SUPPLEMENTARY REPORT

CRYSTAL BROOK ENERGY PARK

AVIATION IMPACT STATEMENT

SOLAR GLARE REVIEW

QUALITATIVE RISK ASSESSMENT

AND

OBSTACLE LIGHTING REVIEW

This report must be read in conjunction with the Final Report dated 5 March 2018

CCP01

Report to:

NEOEN

21 May 2018



Chiron Aviation Consultants Essendon Vic 3040 Australia

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EXECUTIVE SUMMARY

Neoen Australia Pty Ltd have requested that Chiron Aviation Consultants provide an Aviation Impact Statement, Qualitative Risk Assessment, Obstacle Lighting Review and a Solar Glare Analysis for the Crystal Brook Energy Park near Port Pirie in South Australia. The Crystal Brook Energy Park has two components, a Wind Farm comprising 26 turbines with a tip height of 240m above ground level and a Solar Farm comprising up to 150Mw or 170ha of single axis tracking photovoltaic panels facing north and no more than 4m above ground level.

The Aviation Impact Statement concludes that the Crystal Brook Energy Park **will not impact** upon the following:

- The Obstacle Limitation Surface and Procedures for Air Navigation Services -Aircraft Operations surfaces published for any registered or certified aerodrome;
- Any air route Lowest Safe Altitudes;
- The operation of any Communication, Navigation Aids or Surveillance facilities;
- The landing or take-off phase of flight from any identified aerodromes due to glare or glint from the photovoltaic panels; and
- The normal flight of aircraft over the Solar Farm due to glare or glint from the photovoltaic panels.

The Airservices Australia assessment concurs with the above conclusions regarding the Crystal Brook Energy Park aviation impact.

The Department of Defence assessment finds that the Crystal Brook Energy Park will have no impact on Defence activities.

The Qualitative Risk Assessment finds that for the Crystal Brook Energy Park:

- By day the wind turbines are conspicuous by their size and colour;
- Night operations of aircraft do not occur below prescribed airspace. IFR aircraft are protected by the Instrument Approach Procedures;
- Where an approach to land is undertaken operating to VFR at Night, descent below the Lowest Safe Altitude does not occur until within 3nm of the airport and with it in sight; and
- Is assessed as a LOW risk to aviation and is therefore not a hazard to aircraft safety.



The Obstacle Lighting Review for the Crystal Brook Energy Park finds that in accordance with the NASF Guideline D risk assessment:

 Obstacle lighting is not required as the risk to aviation is LOW and no additional mitigating strategies are necessary.



1. INTRODUCTION

Neoen Australia Pty Ltd have requested that Chiron Aviation Consultants provide an Aviation Impact Statement, Qualitative Risk Assessment, Obstacle Lighting Review and a Solar Glare Analysis for the Crystal Brook Energy Park near Port Pirie in South Australia.

This is a Supplementary Report is to be read in conjunction with the report titled *Final Report Crystal Brook Energy Park Aviation Impact Assessment, Solar Glare Analysis, Qualitative Risk Assessment and Obstacle Lighting Review, dated 5 March 2018.* [Final Report]. As noted in sections 4.10, 4.11, 8.1.1 and 8.1.2 of the Final Report the assessments from Airservices Australia and the Department of Defence would be published in a supplementary report. This Supplementary Report conveys these assessments.

2. AIRSERVICES AUSTRALIA RESPONSE

Airservices Australia provided their response and assessment of the Aviation Impact Statement by e-mail dated 6 April 2018. See Appendix A. The Airservices assessment is detailed below.

All the published Instrument Approach Procedures for Port Pirie Airport are designed by Airservices Australia.

The Airservices Australia response concurs with the findings of the Aviation Impact Statement in Part 4 of the Chiron Aviation Consultants report.

2.1 Airspace Procedures

With respect to procedures designed by Airservices in accordance with ICAO PANS-OPS and Document 9905, at a maximum height of 532m (1746ft) AHD the wind farm will not affect any sector or circling altitude, nor ay instrument approach or departure procedure at Port Pirie Airport.

Note that procedures not designed by Airservices at Port Pirie Airport were not considered in this assessment.

2.2 Communications/Navigation/Surveillance (CNS) Facilities

This wind farm to a maximum height of 532m (1746ft) AHD will not adversely impact the performance of Precision/Non-Precision Nav Aids, HF/VHF Comms, A-SMGCS, Radar, PRM, ADS-B, WAM or Satellite/Links.



