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Mamre Road Data Centre Campus (SSD-92743706)

Construction Air Quality Management Plan

Addressee(s): Plan Project Management Pty Ltd

Site Address: 706 – 752 Mamre Road, Kemps Creek NSW

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Final Authority

This report must be regarded as draft until the above study components have been each marked as final, and the document has been signed and dated below.



G. Graham

11 December 2025

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1. INTRODUCTION

Northstar Air Quality Pty Ltd (Northstar) has been commissioned by Plan Project Management Pty Ltd (PPM) (the Applicant) to perform a construction air quality management plan (CAQMP) to accompany a State Significant Development Application (SSDA) for the construction of the Mamre Road Data Centre Campus (the Proposal) at 706-752 Mamre Road, Kemps Creek NSW 2178 (the Proposal site).

The CAQMP has been performed to support SSDA-92743706 to be submitted to NSW Department of Planning, Housing, and Infrastructure (NSW DPHI).

This CAQMP outlines the strategy (encompassing mitigation measures, monitoring and documentation) for the effective control of air quality through the construction phase of the Proposal. Specifically, the CAQMP identifies the potential sources of air emissions associated with proposed construction activities to be conducted at the Proposal during construction and outlines a series of measures that are to be implemented in order to mitigate against and minimise fugitive dust and particulate emissions.

An air quality impact assessment (AQIA) was performed by Northstar (Northstar, 2025) as part of SSD-92743706 for the Proposal. The AQIA included a quantitative (i.e. modelled) assessment of potential emissions from construction related activities which may give rise to dust and particulate releases during the construction stages of the Proposal (i.e. Stage C1 and C2). Reference should be made for details of the construction phases modelled and the predicted impacts.

The AQIA concluded that potential impacts at surrounding receptors would be greater during Stage C1 construction works than Stage C2. Stage C1 impacts were predicted to give rise to additional exceedances of short-term particulate matter criteria (i.e. 24-hour PM_{10}), whereas Stage C2 impacts were predicted not to give rise to any additional exceedances, although that does not infer that adequate, commensurate and reactive controls are not required.

The AQIA states:

“Whilst a range of mitigation measures representing best management practice have been applied within the assessment, further management would be required to ensure that exceedances of the relevant air quality criteria do not occur at surrounding receptors. A detailed Construction Air Quality Management Plan (CAQMP), including a Trigger Action Response Plan (TARP) would be implemented as part of the construction works. This would ensure that real-time air quality monitoring guides real-time responses during construction and applies a hierarchy of responses to ensure that impacts associated with the construction works are minimised.”

This CAQMP details the air quality management requirements that must be satisfied in order to demonstrate compliance with the anticipated Approval Conditions with regard to dust minimisation and is part of a series

of management plans contained within the Construction Environmental Management Plan (CEMP). The CEMP serves as the overarching document overseeing environmental management for the Proposal.

The CAQMP has been performed by Northstar, a specialist air quality consultancy with extensive experience in the provision of air quality management plans.

It is noted that construction works for the Proposal may not commence until the SSDA and subsequently the CAQMP is approved by the Planning Secretary.

1.1. Objectives and Targets

The objectives of this CAQMP are to provide a management framework to minimise and mitigate potential emissions of air pollutants from the Proposal using appropriate best practice measures and to ensure that impacts on air quality are minimised and within the scope permitted by the Approval.

To achieve these objectives, the summarised targets in Table 1 have been proposed for the management of air quality impacts during construction.

