Preliminary Air Quality Assessment

Proposed Molong BESS:
1 Deight Street & 19 Back Saleyards Road, Molong NSW 2866

FOR: StorEnergy 3 Pty Limited

SLR PROJECT No: 620.041615.00023 Revision: 1.1

28 August 2025

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1.1	28 August 2025	M Skoroszewski	D Echeverri	K Lawrence
1.0	6 August 2025	M Skoroszewski	D Echeverri	K Lawrence

Basis of Report

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Acronyms and Abbreviations

Term	Meaning
Approved Methods	Approved Methods for the Modelling and Assessment of Air Pollutants in NSW
AQ	air Quality
AQMS	air quality monitoring station
BESS	Battery Energy Storage System
BESS Footprint	Footprint of BESS and ancillary infrastructure on 1 Deight Street (Lot 99 DP1020247)
DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
EES	Environment, Energy and Science
EIS	Environmental Impact Statement
EPA	Environment Protection Authority (NSW)
IAQM	Institute of Air Quality Management
km	kilometre
kV	kilovolt
MJ/m^2	megajoules per square meter
MW	megawatt
MWh	megawatt-hours
PM_{10}	Particulate matter < 10 µg/m³
$PM_{2.5}$	Particulate matter < 2.5 µg/m³
POEO Act	Protection of the Environment Operations Act 1997
Project Lots	Combined Lots - 1 Deight Street (Lot 99 DP1020247), 19 Back Saleyards Road (Lot 1 DP542283) and the road reserve
SLR	SLR Consulting Australia
Stor	StorEnergy 3 Pty Ltd
the Regulation	POEO (Clean Air) Regulation 2022
Lot 1	Transgrid Molong Substation Site), 19 Back Saleyards Road (Lot 1 DP542283)
Lot 99	BESS Site, 1 Deight Street (Lot 99 DP1020247)
TSP	Total suspended particulates

1.0 Introduction

StorEnergy 3 Pty Ltd (Stor) are developing a Battery Energy Storage System (BESS) with an associated overhead transmission line to the existing Molong Substation, east of Molong, NSW.

SLR Consulting Australia (SLR) has been engaged to perform a preliminary desktop air quality (AQ) study to identify any air quality and associated reporting requirements to support the Environmental Impact Statement (EIS) for this Project.

This report outlines findings of our preliminary AQ study, focusing on the following:

- Identification of emissions to air.
- Existing environment and sensitive receptors.
- Preliminary assessment – Air Quality.
- Conclusion and Recommendations.

1.1 Project Description

The Project will involve the development, construction, operation, and eventual decommissioning of a BESS with a capacity of 150 MW/ 730 MWh on 1 Deight Street, Molong, NSW 2866. The BESS will connect to the grid via an aboveground transmission line to the existing Molong 132/66kV substation operated by Transgrid located at 19 Back Saleyards Road, Molong, NSW 2866.

The BESS will comprise battery units, inverters, transformers, a substation and ancillary infrastructure all within the indicative BESS area. The battery units will be within individual containers (or enclosures), with each container measuring approximately 6m or 20ft in length with an approximate weight of 43,000kg. The battery units will generally be in a linear arrangement with some minor changes anticipated as detailed design progresses.

The inverters will convert the electricity stored in the battery units from Direct Current (DC) to Alternating Current (AC), and vice versa, that will be directed through a reticulation network of underground 33kV cables within the BESS area and the proposed 33/132kV main transformer and 132kV overhead lines (approximately 900m in length) to the existing Transgrid Molong Substation.

Other physical features of the BESS include a 33 kV switchroom and control room, 33/132 kV main transformer, 132kV switchgear, car parking, landscaping, and security facilities.

2.0 Identification of Emissions to Air

Based on the review of available preliminary project information, key air pollutants associated with the construction phase of the Project would be generation of particulate matter. This would mainly be associated with soil disturbance during earthworks and the movement of trucks and equipment on unpaved roads and construction areas.

There will also be small scale releases of products of combustion (e.g. nitrogen dioxide and carbon monoxide, etc.) associated with the operation of diesel-powered stationary and mobile equipment during both construction and operational phases of the Project. The nature and scale of release of combustion emissions from the proposed construction and operational activities, however, are highly unlikely to cause any significant changes to the current air quality levels in the surrounding environment.

Given the above, the following key pollutants of interest have been identified in relation to potential air quality impacts:

- Particulate matter < 2.5 µg/m³ ($PM_{2.5}$)
- Particulate matter < 10 µg/m³ (PM_{10})
- Total suspended particulates (TSP)
- Deposited dust

These emissions are associated with the construction stage of the Project only, and no significant air emissions would be associated with normal operational activities.

3.0 Relevant Legislation and Guidance

The following air quality policy and guidance documents have been referenced within this assessment and have been used to identify the relevant air quality criteria.

3.1 Protection of the Environment Operations (POEO) Act 1997 & Amendment Act 2011

The POEO Act (and Amendment Act 2011) is a key piece of environment protection legislation administered by the NSW Environment Protection Authority (EPA) which enables the Government to establish instruments for setting environmental standards, goals, protocols and guidelines.

