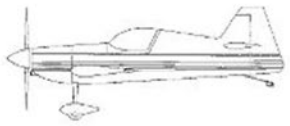
GRANT PIPER
B.E.(Aeronautical Engineering), MRAeS



Aviation Consultant & Aerobatic Training
6000 hr pilot multi engine, single engine, aerobatics.
Recipient FAI Paul Tissandier Diploma 2018

1.0 This submission is made without prejudice.

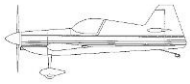
1.1 This submission is a supplement to my presentation at the VOTW IPCN on Thursday 10 April 2025 at Coolah, Attachment A. This is necessary due to the limited presentation time available, and the brevity of information imparted to the Commissioners during their meetings with ACEN and DPHI prior.

1.2 My focus is aviation and aerial firefighting, as these are immediately life-threatening to pilots and the people who live in the vicinity of Valley of the Winds and Liverpool Range wind projects. I am very concerned that DPHI has relied on the consultants paid by the Applicant and an aviation consulting firm that have completed desktop modelling only, with their findings limited to airport usage and circuit area operations.

1.3 This submission focuses on the following from the DPHI Assessment document:

Aviation safety	
• Submitters raised concerns regarding the safe operation of aircraft in the vicinity of wind turbines, particularly aircraft used for aerial firefighting and wake turbulence and obstacle impacts for nearby airstrips. • The project is located 6 km south of Coolah Airport and 56 km north of Mudgee Airport. There are also two private air strips in proximity to the project – Tongy Aerodrome (approximately 1.4 km from the nearest turbine) and Turee Aerodrome (approximately 2.4 km from the nearest turbine). • ACEN undertook an assessment of aviation impacts as part of its EIS and provided additional information during the assessment. The assessment concluded that project would not have any adverse or significant impacts to air safety, subject to the implementation of mitigation measures and administrative controls. • The Department also engaged an independent aviation expert to review **(Appendix G)** ACENs assessment. • Aviation lighting is discussed in **Section 6.4.3**. **Airspace interference** • The site is not located in controlled airspace but is within Danger Area D538B and Restricted Area R559B associated with Military flying training operated by Royal Australian Air Force Base Williamtown. The Department of Defence (DoD) requested that the turbines be obstacle lit. • CASA identified that turbines would reach a height of 853 ft AGL, and therefore would infringe navigable airspace and may impact aircraft operating in the vicinity of the project, however this could be managed with appropriate notification to CASA. CASA also recommended that the site be obstacle lit. • Airservices Australia advised that the maximum height of turbines MH13 and MH25 would affect the lowest safe altitude (LSALT) for air route W627. ACEN removed turbine MH13 in their amended design and committed to request for the air route to be amended prior to construction of turbine MH25, in consultation with Airservices Australia. • Prior to construction of any wind turbines or meteorological monitoring masks masts, ACEN has committed to consultation with CASA, Airservices Australia and any relevant aerial agricultural or firefighting operators to communicate the final turbine coordinates and heights. • The Department has recommended a condition requiring ACEN to detail operational procedures in the event of a bushfire in its Emergency Plan. This would include measures such as shutting down turbines and positioning blades in a manner to minimise interference with aerial firefighting operations. • The Department has also recommended a condition requiring ACEN to develop an Aviation Management Plan in consultation with the Tongy and Turee Aerodrome operators which details the ongoing consultation with potentially impacted operators,	• Carry out the development in accordance with the *National Airports Safeguarding Framework Guideline D: Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms)/Wind Monitoring Towers* • Notify the relevant aviation authorities and local airstrip operators of the final location and specifications of the wind turbines and any wind monitoring masts. • Install aviation hazard lighting in accordance with CASA's requirements. • Request for air route W627 to be amended in consultation with Airservices Australia. • Minimise the off-site lighting impacts of the project. • Shutting down turbines, positioning of turbine blades to minimise interference with aerial firefighting operations and use of aviation hazard lighting during firefighting. • Prepare and implement an Aviation Management Plan in consultation with the operators of Tongy and Turee aerodromes.

"Peridot" 703 Tongy Lane Coolah NSW 2843 Australia Phone 0438890242 Email: grant.piper2@gmail.com



Findings	Recommended conditions
procedure to ensure safe operations of aerodrome runways and mitigation measures for the management of impacts and hazards. **Wake Turbulence and Obstacle impacts for nearby Airstrips** • CASA identified a number of small airstrips in close proximity to the project. ACEN provided additional information, assessing potential wake turbulence and obstacle impacts for Tongy Aerodrome and Turee Aerodrome which fall within the area of interest for aviation activity (3 nautical miles or 5.6 km). • ACEN's assessment confirmed that all proposed WTG and meteorological mast locations fall outside the minimum safe lateral distance for both Tongy and Turee Aerodromes and therefore do not represent obstacles for take off or landing. • Wind data for the area indicates an easterly to southeasterly wind is the predominant wind in the area (approximately 70% of the time), which would not result in any turbulence impacts and either airstrip. The strongest winds for the area tend to blow from the north and east. • ACEN's assessment determined that, under westerly wind conditions which occur 20% of the time there would be some potential for light turbulence from turbines GR03 and GR04 experienced by aircraft operating in the western edge of the standard circuit area of Tongy Aerodrome. Turbulence levels were classified as being 'light' in accordance with the Bureau of Meterology's turbulence intensity classifications and is considered manageable for the light aircraft activities undertaken at Tongy aerodrome. • ACEN's assessment determined that, under westerly and south westerly wind conditions which occur 20% of the time there would be some potential for light turbulence from turbines GR08, GR09, GR10 and GR11 experienced by aircraft operating in the south western edge of the standard circuit area of Turee Aerodrome. Turbulence levels were assessed as being light and therefore manageable for the light aircraft activities undertaken at Turee aerodrome. • To minimise perceived risks associated with the nearby turbines, pilots operating from these aerodromes may choose to make minor adjustments to their usual flight paths. This would be undertaken at the pilot's discretion and requires registration in aeronautical publications to alert other pilots of the operating conditions at the aerodrome. • ACEN has committed to notify Tongy and Turee Aerodromes of the timing of both construction and operational phases of the project. The Department has also recommended that these operators be consulted in the preparation of the Aviation Management Plan. • The Department engaged an independent aviation expert to review (**Appendix G**) ACENs assessment. The independent review concluded that ACEN's assessment sufficiently addresses the potential risks and mitigation measures associated with wind turbulence and wind turbines as obstacles to these two aerodromes.	