Table 1 Proposed targets and Key Performance Indicators (KPI) for air quality management

Measure	Target / KPI	Timeframe	Responsibility	Documentation
Air quality monitoring indicates triggers activated	<ul style="list-style-type: none"> Any triggers of air quality monitoring actioned immediately Review controls applied and increase controls or modify activities 	At all times	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
Visible dust emissions leaving the site boundary	<ul style="list-style-type: none"> Any emissions of visible dust leaving the site boundary investigated immediately Review controls applied and increase controls or modify activities 	At all times	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
Spillage or track out onto public roads	<ul style="list-style-type: none"> Any spillage or track out on public roads to be cleaned immediately 	At all times	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
Maintenance of all plant and equipment used on site in a proper and efficient condition	<ul style="list-style-type: none"> All plant and equipment to be maintained in accordance with manufacturer specifications All plant and equipment to be operated efficiently 	At all times	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist

Measure	Target / KPI	Timeframe	Responsibility	Documentation
Operation of all plan and equipment used on site in a proper and efficient manner				
Complaints regarding air quality	<ul style="list-style-type: none"> • Zero validated complaints • Any complaints would be investigated (see Section 5.5) 	At all times	Site supervisor	Complaints register
Meeting Project Approval Conditions regarding air quality	<ul style="list-style-type: none"> • Compliance with conditions 	At all times	Site supervisor	Environmental inspection checklist Construction Compliance Report

2. THE PROPOSAL

The following provides a description of the context, location, and scale of the Proposal and provides a description of the processes to be conducted during the construction phase. This section also identifies the potential for emissions to air associated with the Proposal.

2.1. Environmental Setting

The Proposal site is located at 706–752 Mamre Road, Kemps Creek NSW 2178. It is legally described as Lot 10 in Deposited Plan (DP) 1280592 and covers an area of approximately 52 hectares (ha). A map showing the location of the Proposal site is provided in Figure 1.

Figure 1 Proposal site location



Source: Northstar

The closest residential property is approximately 280 metres (m) from the Proposal site boundary to the northwest.

2.2. Proposal Overview

The site is proposed for development under an SSDA as a data centre campus comprising:

- Approximately 26 shells across four-storeys data centre buildings (4x four shells and 2x five shells), including six technical office buildings, plus a campus office.
- Incoming and internal electrical substations and associated infrastructure.
- Site preparation, including earthworks, stormwater, sewer, roads, and associated infrastructure.

Figure 2 presents the Proposal site layout, with Figure 3 providing an indication of the Proposal staging. More detailed versions of these figures can be found in the main EIS.

It is important to note that the Proposal would be constructed in a staged manner, over a period of approximately 10 years. Presented in Table 2 is a summary of the construction staging of the Proposal, and includes detail related to site access arrangements. Of note:

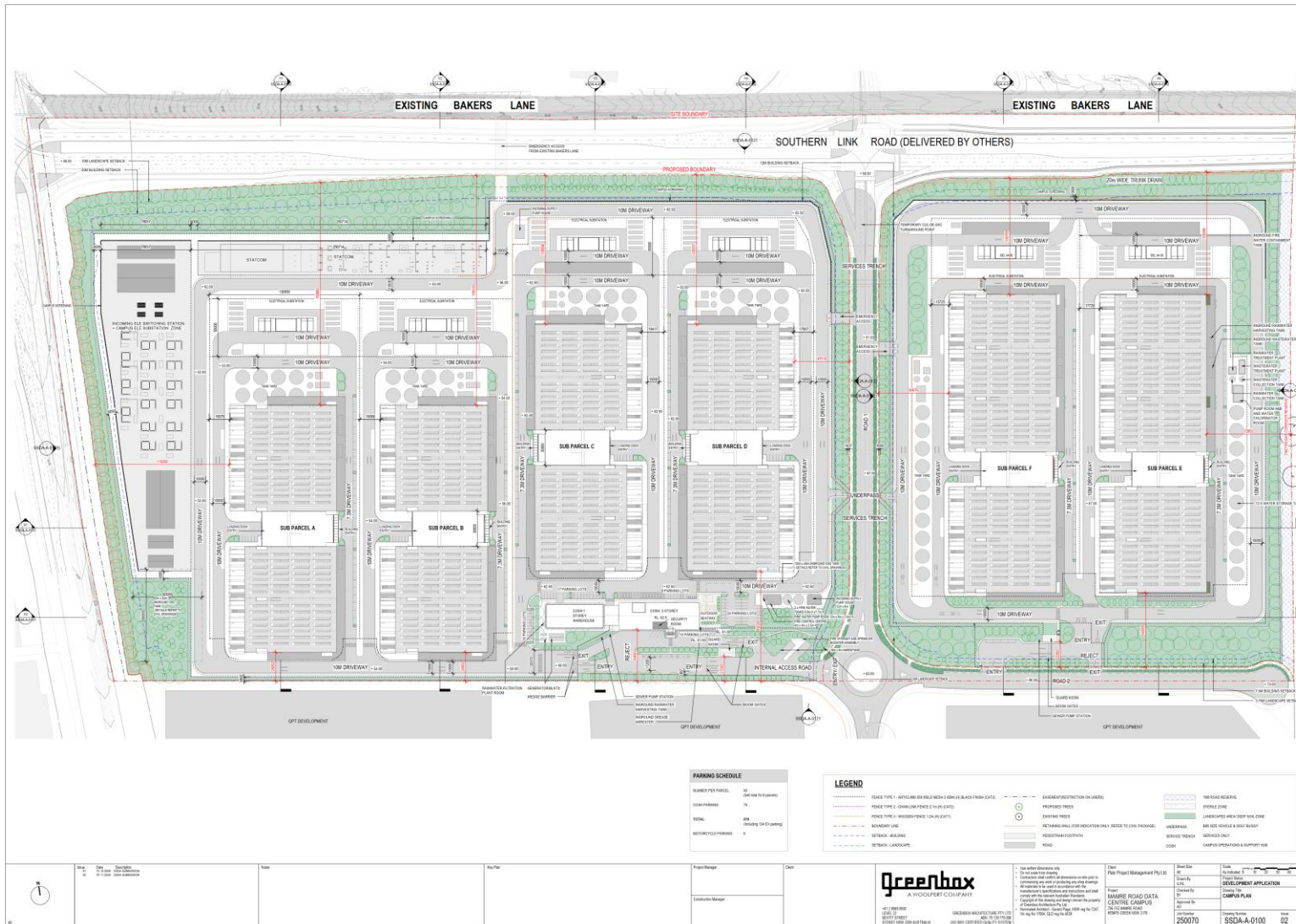
- Earthworks and construction activities for all 26 data centre buildings would not be performed at the same time. Major earthworks would be performed in two main stages, approximately seven to eight years apart. Minor earthworks would be performed progressively as the Proposal site is developed.
- Construction traffic would not access the Proposal site via Bakers Lane during any phase of construction activities.
- Data centre buildings within each sub-parcel would be progressively constructed and commissioned over a period of approximately 10 years.

The assessment of potential construction stage impacts has considered the staging proposed and provides a realistic approximation of the anticipated impacts at nearby sensitive receptors as described above and summarised in Table 2.

Table 2 Description of Proposal staging (construction)

Timing (indicative)	Stage	Phase	Land parcel	Description (Construction)	Site Access
0 to 2 years	1	0	A, B, C, D	Earthworks in the western portion of the Proposal site. This would prepare land for the construction of the sixteen data centre buildings to the west of the internal road, and closest to Mamre Road.	Temporary construction access from Mamre Road to the south western corner of the site.
2-6 years		1	A	Construction of the data centre building in Parcel A plus the campus offices.	
		2	B	Construction of data centre building in Parcel B.	
		3	C	Construction of data centre building in Parcel C.	
7-10 years	2	4	D	Construction of data centre building in Parcel D.	Construction and operational access via the GPT development to the south.
		5	E,F	Earthworks in the eastern portion of the Proposal site, with temporary access from the south for construction vehicles. This would prepare land for the construction of 10 data centre buildings to the east of the internal road.	
		6	E	Construction of data centre building in Parcel E.	
		6	F	Construction of data centre building in Parcel F.	
10+ years	3	7	-	Construction finalised	Operational access via GPT development to the south.
				Construction of north-south road.	