The following sections of the POEO Act are of general relevance to the Project:

- Sections 124 and 125 of the POEO Act state that any plant located at a premise should be maintained in an efficient condition and operated in a proper and efficient manner to reduce the potential for air pollution.
- Section 126 of the POEO Act requires that materials (eg waste materials stored/handled at the project) are managed in a proper and efficient manner to prevent air pollution (eg odour).
- Section 128 of the POEO Act states:
  1. *The occupier of a premises must not carry out any activity or operate any plant in or on the premises in such a manner to cause or permit the emission at any point specified in or determined in accordance with the regulation of air impurities in excess of [the standard of concentration and/or the rate] prescribed by the regulations in respect of any such activity or any such plant.*
  2. *Where neither such a standard nor rate has been so prescribed, the occupier of any premises must carry on activity, or operate any plant, in or on the premises by such practicable means as may be necessary to prevent or minimise air pollution.*

3.2 Protection of the Environment Operations (Clean Air) Regulation 2022

The POEO (Clean Air) Regulation 2022 (the Regulation) is the core regulatory instrument for air quality issues in NSW. In relation to industry, the Regulation:

- Sets maximum limits on emissions from activities and plant for a number of substances.
- Deals with the transport and storage of volatile organic liquids.

- Restricts the use of high sulfur liquid fuel.
- Imposes operational requirements for certain afterburners, flares, vapour recovery units and other treatment plant.

The project would be required to comply with the content of the Regulation during construction and operation.

3.3 NSW EPA Air Quality Policy and Guidance

The Environment Protection Authority (EPA) is the NSW regulatory authority responsible for air quality regulation and associated activities.

The NSW EPA document, *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (hereafter 'the Approved Methods') (NSW EPA 2022), lists the statutory methods for modelling and assessing air pollutants from stationary sources and specifies criteria that reflect the environmental outcomes adopted by the EPA. The Approved Methods are referred to in the Regulation for assessment of impacts of air pollutants.

The relevant air quality criteria set out in the Approved Methods have been reproduced in Table 1.

Table 1 Air Quality Assessment Criteria Adopted for this Study

Pollutant	Averaging Period	Assessment Criteria	Source
PM_{10}	24-Hour	50 µg/m^3	Approved Methods, 2022
	Annual	25 µg/m^3	
$PM_{2.5}$	24-Hour	25 µg/m^3	
	Annual	8 µg/m^3	
TSP	Annual	90 µg/m^3	
Dust Deposition	Annual increment	2 g/m^2/month	
	Annual cumulative	4 g/m^2/month	

4.0 Receiving Environment

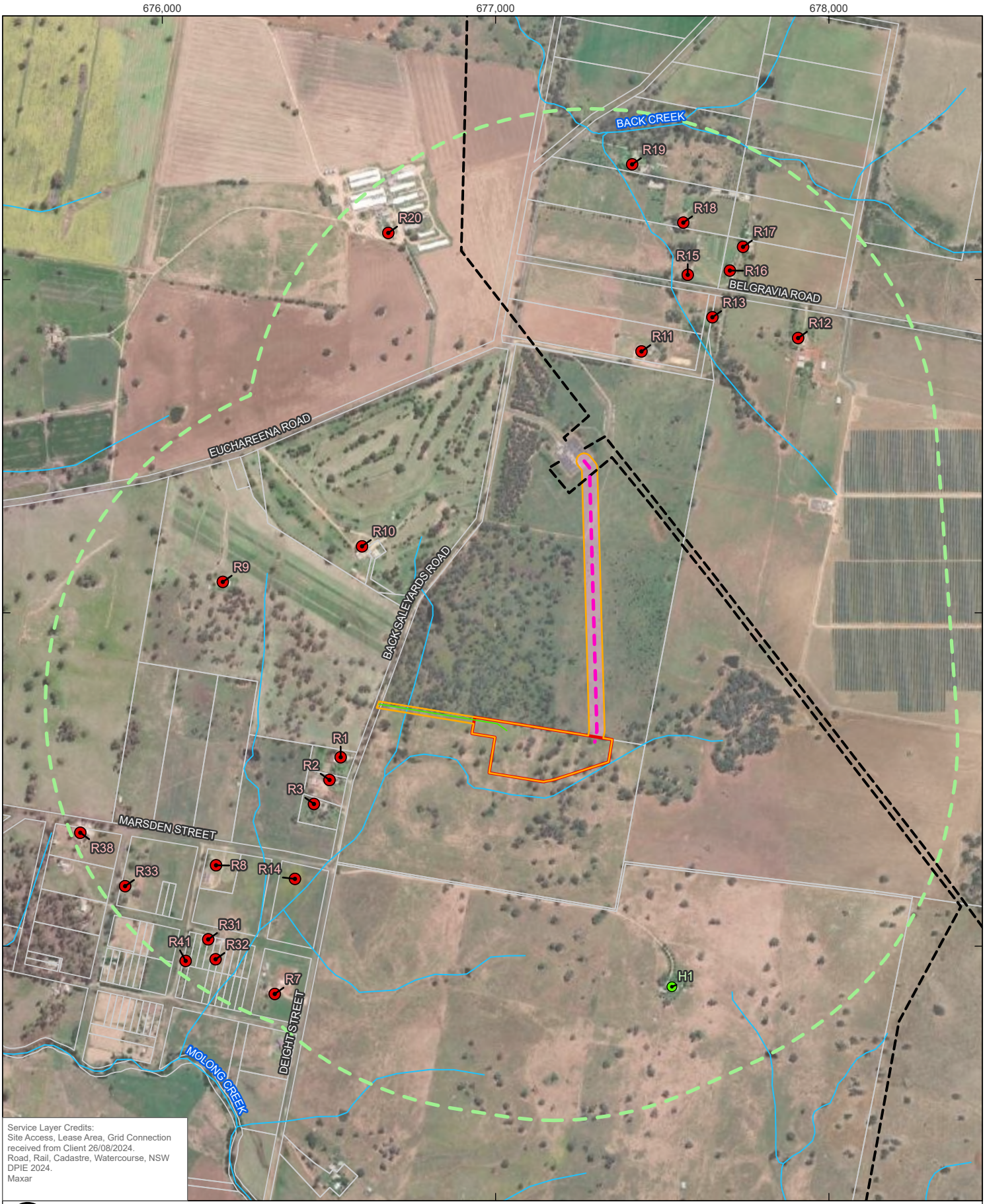
4.1 Surrounding Land Use and Sensitive Receptors

