Terang BESS

Post-Construction Noise Assessment

S8026C12

November 2026

sonus.

Sonus Pty Ltd
17 Ruthven Ave
Adelaide SA 5000
Phone: +61 (8) 8231 2100
Email: info@sonus.com.au
www.sonus.com.au

Document Title	: Terang BESS Post-Construction Noise Assessment
Document Reference	: S8026C12
Date	: November 2026
Author	: Tim Aplin, MAAS
Reviewer	: Chris Turnbull, MAAS

© Sonus Pty Ltd. All rights reserved.

This report may not be reproduced other than in its entirety. The report is for the sole use of the client for the particular circumstances described in the report. Sonus accepts no responsibility to any other party who may rely upon or use this report without prior written consent.

1 INTRODUCTION

The Terang BESS (the **Facility**) is a 100 MW / 200 MWh battery energy storage system (**BESS**), located at 70 Littles Lane, Terang (the **Subject Site**). Provisions for a BESS on the Subject Site were approved in an *Incorporated Document*, dated February 2021, subject to a number of conditions.

Condition 14 of the *Incorporated Document* requires a Post-Construction Acoustic Assessment Report to be prepared within one month of the commencement of the use of the Facility. The full condition is repeated below:

> *14. Within 1 month of the commencement of the use, a Post-Construction Acoustic Assessment Report must be prepared by a suitably qualified acoustic engineer and must be submitted to the Minister for Planning and Corangamite Shire Council, demonstrating compliance with the NIRV Standard at all times. The Acoustic Report must be made available to the public. The report must assess the compliance of the use with the NIRV Standard and, where necessary, make recommendations to limit the noise impacts in accordance with the NIRV Standard. If recommendations to limit the noise impacts are made, they must be implemented to the satisfaction of the Minister for Planning and Corangamite Shire Council.*

The NIRV Standard referenced in the *Incorporated Document* is the Environment Protection Authority's (**EPA**) *Noise from Industry in Regional Victoria* standard (as documented in EPA publication 1411). It is noted that the NIRV Standard has since been superseded by the EPA Publication *1826.5 Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues* (the **Noise Protocol**).

Sonus has been engaged by Canadian Solar to conduct a post-construction noise assessment (the **Assessment**) in accordance with Condition 14 of the *Incorporated Document*.

An initial period of monitoring was conducted at two locations, the associated landowner's residence and Residence 8. The associated landowner's residence is located close to the BESS facility and is shielded by a seven metre tall noise wall on the boundary of the BESS facility. However, observations made on site and the data obtained from the initial logging period indicated that the barrier was not performing in accordance with the manufacturer's specification.

Repairs to the noise wall were completed on 17 September, at which point the 30-day monitoring period for the assessment of compliance re-commenced. The results of the noise logging campaign are detailed in this report.

2 CRITERIA

Applicable noise limits for the assessment of noise from the Facility were provided in the earlier post-construction noise assessment. They are reiterated below for clarity. The receiver locations are shown in Table 1.

Table 1: Assessment periods and criteria.

Assessment Period	Day of Week	Applicable Times	Noise Criteria at Sensitive Receivers [dB(A)]	
			1, 2, 3, 4, 5, 6	7, 8, 9, Landowner
Day	Monday – Saturday	7am – 6pm	49	48
Evening	Monday – Saturday	6pm – 10pm	48	45
	Sunday and public holidays	7am – 10pm		
Night	Monday - Sunday	10pm – 7am	47	44



Terang BESS

Proposed Monitoring Locations

Figure 1

Project Number: S8026

Legend

- Site Area (Terang BESS)
- Terang Terminal Station
- Dalvui BESS
- Residences
- Monitoing Locations

sonus.

0 100 200 300 m

3 ASSESSMENT

A noise logger was placed at a location on the associated landholder's property. The coordinates of the noise logger installation location are shown in Table 2.

Table 2: Noise monitoring location.

Location	Coordinates WGS 84 / UTM zone 54S	
	Easting	Northing
Landowner	669157	5766771

The noise measurements were performed using a Rion Class 1 sound level meter last calibrated by a NATA certified laboratory within the last two years. The sound level meter was calibrated in the field using a handheld sound level calibrator (last calibrated by a NATA certified laboratory within the last year), before placement and during intermediate data collections. No significant drift has been observed in any instance. The measurements were taken using the 'fast' time weighting and the 'A' frequency weighting.