3. DEPARTMENT OF DEFENCE RESPONSE

The Department of Defence have advised by letter that *Defence has no objections to the wind turbine layout and increased height*. This letter is dated 15 May 2018 [their reference ID-EP-DLP&R-OUT/2018/AF33334448]. Also attached is an earlier letter dated 30 June 2017 [their reference ID-EP-DLP&R/OUT/2017/AF29643463] referring to turbines with a lower tip height. See Appendix B.

The Department of Defence refer to various items as outlined below, associated with tall structures. All these items are dealt with in the Final Report.

3.1 Reporting Tall Structures

Tall structures are required to be reported to Airservices Australia in accordance with AC139-08 v2.0 *Reporting of tall structures and hazardous plume sources* dated March 2018. This is referred to in section 7.3 of the Final Report.

3.2 Wavelength of LED Aviation Obstruction Lighting

If LED aviation obstruction lighting is used then the light emitted should be within the range of wavelengths 655 to 930 nanometres to ensure compatibility with night vision devices used by military and civilian pilots. Aviation obstacle lighting is not required.

3.3 Marking of Meteorological Monitoring Masts

Recommendation that the top one third of met masts be painted in alternating contrasting bands of colour. This is referred to in section 7.1 of the Final Report.

3.4 National Airports Safeguarding Framework - Guideline D

The recommendations of the National Airports Safeguarding Framework (NASF) Guideline D are covered in sections 5.15 and 6.1.3 of the Final Report. Aviation obstacle lighting is not required.

4. CONCLUSION

Airservices Australia concur with the findings of the Aviation Impact Statement that the Crystal Brook Energy Park will have no impact on any Communications, Navigation or Surveillance (CNS) facilities used for civil aviation.

The Department of Defence has no objection to the Crystal Brook Energy Park with a maximum turbine height of 240m above ground level.



APPENDIX A

Airservices Australia Response To Aviation Impact Statement



lan Jennings		
From:	Airport Developments <airport.developments@airservicesaustralia.com></airport.developments@airservicesaustralia.com>	
Sent:	Friday, 6 April 2018 13:08	
To:	'lan Jennings'	
Cc:	airspace.protection@casa.gov.au	
Subject:	AIRSERVICES RESPONSE: SA-WF-018 - Wind Farm, Crystal Brook Energy Park ISEC=UNCLASSIFIED]	

Hi lan,

I refer to your request for an Airservices assessment of the wind farm development for Crystal Brook Energy Park.

Airspace Procedures

With respect to procedures designed by Airservices in accordance with ICAO PANS-OPS and Document 9905, at a maximum height of 532m (1746ft) AHD the wind farm will not affect any sector or circling altitude, nor any instrument approach or departure procedure at Port Pirie Airport.

Note that procedures not designed by Airservices at Port Pirie Airport were not considered in this assessment

Communications/Navigation/Surveillance (CNS) Facilities

This wind farm to a maximum height of 532m (1746ft) AHD will not adversely impact the performance of Precision/Non-Precision Nav Aids, HF/VHF Comms, A-SMGCS, Radar, PRM, ADS-B, WAM or Satellite/Links.

Kind regards,

William Zhao

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APPENDIX B

Department of Defence Response To Aviation Impact Statement





Australian Government

Department of Defence Estate and Infrastructure Group Sonya Dare Director Land Planning and Regulation Estate Planning Branch Brindabella Business Park (BP26-1-A053) PO Box 7925 Department of Defence CANBERRA BC ACT 2610 E: (02) 6266 8191 E: sonya.dare@defence.gov.au

ID-EP-DLP&R-OUT/2018/AF33334448

Mr Ian Jennings Chiron Aviation Consultants 27 Hilda Street ESSENDON VIC 3040

Dear Mr Jennings

RE: Crystal Brook Energy Park, SA - Aviation Impact Statement

Thank you for referring the above Aviation Impact Statement (AIS) to the Department of Defence (Defence) for comment. I understand that the AIS has been prepared to consider the impacts on aviation safety arising from the Crystal Brook Energy Park and Wind Farm which was initially assessed by Defence for turbines with a 220m tip height. The proposed AIS includes amendments to increase the turbine tip heights from 220m to 240m Above Ground Level (AGL).

Defence has assessed the proposed amendment for an increase in tip height. The previous advice provided by Defence for an earlier version of the proposed energy park / wind farm dated 30 June 2017 remains current. A copy of this submission is attached.