The Lot 99 is located in a rural environment, with the surrounding area mainly used for agricultural purposes. Nearby non-agricultural land uses include a golf course located 600 m to the northwest, and Molong Solar Farm located 800 m to the northeast.

There are also a small number of scattered residential dwellings in the vicinity of Lot 99 (as shown in Figure 1), with the nearest town, Molong, located approximately 2.5 km to the west.

Locations of the nearest identified existing sensitive receptors in the vicinity of Lot 99 are summarised as follows:

- 315 m north-northeast of proposed transmission line.
- 480 m west of the proposed Lot 99.
- 190 m southwest of the entrance to the Lot 99 access road.



Service Layer Credits:
Site Access, Lease Area, Grid Connection received from Client 26/08/2024.
Road, Rail, Cadastre, Watercourse, NSW DPIE 2024.
Maxar

0 250 500 m

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:15,000 at A4
Project Number:	620.041615
Date Drawn:	01-Aug-2025
Drawn by:	NT

LEGEND

- Host Receiver
- Sensitive Reciever
- 1km BESS Area Buffer
- Watercourse
- Rail
- Primary Road
- Cadastre
- Proposed Electricity Transmission Line
- Proposed Site Access

Transgrid Line

- 132kV

- BESS Footprint (5.06 ha)
- Development Footprint (5.06 ha)
- Proposed Easement

MOLONG BESS

SENSITIVE RECEIVERS

SLR

FIGURE 1

Path: H:\Projects-SLR\620-BNE\620-BNE\620.041615.00001 Stor Energy NSW\06 SLR Data\01 GIS\GIS\NSW_Stor.aprx\620041615_AQ_F01_Recievers

As this assessment is limited to the construction phase only, given the lack of any significant air emissions associated with the ongoing operations, potential future receivers are not considered. The construction works are anticipated to be completed prior to any new residential dwellings being occupied.

4.2 Climate and Meteorology

The nearest available meteorological monitoring station collecting data suitable for use in a quantitative air dispersion modelling study operated by the Bureau of Meteorology (BoM) is located at Orange. The following description of the regional climate is based on long-term data reported from Orange Airport (Station 063303, elevation 945 m), which has data available from 1996 to 2025 for the following parameters:

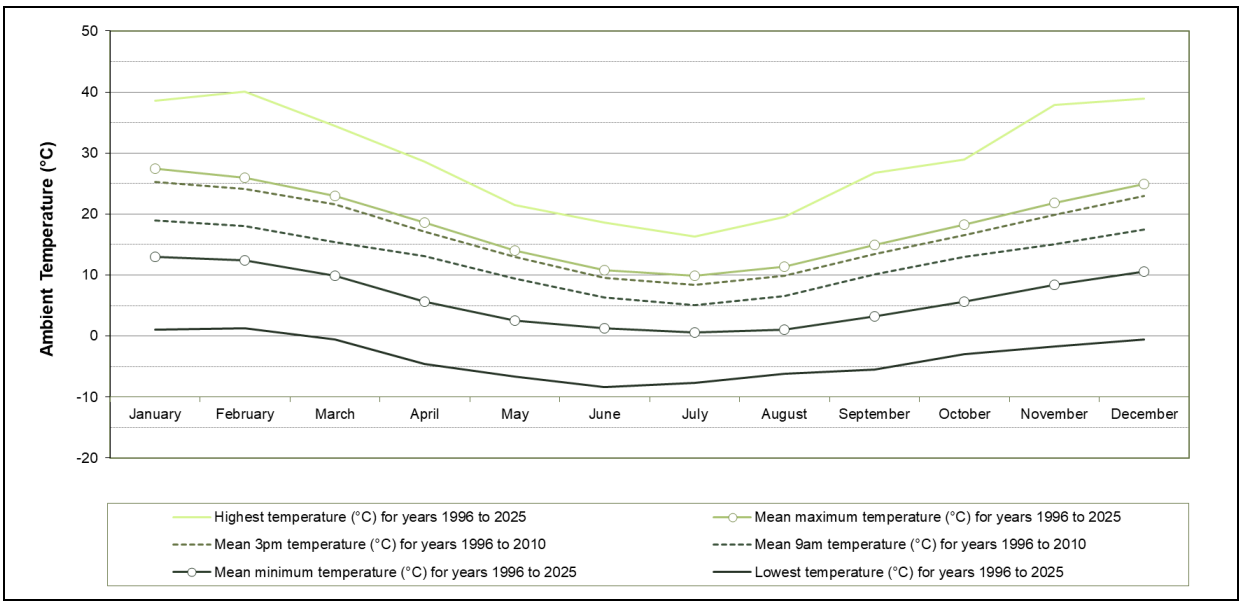
- Temperature (°C)
- Rainfall (mm)
- Solar radiation (MJ/m^2)
- Relative humidity (%)
- Cloud cover
- Wind speed (m/s) and wind direction (degrees).