Meteorological data for the assessment was obtained from the nearest Bureau of Meteorology (**BOM**) station, located at the Mortlake Racecourse, approximately 23 km from the Facility. Wind data from the BOM is provided at 10m above ground level, which has been used for the assessment. Operational data for the Facility, provided by Canadian Solar, was correlated against wind speed and direction to determine periods when downwind conditions occurred during operation of the Facility.

The measured noise levels have been adjusted for tonality where necessary, in accordance with the requirements of the Noise Protocol, resulting in an Effective Noise Level (**ENL**) for each period.

Clause 77 of the Noise Protocol requires the ENL to be determined from the arithmetic average of three measurements taken on different days within a 30-day monitoring period. Therefore, three measurements are required for each of the day, evening, and night periods. Clause 78 requires these measurements represent the worst-case scenario of noise exposure when considering operational and atmospheric conditions. The three worst-case periods have been determined by considering the following factors:

- The capacity at which the facility is operating
- The fan speeds of the units
- The atmospheric conditions, including ambient temperature, relative humidity, pressure, wind speed, wind direction, and cloud cover
- The time of day

4 RESULTS

4.1 Day

Measurement Time	Wind Speed [m/s]	Wind Direction	Average Operation [kW]	Measured Noise Level [dB(A)]	Tonality Penalty [dB(A)]	Effective Noise Level [dB(A)]
21/9 7:00am	3.6	SSW	75181	43	5	48
28/9 5:30pm	2.5	ESE	85522	42	5	47
14/10 2:30pm	3.1	SSE	-100000	47	2	49

In accordance with the requirements of Clause 77 of the Noise Protocol, the arithmetic average for the three ENLs determined for the period has been calculated and results in a noise level of 48 dB(A), which achieves the daytime criterion of 48 dB(A).

4.2 Evening

Measurement Time	Wind Speed [m/s]	Wind Direction	Average Operation [kW]	Measured Noise Level [dB(A)]	Tonality Penalty [dB(A)]	Effective Noise Level [dB(A)]
21/9 7:30pm	3.1	SSW	77708	39	5	44
28/9 6:30pm	3.6	E	72965	40	5	45
14/10 7:00pm	3.6	SE	91395	35	2	37

In accordance with the requirements of Clause 77 of the Noise Protocol, the arithmetic average for the three ENLs determined for the period has been calculated and results in a noise level of 42 dB(A), which achieves the evening criterion of 45 dB(A).

4.3 Night

Measurement Time	Wind Speed [m/s]	Wind Direction	Average Operation [kW]	Measured Noise Level [dB(A)]	Tonality Penalty [dB(A)]	Effective Noise Level [dB(A)]
21/9 5:00am	3.6	WSW	54670	38	5	43
30/9 10:30pm	1.1	WSW	30045	35	5	40
3/10 11:00pm	1.1	WSW	92248	36	5	41

In accordance with the requirements of Clause 77 of the Noise Protocol, the arithmetic average for the three ENLs determined for the period has been calculated and results in a noise level of 41 dB(A), which a achieves the night criterion of 44 dB(A).

4.4 Discussion

The measured noise levels at the associated landowner's residence complied with the day, evening, and night time periods of the Noise Protocol.

5 CONCLUSION

Sonus has been engaged by Canadian Solar to perform a post-construction noise assessment for the Terang BESS to satisfy Condition 14 of the *Incorporated Document*.

The assessment has been conducted in accordance with the requirements of EPA Publication *1826.5 Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues* (the **Noise Protocol**).

An initial period of monitoring was conducted at two locations, the associated landowner's residence and Residence 8. The monitoring at location 8 is indicative of other non-associated receivers and demonstrated compliance with Condition 14 of the Incorporated Document. At the associated landowner's residence, un underperforming noise barrier resulted in the noise criteria being exceeded.

Following repair of the noise barrier, the noise monitoring at the Associated Landowner's residence has been repeated. The second period of noise monitoring demonstrated that the noise from the BESS complied with the noise requirements of the Incorporated Document at the associated landowner's residence.

Terang BESS

Post Construction Noise Assessment

S8026C8

September 2026

sonus.

