

**A E R I A L A G R I C U L T U R A L
A S S O C I A T I O N O F A U S T R A L I A
L T D .**

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21 August 2009

The Director
General Purpose Standing Committee Number 5
Parliament House
Macquarie Street
Sydney NSW 2000

By email: gpscno5@parliament.nsw.gov.au

Dear Director

AAAA Submission to Inquiry into Rural Windfarms

The Aerial Agricultural Association of Australia (AAAA) represents Australia's aerial application industry, including crop protection spraying, fertilizer application and firebombing.

Aerial application is heavily regulated by the Civil Aviation Safety Authority and pilots and operators are licenced to at least Commercial Pilots Licence standard and undergo ongoing professional development conducted by CASA appointed examiners and AAAA.

AAAA works closely with CASA and industry members on safety promotion, training, regulatory development and identifying emerging threats to aviation safety and appropriate responses.

A key emerging threat to aviation safety both in Australia and overseas is developing windfarm infrastructure. In particular, wind monitoring towers are a critical threat to low level aviation safety.

Wind monitoring towers are very tall in relation to aerial application operations, are erected within very short timeframes, are extremely difficult for any pilot to identify from the aircraft and are often not notified to aviation users because of the lack of a Government-mandated notification system and the desire of the developers to keep their positions a secret because of commercial issues.

There are two quite distinct issues arising from windfarms that affect aerial application:

- safety of the aircraft and pilot and
- economic impact on aerial applicators.

Safety Impacts

AAAA view is that the case of *Sheather v Country Energy* (NSW Court of Appeals) clearly established that anyone with infrastructure posing a threat to aviation must consider the risks that infrastructure poses to aviation safety and respond appropriately through marking or other measures to safeguard aviation operations. This precedent is of critical relevance to windfarm developers although not apparently widely known to them.

There are also a range of activities currently underway that are important to the consideration of the impact of windfarms and potential directions for the future. These include:

- Commonwealth Aviation White Paper (Department of Infrastructure etc)
- Commonwealth Inquiry into Safeguards for Airports and the Communities Around Them (Department of Infrastructure etc)
- CASA consultancy on safety implications of tall structures not in the vicinity of airports
- Relatively recent review and release of Australian Standard AS3891 - Air Navigation - Cables and their supporting structures - Marking and safety requirements

AAAA has made submissions to each of these processes and has consistently raised the need for appropriate risk management of windfarms and wind monitoring towers in an aviation context.

For example, the AAAA submission to the Commonwealth Government's Aviation White paper included the following recommendation:

- Establish and fund a national database of powerlines, wind monitoring and power generation towers and other obstacles so as to address this significant threat to low-level aviation. Despite the best efforts of AAAA, such information is not made available from any power companies and most wind farm developers.

This proposal is expanded on in the attached recent submission to the Commonwealth Government Inquiry into Safeguards for Airports which is at **Attachment A**.

AAAA has done a lot of work to make it easier to mark guy wires and powerlines – including on wind monitoring towers – through amendment of the national standard on marking of wires so as to use a new marker developed by Country Energy (NSW) with the cooperation of AAAA.

There is now little practical reason why wind towers and especially wind monitoring towers should not to be clearly marked at least.

In addition, AAAA has attempted to provide relevant information to developers through the Wind Energy Association, but this process/advice is voluntary and consequently will not provide coverage of all developers.

AAAA also passes on information to members that has been provided to it by wind farm developers on the physical location of wind monitoring towers. However, only a few developers provide this information and again there is little doubt that many towers are going

up unmarked and unknown until hopefully spotted by pilots during pre-application inspections.

More comprehensive safeguards must include a mandatory national system of communication of the position of all wind monitoring towers and the inclusion of this on a national database accessible by low level pilots.

This is a very real issue for topdressing and firebombing operations - as wind monitoring increases, so does the threat to legal aviation activities.

Economic Impacts

Safety is not the only consideration that is imposing additional risk and consequences on the aerial application industry.

The placement of wind farms in areas of highly productive agricultural land is leading to reductions in treatment areas of aerial application companies with no compensation for this externalization of costs by wind farm developers.

For example, placement of a wind farm may affect flight lines and application height or even whether the application can be conducted at all - leading directly to either an increase in cost or a reduction in income - and sometimes both - for aerial application operators.