A review of the long-term data available is provided in the following sections.

4.2.1 Temperature

Long-term temperature statistics for Orange Airport are summarised in Figure 2. Mean maximum temperatures range from 9.9°C in winter to 27.4°C in summer, while mean minimum temperatures range from 0.6°C in winter to around 13°C in summer. Maximum temperatures up to 40°C and minimum temperatures less than -5°C have been recorded.

Figure 2 Long Term Temperature Data for Orange Airport

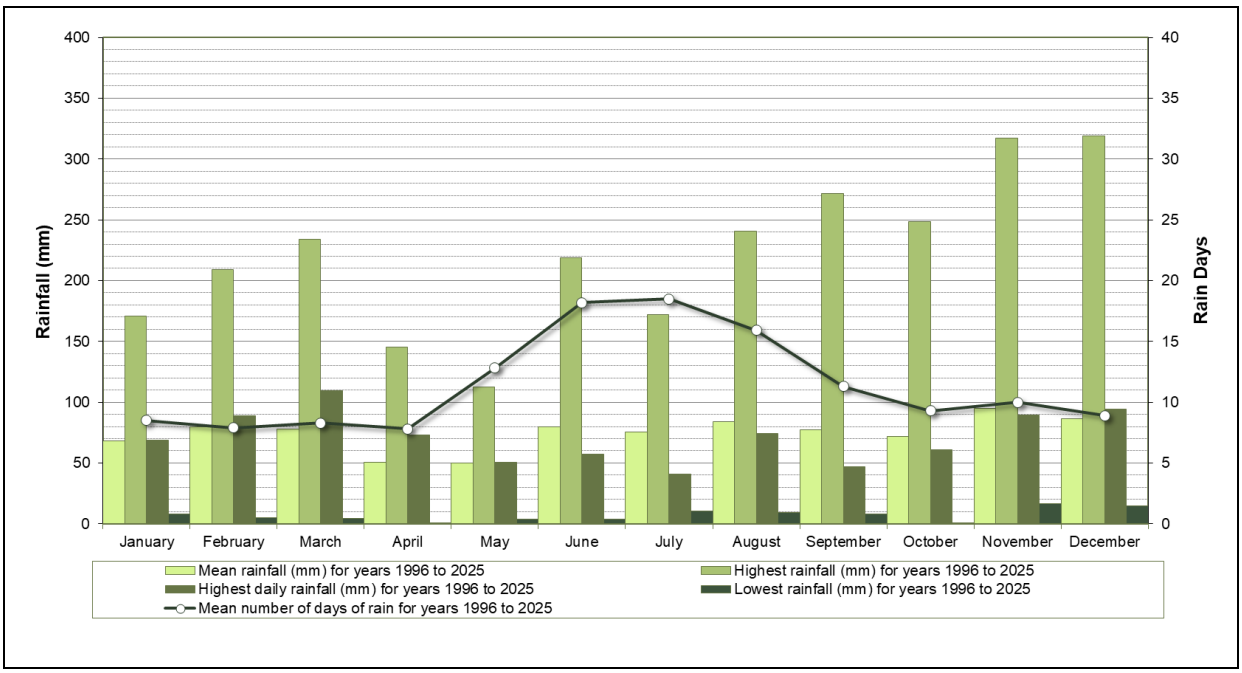


4.2.2 Rainfall

Long-term rainfall statistics for Orange Airport are summarised in Figure 3.

The average monthly rainfall is relatively constant throughout the year, with the lowest average rainfall occurring during autumn (down to 50 mm/month recorded during May over an average of around five rain days per month). The highest average monthly rainfall of 95 mm/month occurs in November, with an average of 9 rain days recorded in this month. The highest monthly rainfall recorded over the time period examined was 319.2 mm recorded in December 2010. Peak rainfall events occur during autumn, with the maximum daily rainfall of 109.6 mm recorded on 1 March 2013.