Sonus Pty Ltd
17 Ruthven Ave
Adelaide SA 5000
Phone: +61 (8) 8231 2100
Email: info@sonus.com.au
www.sonus.com.au

Document Title	: Terang BESS Post Construction Noise Assessment
Document Reference	: S8026C8
Date	: September 2026
Author	: Tim Aplin, MAAS
Reviewer	: Chris Turnbull, MAAS

© Sonus Pty Ltd. All rights reserved.

This report may not be reproduced other than in its entirety. The report is for the sole use of the client for the particular circumstances described in the report. Sonus accepts no responsibility to any other party who may rely upon or use this report without prior written consent.

1 INTRODUCTION

The Terang BESS (the **Facility**) is a 100 MW / 200 MWh battery energy storage system (**BESS**), located at 70 Littles Lane, Terang (the **Subject Site**). Provisions for a BESS on the Subject Site were incorporated into the *Corangamite Planning Scheme* in an *Incorporated Document*, dated February 2021, subject to a number of conditions.

Condition 14 of the *Incorporated Document* requires a Post-Construction Acoustic Assessment Report to be prepared within one month of the commencement of the use of the Facility. The full condition is repeated below:

> *14. Within 1 month of the commencement of the use, a Post-Construction Acoustic Assessment Report must be prepared by a suitably qualified acoustic engineer and must be submitted to the Minister for Planning and Corangamite Shire Council, demonstrating compliance with the NIRV Standard at all times. The Acoustic Report must be made available to the public. The report must assess the compliance of the use with the NIRV Standard and, where necessary, make recommendations to limit the noise impacts in accordance with the NIRV Standard. If recommendations to limit the noise impacts are made, they must be implemented to the satisfaction of the Minister for Planning and Corangamite Shire Council.*

The NIRV Standard referenced in the *Incorporated Document* is the Environment Protection Authority's (**EPA**) *Noise from Industry in Regional Victoria* standard (as documented in EPA publication 1411). It is noted that the NIRV Standard has since been superseded by the EPA Publication *1826.5 Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues* (the **Noise Protocol**).

Sonus has been engaged by Canadian Solar to conduct a post-construction noise assessment (the **Assessment**) in accordance with Condition 14 of the *Incorporated Document*.

2 CRITERIA

Noise limits for the Facility have previously been determined in accordance with the Noise Protocol and were summarised in the pre-construction environmental noise assessment (Sonus report "Terang BESS, Environmental Noise Assessment" with reference "S8026C3", dated July 2024). The applicable noise limits have been reproduced in Table 1. The receiver locations can be seen in Figure 1. It is noted that the limits shown in Table 1, which have been determined in accordance with the Noise Protocol, are the same as those that would have applied in accordance with the NIRV Standard.

Table 1: Assessment periods and criteria.

Assessment Period	Day of Week	Applicable Times	Noise Criteria at Sensitive Receivers [dB(A)]	
			1, 2, 3, 4, 5, 6	7, 8, 9, Landowner
Day	Monday – Saturday	7am – 6pm	49	48
Evening	Monday – Saturday	6pm – 10pm	48	45
	Sunday and public holidays	7am – 10pm		
Night	Monday - Sunday	10pm – 7am	47	44



Terang BESS

Proposed Monitoring Locations

Figure 1

Project Number: S8026

Legend

- Site Area (Terang BESS)
- Terang Terminal Station
- Dalvui BESS
- Residences
- Monitoing Locations

sonus.

0 100 200 300 m

3 ASSESSMENT

In order to perform the assessment, unattended noise monitoring was conducted at a non-associated residence, an intermediate location close to the BESS and at a residence of a landowner associated with the project. Residence 8 was selected as the non-associated receiver as it is located away from extraneous noise sources, such as Princes Highway, the Terang Terminal Station, and the future Dalvui BESS. In addition, a noise monitor was installed at an intermediate location between Residence 8 and the Facility to aid in isolating noise from the Facility. Despite being associated with the project, the landowner monitoring location was selected as it has the highest predicted noise level from the operation of the Facility.

The noise monitoring locations are shown in Figure 1, with the coordinates provided in Table 2.

Table 2: Noise monitoring locations.

