

## APPENDIX 16

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Review of Aviation Operations from a Landing Area Located to the South East  
of the Boco Cluster of the Boco Rock Wind Farm

Argus Consulting Group

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*Submitted by*

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*Date 18.06.2009*



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## 1.1 Background

Argus Consulting Group has been asked to comment on the location of three 100 m towers for wind turbines located in the Boco Cluster of the Boco Rock Wind Farm within a kilometre of an aircraft landing area located on an adjacent property.

The aircraft landing area is orientated 015/195° magnetic. The area is approximately 500 m long. The closest tower is on a bearing of 337° magnetic approximately 750 m from the northern end of the landing area. The second closest tower is on a bearing 326° magnetic approximately 800 m from the northern end of the landing area. The third closest tower is on a bearing of 347° magnetic 1000 m from the northern end of the landing area. The third tower is the closest to the extended centreline of the landing area.

The particular landing area has been used for aircraft carrying out aerial application of superphosphate to the surrounding pastoral country. The use of the landing area is likely to be confined to a period of possibly 2 to 3 weeks annually by one aircraft. If that aircraft spread 100 tonnes of fertiliser, it is likely that there would be 90-100 takeoffs and landings annually. Using the size of aeroplane that could operate from this landing area, this represents approximately 10 hours of flying annually.

## 1.2 Risk to aviation

Any obstacle protruding above the terrain represents some risk to aviation. In this instance, obstacles up to 150 m high introduce an obstacle which cannot be flown over the top of my heavily laden aerial application aircraft taking off heading 015° magnetic and turning towards the towers. The highest climb gradient required to out climb the towers would be 20% which is beyond the performance capability of most aerial application aircraft in a fully laden state.

There is nothing preventing an aerial application aircraft from flying between the towers given that the closest pair is approximately 300 m apart. Given that aerial application aircraft routinely fly close (within 5 metres) to obstacles such as trees, powerlines, radio towers and any other obstacles found in a rural environment, it is reasonable to expect that a pilot would be able to safely manoeuvre around these obstacles.

In terms of an AS 4360 risk assessment, there has been one instance in the history of aerial application in Australia where an aerial application aircraft has collided with a radio tower over 250 feet high. This was in conditions of thick fog and the pilot in command was not complying the safety regulations pertaining to the operation at the time of the accident. The aircraft was severely damaged and the pilot suffered minor injuries. To bring this into language of the risk management, the exposure is small (1 event every 10-100 years) and the consequence is moderate.

Using the matrix at Appendix 1 in terms of probability and consequence and relating that to the table of consequence severity, a score of 5 is possible using the most pessimistic estimates. With this in mind, the construction of the towers would **not create an unacceptable** risk to aviation activities from the aircraft landing area in question.

## 1.3 Operations

The question whether the construction of three wind turbines as proposed prohibits the use of this landing area is very simple. None of the turbines in any way impinge on the extended centreline of the landing area. The fact that the smallest angle between the extended centreline and a line drawn from the northern end of the landing area to each of the turbines is 29° is conclusive evidence that construction of the wind turbines does not compromise the use of the landing area for aerial application operations. Using the more restrictive requirements for aircraft charter operations, if this landing area had the other requirements for charter, the obstacles would still not pose any restriction on operations. For these

operations, a clear area 900 m long and 30 metres wide from the centreline of the runway with a 5° splay on the outer limit commencing from northern end of the landing area would be required. The wind turbines do not fall in this area.

Aerial application around the wind turbines could be conducted safely, considering each of the turbines as an obstacle. Obstacles are routine in aerial application and pilots are trained to deal with them appropriately.

Aerial application of fertiliser to the non-associated landowners property would not be compromised. From the maps provided, there is evidence of ample room to manoeuvre an aircraft along the boundary of the property the purposes of aerial application without markedly changing the flight patterns to deal with the wind turbines.

#### **1.4 Firebombing operations**

Considering the location the elevation and the length of this landing area, it is unlikely that firebombing operations using the Air Tractor 802 or 602 would be conducted from the site. Given that there is a longer landing area that is significantly more accessible at a slightly lower elevation 8 km away, it would make sense to use an alternative landing area than the one located near the Boco Cluster.

In the unlikely event that the landing area close to Boco Cluster was used to firebombing, the aircraft operating would be restricted to reduced loads limited by the landing area length. This would give the aircraft significantly more manoeuvrability, once airborne and again the ability to manoeuvre around the wind turbines.

To summarise the issue of firebombing, it is unlikely that operations would be conducted from the Boco Cluster location and if they were, the aircraft would be very lightly loaded with high manoeuvrability.

#### **1.5 Summary**

In summary, in the opinion of Argus Consulting Group, the construction of the three wind turbines at the South Eastern end of the Boco Cluster in no way compromise the safety of using the landing area located near the Boco Cluster nor compromise the aerial application of fertiliser to the non-associated landowners property.

# Appendix 1

Probability		
	Description	Frequency examples
A	Happens often	More than 1 event per month
B	Could easily happen	More than 1 event per year
C	Could happen and has occurred here or elsewhere	1 event per 1 to 10 years
D	Hasn't happened yet but could	1 event per 10 to 100 years
E	Conceivable, but only in extreme circumstances	Less than 1 event per 100 years

Consequence		
	People	Environment
1	minor injury, medical treatment (no LTI)	Limited damage to minimal area of low significance
2	Reversible disability or impairment	Minor effects on biological or physical environment
3	Irreversible disability or impairment (<30%)	Moderate short term effects but not affecting eco-system
4	Single fatality and/or severe irreversible disability (>30%)	Serious medium term environmental effects
5	Multiple fatalities	Very serious long term environmental impairment of eco-system

		Consequence Severity				
	Probability Factor	Level 1	Level 2	Level 3	Level 4	Level 5
A	Happens often	11	16	20	23	25
B	Could easily happen	7	12	17	21	24
C	Could happen and has occurred here or elsewhere	4	8	13	18	22
D	Hasn't happened yet but could	2	5	9	14	19
E	Conceivable, but only in extreme circumstances	1	3	6	10	15

<b>TOLERABLE</b>	<b>ALARP</b>	<b>ALARP</b>	<b>INTOLERABLE</b>
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