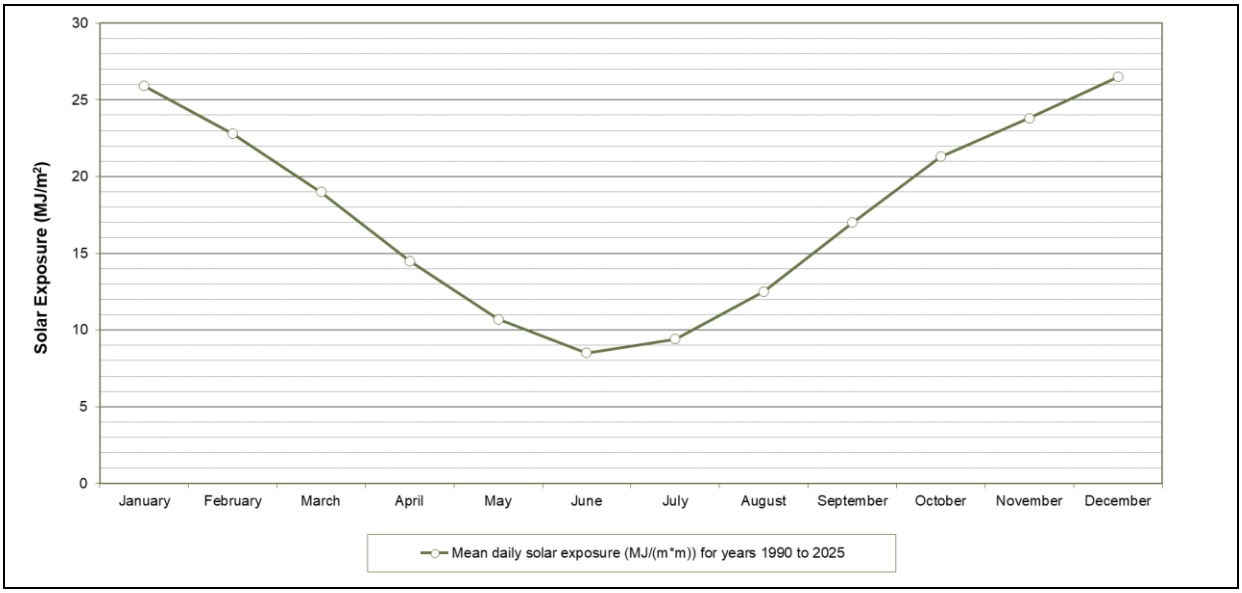
Figure 3 Long-Term Monthly Rainfall Data for Orange Airport



4.2.3 Solar Radiation

As would be expected, the mean daily solar exposure levels recorded at Orange Airport (see Figure 4) are highest in summer (peaking at 26.5 MJ/m^2 in December) and lower in winter (dropping to 8.5 MJ/m^2 in June).

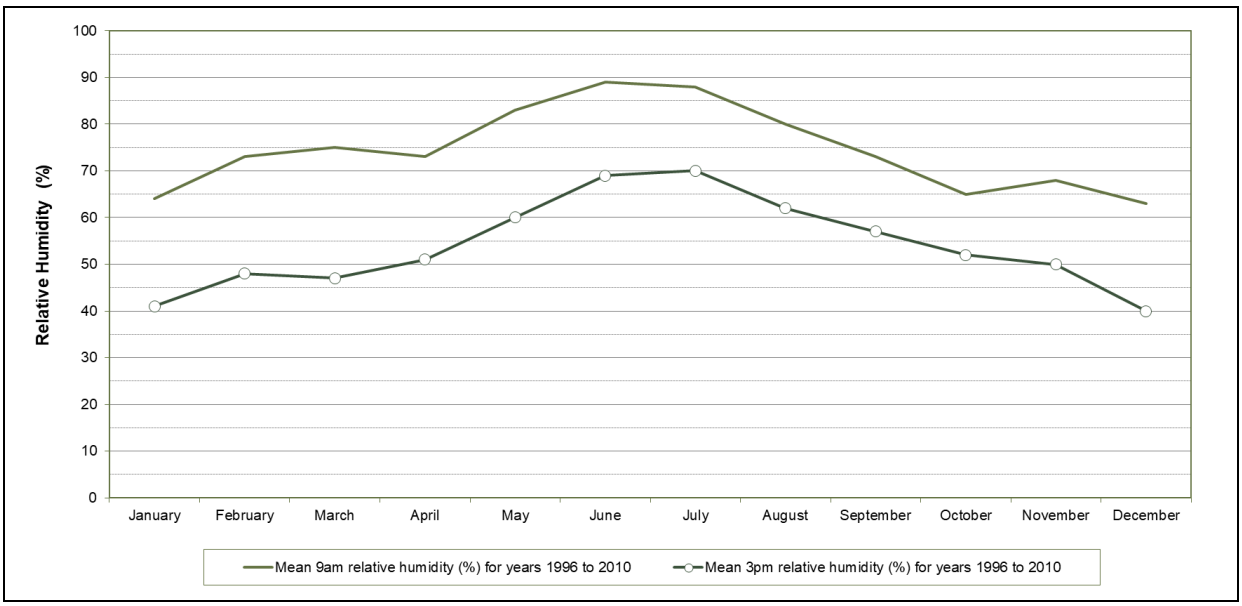
Figure 4 Long Term Solar Radiation Data for Orange Airport



4.2.4 Relative Humidity

Long-term humidity statistics (9 am and 3 pm monthly averages) for Orange Airport are summarised in Figure 5. Morning humidity levels range from an average of around 63% in early-summer to around 89% in early-winter. Afternoon humidity levels are lower, at around 70% in mid-winter and dropping to a low of 40% in early summer.

