

Sherpa Ref: 21687-LET-002-REV0

23 January 2025

Attention: David Richards

EMM Consulting Pty Ltd
Level 3, 175 Scott Street, Newcastle
NSW 2300

Subject: Technical Memo (Hazards and Risks) - Dinawan Wind Amendment

Dear David,

To provide *Hazards and Risks* input for the Dinawan Wind Farm Amendment Report, Sherpa Consulting Pty Ltd (Sherpa) has prepared a technical memo outlining the implications of the proposed reduction of the project's development footprint to accommodate 200 Wind Turbine Generators (WTGs). Specifically, Sherpa reviewed the implications to the blade throw risk associated with the amended project layout and determine if there would be any changes to the completed Blade Throw Risk Assessment findings.

Please find enclosed the technical memo. The technical memo forms an addendum to the project's Blade Throw Risk Assessment (Report No: 21687-RP-002-Rev1, May 2024).

Regards,



Ossy Alim
Principal Risk & Safety Engineer
Sherpa Consulting Pty Ltd

Technical Memo (Hazards and Risks) – Dinawan Wind Farm Amendment

1 CONTEXT

1.1 Background and requirement for review

Spark Renewables Pty Ltd (Spark Renewables) proposes to develop the Dinawan Wind Farm (the project). An Environmental Impact Statement (EIS) was prepared to support the Development Application (SSD-50725708), Ref [1]. A Blade Throw Risk Assessment (2024) was prepared by Sherpa Consulting Pty Ltd (Sherpa), Ref [2], for input to the EIS. The EIS was submitted to the NSW Department of Planning, Housing and Infrastructure (DPHI) in June 2024. As a result of further detailed design work, Spark Renewables is now seeking an amendment to reflect the following changes:

1. A reduction in the development footprint to accommodate 200 Wind Turbine Generators (WTGs). This reflects refinements in the number of WTGs - as follows:

	Previously considered*	Now refined to
Eastern area	117 WTGs	84 WTGs
Western area	150 WTGs	116 WTGs
Note: * Represents the maximum number in each area, the total number of WTGs for the project was not to exceed 200 WTGs.		

2. A change to the location of some WTGs, on-site substations and transmission infrastructure.

EMM Consulting Pty Ltd (EMM) is preparing an Amendment Report to reflect the proposed changes to the project. EMM has requested Sherpa to review the blade throw risks associated with the amended project layout to provide *Hazards and Risks* input to support the Amendment Report.

This technical memorandum (memo) forms an addendum to the project's Blade Throw Risk Assessment, Ref [2].

1.2 Blade throw risk assessment findings

The 2024 Blade Throw Risk Assessment, Ref [2], assessed blade throw risks to residences (associated and non-associated) and Battery Energy Storage System (BESS) facilities. As a BESS facility is not proposed for the project, blade throw risks to BESS facilities on nearest known SSDs from the project were assessed. The risks were assessed against the NSW Hazardous Industry Planning Advisory Paper (HIPAP) No. 4 *Risk Criteria for Land Use Safety Planning*, Ref [3]. The findings were as follows:

- Distances from WTG to Location Specific Individual Risk (LSIR) of 1×10^{-5} and 1×10^{-6} per year are approximately 100 m and 750 m, respectively.
- For impact to residences, the HIPAP No. 4 risk criterion for residential land use (1×10^{-6} per year) was used for assessment. As the nearest residence is located approximately 1,176 m (R042; associated) from its nearest WTG (T105_E), the risk criterion for residential land use is met.
- For impact to BESS facilities on nearest SSDs, the HIPAP No. 4 risk criterion for accident propagation (50×10^{-6}) per year was used for assessment. As the nearest

BESS is located at least 1,600 m from the nearest WTG (T_001E), the risk criterion for accident propagation is met.

1.3 Proposed amendment

The proposed amendment relevant for this is the revised number and location of the WTGs. In addition to the WTGs that were removed as part of the layout refinements, the location of some WTGs has changed.

There are no changes proposed for the following:

- Dangerous Goods stored or used on site (i.e. no update required for the *Resilience and Hazards SEPP* preliminary risk screening).
- WTG dimensions and maximum operating speed (i.e. the existing blade throw consequence analysis remain applicable).