Findings	Recommended conditions
• The Department notes that the community has raised concerns around the use of non-standard circuits as a mitigation measure, particularly in relation to the level of experience of the pilot and in instances of poor weather. The Department considers that operations could continue and that any adjustments would be at the pilot's discretion and based on their own assessment of the risks taking into consideration wind direction, speed, weather, aircraft type and level of experience. • The Department considers that any hazards from the turbines would be appropriately managed as long as the development is carried out in accordance with the *National Airports Safeguarding Framework Guideline D: Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms)/Wind Monitoring Towers*, or its latest version. • With the recommended conditions, the Department is satisfied that the project is unlikely to result in any significant aviation hazards or impacts to aerial activities. **Aerial firefighting** • The community has raised concerns around the safety and practicality of aerial firefighting being carried out in proximity to the Project. • The NSW Rural Fire Service did not raise any concerns about the project however recommended that blade rotation cease, and aviation lights be lit when aerial firefighting is occurring in the locality. • ACEN committed to include in their Emergency Response Plan the requirement for wind turbines to be shut down immediately during emergency operations, and where possible position blades in the 'Y' or 'rabbit ear' position to provide the maximum airspace for aircraft to manoeuvre underneath, minimising potential obstacle issues. • ACEN also committed to including appropriate aviation markers on the meteorological masts. • The Department has recommended a condition that the Emergency Plan include operational procedures in the event of bushfires such as shutting down turbines and turning on aviation hazard lighting.	

And this from the interview with the Department:

The project is also located in proximity to two private airstrips, Tongy Aerodrome, which is 1.4 kilometres away, and the Turee Aerodrome, which is 2.4 kilometres away. And the impact on these aerodromes was also a key issue raised in submissions.

So, there are no turbines or met masts that represent obstacles for take-off or landing at these aerodromes. And in light of the particular concern from the community on that issue, the Department engaged an aviation expert to review that information in ACEN's assessment. And that expert advice concluded that ACEN's assessment sufficiently address the potential risks and mitigation measures associated with wind turbulence and wind turbines as obstacles to these two aerodromes.

So, essentially, the wind data indicates that the sort of easterly and southeasterly winds are the dominant ones, so that's 70% of the time. And under those winds, there wouldn't be any turbulence impacts that would be experienced by either airstrip. So, the dominant winds don't create turbulence impacts to those airstrips.

There are westerly winds which occur 20% of the time, which could result in light turbulence from six of the turbines being experienced by aircraft operating at that western edge of a standard circuit area. Light turbulence is something obviously that's common, and a common constraint that pilots have to navigate, and it was considered by the expert that that's manageable for the aircraft activities undertaken at those airstrips.

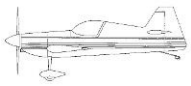
VALLEY OF THE WINDS WIND FARM (SSD-10461) [02/04/2025] P-17

So, the Department also recommended a condition requiring ACEN to develop an Aviation Management Plan in consultation with those two aerodrome operators and including procedures to ensure safe operation of those aerodrome runways, and mitigation measures for the management of impacts and hazards.

So, in response to the community concerns about the potential impacts of the project to safety, and to the practicality of aerial firefighting, the Department's recommended a condition requiring ACEN to detail those operating procedures in the event of a bushfire in its Emergency Plan. And this would include measures such as shutting down the turbines or positioning blades in a manner to minimise interference with aerial firefighting operations.

1.4 I will show evidence that

a. The desktop reports of Aviation Projects and To70 are inadequate and do not address more than aerodrome operations and aircraft in the circuit area. They do not address operations in the general area, where existing light aircraft undertake aerobatic training and VFR flight and do not take into account the local weather conditions.
b. The reference by the Applicant and DPHI to aerial firefighting is based on the advice of a minimal reply from the RFS and an inadequate "study" on which AFAC created a "national position on wind turbines".
c. The tall structures of the turbines are an aviation hazard (as admitted by CASA). In the case of aerial firefighting, the Pilot in Command will, after a risk analysis, reject flying near the wind project(s). This will, inevitably, lead to the destruction of the Coolah district in the case of a large scale bushfire (which the area has experienced before).



2.0 My qualifications and experience are particularly suited to the identified problems. It appears I must detail these to support my statements, as thus far my warnings appear unheeded by both DPHI and ACEN. I don't make these assertions lightly, just as the problems identified should not be dismissed lightly nor the possible catastrophic consequences.

2.1 As a local I have attended bushfires, large and small, for over 50 years. When I returned to the area 25 years ago, I served as Secretary/Treasurer for the Uarbry Brigade for several years and am an active RFS volunteer.

2.2 The most notable fires in this district were the 1980 Birriwa fire and then the 2017 Sir Ivan Fire. During the Sir Ivan fire I had the opportunity to observe at close hand aerial firebombing by helicopters, ag aircraft and large aircraft such as the DC-10 and C130 Hercules.

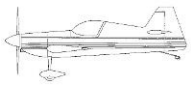
2.3 I have a Bachelor in Aeronautical Engineering from UNSW and worked for Hawker de Havilland, Australia as an engineer before joining the RAAF as a Pilot.

2.4 I have logged 1600 hours in the C130, some of it at low level. This is also the aircraft type that crashed in the Snowy Mountains killing all crew members during the 2019/2020 fires. I also deployed to the 1991 Gulf War in this aircraft.

2.5 I was a Forward Air Controller for 12 years, logging over 1400 hours and finishing as Flight Commander and Check and Training. Forward Air Control entails flying at low level in a reconnaissance aircraft, well below 500ft, marking targets before directing attack aircraft to bomb the targets. Thus I know the difficulty of dropping accurately and the hazards of low level flight in hilly terrain, sometimes obscured by smoke, cloud or rain.

2.6 I was Unit Flying Safety Officer, responsible for completing the Risk Assessments for the flying tasks we had. Unfortunately in aviation, especially at low level, the consequences of most events are catastrophic, so all effort must be made to quantify and minimise the likelihood of an unanticipated event occurring. Failing to identify events, or wilfully not acknowledging them, even if presumed 'unlikely', undermines the practical value of doing the Risk Assessment, and ultimately Aviation Safety.

2.7 As a civilian pilot I have held Commercial, Multi-Engine, Instrument Flying, Formation, Instructor and Low Flying qualifications. Most relevant here is an Endorsement to conduct aerobatics to ground level (FAE AUNL). In exercising these skills I've placed 2nd twice at the Australian Aerobatic Championships in Unlimited Category and am also an internationally listed aerobatic judge. I was awarded the Paul Tissandier Diploma in 2018 by the FAI for my long-term contributions to general



aviation. I coach pilots in aerobatics and have also been authorised by CASA to issue aerobatic endorsements to ground level.

2.8 My professional experience at low level and ability to make accurate assessment of risk is recognised by the relevant authority, be it RAAF, CASA or the Federation Aeronautical Internationale (FAI).

3.0 Aviation Projects and To70: Despite my experience, my assessment of the risk to light aviation in this matter is disregarded and supposedly countered with desk-top studies by Aviation Projects (engaged by the Applicant) and To70 (engaged by DHPI).