AAAA's submission to the Commonwealth Inquiry into Safeguards at Airports (**Attachment A**) makes a number of points regarding land planning issues that are equally relevant to the development of wind farms regardless of whether they are near airports or in agricultural land that may be treated by air.

In particular, AAAA is concerned that not enough consideration is being given through the State planning approval processes to the impacts of windfarms on productive agricultural land and the aerial application industry, remembering that it may not only be the land footprint where the windfarm is sited, but also land surrounding that for some kilometers where aircraft may have to maneuver to conduct aerial application.

At the very least, windfarm developers should be required to pay compensation to aerial applicators where it can be reasonable established that there will be an economic impact imposed on the aerial application company by the wind farm developer.

Further information

If you require any further information or would like AAAA to expand on or further explain any of the issues raised in this submission, please do not hesitate to contact the Association's CEO, Mr Phil Hurst on 02 6241 2100 or email: phil@aerialag.com.au. Similarly, if it would be of assistance, AAAA would be happy to appear at the public hearing on the 9th September.

Yours sincerely

Phil Hurst
CEO - AAAA

Attachment A - AAAA Submission to the Commonwealth Inquiry into Safeguards for airports and the communities around them.

10 July 2009

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AAAA Submission Safeguards for Airports and the communities around them

Introduction

The Australian community - the commonwealth in its broadest interpretation - has significant resources invested in airports and related infrastructure.

That investment is under increasing pressure due to poor planning at all Government levels.

In regional and remote areas, aviation provides a critical link to services that are only available in larger cities, including emergency, health, banking, business and government services.

In many communities that have excellent aviation infrastructure paid for by the taxpayer, potential for growth is being compromised by local government ownership that handicaps aviation uses of the local facility. In some cases, this is further compromised by development interests encouraging local government to shut down existing airports developed at a cost of millions of dollars so that the airport land can be sold for a significant profit for non-aviation uses.

By way of contrast, there are some local owners who see the potential benefits for their communities by implementing use-policies that support aviation. They present a marked difference between the potential and the broader reality of local airport ownership.

Some planning issues surrounding aviation operations, however, are not limited to the immediate surrounds of airports. Poorly planned urban encroachment into traditional and often highly productive agricultural land is setting many communities up for unnecessary conflict because of competing priorities. Nowhere is this more evident than in the attractiveness of hobby farm type developments to local governments with an eye on increased rate revenue.

As urban and small holding encroachment is encouraged at the peri-urban interface by local government planning, the aerial application industry is paying a heavy price in terms of lost business, increased complaints and spurious and vexatious accusations while legally performing their work.

In addition, an emerging threat to aviation safety is being allowed to develop without appropriate and prudent measures to ensure that one sector is not permitted to inflict a cost on another sector with appropriate compensation. Windfarms and their associated wind monitoring towers that always precede construction are an immediate threat to legal low-level aviation such aerial application. Windfarms have been identified in the US as contributing to a number of accidents and incidents.

It is only a matter of time in Australia, given the current lack of regulatory oversight, guidance or risk management by government, that a wind farm monitoring tower will cause an accident.

The remedy is already available to government through internet mapping of the positioning of wind monitoring towers. All that is missing is a clear commitment to address this obvious threat to aviation safety.

Key issues

AAAA has identified four key issues that the Commonwealth should address to safeguard not only airports, but the safer operation of aviation and particularly the aerial application sector:

1. need for coordinated planning around airports to:
 - a. protect aviation facilities from urban encroachment and noise complaints
 - b. protect existing airport infrastructure from Federal, State and local governments and developers pursuing large returns by closing down airports and selling the land for non-aviation purposes
2. need for broader improved and coordinated planning to protect agriculture and aerial application from urban encroachment and hobby farm developments at the peri-urban interface with significant impacts on traditionally productive agricultural land and uses.
3. need to protect low-level aviation companies and pilots from the safety and economic impacts of wind monitoring towers and windfarm development.
4. need to protect low-level aviation companies and pilots from the safety and economic impacts of powerlines

What is ‘aerial application’?

Aerial application includes the spraying of agricultural chemicals onto crops, forests, pasture and grazing land to protect against the impacts of insect pests, weeds, fungi and a range of other threats to land productivity.