1.4 Approach

The following activities were completed to determine whether the proposed amendments changed the Blade Throw Risk Assessment findings:

- Review changes to the WTG locations resulting from the layout refinement.
- Confirm that the separation distances between the WTGs and nearest receptors (residences and BESS facilities) remain similar if not greater for the amended layout.

The review assumed that there are no new receptors (i.e. residences and BESS facilities).

2 BLADE THROW RISK REVIEW

2.1 Changes to WTGs resulting from the layout refinement

Sherpa reviewed the amended WTG layouts for both the eastern area, Ref [4], and western area, Ref [5]. The review findings are summarised in Table 1.

Table 1: Changes to WTGs

Area	2024 layout	Amended layout		
	No of WTGs considered	No of WTGs removed	No of WTGs remaining	No of WTGs repositioned
Eastern	117	33	84	46
Western	150	34	116	1

2.2 Separation distances between WTGs and nearest receptors

For the amended WTG layout, Sherpa reviewed the separation distances between the WTGs and nearest receptors (i.e. residences and BESS facilities).

A comparison of the separation distances to residences within 2.5 km of a WTG for the existing and amended WTG layout is shown in Table 2. The review found that for the amended project layout:

- There are 5 residences within 2.5 km of a WTG (i.e. one less compared to the existing layout).
- The shortest separation distances between WTGs and residences remain similar if not greater.

Table 2: Separation distances between WTGs and residences

Project layout	ID	Type	Nearest WTG ^(a)	Distance to closest WTG (m)
2024	R042	Associated	T105_E	1,176
	R156	Associated	T113_E	1,177
	R084	Associated	T154_W	1,675
	R093	Associated	T154_W	1,771
	R019	Non-associated	T122_E	2,041
	R143	Non-associated	T39_E	2,494
Amended	R156	Associated	T113_E	1,155
	R042	Associated	T113_E	1,167
	R019	Non-associated	T117_E	2,057
	R093	Associated	T145_W	2,189
	R084	Associated	T152_W	2,264
Note: (a) E and W denote turbines within the Eastern and Western areas.				

A comparison of the separation distances to BESS facilities and the nearest WTG for the existing and amended WTG layout is shown in Table 3. The review found that for the amended project layout:

- There is a greater separation between the Yanco Delta Wind Farm BESS and the closest WTG.
- The separation between the Dinawan Solar Farm BESS and the closest WTG is reduced but remain greater than 3 km.

Table 3: Separation distances between BESS facilities and nearest WTG

Project layout	BESS facilities	Nearest WTG ^(a)	Distance to closest WTG (m)
2024	Yanco Delta Wind Farm	T001_E	1,600 ^(b)
	Dinawan Solar Farm	T107_E	3,282 ^(c)
Amended	Yanco Delta Wind Farm	T003_E	2,525 ^(b)
	Dinawan Solar Farm	T119_E	3,052 ^(c)
Note: a) E denotes turbines within the Eastern area. b) Estimated from the Yanco Delta Wind Farm DPHI Assessment Report (Site layout figure). c) Estimated from the spatial data pack provided by EMM.			

2.3 Conclusion

As the separation distances between WTGs and nearest receptors remain similar if not greater, it is concluded that the blade throw risks to the residences and BESS facilities are similar if not lower.

The conclusions of the 2024 blade throw risk assessment do not change and there is no requirement to update the assessment.

2.4 References

- [1] EMM Consulting Pty Ltd, "Environmental Impact Statement - Dinawan Wind Farm," E220305 RP#5 V3, June 2024.
- [2] Sherpa Consulting Pty Ltd, "Hazards and Risk Assessment - SEPP Risk Screening and Blade Throw," 21687-RP-002-Rev1, May 2024.
- [3] NSW Department of Planning, "Hazardous Industry Planning Advisory Paper No. 4 - Risk Criteria for Land Use Safety Planning," 2011.
- [4] EMM Consulting Pty Ltd, "Dinawan Wind Farm, Amended WTG Layout - Eastern Area, WTG_DINW_V172-7_2_v016E," 2024.
- [5] EMM Consulting Pty Ltd, "Dinawan Wind Farm, Amended WTG Layout - Western Area, WTG_DINW_V172-7_2_v015W," 2024.