3.1 To70 employees appear to have little or no flying or firefighting experience, the Australian agent being a town planner/airport planner who holds a Recreational Aviation Association Australia (RAAUS) certificate only. The author based at Milan Head Office has a Masters and Bachelor in Aerospace Engineering, and has worked in flight simulators and airport design. No low flying or firebombing experience is listed.

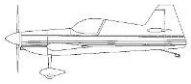
3.2 Aviation Projects appears to be led by an experienced pilot with jet and large aircraft hours, however no light aircraft or aerial firefighting experience appears. Most employees have no known flying experience of relevance to this matter.

4.0 Collision Hazard for Light Aircraft Operating Under Visual Flight Rules in Poor Weather. The Applicant and DPHI repeatedly fail to explain how light aircraft arriving or departing from local airfields in poor weather or low cloud are meant to proceed. As for turbine turbulence, only flight in the circuit areas is considered. Aircraft do not teleport into the circuit, they must transit there from somewhere else. In good weather avoiding the turbines is no problem, if inconvenient. In poor weather the fact turbines are in the area will become a significant consideration and potential danger for the pilot.

4.1 Delaying or cancelling the flight may be the best option, but in the case of an emergency while airborne, the extra hazards may lead to an accident. If a pilot is caught in unexpected bad weather, is running out of daylight or fuel, and needs to land with some urgency, he may not have the option of going elsewhere or diverting around a turbine area, if he is aware they are there. In this case the turbines may become a fatal inconvenience.

4.2 As identified by the Applicant, easterly winds dominate this area. This easterly flow brings moisture from the coast, funnelling up the Hunter Valley and over the Great Dividing Range at this location. This lifting of moist air often creates a layer of stratus cloud that sits on the hills blanketing the valleys reducing visibility.

4.3 Aviation Projects and To70 have only considered the circuit area of the airfields, not flight outside of these areas. Unlike large aircraft flying under the Instrument Flight



Rules (IFR), which take off and climb immediately to high altitude well above turbines, light aircraft operating in accordance with Visual Flight Rules (VFR) may not. They are constrained by the prevailing weather and usually remain below cloud to remain visual with the ground and horizon.

4.4 The National Airports Safeguarding Framework (NASF) acknowledges that:

'Wind farms can be hazardous to aviation as they are tall structures with the potential to come into conflict with low flying aircraft. Temporary and permanent wind monitoring towers can be erected in anticipation of, or in association with, wind farms and can also be hazardous to aviation, particularly given their low visibility.'

4.5 And it further specifies that:

'25. Consultation with aviation stakeholders is strongly encouraged in the early stages of planning for wind turbine developments. This should include:

...f) consultation with local agricultural pilots and nearby unlicensed airstrip owners; and

..... However, wind farm operators should be conscious of their duty of care to communicate this risk to aviation operators in the vicinity of the wind farm. CASA will also raise awareness of this risk with representatives of aerial agriculture, sport aviation and general aviation '

4.6 In May 2022, CASA outline dangers to VFR aircraft where "*pilots are permitted to fly as low as 500ft AGL and may need to fly lower due to weather, emergency situations or aircraft performance issues...may impact VFR aircraft operating in the vicinity...*' They also "*recommends each strip operator be consulted with regard to potential impacts on these strips*" .

Civil Aviation Safety Authority

Air Navigation, Airspace and Aerodromes

File Ref: F18/2322-25
Your Ref:

25/05/2022

Natasha Homsey
Senioer Environmental Assessment Officer
Energy Assessments I Planning and Assessment
Department of Planning and Environment
Locked Bag 5022
Parramatta NSW 2124

Email: [redacted]

Dear Ms. Homsey,

VALLEY OF THE WINDS WIND FARM, SSD-10461

CASA has reviewed the Aviation Impact Assessment prepared by Aviation Projects for the proposed Valley of the Winds Wind Farm near Coolah, NSW.

The proposed wind farm will comprise approximately 148 wind turbines with a maximum tip height of approximately 250 m (853 ft) AGL. With regard to Visual Flight Rules (VFR) operations, pilots are permitted to fly as low as 500 ft AGL and may need to fly lower due to weather, emergency situations or aircraft performance issues. The turbines will reach to a height of 853 ft AGL, and therefore the turbine blades will infringe navigable airspace by 353 ft and may impact VFR aircraft operating in the vicinity of the proposed turbines.

CASA notes there are a number of small airstrips in close proximity to the proposed wind farm development. CASA recommends each strip operator be consulted with regard to potential impact on these strips.

Due to the height proposed AGL, CASA considers the proposed wind farm likely be a hazard to aviation safety and recommends that the wind farm is obstacle lit. While international standards and the NASF guideline recommend 2,000 candela lighting intensity, CASA would accept 200 candela lighting intensity based on trial installation at another site where 200 CD was found to be sufficient in areas with low backlighting.

To minimise lighting impact on local residents CASA would also recommend the installation of radar activated hazard lights or lighting activated by low visibility measuring equipment. If the lighting fails, it should fail in the 'on' condition until it can be rectified.

Regardless of CASA's advice, the Applicant has continued to ignore VFR flight operations (apart from landing/take off/circuits) in the area. The consultants, Aviation Projects and To70 have only considered the minimum, specifically turbine induced turbulence in the standard circuit area, and take off and landing paths in the immediate proximity of the airfields. To date the Applicant has made no attempt to consult with the operators of either Tongy or Turee airfields, making it almost three years since this was a recommended action by CASA. This should have been undertaken before the project was recommended for approval by DPHI.

4.7 Nowhere do the NASF limit consideration to only these areas, and in fact states *'wind farm operators should be conscious of their duty of care'*.

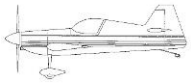
4.8 Nowhere in the NASF does it exclude consideration of normal light aircraft operations or small airfields from a valid risk assessment. Naturally the NASF is more specific regarding what needs to be done in proximity of large civil and military airfields, but this does not remove a requirement to safeguard all airfields and mitigate light aircraft risk as well.

4.9 It appeared the Applicant did not inform the IPC in their briefing of much detail on this topic, despite it being a contentious issue. The fact they did not know Turee airstrip was set up for firebombing, specifically shows a lack of diligence or care about our lengthy communications.

5.0 Turbine Turbulence. The standard is 16 rotor diameters downwind, however this is quite old data and was derived from much smaller turbines. We question the validity and request new data be acquired from actual large turbines, representative of the size being installed today.

5.1 Prof. Ivan Kennedy's IPC presentation stated that turbulence can persist much farther downstream than commonly accepted. Further, no mention is made of the wake interaction/wave superposition of multiple turbines, possibly creating increased turbulence in some locations.

