby wind turbines. An alternative temporary mast location should have been chosen that will not be subject to influence from any future turbine.

The Hills of Gold Wind Farm is large and topographically diverse so the suitability of just two met masts for use in Background data reporting should have been justified in the EIS.

Given the fact that the two wind speed measurements have been taken in areas that will be wake affected after wind farm construction there is the option for the developer to obtain wind speed and direction data from the wind turbine closest to a dwelling for compliance/complaints checking. SA 2009 requires: *"Evidence that the wind speed and direction sensor used in such circumstances is certified for the accurate determination of wind parameters is to be supplied as part of the application. Accuracy of the wind speed measurements should be +/-0.5m/s, and wind direction better than +/-3° or better."*

Sonus refer to wind speed data that had been corrected/sheared to hub height wind speed by unidentified others before being supplied to Sonus in preparation of the background noise report. The extrapolation methodology should be described in the EIS together with details of the measurement equipment certification and accuracy.

Explanation is also required that the met mast location meets the SA 2009 requirement that '*the wind speed measurement location at the wind farm site should not .. provide lower wind speed results than other locations on the wind farm site, where those locations will house WTGs that affect the noise level at a relevant receiver.'*

The wind speed measurement locations used for assessing background at NAD_74 and NAD_33 are greater than 6 km away, and the wind speed measurement location for NAD_12 is over 5 km away from the dwelling.

Background Measurement Period

The background survey period was from 5 May 2020 through to 16 June 2020.

SA 2009 states:

> A community concern is that the developer may measure during a limited (minimum two weeks) period that is not representative of the whole year.

> This guideline recommends that compliance checking be repeated at different periods of the year where valid concerns exist.
> The developer must collect representative background noise data.

The EIS has not provided information to demonstrate that background noise data is representative of other times of the year.

Background measurement equipment

SA 2009 states:

> *Equipment*
> Background noise levels should be collected for continuous 10-minute intervals using sound level meters or loggers of at least Class 2 certification in accordance with Standard AS IEC−61672. The lower limit of the instrument measurement range must be chosen to provide accurate measurements which might be limited by the noise floor of the data acquisition device.

Sonus state that they used Rion Class 1 sound level meter loggers but do not specify the model or serial numbers and calibration evidence for this equipment

The *measurement range* over which the sound level meters comply with AS IEC-61672 is not stated. The lower measurement level compliant with AS IEC-61672 is generally 10 dB above the noise floor of the sound level meter and microphone combination for Class 1 instruments. Sonus state that the noise floor of the instruments is less than 20 dB. This would suggest that the measurement range providing accurate results in compliance with AS IEC61672 is below 30 dB, although Sonus have not specified the actual lower measurement limit.

The effect of this equipment limitation is that if the Background sound levels are shown to be below, say, 28 dBA then the reported measurements will be artificially elevated and the corresponding target noise limits will be too high[1].

Many measurements (estimate >30%) fall below 28 dBA in the results presented for Background measurements in Appendix E of Sonus report S6400C10. Because the trend line regression analysis considers dB values without consideration of data point accuracies, this can have a marked effect on the trend line and the validity of the target noise limits proposed in the Sonus background could artificially be elevated.

When the base line target noise limit is 35 dBA, or Background plus 5 dB, it is important to recognise that measurement equipment must remain accurate to AS IEC-61672 Class limits below 28 dBA. If poor low level accuracy equipment is used then it would be appropriate to adjust the trend line determination lower to compensate and provide a note in any reported sound levels below the measurement range that those measurement levels will be overestimated.

With the requirement in the current SA 2009 to analyse background data into ‘wind speed BINS’ it is possible to estimate any artificially raised background sound levels caused by instrumentation.

This is another reason to re-issue the Background Noise Monitoring report.

Sound level loggers capable of achieving measured results compliant with AS IEC-61672 accuracy limits are readily available down to < 23 dBA. A typical sound level meter from Larson Davis states in its manual (my emphasis in bold type):

[1] Huson, W.L.: “Constraints imposed by and limitations of IEC 61672 for the measurement of wind farm sound emissions.” 6th International Conference on Wind Turbine Noise, Glasgow 2015

> The measurement ranges over which the Model 831 meets the standards, which depend upon the selected frequency weighting, as shown in 'Performance Specifications" on page A-4. Measurements which include levels outside this range should not be considered accurate. An overload indication will appear when levels above the range appear. **However, the user should take care not to rely on measurements whose levels are below the lower limit of the specified range.**

Local wind speed at logger locations

SA 2009 require local wind speed measurements near to the background survey microphones. Sonus state that these were installed but the photographs provided of the equipment installations do not show local wind speed measurement equipment at NAD_12, NAD_74 or AD_2.