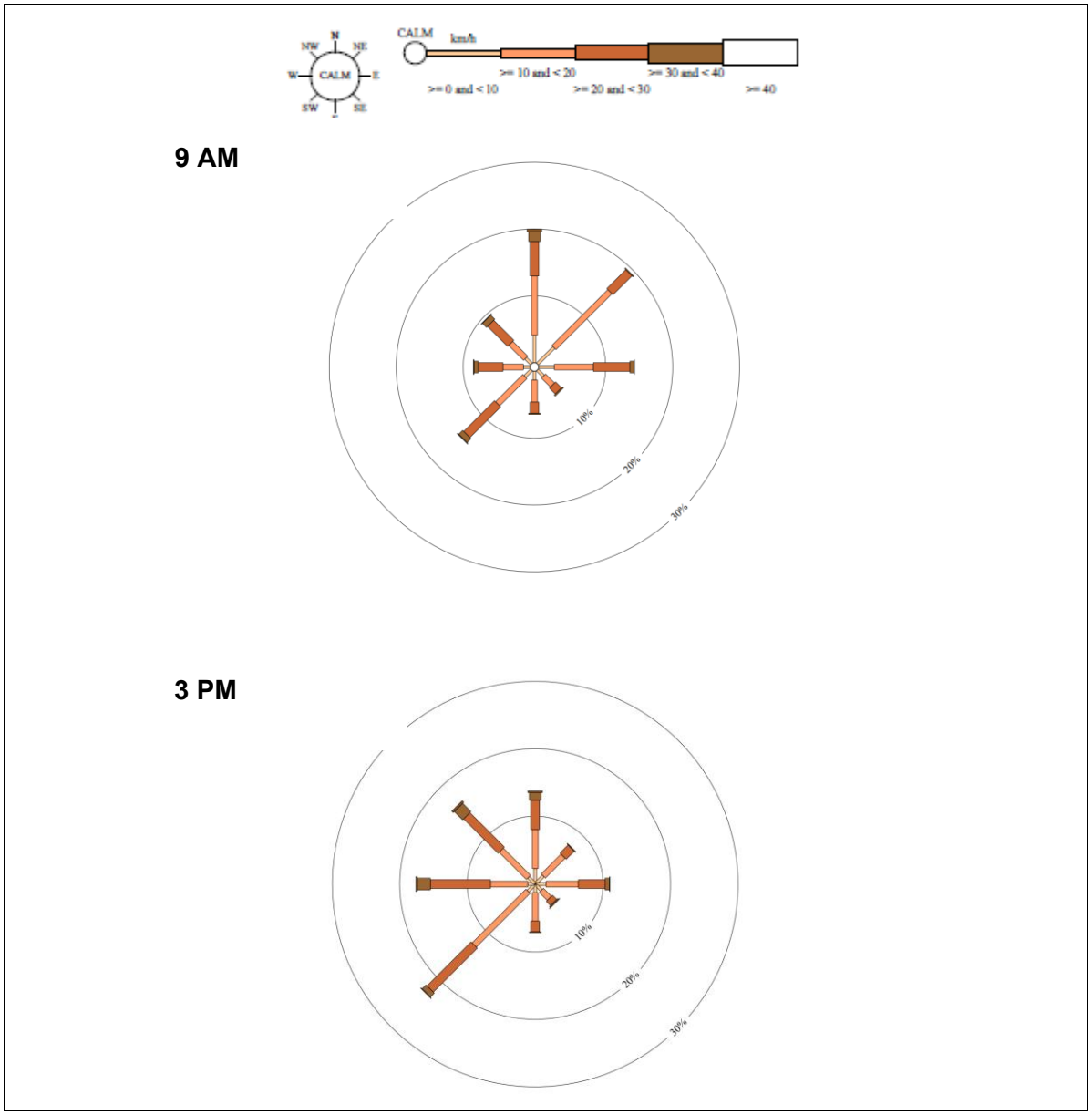
Figure 5 Long Term Humidity Data for Orange Airport



4.2.5 Wind Speed and Direction

Long-term wind data (9 am and 3 pm) for Orange Airport are presented as wind roses in Figure 6. The wind roses show that winds from north are predominant in the morning with winds blowing from the southwest, west and northwest directions in the afternoon. Winds from the southeast quadrant, which would blow emissions from Lot 99 towards the nearest sensitive receptors, occur very infrequently in either the morning or afternoon period.

Figure 6 Rose of Wind Direction vs Wind Speed (km/hr) at Orange Airport (1996 - 2024)



4.3 Existing Ambient Air Quality

The NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW), operates an AQMS at Orange (Orange AQMS), located approximately 27 km southeast of the Project Lots, which monitors PM_{10} and $PM_{2.5}$ concentrations. TSP and deposited dust are not routinely monitored.

Available validated $PM_{2.5}$ and PM_{10} concentration data recorded by the above monitoring station is summarised in Table 2 and presented as time series plots in Figure 7.

The PM_{10} and $PM_{2.5}$ data summaries show that exceedances of the short-term (24-hour average) air quality criteria for PM_{10} and $PM_{2.5}$ are sometimes recorded in Orange. However, typically, the ambient levels are well below the standards. The main causes of these intermittent exceedance events are bush fires, hazard reduction or agricultural burning, and dust storms. Care should be taken during the construction works therefore to not contribute

to any additional exceedances of particulate criteria during periods of high background levels.

Table 2 Summary of Review of Available Monitoring Data – Orange (2021-2024)

Year	PM_{10} (µg/m³)			$PM_{2.5}$ (µg/m³)		
	24-Hours		Annual Average	24-Hours		Annual Average
	Maximum	90th %ile		Maximum	90th %ile	
2021	46.3	20.4	11.3	32.3 (3)	13.4	6.6
2022	43.1	14.7	8.6	38.9 (5)	9.9	5.3
2023	34.1	21.3	11.4	24.9	15.5	6.7
2024	39.7	20.5	11.3	26.4 (1)	13.1	6.7
All Years	46.3	19.6	10.7	38.9	14.9	6.3
Criterion	**50**		**25**	**25**		**8**
Red indicates exceedance of the criteria with number of exceedances indicated by value in parentheses						

Figure 7 Measured 24-Hour Average $PM_{2.5}$ – Orange Station (2021-2024)