Aerial application also covers the application of fertilisers - both liquid and granular - to crops, pastures and forestry, significantly lifting agricultural productivity. Aerial application also covers the sowing of seed for crops (such as rice and occasionally wheat) and the establishment of pasture.

Aerial application helps to improve and stabilise the environment through erosion control and reduces soil compaction and disease transfer due to flying over the crop rather than passing through it.

Aerial application also includes the use of aircraft (both fixed-wing and helicopters) in the fire-bombing of bushfires, the management of oil spills for environmental protection, and vertebrate pest management and noxious weed control in National Parks and elsewhere.

Aerial application is generally undertaken at heights of approximately three metres above the ground for spraying operations to approximately 30 metres above the ground for topdressing and similar operations. Ferrying of aircraft often occurs below 500 feet to provide safe separation from other aircraft.

Coordinated Planning Around Airports

Improved and better coordinated planning around airports can best be addressed by the Commonwealth reconsidering its role in mandating certain planning requirements and protections around all airports so as to make them more sustainable from land-use competition, noise and amenity perspectives.

At the very least, the Commonwealth should establish a mechanism for engaging airport owners and airport users in a discussion of how best to establish and importantly maintain suitable buffers around airports.

The Commonwealth should not underestimate the power of producing national guidelines for the protection of aviation assets. Local governments are often very reluctant to ignore Commonwealth guidelines and advice, especially if it is tied to funding grants.

It is critical in establishing such a process to give suitable weight to the airport users' issues and concerns rather than only engaging airport owners, many of whom have a clear drive to wring the maximum profit from their investment, often at the expense of the aviation industry and levels of activity.

In any aviation policy, care should be taken to ensure that any measures are aimed of fostering and promoting aviation activities, rather than curtailing them. It seems many airport owners to not share this objective, but are more interested in the real-estate value of the airport for development of non-aviation activities.

This is not just the case for major airports, but is equally true of many local airports that are owned by local governments who continually under-estimate the benefits to their communities from an airport and frequently only focus on short term gains through uncompromising charging regimes or the allure of development for non-aviation purposes.

The experience of aerial application operators is that as airports are privatised, fees increase and the incentive for operators to establish their own base also increases.

In the overall picture this is a ridiculous waste of resources, where operators are leaving excellent infrastructure previously paid for by the taxpayer to work off dirt/gravel strips and out of farmer's paddocks.

From a safety perspective this can only mean a reduction in safety margins where often wide bitumen strips with excellent run-off space etc are being vacated for strips with less safety margins.

A key issue for good government is to maintain access to airports for aviation activities, including aerial application.

Coordinated Planning to protect Agriculture and related aviation activities

Improving planning to ensure that Australia's capacity to produce significant wealth from agriculture would best be approached by a wider 'whole of government' review of planning systems and outcomes for agriculture, rather than attempting to conduct such an exercise with the limitations of a review of aviation activities.

The issues surrounding a 'right to farm' are complex. They are at the heart of many conflicts in local communities and directly affect the activities of aerial application and a range of other aviation activities.

Windfarms and wind monitoring towers

Windfarms and their pre-construction wind monitoring towers are a direct threat to aviation safety – and especially aerial application.

While AAAA has previously encouraged the Wind Energy Association to provide detailed information to their members about the needs of aerial application and the threat posed to low-level aircraft by monitoring towers and the windfarm itself, this appears to have had inconsistent effects. Examples of the information available on the Wind Energy Association website are at Attachment 2 and Attachment 3.

Some windfarm developers are contacting AAAA to advise of the erection of wind monitoring towers as advised by the Wind Energy Association (see Attachment 3 - 3.1.1.1 *Potential wind resource*), however, AAAA assumes that this is not all wind farm developers and not all wind monitoring towers.

AAAA passes on any information on the position of wind monitoring towers and completed masts to its members via email, however, this is on the basis of 'best endeavours' and may not cover all aerial applicators operating in the relevant area (see the conditions of provision of such information in the final paragraph of Attachment 1).

This is further complicated by Wind Energy Association advice to developers that they should also notify the RAAF Tall Structures Database regarding any towers over 20 metres in height. If wind farm developers are making information on wind monitoring towers available to the RAAF (see Attachment 3 - 3.2.1.4 *Other agencies - RAAF tall structures database*) then that information is not being passed on to other users of low level airspace and there is

no established mechanism to provide such information direct to AAAA for distribution to members.