Photo - Visible wake from turbines extending beyond 16 diameters:



5.2 If DPHI and wind proponents are serious about continuing to build wind projects, they should invest in independently verified wake turbulence and wake interaction studies of large turbines. This would aid in properly informing those affected and the mitigation required, rather than trying to minimise the issue and hope it goes away.

6.0 **I request** the Commission consider the above in relation to the aviation impact at Tongy and Turee airfields.

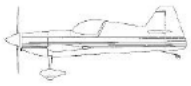
6.1 **I request**, at a minimum, the removal of the easternmost string of turbines in the Girragulang Cluster (GR2,GR3,GR4,GR5,GR6,GR7,GR8,GR9,GR10,GR11 and GR53). This would remove most of the concerns of the operators of Tongy and Turee airfields. It would greatly reduce the risk of turbulence and enable a higher degree of safe VFR operations within the general vicinity of the Tongy and Turee airfields. The same consideration should be given to the Mt Hope cluster and its impact on Coolah airfield.

6.2 **I also request** the Conditions of Consent B40 be amended as follows:
B40. Prior to commencement of constructions, an Aviation Management Plan must be developed by an appropriately qualified expert in aviation safety, addressing concerns of the operators of the Tongy Aerodrome and Turee Aerodrome. A draft of the Plan must be provided, prior to submitting to the Department for approval, to the operators of Tongy Aerodrome and Turee Aerodrome, for their oversight, as identified in the EIS.

7.0 Aerial Firefighting: Attachment B - *'Wind Turbines and Aerial Firefighting'* detail the aerial firefighting problems as provided previously to DPHI and apparently ignored.

7.1 I am not alone in being critical of placing many large turbines on hills with regards aviation safety. The Aerial Agriculture Association of Australia is never referenced in any proponent's document, despite the impact on their work and their expertise in low flying.

7.2 Many aerial ag operators also contract to the RFS for firebombing. One would think it would be a good idea to ask for their input, but the Applicant has not done so. 'Eagle Helicopters' a CWO REZ based aviation business that provides aerial firefighting services provided the following:



EAGLE HELICOPTERS PTY LTD

"Maroombah North"
2860 Euchareena Rd
Euchareena NSW 2866

Ph: 02 63641144
Fax: 02 63641155
Mobile: 0427 427 207
Email: eaglehel@bigpond.com
web:www.eaglehelicopters.com.au
ABN: *78 069 785 315*

11th April 2024

To whom it may concern.

I David Braid acting as Managing Director and Chief Pilot of Eagle Helicopters.

Issue this statement as a directive to all staff Aircrew that whilst participating in aerial firefighting activities do not at any time enter any wind farm whether turbines are static or rotating do not at any time enter the windfarm to conduct aerial fire fighting duties.

This directive is active forthwith of the publication of this Letter.

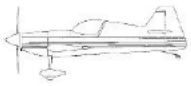
Justification of this Company directive

That in the event of a fire in the windfarm it is and would be deemed that at no time can or could we 100% guarantee the safe conduct of operations, that would allow operations to be conducted in a safe manner in regard to any incursion with blades towers whilst the effect of bush fire smoke creates a limited view of the working area.

[redacted]

David A. Braid
Managing Director

and 'Willams Agribusiness' provided this testimony to the IPC for a previous case in 2024:



From: [redacted]
Sent: Thursday, April 11, 2024 6:57 PM
To: 'submissions@ipcn.nsw.gov.au' <submissions@ipcn.nsw.gov.au>
Subject: Thunderbolt Wind Farm (SSD-10807896) Submission on Additional Material

My name is Rohan Williams, and I am a Fixed wing Aerial Firefighting pilot with experience gained fighting fires over 19 fire seasons flown in three states of Australia, three island provinces of Indonesia, as well as four states in the United States of America.

I write in response to the answers given to Mr Steven Barry's questions by Nicole Brewer, Director of Energy Assessments, of the New South Wales Department of Planning and Environment on 03/04/2024. My specific response is to Ms Brewer's response to Question 2 – Firefighting Operations. I would like to flag the specific dangers of aerial firefighting within and around wind farm developments which seem to have been broadly overlooked in Ms Brewer's response.

In her response, Ms Brewer sites the department's consultation with "various State agencies, including the NSW Rural Fire Service (RFS) during assessment and preparation of the recommended conditions of consent". There is no mention of consultation with industry representatives such as operators, their pilots, or their relevant peak body, the Aerial Application Association of Australia. It is such later consultation that would gain the most relevant response as it is those operators and their association that are trained, qualified, and experienced in the provision of professional aerial firefighting capabilities.

There are actually no personnel within the vast ranks of the New South Wales Rural Fire Service qualified to operate, or indeed fly, aerial firefighting sorties. All such sorties carried out on behalf of the New South Wales Rural Fire Service are outsourced to private business. That includes the operation and flight crew provision for aircraft owned by the RFS themselves. Ms Brewer's consultation therefore falls quite short of that leading to any meaningful response. The consultation is actually flawed by misdirection.

The mitigating actions raised by Ms Brewer's department under their requirement of a comprehensive Emergency Plan do not reflect the real dangers that wind turbines and their associated wind monitoring towers, plus the additional power transmission infrastructure, pose to aerial firefighting aircraft. No reference to issues resulting from the nature of significant, tall standing obstacles being obscured from immediate view by bushfire smoke are either raised or mitigated.

The first sentence of the Wind Farm Policy developed by the Australian Aerial Application Association, the national peak body representing fixed wing aerial firefighting conducted under Part 137 of the Australian Civil Aviation Safety Regulations, reads "Windfarms and their pre-construction wind monitoring towers are a direct threat to aviation safety and especially aerial application". This is a direct and heavily weighted statement.

The dangers of wind turbines and meteorological evaluation towers (MET towers) to low level aviation operation are significant. These dangers are also significantly amplified by the presence of bushfire smoke. The most significant danger is not that represented by the wind turbines themselves but, more so, of the MET towers. MET towers are deliberately designed to be of little visual significance. They usually stand at a height of that equivalent to the hub of their associated wind turbines within the wind farm. These structures are notoriously hard to see and represent a significant danger to low level aviation under clear visual conditions. They can be impossible to visually locate under just a thin vale of bushfire smoke.

However, the wind turbines themselves do still represent a significant threat to the safety of aerial firefighting aircraft of both the fixed and rotary wing varieties. The turbines in the proposed Thunderbolt Wind Farm are projected to be of 150 – 270 meters in height. The average application height of fixed wing air tankers operating under Part 137 of the Australian Civil Aviation Safety

Regulations is 80 – 100 feet (24 – 30 meters). That means that the aircraft must operate from a height well below that of both the wind turbines and their associated MET towers. Where bushfire smoke either partially or completely obscures the structures concerned, aerial firefighting crews, under best practice, and in the immediate interest of aircrew safety, must refuse to enter the area.