I note, that the National Airports Safeguarding Framework Guideline D - Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms)/Wind Monitoring Towers recommends that where a wind turbine 150 metres or taller in height is proposed away from aerodromes, the proponent should conduct an aeronautical risk assessment. It also recommends that the risk assessment be submitted to the Civil Aviation Safety Authority (CASA) to determine whether the proposal is a hazard to aircraft safety and requires approved lighting or marking. Defence supports this requirement and believes that in this instance, it would be prudent for the risk assessment of this proposal to be sent to CASA for consideration.

If CASA determines that LED obstruction lighting is to be provided, it should be compatible with persons using night vision devices and that the frequency range of the LED light emitted should be within the range of wavelengths 655 to 930 nanometers.

Defence notes that the National Airports Safeguarding Framework Guideline D – Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms)/Wind Monitoring Towers - Paragraph 39 recommends that any meteorological towers used in connection with a wind farm should be appropriately marked. The guidelines indicate that the top 1/3 of wind



monitoring towers should be painted in alternating contrasting bands of colour in accordance with the Manual of Standards for Part 139 of the Civil Aviation Safety Regulations 1998.

Defence has no objections to the wind turbine layout and increased height subject to the project complying with the above conditions and those previously identified in earlier correspondence.

Should you wish to discuss the content of this advice further, my point of contact is Mr Tim Hogan at <u>DSRGIDEP.ExecutiveSupport@defence.gov.au</u> or by telephone on (02) 6266 8193.

Yours sincerely

Sonya Dare Director Land Planning and Regulation Estate Planning Branch

15 May 2018





Australian Government

Department of Defence Estate and Infrastructure Group David Harrison A/Director Land Planning and Regulation Estate Planning Branch Brindabella Business Park (BP26-1-A053) PO Box 7925 Department of Defence CANBERRA BC ACT 2610 ©: (02) 6266 8291 E: (02) 6266 8291

ID-EP-DLP&R/OUT/2017/AF29643463

Ms Clara Wilson Project Manager – Australia Neoen Australia Level 6, 16 Marcus Clarke Street CANBERRA ACT 2601

Dear Ms Wilson

RE: CRYSTAL BROOK ENERGY PARK - CRYSTAL BROOK, SOUTH AUSTRALIA

Thank you for your correspondence of 26 May 2017 referring the abovementioned proposal for an energy park, including solar and wind farms and storage, to the Department of Defence (Defence) for comment. The use proposes wind turbines with a height up to 220 metres above ground level (AGL). Defence has reviewed the proposal for any possible impact on the safety of flying operations and would like to provide the following comments.

At a height of up to 220 metres AGL the turbines will protrude into navigable airspace. Defence notes that the National Airports Safeguarding Framework Guideline D: 'Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms) / Wind Monitoring Towers' recommends that where a wind turbine of 150 metres or taller in height is proposed away from aerodromes, the proponent should conduct an aeronautical risk assessment. It also recommends that the risk assessment be submitted to the Civil Aviation Safety Authority (CASA) to determine whether the proposal is a hazard to aircraft safety and requires lighting or marking. Defence supports this requirement and believes that in this instance, it would be prudent for the risk assessment of this proposal to be sent to CASA for consideration.

If CASA determines that lighting is required, and LED obstacle lighting is proposed, it should be compatible with persons using night vision devices and that the frequency range of the LED light emitted should be within the range of wavelengths 665 to 930 nanometers. This will ensure the turbines are visible to aircrew using night vision devices.

There is an ongoing need to obtain and maintain accurate information about tall structures so that this information can be marked on aeronautical charts. Marking tall structures on aeronautical charts assists pilot navigation and enhances flight safety. Air Services Australia (ASA) is responsible for recording the location and height of tall structures. The information is held in a central database managed by ASA and relates to the erection, extension or dismantling of tall structures the top of which is above:

a. 30 metres AGL, that are within 30 kilometres of an aerodrome, and

b. 45 metres AGL elsewhere.



The proposed wind turbines meet the requirements for reporting of tall structures. Defence therefore requests that the applicant provide ASA "as constructed" details. The details can be emailed to ASA at the following email address: vod@airservicesaustralia.com.

Should you wish to discuss the content of this advice further, my point of contact is Mrs Rebecca Soric at DSRGIDEP.ExecutiveSupport@defence.gov.au or by telephone on (02) 6266 8186.

Yours sincerely

- V

David Harrison A/Director Land Planning and Regulation Estate Planning Branch

30 June 2017