CASA does not have a clear pathway for windfarm developers to ensure the risks their developments are posing are appropriately managed so as to protect legitimate activities of low-level aviation operators.

In particular, previous CASA efforts to address this issue by requiring marking and lighting of certain towers above a certain height and within a certain distance of an airport misses the main risk to aviation and this is the wind monitoring towers as they are frequently lower than the height trigger, but still a threat to legitimate low-level aviation.

Wind monitoring towers are erected within very short timeframes, are extremely difficult for any pilot to identify from the aircraft and are often not notified to aviation users because of the lack of a Government-mandated notification system and the desire of the developers to keep their positions a secret because of commercial issues.

AAAA has recently revised its advice to windfarm developers in light of misrepresentations of the AAAA position in a development application to government planning authorities. That advice to developers is at Attachment 1.

In addition, AAAA recommends that government provide better information to all windfarm developers on their responsibilities for aviation safety, including raising the requirements established under *Sheather v Country Energy* (NSW Court of Appeals) for owners of assets that pose a known threat to aviation activities to provide for suitable marking and other safety initiatives.

There are a range of initiatives that the Commonwealth and CASA should actively pursue in developing a more appropriate response to managing the aviation risks from wind farm developments:

1. CASA should develop regulations of wind farm developments and other tall structures for reporting and development approval purposes, placing a strong emphasis on protecting aviation safety.
2. CASA should set a much lower than previously used height trigger for notification to CASA of developments - down to 50 feet outside an agricultural area and even lower in an area of known aerial application activity.
3. CASA should work with Airservices Australia and any other relevant agencies to ensure that completed windfarms are included on suitable aviation mapping including WAC charts.
4. CASA should develop a national tall structures database that is accessible by all low-level aviation pilots and which captures all wind-monitoring towers as well as completed wind farms. The database should also capture other tall structures such as radio masts etc.
5. CASA should provide improved information to windfarm developers to ensure they are aware of their responsibilities.

Powerlines

Most agricultural land in Australia is criss-crossed with powerlines and aerial application companies and pilots put enormous effort into managing these hazards safely, generally using a risk identification, assessment and management process in line with Australian Standard AS4360.

The agricultural pilot curriculum mandated by CASA includes training for the safe management of powerlines and AAAA has been active in providing ongoing professional development for application pilots that includes a focus on planning, risk management and a knowledge of human factors relevant to managing powerlines in a low-level aviation environment.

AAAA runs a specific training course for aerial application pilots entitled '*Wire Risk Management*' to address these issues.

Every aerial application mission is planned to take account of the threat of powerlines and to manage them as safely as possible while still applying the essential chemicals to protect the crop.

In terms of due diligence, the aerial application industry is doing everything it can to reduce the risk of hitting powerlines.

This is in stark comparison to the very lax, on occasions hostile attitude of powerline companies to the threat their powerlines pose to aviation operations being conducted legally and under the regulation of CASA.

In some cases, it can be argued, the powerline companies' ongoing refusal to provide to aerial application companies the detailed mapping of the position of their network or to mark their wires to make them easier to see, is negligent.

Certainly, the courts (*Sheather v Country Energy*, NSW Court of Appeals) have found that powerline companies do owe a duty of care to all pilots and should mark their powerlines where they are an obvious threat to aviation safety.

AAAA has worked very successfully with one powerline company with coverage of most of NSW - Country Energy - on the development of a cheap and simple powerline marker that can help pilots keep visual contact with the position of powerlines in and around treatment areas. Unfortunately, these markers are not used in other States, although AAAA notes that Ergon Energy, with coverage of much of Queensland, has recently introduced the same markers and this may improve safety, although take-up rates are still very low.

AAAA's CEO acted as Chair of the Australian Standards Committee for the recent review of AS 3891 - Marking of Cables and their Supporting Structures. Unfortunately, due to the number of powerline operators represented on that committee, it was not possible to secure a significantly improved approach to the marking of powerlines, especially in relation to low level aviation and especially in terms of lowering any thresholds for the mandatory marking of powerlines, such as long spans across valleys etc that have previously caused fatalities. However, a useful risk management approach was included in the standard to encourage

landowners to consider the marking of wires in areas of known low level aviation activity. The key aim of the review was achieved however, and that was to permit the markers developed by Country Energy to be used legitimately under the Australian Standard which previously had no provision for them.