Location	Coordinates WGS 84 / UTM zone 54S	
	Easting	Northing
Residence 8	669705	5766982
Intermediate	669308	5766815
Landowner	669157	5766771

The noise measurements were performed using Rion Class 1 sound level meters last calibrated by a NATA certified laboratory within the last two years. All sound level meters were calibrated in the field using a handheld sound level calibrator last calibrated by a NATA certified laboratory within the last year, before placement and during intermediate data collections. No significant drift has been observed in any instance. The measurements were taken using the 'fast' time weighting and the 'A' frequency weighting.

Meteorological data for the assessment was obtained from the nearest Bureau of Meteorology (**BOM**) station, located at the Mortlake Racecourse, approximately 23 km from the Facility. Wind data from the BOM is provided at 10m above ground level, which has been used for the assessment.

Operational data for the Facility, provided by the client, was correlated against wind speed and direction to determined periods when each location was downwind during operation of the Facility.

The measured noise levels have been adjusted for tonality where necessary, in accordance with the requirements of the Noise Protocol, resulting in an Effective Noise Level (**ENL**) for each period.

Clause 77 of the Noise Protocol requires the ENL to be determined from the arithmetic average of three measurements taken on different days within a 30-day monitoring period. Therefore, three measurements are required for each of the day, evening, and night periods. Clause 78 requires these measurements represent the worst-case scenario of noise exposure when considering operational and atmospheric conditions. The three worst-case periods have been determined by considering the following factors:

- The capacity at which the facility is operating.
- The fan speeds the various units are operating at.
- The atmospheric conditions, including ambient temperature, relative humidity, pressure, wind speed, wind direction, and cloud cover.
- The time of day.

4 RESULTS – NON-ASSOCIATED RESIDENCES

The measurement periods used for the assessment, as required by Clause 78 of the Noise Protocol, are provided in the following tables. For the "average operation" shown in the tables, a negative value indicates the BESS was charging from the grid for the period, while a positive value indicates the BESS was discharging to the grid.

The measurement and analysis period is from Friday 21 August 2026 to Monday 14 September 2026.

4.1 Residence 8

4.1.1 Day

Measurement Time	Wind Speed [m/s]	Wind Direction	Average Operation [kW]	Measured Noise Level [dB(A)]	Tonality Penalty [dB(A)]	Effective Noise Level [dB(A)]
21/8 5:30pm	3.1	WNW	80052	44	-	44
10/9 2:30pm	3.6	SW	-97711	46	-	46
14/9 8:00am	3.1	WNW	86401	47	-	47

In accordance with the requirements of Clause 77 of the Noise Protocol, the arithmetic average for the three ENLs determined for the period has been calculated and results in a noise level of 46 dB(A), which achieves the daytime criterion of 48 dB(A).

4.1.2 Evening

Measurement Time	Wind Speed [m/s]	Wind Direction	Average Operation [kW]	Measured Noise Level [dB(A)]	Tonality Penalty [dB(A)]	Effective Noise Level [dB(A)]
22/8 9:00pm	0.6	WSW	68483	41	-	41
6/9 9:30am	3.6	W	-52744	43	2	45
6/9 8:00pm	0.6	SW	77314	42	-	42

In accordance with the requirements of Clause 77 of the Noise Protocol, the arithmetic average for the three ENLs determined for the period has been calculated and results in a noise level of 43 dB(A), which achieves the evening criterion of 45 dB(A).

4.1.3 Night

Measurement Time	Wind Speed [m/s]	Wind Direction	Average Operation [kW]	Measured Noise Level [dB(A)]	Tonality Penalty [dB(A)]	Effective Noise Level [dB(A)]
22/8 10:00pm	1.1	WSW	71214	37	-	37
23/8 12:00am	1.7	WSW	57704	34	-	34
7/9 3:30am	2.5	W	-38365	39	-	39

In accordance with the requirements of Clause 77 of the Noise Protocol, the arithmetic average for the three ENLs determined for the period has been calculated and results in a noise level of 37 dB(A), which a achieves the night criterion of 44 dB(A).

4.1.4 Discussion

The measured noise levels at Residence 8 complied with the day, evening and night time noise limits of the Noise Protocol.

However, for each of the monitoring periods, the measured noise levels at Residence 8 included extraneous noise (i.e. the measured noise levels included noise from the BESS as well as other noise sources). Therefore, the measured noise levels are greater than the predicted noise levels at this location (day time predicted noise level was 37 dB(A) and evening and night time predicted noise level was 34 dB(A)). As such, further analysis has been undertaken at the intermediate measurement location in order to better understand the noise levels from the Facility and compare with the predicted noise levels.