Sonus should clarify that all measurement sites contained local wind speed measurement instruments. Furthermore, SA 2009 require that such data also be provided in the report and this can be achieved simply with a chart for each measurement location showing local wind speed and sound level across the survey period.

Background Data Filtering

The Background noise report states that local wind speeds above 5m/s and rainfall were used to identify data that was removed from subsequent data analysis. This is appropriate since no manufacturer data was provided for the windscreens used on the microphones.

However, data was excluded for hub height wind speeds above 12m/s and the removal of this data is not appropriate.

Only 24 -hour data is provided. Since the target noise limits are intended to protect sleep it would be appropriate to include additional night time only data charts. Night time only data should be used to set night time target noise limits.

Noise model predictions

SA 2009 states:

> Noise Model
>
> A conservative approach should be used for predicting wind farm noise by calculating noise levels in octave bands from at least 31.5 - 4,000Hz to determine an overall predicted level and using the following inputs:
>
> - atmospheric conditions at 10ºC and 80% humidity,
> - weather category 6 (if CONCAWE method is utilised),
> - hard ground (zero ground factor).

It is apparent that the current SA 2009 has introduced a typographic error when specifying the lower octave band for analysis using CONCAWE or ISO9613-2. The original SA 2009 had a lower octave band analysis requirement of 63 Hz and this is consistent with the two most commonly used noise models of CONCAWE or ISO9613-2. Unfortunately, these two models do not extend down to the 31.5 Hz octave band and are not verified for use in the 31.5 Hz octave band.

The requirement to use hard ground (zero ground factor, G=0) is consistent between the original and updated SA 2009.

The EIS has not used the appropriate input parameters.

In a recent decision of the Victorian Supreme Court (**Uren**) relating to wind turbine noise the expert representing the wind farm (Mr Turnbull of Sonus Pty Ltd) incorrectly interpreted "the method for

assessing wind farm noise prescribed" and the interpretation was accordingly not accepted by Judge Richards.

It is inappropriate for the Sonus noise model to use input parameters other than those required in the SA 2009 guidelines; ie. using G=1 (soft ground) instead of G=0 (hard ground).

Sound Power Level (SWL)

SA 2009 states:

> The sound power level data at wind speeds from cut-in speed to the speed of rated power and each integer speed in between should be specified in the development application as determined in accordance with International Electrotechnical Standard IEC 61400−11. The sound power level determined in accordance with other relevant standard or procedure might be acceptable for the purpose of the guidelines.
>
> At the time of development application, the contractual arrangements for a particular WTG model may not have been finalised between the developer and WTG supplier. If the WTG model to be installed differs from that indicated at the time of development application, the developer should assess and discuss the effect on the propagation model with the EPA.

The last sentence from the extract above can be problematic if the applicant plans to change the unidentified candidate WTG for final construction.

If alternative WTGs may be considered then these should be included in the EIS.

Hills of Gold Wind Farm Pty Ltd (ENGIE Australia & New Zealand) should have sufficient experience to firm up on their WTG choice and understand the extent of any altered layout that may be required. Each of any alternative 'final design' options should be included in the EIS report.

SWL data for a range of actual contemporary candidate wind turbines should be included in the EIS/NVA, rather than data for an undefined wind turbine that is optimistically too low by some 5 dB.

Tonality

No predictive correction penalty has been applied to the SWL of the candidate wind turbine for tonality, it has been assumed that any wind turbine chosen for the development will not exhibit tonal sound emissions.

Recent Vestas installations of their WTGs has demonstrated tonal noise emissions, as measured by Sonus at the Salt Creek Wind Farm for the Vestas V126 3.6MW turbines using the 1/3 octave band assessment method used in this NVA, that were not considered in earlier predictions for development approval of the wind farm.

Many other wind farms have been approved on the assumption that the wind turbines will be non-tonal only to find after construction that this was not the case.

If an IEC61400-11 test result is unavailable for the proposed candidate wind turbine then an alternative candidate that has such a test should be offered as a possibility. It is disingenuous to refer to test results from a candidate turbine that has no tonal audibility to secure a planning approval but then install a different wind turbine that has tonal audibility.