Aerial firefighting crews will do all that they can in order to suppress the progression of the fire and endeavour to keep the fire as cool as possible so that ground crews can access the fire flanks more safely in order to extinguish the flames. However, when the threat of hidden wind turbines and MET towers becomes an issue, the efficacy and efficiency of aerial firefighting aircraft may significantly diminish. The safety of the aircrews must be considered in preference to the consequences of the impacting fire, and compromises made in order to uphold it.

Outside of the wind farm development area itself is also the additional above ground power transmission infrastructure which transmits the generated power to the existing 330Kv transmission lines. That infrastructure itself represents an additional obstacle that also detracts from the safety of local aerial firefighting activities. Power lines represent the leading cause of low-level aviation safety incidents in Australia.

According to the Australasian Fire and Emergency Service Authorities Council Limited (AFAC) in their Wind Farms and Busfire Operations Guildline V3.0 (2018), "Turbine towers, meteorological monitoring towers and power transmission infrastructure pose risks for aerial firefighting operations. Meteorological monitoring towers and power transmission infrastructure are generally difficult for aerial personnel to see, if they are not marked appropriately. If wind turbines were not shut down, moving blades and wake turbulence would create significant hazards for low flying aircraft, thus the shutting down of wind turbines, in an emergency situation, is defined in wind farm emergency procedures. A wind farm facility's power lines may pose electrocution risks, that are exacerbated due to smoke during a bushfire".

This clearly facilitates a potential amplification factor for bushfire risk to properties within and surrounding wind farms. In turn, insurance premiums and other mitigation measures need to be bolstered in response creating another increase in cost to surrounding farmers and graziers, as well as a general amplification of bushfire risk to other land classifications.

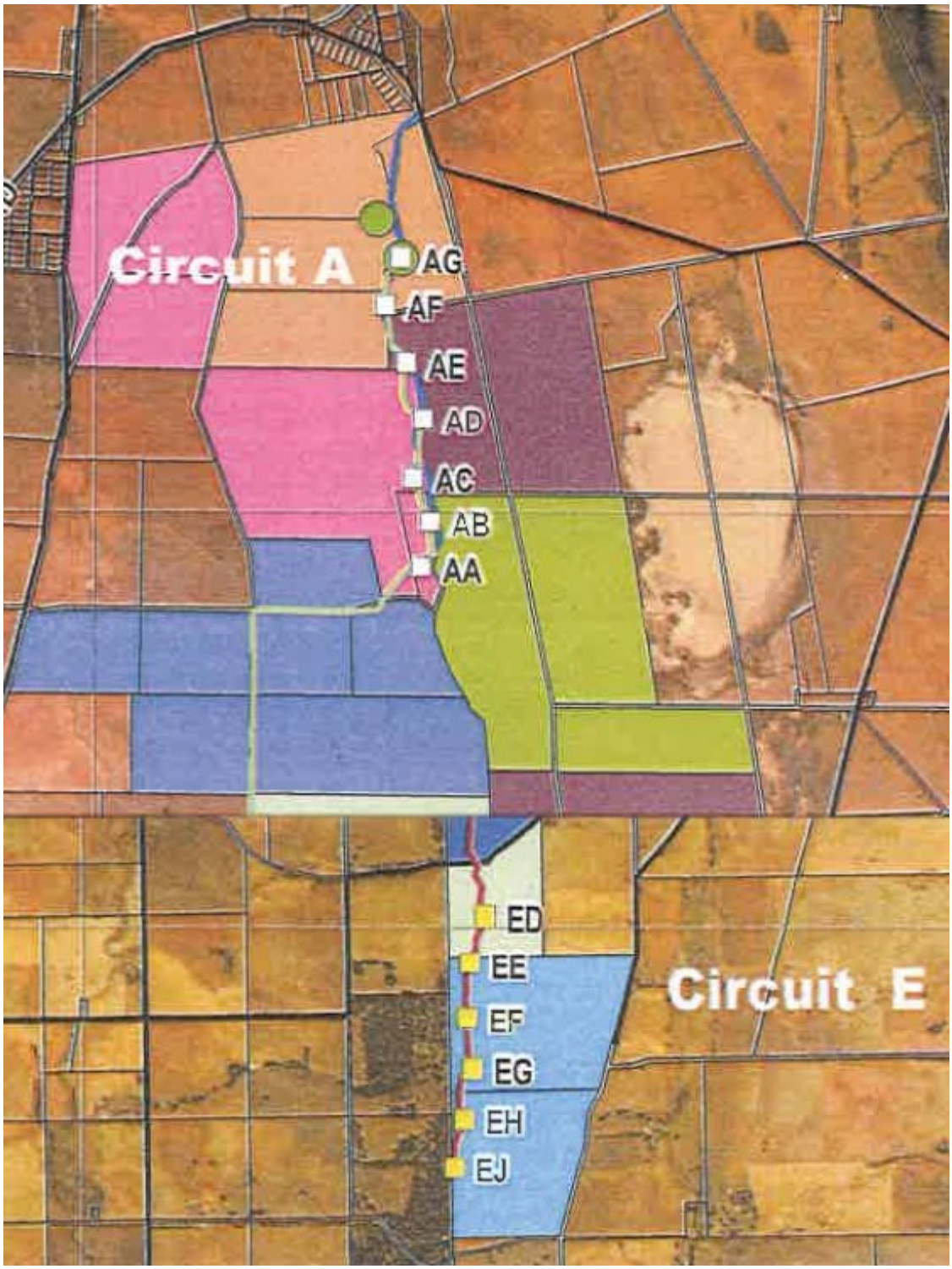
From my own extensive experience in flying aerial firefighting and aerial agricultural sorties into areas occupied by, and adjacent to, both wind and solar farm developments, I can make honest and very serious testament to the fact that wind farm developments pose a rather extraordinary risk to the safety and efficacy of aerial firefighting operations. I do not believe that this phenomenon has yet been sufficiently explored by the department in the consideration of this and other such developments.

Yours sincerely,

7.3 In contrast, the National Council for Fire and Emergency Services (AFAC) is referenced by the Applicant, which <u>does acknowledge turbines are a limitation to aerial firefighting</u>. But then goes on to refer to the Waterloo fire "study" and says *'if conditions are clear.....turbines are clearly visible to aircraft'*. Like Aviation Projects and To70, no consideration is made for poor weather and low visibility conditions, as occurs in a bushfire situation.

7.3.1 Note that the AFAC policy is based on a “study”. This is actually an article on the Clean Energy Council website https://cleanenergycouncil.org.au/news-resources/in-case-of-fire-a-real-life-experience-at-a-wind-farm-site and is clearly designated as “*This opinion piece was originally published by ecogeneration*”. Ecogeneration is a renewable industry online magazine and the article was penned by “staff writer”. Hardly a “study” on which to base a policy.