Agricultural areas and areas of probable bushfire activity would be two obvious places where powerline companies should be exercising their court-defined duty of care and marking powerlines so as to assist aerial agricultural and firebombing pilots manage another risk in an already hostile aviation environment.

Recommendations

AAAA recommends that:

1. The Commonwealth, in consultation with airport users and owners, establish a mechanism for mandating planning buffer zones around airports that would minimize incompatible uses being permitted near airports.
2. The Commonwealth establish a wide ranging inquiry into ‘right to farm’ issues that would provide a way forward on minimizing community conflict over land use at the peri-urban interface.
3. The Commonwealth mandate a wind farm development approval process that would minimise the risks to legitimate low-level aviation and which would feature:
 - a. a mandatory requirement for development approval and notification of any tall structure, including wind monitoring towers, not restricted to in the vicinity of an airport, but based on whether the proposal would pose a risk to aviation, including aerial application.
 - b. a national internet-based database and mapping system, accessible by pilots, that would accurately identify the position of all windfarm monitoring towers and wind farm turbine towers
4. The Commonwealth mandate a powerline safety program for all owners and operators of powerlines that would minimize the risks to legitimate low-level aviation and which would feature:
 - a. the mandatory marking of powerlines in areas of aerial application and firebombing activity
 - b. a national web-based database and mapping system, accessible by pilots, that would accurately identify the position of all powerlines and relevant infrastructure.

- c. the placement either underground, or aligned with paddock boundaries or road easements, of all new powerlines and powerlines being repaired in areas of aerial application and firebombing activity.

About AAAA ('four As')

The Aerial Agricultural Association of Australia (AAAA) is a not-for-profit company limited by guarantee that represents the aerial application industry in Australia. AAAA is in a unique position in that its members are both employers and employees.

Of the approximately 130 Air Operator Certificate holders (employers) involved in the sector on a full-time basis, AAAA has approximately 90 as members. However, those members represent over 90% of the work carried out in the industry.

In addition, AAAA has approximately 120 pilot members (employees) of the approximately 300 pilots active in the industry in non-drought years. As many of the 300 pilots are also business owners as well and are members of AAAA through the 90 AOC holders described above, AAAA has a very solid representation of the aerial application sector - both employers and employees.

The Aerial Agricultural Association of Australia (AAAA) was formed in July 1958 at a meeting jointly convened by the then Department of Civil Aviation and the Bureau of Agricultural Economics.

AAAA's mission is to promote a sustainable aerial agricultural industry based on the professionalism of operators, pilots and staff and the pursuit of industry best practice.

- Agricultural aviation directly employs approximately 2000 personnel comprising pilots, field staff, maintenance staff and administrators. A further 2000 people have part-time employment in the industry depending on seasons. The industry uses more than 300 specialist aircraft with supporting vehicles and equipment, together with established aircraft maintenance facilities throughout the country.
- The Association has its national office based in Canberra and is governed by a Board of Directors with representation from States and pilots. The Board is in regular consultation with the CEO and application operators and meets formally on a regular basis.
- The industry has progressed considerably in knowledge, skill and degree of professionalism since the late 1940's image of the 'crop duster', partly due to the role of AAAA in professional development and training and representing the interests of both pilots and operators.

Further information

If you require any further information or would like AAAA to expand on or further explain any of the issues raised in this submission, please do not hesitate to contact the Association's CEO, Mr Phil Hurst on 02 6241 2100 or email: phil@aerialag.com.au.

Yours sincerely



Phil Hurst
CEO - AAAA

Attachment 1 - AAAA Windfarm Advice to Developers

AAAA's formal policy position on all windfarm developments and wind monitoring towers is to automatically oppose such developments, unless the developer is able to clearly demonstrate they have:

1. consulted honestly and in detail with local aerial application operators
2. sought and received an independent expert opinion on the safety and economic impacts of the proposed development
3. clearly and fairly identified that there will be no short or long term impact on the aerial application industry from either safety or economic perspectives and
4. if there is an identified impact on local aerial application operators, provided a legally binding agreement for compensation over a fair period of years for loss of income to the aerial operators affected.