It has been recent common practice for a WTG manufacturer to offer predicted SWL data rather than measured SWL data but in such circumstances it would be appropriate to add some additional measure of uncertainty in the predictions.

Likewise, if there are no test results demonstrating that the candidate wind turbines do not have tonal sound emissions then it would be appropriate to assume that the candidate wind turbines will have tonal qualities and add the appropriate 5 dB penalty to the predicted sound levels as a precaution.

Without an IEC61400-11 test report it is not possible to evaluate tonality or provide confidence to predicted sound pressure levels. Section 4.6 of SA 2009 specifies the assessment procedure for tonality to be as detailed in IEC61400-11, rather than the simplified 1/3 octave band method suggested in the NVA.

From the Bulletin:

SA 2009 requires that development applications for wind energy projects report the following:

> "To help determine whether there is tonality, the method and results of testing (such as in accordance with IEC 61400−11) carried out on the proposed WTG model to determine the presence of tonality should also be specified in the development application."

> In NSW, in addition to the SA 2009 requirements, for both environmental assessment and compliance purposes, the presence of excessive tonality (a special noise characteristic) shall be consistent with the methodology described in ISO 1996.2: 2007 Acoustics - Description, measurement and assessment of environmental noise – Determination of environmental noise levels (Annex D – Objective method for assessing the audibility of tones in noise – Simplified method). Tonality is defined as when the level of one-third octave band* exceeds the level of the adjacent bands on both sides by:
>
> 5 dB or more if the centre frequency of the band containing the tone is in the range 500 Hz to 10,000 Hz;
>
> 8 dB or more if the centre frequency of the band containing the tone is in the range 160 Hz to 400 Hz; and/or
>
> 15 dB or more if the centre frequency of the band containing the tone is in the range 25 Hz to 125 Hz.

The NVA only used the 1/3 octave band method to estimate the possibility of tones for the candidate wind turbine, not that of IEC61400-11preferred by SA 2009. The Bulletin uses the 1/3 octave band tone analysis option as an *additional* requirement, not a replacement requirement for assessing tonality.

Low frequency noise

Low frequency noise predictions to determine dB(C) levels should be re-calculated with the correct ground absorption factor required in SA 2009 of G=0 and a receiver height of 1.5m.

Unfortunately, due to the lower frequency limits of CONCAWE this noise model is unsuitable to predict dB(C) levels accurately. Other noise models can be used to assess dB(C) levels, assuming that test data is available for real candidate wind turbine options.

The predicted dB(C) levels offered in the NVA cannot be relied upon.

Infrasound

The SA2009 guideline mentions infrasound but considers wind farm generated infrasound to be of no concern. Unfortunately, the references used to prepare the SA2009 guideline (updated in 2021) only considered out of date information up to 2015. For example, the NHMRC reference in SA2009 is dated 2015 but after that time the NHMRC commissioned an extensive study into the health effects caused by infrasound from wind turbines to the value of $3,300,000, awarded to the University of NSW and Flinders University.

This research is ongoing and one of the published papers in 2019 by researchers at Flinders University (Nguyen, D. P., Hansen, K. et al. Wind farm infrasound detectability and its effects on the perception of wind farm noise amplitude modulation, Acoustics 2019) stated in its conclusions that: "Overall these preliminary results suggest that WF noise complaints could potentially be governed to some degree by the presence of infrasound" and that " We found that self-reported noise sensitive individuals can detect the presence of low-level infrasound (48 ± 2 dB(G)) above chance."

The finding that infrasound at levels of 48 +/- 2 dB(G) can be observed by individuals is in stark contrast to the older research referenced in SA2009 which suggest that a conservative human perception threshold of 85 dB(G) might be appropriate to account for variations in sensitivity of human hearing.

The issue of adverse health effects from wind farm generated infrasound remains contentious.

Summary

General

Table 3-1 of the EIS lists the maximum tip height as 230m in contrast to the SEAR that limits the maximum tip height to 220m.

Section 6.2.3 of the EIS refers to the NVA (Appendix F) for recommendations but only lists those for construction activities. No mention has been made of the operational recommendations such as wind turbine curtailment to reduce noise in the Community or the fact that there are clear exceedances of noise limits for many existing dwellings and dwelling approved sites.

Appendix C of the EIS, Updated Mitigation Measures, in the last two bullet points of the section on Noise is non-committal on the choice of wind turbine and suggests a further NVA will need to be prepared that will outline any curtailment strategies that will be needed to meet noise criteria.