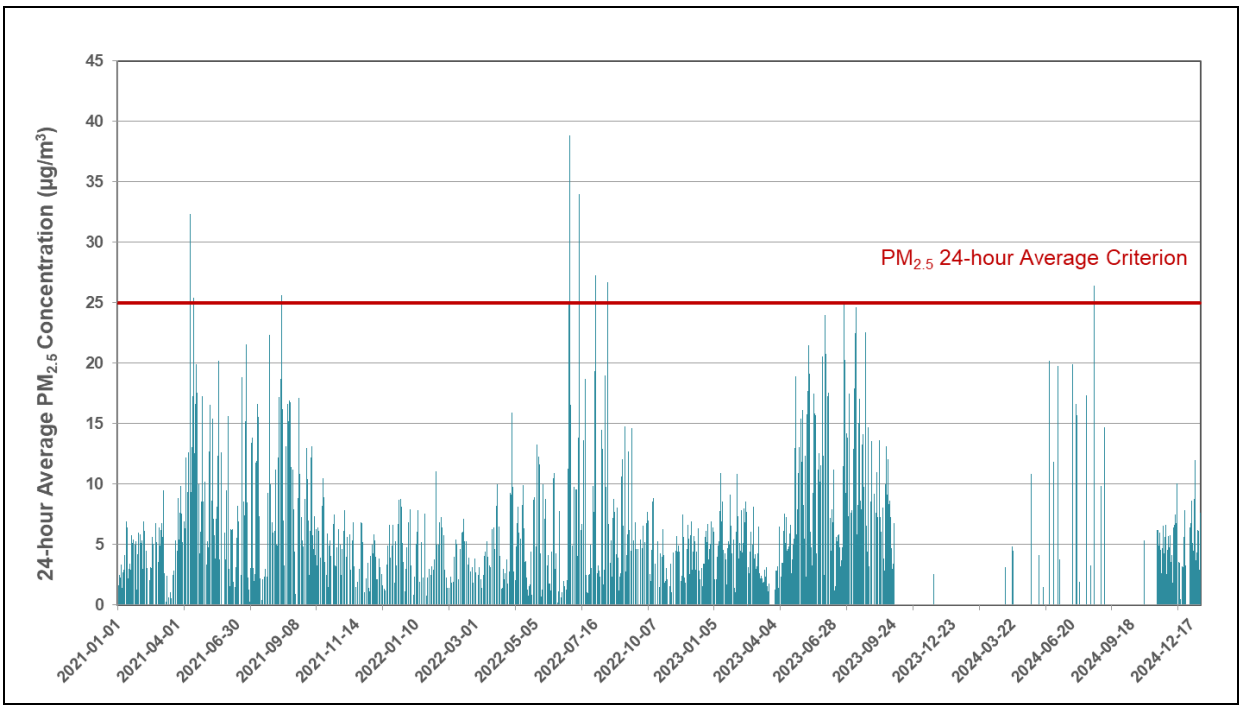
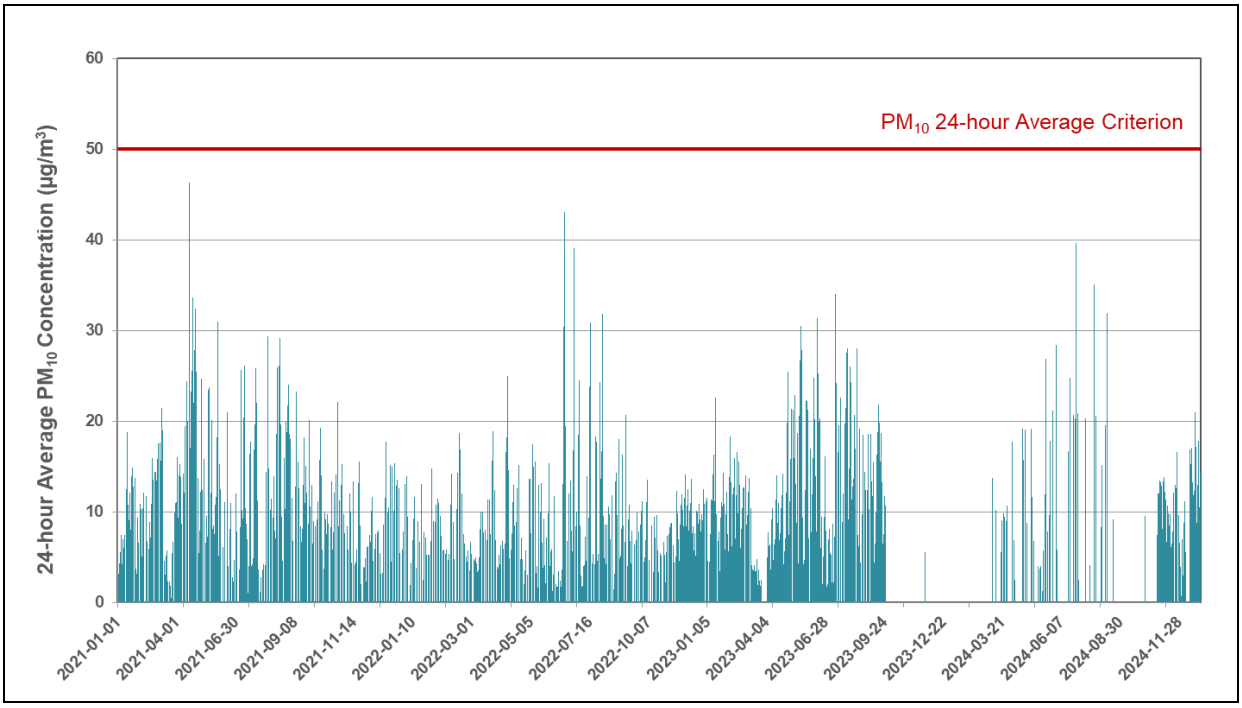