7.4 The 'Waterloo Layout'



And

'Waterloo View Along Ridge' photo showing the single line of wind turbines pertaining to the grass fire event. Note the Waterloo project's turbines are far smaller than the Applicant's (at less than half the height).

You can see the Waterloo layout is a single line of turbines on a single low ridge. This is vastly different to the terrain near Coolah and the random turbine layout of Valley of the Winds and the adjoining Liverpool Range wind projects. The Waterloo Fire was also a grass fire of 60ha, not a bushfire of thousands of hectares (the Sir Ivan Fire in 2017 burned 55,000 ha including ground for the proposed project). The aircraft employed in the Waterloo fire were small agricultural aircraft, not large water bombing aircraft.

7.5 Flight when affected by smoke, cloud, rain and turbulence near turbines is a flight hazard, as evidenced by the following two videos:
'Boeing 737 March 2024' https://youtu.be/FvPelvzPT9w and
'Cockpit View of Firebombing' https://youtu.be/I9atYDG1X1s

7.6 The first shows a Boeing 737 firebomber dropping from below 200ft and as you can see it is almost totally obscured by smoke for some of its run. The crew would not be able to do this if the smoke was hiding wind turbines or met masts from view, even partially.

7.7 The second video is an in-cockpit view of a Spanish firebomber and you can see the large control inputs required to manoeuvre a large heavy aircraft at low level in turbulence, as you would encounter around a fire.

7.8 A significant margin, whether lateral distance or altitude above, needs to be kept from turbines for large, ponderous aircraft. Stopping the turbines in the 'bunny ears' position, as mentioned by AFAC, is irrelevant with regard to large firebombers.

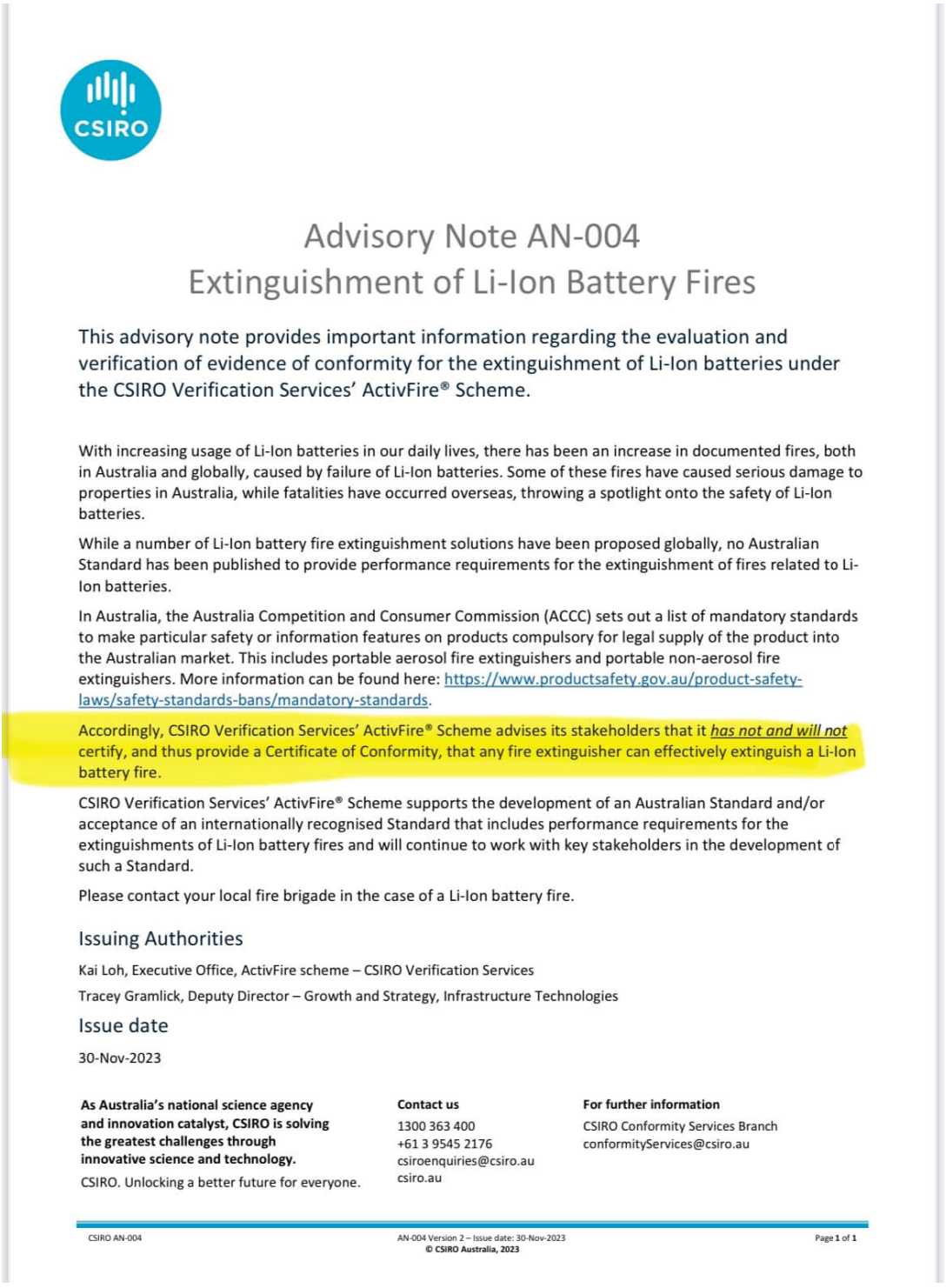
7.9 Dropping retardant from above the turbine height would be ineffective due to dispersion of the retardant by the time it hit the ground, even if it did land on the desired area.

8.0 Fire Ignition Hazards. The Warrumbungle and CWOREZ area is a fire prone region, and we are very sensitive to fire particularly after the 2017 Sir Ivan bushfire which burnt 55,000Ha. Adding 316 ignition sources/turbines in the vicinity of Coolah, and a thousand in the REZ, is inviting disaster.

8.1 It is unlikely adequate maintenance will be carried out over the full life of the turbines. Ownership changes, difficulty and expense of working at height, aging machinery and the overriding motive to make a profit will ensure skimping on maintenance. Mechanical failures and potential fires will become more prevalent.

8.2 See the slideshow accompanying my IPC address with pictures of turbine fires in Australia recently. As turbine numbers increase, these incidents will increase also.