It is further stated that operational noise monitoring will be undertaken as required to confirm compliance with project noise limits at relevant receivers but does not identify those receivers or detail any operational noise monitoring program. It is perhaps implicit that the reference to 'as required' means any permit condition requirement.

The EIS states in Appendix F (NVA) that:
"In order to ensure that operational noise from the wind farm is appropriately managed during subsequent stages of the development, the following is recommended:

- The predicted operational wind turbine noise levels should be updated with final layout and sound power levels of the final turbine selected for the site to verify compliance with the criteria in accordance with the NSW Assessment Bulletin"

The EIS has not considered the effect of different layouts or details for other potential wind turbine candidates. With more credible noise modelling it is expected that a revised layout would be required.

If the development is approved then any layout change or alternative wind turbine choice must not result in an increased noise exposure to the surrounding Community. To address this issue, it would be appropriate to specify a maximum SWL for any wind turbine for a given layout as part of a permit condition and that the input parameters to any revised noise model must be based on measured data plus uncertainty and with the noise model including hard ground (G=0) as a specified input parameter.

Background Noise Measurements

For the reasons identified and detailed in this review there are concerns over wind speed measurements used in the Background noise scatter charts and the accuracy of sound level measurements close to the

instrument noise floor (poor sound level meter low level performance and corrections required for wind speed measurements).

Derived target noise limits are artificially elevated due to the inclusion of data below the lower measurement range of the instruments down to the noise floor.

The Background noise report should be re-issued to address the requirements of the current SA 2009 and affirm that wind speed measurements were taken near to each background measurement microphone.

The wind speed measurements representing wind across the proposed wind farm should be located where there is no potential influence from subsequently constructed wind turbines that can cause errors due to wind turbine wake effects during compliance testing.

The wind speed measurements must comply with the uncertainty requirements of SA 2009 at hub height and the uncertainty should be included in the EIS.

The location of the wind met masts used to provide data in the EIS needs to be verified as to the appropriateness for each of the Background measurement locations.

The EIS has not provided information to demonstrate that background noise data is representative of other times of the year.

The Background noise report needs to be re-issued to address the deficiencies identified in this review.

Noise Model

The deficiencies of the CONCAWE noise model input parameters used in the EIS are detailed in the above.

The deficiencies relate to unverified sound power levels and the incorrect application of the Ground Effect term recommended in SA 2009.

The EIS significantly underestimates the noise impact in the community surrounding the proposed wind farm by at least 5 dB due to an optimistic SWL suggestion for an unnamed contemporary wind turbine.

The 5 dB underestimation of community sound levels does not include: site effects that can further increase actual sound levels; a correction to account for the misuse of the ground effect term in CONCAWE (+6 dB) or; the possibility of including a penalty for tonality (+5 dB) due to the lack of any IEC61400-11 test results.

The noise model should be re-calculated with the correct ‘hard ground’ term G set to 0 with a receiver height of 1.5m and a more realistic sound power level.

In addition, a sensitivity analysis is required of any alternative layout and different candidate wind turbine generator (WTG) using test results rather than manufacturer’s specifications.

The predicted dB(C) levels offered in the NVA cannot be relied upon and should be re-calculated with an appropriate noise model other than CONCAWE.

The EIS should specify actual candidate WTGs and provide full IEC61400-11 test results. The developer should avail themselves of actual test results for each candidate WTG and only those WTG options should be allowed through permit conditions.

The EIS currently shows non-compliance at a number of dwellings and shows no compliance margin after implementation of a curtailment strategy. With the correct input parameters to CONCAWE it is inconceivable that compliance will be demonstrated for many more dwellings, even after applying the curtailment strategy described in the NVA, so a revised layout will be needed.

SA 2009 Section 5.1(9) requires 'an indication of accuracy of the wind farm noise prediction.' This has not been provided.

The NVA can best be described as a scoping study worthy only of reporting at the pre-lodgement stage in the development. The NVA is not suitable for submission as a definitive project EIS lodgement.

The NVA needs to be re-issued to address the deficiencies identified in this review.

Negotiated Agreements

Examples of negotiated agreement for associated dwellings and DAD_2 should be provided to show how any adverse noise issues have been mitigated.

Yours sincerely,

W Les Huson BSc(Hons) MSc CPhys MInstP MIoA MAAS