It is also AAAA policy not to provide specific comment on particular development proposals as the operational implications of each development will vary enormously depending on the site, the positioning of the turbines, orientation of affected paddocks relative to the turbines, the type of aerial application taking place, the aircraft used, the pilot's experience, the meteorological conditions, the site elevation, position of any airstrip relative to the turbines etc.

However, AAAA does not have the resources to undertake such on-site assessments, and that is why we advise wind farm developers to talk to the local aerial applicators who may be affected by the development, and to seek independent expert opinion from an ag qualified pilot with an understanding of risk assessment and potential impacts.

Other than that, AAAA also makes the following observations:

- positioning of wind farms may affect local aerial application operations, depending on the particular site. Impacts could vary from affecting flight lines to treatment height and accuracy, manouevring areas and possibly take-off and landing splays if an airfield is nearby (see for example, CASA CAAP 92-1 for agricultural airstrips – www.casa.gov.au – search for CAAP 92-1.)
- it may not be the land or farm that the wind farm is to be situated on that will be affected. Neighbouring farms, especially any with borders close to the windfarm site, would need to be liaised with closely to ensure there are no impacts.
- a key impact may not be the turbines themselves, but the positioning of any powerline that would lead from the windfarm substation back to the grid, or any other above ground powerline that would be put in to support the development. Again, consultation with local operators is the key, and if there are any concerns one alternative may be to mark any difficult to see sections of the wire with the new marking system developed by AAAA and Country Energy in NSW. AAAA has contacts for the relevant Manager in Country Energy.

Sensible solutions are those generally worked out locally, and as long as you are discussing these matters with any applicators or neighbouring farms that may be affected, AAAA can make no further suggestions.

I am sorry that I am not be able to be more definitive on your particular proposal but at this stage and pending advice from you on the above requirements, AAAA is opposed to the development.

On the related matter of aviation safety, AAAA tries to assist aviation safety by advising those of our members who use email and are on our email lists of the position of wind monitoring towers and also wind turbines when they are under construction and finally constructed, if advised by windfarm developers. Please feel free to provide these details (in lats and longs) so that AAAA can pass them on to those members. AAAA provides this facility on basis of it being information of a general nature only and the understanding that the information, for a range of reasons (including email failure, not all members being covered by email, or non-use by members, or operational shortcomings) will not provide any guarantees of aviation safety.

Yours sincerely

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CEO – AAAA

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Wear wool? Thank an ag pilot!

FACT: Aerial fertilising makes pastures more productive for sheep grazing

Attachment 2 -- WEA advice to Members - excerpts from APPENDIX 5 of the Wind Energy Association website - Best Practice Guidelines -
<http://www.auswind.org/bestpractice/>

As an adjunct to the above requirements, CASA has produced a Civil Aviation Advisory Publication (CAAP 89W-2, available from the CASA website) entitled "Reporting of Tall Structures" to inform those planning tall structures of the recommended notification process. This document defines tall structures as those within 30 km of a regulated airport and exceeding 30m in height, or 45 m in height elsewhere. However the RAAF Aeronautical Information Service (AIS), which is responsible for maintaining the database of such structures on behalf of CASA, have recommended notification of any planned structures as low as 20 meters in height. Once layout options have been narrowed down, Proponents will provide AIS with details and descriptions of any planned structures exceeding this lower limit.

In December 2003 CASA released for comment a proposed standard for the lighting and marking of wind farms and wind turbines in Australia. Following an extended period of discussion with the wind industry CASA are finalising the elements of what will become the standard for marking and lighting of wind farms and wind turbines in Australia. Details of the revised proposal can be seen in the Notice of Final Change – Amendment to Manual of Standards (MOS) Part 139-Aerodromes at http://rrp.casa.gov.au/download/04_nfc.asp. This document also provides a commentary on how the new standards are to be applied. The final draft standards themselves are provided in a draft Advisory Circular which can be seen at <http://casa.gov.au/avreg/aerodromes/draftac.htm>.