8.3 In addition, the installation of large BESS in the project area adds another unmitigable fire hazard. It is incomprehensible to us the reckless carelessness with which these proposals are devised with no thought to the potential hazards, and who will have to deal with them. CSIRO Advisory Note AN-004, states that no fire extinguisher will extinguish a Lithium Iron battery fire:



Advisory Note AN-004
Extinguishment of Li-Ion Battery Fires

This advisory note provides important information regarding the evaluation and verification of evidence of conformity for the extinguishment of Li-Ion batteries under the CSIRO Verification Services' ActivFire® Scheme.

With increasing usage of Li-Ion batteries in our daily lives, there has been an increase in documented fires, both in Australia and globally, caused by failure of Li-Ion batteries. Some of these fires have caused serious damage to properties in Australia, while fatalities have occurred overseas, throwing a spotlight onto the safety of Li-Ion batteries.

While a number of Li-Ion battery fire extinguishment solutions have been proposed globally, no Australian Standard has been published to provide performance requirements for the extinguishment of fires related to Li-Ion batteries.

In Australia, the Australia Competition and Consumer Commission (ACCC) sets out a list of mandatory standards to make particular safety or information features on products compulsory for legal supply of the product into the Australian market. This includes portable aerosol fire extinguishers and portable non-aerosol fire extinguishers. More information can be found here: https://www.productsafety.gov.au/product-safety-laws/safety-standards-bans/mandatory-standards.

Accordingly, CSIRO Verification Services' ActivFire® Scheme advises its stakeholders that it *has not and will not* certify, and thus provide a Certificate of Conformity, that any fire extinguisher can effectively extinguish a Li-Ion battery fire.

CSIRO Verification Services' ActivFire® Scheme supports the development of an Australian Standard and/or acceptance of an internationally recognised Standard that includes performance requirements for the extinguishments of Li-Ion battery fires and will continue to work with key stakeholders in the development of such a Standard.

Please contact your local fire brigade in the case of a Li-Ion battery fire.

Issuing Authorities

Kai Loh, Executive Office, ActivFire scheme – CSIRO Verification Services

Tracey Gramlick, Deputy Director – Growth and Strategy, Infrastructure Technologies

Issue date

30-Nov-2023

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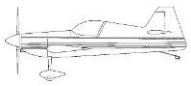
8.4 Lives will be endangered for an intermittent generation and backup system that is grossly technically deficient in its prime role.

8.5 RFS volunteers, people like me who oppose the project, will be compelled to go into the project area and fight the fire from the ground without air support.

8.6 Blade throw of up to a kilometre increases complexity of dealing with a turbine fire.



8.7 During fire season we keep RFS tankers and private fire fighting vehicles loaded at the ready, and the Applicant should be required to do the same. It is unfair to rely on local RFS volunteers and services, as these are minimal. Both Dunedoo and Coolah have no permanent Fire and Rescue personnel stationed there - the town brigades are also wholly manned by volunteers now, like the RFS.

9.0 **I request** that the Commission accedes that aerial firefighting will be impacted by these multiple tall structures, 250m tall, placed randomly on ridges in bushfire prone land.

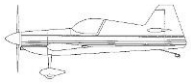
9.1 **I request on behalf of the community** the Commission seriously consider the safety of the community with two large wind projects, comprising 316 turbines, which will severely hinder aerial firefighting as evidenced above and therefore call the Commission to reject the project on the grounds of cumulative impact in a bush fire prone zone.

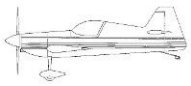
9.2 If approved, **the community requests** the Conditions of Consent C15(iv) be amended to INCLUDE the Fire Safety Study and Emergency Plan as a publicly available document. We the public, and RFS volunteers, should not have critical plans hidden from us.

9.3 **I request** that Condition B54 be amended to include two new conditions:
B54(i) (ix) Turbine operations to cease in high fire danger conditions.
B54(j) The Applicant maintain an equipped and trained fire crew in each project area (Mt. Hope, Leadville and Girragulang) during the fire season.

Yours sincerely
Grant Piper AASM, DFSM
B.E. (Aero), MRAeS

Appendix: Copies of two documents sent to the Department on these topics.





My response to the Applicant's update on Aviation Problems from February 2025:

Response to ACEN update on Aviation Problems

Valley of the Winds SSD-10461

25 February 2025

Dear Sir/Madam,

1. ACEN has again not addressed, by not acknowledging, many of the problems we have with their proposed wind harvesting facility. Not addressing all the serious safety problems does not mitigate risk, it is simply denial.
2. It appears like ACEN has a policy to ignore any risks that they cannot mitigate, and which might result in turbine reductions, or, we hope, cancellation of the whole project.
3. While we are all subject to financial pressures, and natural competitive behaviour 'to win, to get the job done', it is juvenile psychopathy to deny reality to such a degree, repeatedly.
4. Our property is on the Great Dividing Range at the very Western tip of the Hunter Valley. It is common with any onshore airstream, to get low stratus cloud covering the valley and sitting on the surrounding hills. Many times returning from a distant location the weather will be fine enroute with little cloud to the west, north and only broken to the south, but the valley will be 'socked in'. As my aircraft are not equipped for an instrument approach, and there are no instrument approaches to Coolah, Tongy or Turee airfields, the only option is to descend below cloud while outside o f the valley, and then maintain visual below cloud in sight of ground or water. Then depending on the cloud base, arrival can be made between the cloud and the hills, or if the cloud is too low for that, by entering the valley following the Mullaley Road if coming from the North, or the Golden Highway.if coming from the South or West.
5. The alternatves of landing at either Mudgee, Dubbo or Gunnedah may sound reasonable, but each is 1-2 hours drive away, which defeats the purpose of flying to save time. It is inconvenient for someone to come and collect you, and then a repeat trip is needed later to collect the aeroplane. There is no useful public transport or Uber out here.
6. I have much experience at low level due to my time as a Forward Air Controller in the RAAF and also being approved for aerobatics to ground level by CASA. Additionally I am intimately familiar with my local area and weather, and I consider these proposed turbines to be a significant hazard to aviation. Other pilots, either visiting the area or transiting through, who are not as familiar with the locale, would be in much greater danger.
7. Stating the turbines will be marked on a map and able to be visually avoided in VMC/fine weather, is of no help in conditons of poor weather and reduced visibility or light. The frequent case of marginal VMC and descent to low level due to stress of weather must be considered. Expecting me, and others, to simply avoid the area completely in this situation is a severe impost and inconvenience that should not be blithely imposed on us.
8. This area, the Talbragar and Croppy/Turee Valleys, are close to the direct track between Rylstone/Mudgee and Gunnedah. Many light aircraft traverse this area and fly up the valleys. Wake turbulence from the turbines may affect these aircraft flying at cruising speed through the valleys below turbine height. All flying, not only in the circuit areas of Tongy or Turee, must be considered.
9. Light aircraft also use the airfield, many friends have Piper Cub style aircraft and enjoy operating on the grass and the height variation of the runways. These aircraft have very low wing loadings and limited control authority making them more susceptible to turbulence and

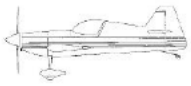
up or down draughts. Turbine wake poses a greater threat to them than high wing loading/higher performance types. See pic attached.