4.2 Intermediate

For the purpose of the additional analysis at the intermediate location, the same periods as selected for the day, evening and night analysis at Residence 8 have been used. The predictive noise model used for the environmental noise assessment was updated to include the intermediate receiver location in order to compare the measured and predicted noise levels.

4.2.1 Day

Measurement Time	Wind Speed [m/s]	Wind Direction	Average Operation [kW]	Measured Noise Level [dB(A)]	Predicted Noise Level [dB(A)]
21/8 5:30pm	3.1	WNW	80052	43	49
10/9 2:30pm	3.6	SW	-97711	49	
14/9 8:00am	3.1	WNW	86401	43	

In all instances, the measured noise level at the intermediate monitoring location is lower than or equal to the predicted noise level for the day time operation.

4.2.2 Evening

Measurement Time	Wind Speed [m/s]	Wind Direction	Average Operation [kW]	Measured Noise Level [dB(A)]	Predicted Noise Level [dB(A)]
22/8 9:00pm	0.6	WSW	68483	41	45
6/9 9:30am	3.6	W	-52744	41	
6/9 8:00pm	0.6	SW	77314	41	

In all instances, the measured noise level at the intermediate monitoring location is lower than the predicted noise level for the evening operation.

4.2.3 Night

Measurement Time	Wind Speed [m/s]	Wind Direction	Average Operation [kW]	Measured Noise Level [dB(A)]	Predicted Noise Level [dB(A)]
22/8 10:00pm	1.1	WSW	71214	39	45
23/8 12:00am	1.7	WSW	57704	37	
7/9 3:30am	2.5	W	-38365	37	

In all instances, the measured noise level at the intermediate monitoring location is lower than the predicted noise level for the night time operation.

4.2.4 Discussion

The measured noise levels at the intermediate location during the day, evening and night time were all lower than the predicted noise levels at this location. The evening and night periods, where there is less extraneous noise showed that the predicted noise levels were 4-8 dB(A) higher than the measured noise levels, which indicate that the noise model is conservative.

Therefore, as the noise model is conservative, and the measured noise levels at Residence 8 met the criteria, which were derived in accordance with the Noise Protocol, it can be determined that compliance at all non-associated residences has been achieved.

5 RESULTS – LANDOWNER

In addition to the assessment conducted for non-associated residences, an assessment has also been made of the noise at the residence of the landowner associated with the project. This residence is located close to the BESS facility and is protected by a 7m high noise barrier on the boundary of the BESS facility.

A noise logger was placed at the residence and noise levels have been measured over a 30 day period. However, observations on site have indicated that the noise barrier is not performing in accordance with the manufacturer's specification, including gaps in the barrier. Actions are currently underway to improve the performance of the barrier to the specified levels.

With the poor barrier performance, the noise measured during BESS operation is up to 49 dB(A), with a high frequency tone observed. This would result in an EFL of up to 54 dB(A). This level exceeds the criteria of the Noise Protocol for this residence of 48 dB(A) during the day, 45 dB(A) during the evening and 44 dB(A) at night.

Once the barrier performance has been corrected, the noise measurements will be repeated to determine compliance with the Noise Protocol criteria.

6 CONCLUSION

Sonus has been engaged by Canadian Solar to perform a post-construction noise assessment for the Terang BESS to satisfy Condition 14 of the *Incorporated Document*.

The assessment has been conducted in accordance with the requirements of EPA Publication *1826.5 Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues* (the **Noise Protocol**). The assessment involved noise monitoring close to the BESS at an intermediate location as well as at a non-associated residence. The measured noise levels demonstrated compliance with the criteria of the Noise Protocol at the non-associated residence and noise levels lower than predicted at the intermediate location. Based on the measured levels and the noise predictions conducted prior to operation, the noise from the BESS achieves the Noise Protocol at all non-associated residences.

In addition, the noise from the BESS has been measured at the residence of the landowner involved in the project. At this location, the noise barrier is not achieving the acoustic performance specified and the noise exceeds the criteria of the Noise Protocol. The performance of the noise barrier is currently being corrected and the noise measurements will be repeated, once this is complete.