CASA states that "Advisory Circulars (AC) are intended to provide recommendations and guidance to illustrate a means but not necessarily the only means of complying with the Regulations, or to explain certain regulatory requirements by providing interpretative and explanatory material. Where an AC is referred to in a 'Note' below the regulation, the AC remains as guidance material. Advisory Circulars should always be read in conjunction with the referenced regulations"

A brief outline of the requirements of the AC are that:

11. CASA must be informed of any proposed wind turbine generator that will penetrate an Obstacle Limitation Surface (OLS) (see note below) to ensure it can be assessed for obstacle lighting requirements. CASA strongly discourages the construction of wind turbine generators in the vicinity of an aerodrome.
12. CASA must be informed of any proposed wind turbine generators that have a blade tip-height of 110 metres or greater, to ensure that it can be assessed for its risk to aviation safety and the need for obstacle lighting.
13. The obstacle lighting requirements, if wind turbine generators are assessed as hazardous to aviation are:
 - outside an OLS nacelle lighting only (no blade-tip-height lighting required and therefore no requirement for free-standing towers)

- inside an OLS a free standing light to the full height of the blade tip will be required
 - lighting is to be at intervals of a minimum 900 metres, and a distance that minimises the number of lighted wind turbine generators without diminishing appropriate aviation safety; with the topographically highest wind turbine generator to be included in the lighted turbines.
- Obstacle limitation surfaces are a complex of imaginary surfaces associated with an aerodrome. They vary depending on number and orientation of runways, and the instrument-approach type of the runway(s). Some surfaces can extend to 15 km from an aerodrome. Aerodrome operators can provide details for their particular aerodrome.

It is understood from CASA that where a wind turbine generator or wind farm is assessed as a risk to aviation, Proponents will be able to discuss and suggest lighting requirements with the CASA assessment officer.

Please note that at the time of writing the Advisory Circular on wind farm lighting has yet to be finalised by CASA. There remains some potential for further changes although any change is unlikely to be more rigorous.

Details provided in the following appendices were correct at the time of writing, however, there is potential for some elements to change. Proponents should confirm the current status of the items addressed in this appendix prior to commencing investigations or works.

Attachment 3 - WEA advice to Members - excerpts from Best Practice Guidelines of the Wind Energy Association website - - <http://www.auswind.org/bestpractice/>

3.1.1.1 Potential wind resource

There are a number of publicly available sources of information about the wind resource in Australia. These include wind studies carried out for state energy departments and agencies, the Bureau of Meteorology's (BoM) general publications and raw data, the internet, and various technical publications.

An estimate of the wind speed over the site can be obtained from databases and computer models, however sensitivity of energy yield (and hence commercial viability) to wind speed requires a more accurate determination by actual site measurements. This is usually achieved through the installation of a wind-monitoring tower.

The proponent should advise the responsible planning authority and the Agricultural Aviation Association of Australia of the intention to construct a monitoring tower. (Ed. - *AAAA bolding and paragraphing - appears as normal body text on website*)

In some states the installation of a wind-monitoring tower above a prescribed height will also require planning approval.

3.1.2.7 Aircraft safety

Proponents should assess potential for aircraft safety issues by noting the proximity of the site to any major airports, aerodromes or landing strips. Proponents should contact the Civil Aviation Safety Authority (CASA), Air Services Australia and the authorities responsible for the operation of such facilities in the vicinity of the proposed site. Advice should be sought on contacting agricultural aviators who may operate in the area.

In addition, proponents should obtain advice from landowners on any farming related uses of aircraft such as aerial spraying or mustering. In such cases, the district aerodrome supervisor should be contacted for advice on the potential impact of a wind energy development on these activities.

3.2.1.4 Other agencies

The Royal Australian Air Force (RAAF) maintains a database of tall structures for structures over 20 metres in height. Proponents should provide the Royal Australian Air Force Aeronautical Information Service with the timing, description and location details of any monitoring masts exceeding 20 metres.

Structures such as wind monitoring masts in the vicinity of an airfield or flight area may cause a safety hazard. It is recommended that the proponent contact the Civil Aviation Safety Authority (CASA) to maximise aircraft safety. Where structures exceed 110 metres above ground level, proponents are required to consult with CASA irrespective of location. The proponent should consult with CASA again once the wind farm design details are finalised.

Further discussion of CASA consulting requirements is provided in Appendix 5. Air Services Australia also undertake assessments, often following referral from

CASA, and require specific details from proponents to conduct those assessments. Proponents should contact Air Services Australia for further information www.airservicesaustralia.com.

Consultation should continue with the rural fire service, both regional and local, throughout the feasibility stage to work towards agreed fire response actions and keep the group informed of proposed locations for the wind development. Further discussion regarding consultation with the rural fire service is contained in Appendix 10.