10. I practise low level aerobatics in the vicinity of Turee and Tongy airfields. I also coach others in low level aerobatics. As stated before, any unexpected turbulence at the wrong time could cause loss of control or momentary distraction, leading to an accident. Aircraft accidents are typically preceded by a series of events - the Reason 'Swiss-cheese' model. If any one event is prevented then the accident may not have occurred. Adding a known hazard event, such as turbine turbulence, increases the likelihood of an accident no matter how unlikely it may seem. Yes, I would take this into consideration and assess the wind direction and strength and make a decision on where to fly to minimise any negative effects. But, as stated in 8. above - this is a severe impost and inconvenience on my normal operations at my home airfield that I should not have to endure for the sake of a foreign-owned-profit-making company building a wind project that we don't need and that will not work very well (average capacity factor ~29%for all turbines in Australia).
11. I must also comment that I have done the least amount of flying over the last 2 years of my career, due to all spare time and effort being spent fighting the REZ and Net Zero nonsense.
12. No satisfactory response has been made regarding aerial firefighting by Large Air Tankers. The NSWRFS management is negligent in refusing to even consider the restriction 250m turbines will have on aircraft. RFS HQ abstaining from the debate puts volunteer firefighters and adjoining landowners, of which I am both, at greater risk. Attached is a document summarising the problems as I see them. Also attached are two written statements from aviation companies regarding their operations around turbines.
13. Further, below are two links to video of tankers in action that should clarify the problems to any layman with an open functioning mind, noexpert knowledge required to interpret.
14. video 1- https://youtu.be/FvPeIvzPT9w Boeing 737 tanker dropping on a fire March 2024 on neighbouring property. Video was filmedfro mour property - note terrain. Using the aircraft length it isestimated that they drop at lessthan 200ft (proposed turbines are ~820ft high).
15. video 2 - https://youtu.be/I9atYDG1X1s in-cockpit view of Spanish tanker. Note the high workload and large control inputs needed to manouvre the aircraft in turbulence. No tanker will be flying between turbines slalom-style to drop from below turbine height.
16. Please considerthe seriousness of what is being proposed here and the real effects on aviation and aerial firefighting, which can and will result in unnecessary loss of life.

Grant Piper AASM, DFSM

MRAeS

BE(Aero) UNSW 1986



My cumulative impact assessment from 2022:

Cumulative Impact Supplementary Aviation Submission

Coolah TILT and ACEN Wind Projects

SE - 49367755 re SSD 6696 - Mod1 and SE - 45120376 re SSD 10461

Grant Piper
[redacted]

28 November 2022

1.0 I am writing this Supplement in response to recent comments made by both TILT and ACEN project officials. These comments downplay the seriousness of the aviation risk, and specifically the limitations that will be imposed on aerial fire fighting. This Supplemental Submission is made to hopefully prevent misinformation being accepted as truth prior to the formal IPC assesment of both projects.

3.0 As explained in my prior Submissions, both the ACEN and TILT projects ignore the collision hazard very large turbines pose to light VFR (Visual Flight Rules) aircraft. Downwind turbulence is mentioned, but the turbulence severity left undefined. The encroachment on the circuit area of aerodromes is considered, but not the approach and departure of light aircraft in the vicintiy of turbines. The risk of collision particularly in poor weather and reduced visibility is a real risk that needs acknowledgement.

4.0 My prior submissions explained why aerial bushfire fighting will be severely constrained by limiting the freedom of operation of all aviation firebombing aircraft. It was heartening to read the lucid National Parks submission to the TILT Mod-1 project regarding this.

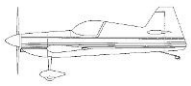
5.0 The project officials are aware of the negative impact on aerial firefighting, as it was a common theme in many opposing submissions to the projects. Now these officials are stating that Large Air Tankers can drop from above the turbine height of 250m.

7.0 At the recent TILT/ACEN/EnergyCo community consultation held in Coolah on 21 Sep 2022, Mr Jeremy Ellis of ACEN stated to me that Large Air Tankers can drop fire retardant from above 250m (825ft).

6.0 Then last week in discussions with a fellow concerned citizen, who had recent correspondence with Ms Martine Holberton of TILT I found he was advised similarly. Further, Ms Holberton ventured that Small Air Tankers could work amongst stopped turbines, as could helicopters.

7.0 It would be wise for DPE and the IPC to seek expert advice on this rather than accept TILT and ACEN assurances, and RFS silence. My observation of C130 Large Air Tanker operation during the 2017 Sir Ivan Fire indicates that they drop from well below 250m.

8.0 Of course aircraft may drop from above this height, however their accuracy and therefore effectiveness will be reduced. Also, with hilly terrain, gusts, turbulence and poor visibility, some buffer above 250m needs to be added for collision avoidance. I would estimate that at least 1000ft/300m would be used, so the drop accuracy is further diminished and the dispersion of



retardant from 1000ft drop height need to be considered.

9.0 Regarding the use of Small Air Tankers (aerial ag type aircraft like the AT802) - NO employer could expose their pilots to this level of workplace risk by advising them to fly amongst turbines, even when they are stopped. Helicopters may have more utility, but certainly the collision risk is increased significantly. Given the reduced visibility due to smoke, and gusty or turbulent conditions around large fires, this would be a very unsafe workplace.

10. Due to this inevitable reduction in aerial firefighting effectiveness, the risk to ground based fire fighters is increased. Ms Holberton also declares, and this is in common with the ACEN EIS statements, that access roads and cleared areas with the project site will aid ground firefighting by the RFS.

11. While being true they need to understand that the Rural Fire Service is comprised predominantly of local farmers and landholders - it is not some mythical force that appears from elsewhere. When a fire is within a turbine area, the landholder and neighbours would be the first on the scene to fight the fire. *Neighbouring non-host landholders would be compelled to fight a fire on turbine host land with reduced aerial support, and thus put in greater danger than otherwise.*

12. *This is not equitable and cannot be discounted as inconsequential or an acceptable risk. Particularly so if those non-host farmers opposed the projects and identified the potential problem years prior to construction.*

13. I do not know what mitigation strategies could rectify the situation. Dropping from a higher altitude is contrary to the objective of getting retardant on to the fire, as it must be effective or it is a waste of time and money, and puts people in greater danger than otherwise.

14. To conclude, with two large projects surrounding Coolah, on steep and difficult terrain, aerial assets are vital in fighting fires. Construction of these turbines will severely hamper firefighting and put more lives and property at risk.