Figure 8 Measured 24-Hour Average PM_{10} – Orange Station (2021-2024)



5.0 Preliminary Assessment – Air Quality

5.1 Construction

Potential impacts

As noted in Section 2.0 the only potential air pollution and amenity issue identified for the Project is associated with fugitive dust emissions from the proposed construction activities. The potential impacts for surrounding sensitive receptors include:

- Annoyance due to dust deposition (soiling of surfaces) and visible dust plumes.
- Health impacts due to elevated suspended particulate concentrations.

If there were excessive dust emissions associated with the works, and considering the dominant southwest wind direction in the afternoon, there is also potential that nuisance or (possibly) engineering related impacts (e.g. dust loadings on electrical equipment) could be experienced by the Molong Solar Farm located to the northeast.

Assessment Approach

Modelling of dust from construction activities is generally not considered appropriate, as emission rates can vary significantly depending on a combination of the activity and prevailing meteorological conditions (i.e., rainfall and wind speed), which cannot be reliably predicted. Instead, a qualitative assessment of the potential risks to air quality associated with dust from the Project's construction activities would be sufficient to address any potential risk.

The *IAQM Guidance on the Assessment of Dust from Demolition and Construction* developed in the United Kingdom by the Institute of Air Quality Management (IAQM 2024) can be used to provide a qualitative assessment. The IAQM method uses a four-step process for assessing dust impacts from construction activities:

- **Step 1**: Screening based on distance to the nearest sensitive receptor; whereby the sensitivity to dust deposition and human health impacts of the identified sensitive receptors is determined.
- **Step 2**: Assess risk of dust effects from activities based on the scale and nature of the works, which determines the potential dust emission magnitude, and the sensitivity of the area surrounding dust-generating activities.
- **Step 3**: Determine site-specific mitigation for remaining activities with greater than negligible effects.
- **Step 4**: Assess significance of remaining activities after management measures have been considered.

The IAQM screening criteria (Step 1) for further assessment is the presence of a 'human receptor' within:

- A 'human receptor' is located within:
  - 250 m of the boundary of the site being assessed (i.e. Development Footprint).
  - 50 m of the route(s) used by construction vehicles on public roads, up to 250 m from the entrance to the site being assessed (i.e. Development Footprint).
- An 'ecological receptor' is located within:
  - 50 m of the boundary of the site being assessed (i.e. Development Footprint).
  - 50 m of the route(s) used by construction vehicles on public roads, up to 250 m from the entrance to the site being assessed (i.e. Development Footprint).

The bulk of the earthworks will occur within the BESS Footprint itself with less intensive earthworks required to construct the site access road and to install the transmission line which are already mostly clear of vegetation.

Given the closest human receptor is 480 m west of Lot 99, and the nearest receptors to Back Saleyards Road are >100m, and land is already clear for the northern area of the transmission line nearest to receptors, a detailed air quality impact assessment is not considered to be warranted for this Project.

Mitigation and Management

A dust management plan outlining the key sources of dust during the construction phase and a list of practical mitigation measures to minimise the potential offsite dust nuisance to receptors situated near entrance to the Project Lots and unsealed areas of Back Saleyards Road should be adequate to minimise or eliminate any adverse air quality or dust deposition impacts outside the Project boundary. At a minimum, the management plan should implement speed limits and, if necessary, watercart treatment for unsealed access roads used by construction vehicles in the vicinity of residential dwellings.

5.2 Operation

No potential air quality risks are identified for the operational phase of the Project. Traffic-related emissions, including wheel-generated dust, associated with any Project-related vehicle movements are expected to be minimal. Given this, an air quality impact assessment to address potential risks associated with the operational phase of the Project is not warranted.

6.0 Conclusions and Further Work

The following conclusions and recommendations are made based on the findings of this study.

- No further qualitative or quantitative air quality assessment is considered to be warranted for this Project. The summary presented in this report can be used to provide an appropriate level of assessment in the application.
- A dust management plan should be prepared and implemented for the construction of the Project, prior to starting the site works.

7.0 References

IAQM. 2024. *Guidance on the assessment of dust from demolition and construction, Version 2.2.* London: Institutre of Air Quality Management.

NSW EPA . 2025. *NSW Guide for Large Emitters.* Sydney: New South Wales Environment Protection Authority.

NSW EPA. 2022. *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales.* NSW Environment Protection Authority.

AUSTRALIA HEAD OFFICE

Tenancy 202, Submarine School
Sub Base Platypus, 120 High Street
North Sydney NSW 2060
(Registered Office)

T: 1300 434 443
sydney@slrconsulting.com

NEW ZEALAND HEAD OFFICE

201 Victoria Street West,
Auckland 1010
(Registered Office)

T: +64 9 303 0311
AotearoaNZ@slrconsulting.com

SINGAPORE HEAD OFFICE

The Work Project,
6 Battery Road,
06-617, Singapore 049909
(Registered Office)

T: +65 6822 2203
singapore@slrconsulting.com

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SLRCONSULTING.COM