Figure 2 Proposal site plan



Source: Greenbox (250070 SSDA-A-0100 02)

Figure 3 Proposal staging plan



Source: Greenbox (250070 SSDAA-A-0030 Issue 01)

2.3. Identification of Potential Emissions to Atmosphere

During the construction Stages of the Proposal, the following activities may have the potential to impact upon air quality:

- Demolition of any existing structures contained within the Proposal site;
- Earthworks including stripping and stockpiling of topsoil and cut and fill;
- Exportation of fill to off-site sources;
- Movement of non-road mobile machinery (NRMM), plant and equipment across the Proposal site and heavy vehicles on unpaved areas; and
- Construction of hardstand areas, internal road network, warehouses and office structures.

The activities described above could give rise to dust and particulate matter releases, and gaseous emissions through the combustion of fuel in vehicles, plant and machinery including NRMM.

The UK Institute of Air Quality Management (IAQM) guidance document '*Guidance on the assessment of dust from demolition and construction*' notes that

"The most common impacts are dust soiling and increased ambient [particulate] concentrations due to dust arising from activities on the site." (IAQM, 2024)

Of the activities outlined above, emissions associated with earthworks and the movement of heavy vehicles on unpaved areas are considered to have the greatest potential to impact on local air quality conditions, and it is these activities which are examined in detail in this CAQMP. However, the controls outlined in this CAQMP consider all sources of emissions (refer Section 5.4) with regard to local air quality.

The risk of dust emissions derived from a demolition / construction site that may cause a loss of amenity and / or health impacts is related to the following (IAQM, 2024):

- The nature of the activities being undertaken;
- The duration of the activities;
- The size of the site;
- The meteorological conditions (wind speed, direction, rainfall). Adverse impacts are more likely to occur downwind of the site and during drier periods;
- Soil moisture content and soil type and erodibility;
- The proximity of receptors to the activities;
- The sensitivity of the receptors to dust; and
- The adequacy of the mitigation measures applied to reduce or eliminate dust.

In addition, the risk of air quality impacts arising from exhaust emissions are related to the following:

- The number and type of plant and equipment being used;
- The duration of use of each item of plant and equipment;
- Appropriate operation and maintenance of plant and equipment; and
- Compliance of plant and equipment with relevant emission standards.

The anticipated volume of earthworks activities performed for the first and second stage of construction of the Proposal are presented in Table 3.

Table 3 Anticipated volume of earthworks activities during construction

Activity	Stage C1	Stage C2	Units
Existing topsoil removal	79 871	44 799	tonnes (t)
Excavation of existing dam and creeks	40 400	28 482	t
Excavation of sediment and erosion basins	76 760	38 380	t
Net cut	1 811 940	1 216 444	t
Net fill	1 890 922	828 402	t
Balance	-118 049	-499 703	t
Construction period	24	18	months
Working days per year	276	276	days
Area	33.8	18.5	ha
Average haulage distance assumed (1-way)	450	290	m
Haulage truck capacity	30.2	30.2	t

Notes: Data taken from Earthworks Strategy Report (AT&L, 2025)
 Assumed bulk density of topsoil 1 370 kg·m⁻³
 Assumed bulk density of cut and fill materials 2 020 kg·m⁻³
 Assumed 5.5 days per week, 52 weeks per year, less 10 public holidays

The proposed emission controls to be adopted during the construction of the Proposal that are associated with justifiable emission control efficiencies have been presented in Table 4. It is noted that the relevant emission control efficiencies have been sourced from the following literature:

- National Pollutant Inventory Emission Estimation Technique Manual for Mining Version 3.1 (DCCEEW, 2012); and
- NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining (Katestone Environmental, 2011).

It is noted that a range of additional control measures are proposed for the Proposal for which justifiable control efficiencies are not available (see Section 5.4).

Table 4 Proposed emission controls with associated control efficiencies

Emission control method	Control efficiency (%)	Activities control method applied to:	Reference
Water sprays keeping materials damp	50	<ul style="list-style-type: none"> • Scraping • Excavation; 	(NPI, 2012)

Emission control method	Control efficiency (%)	Activities control method applied to:	Reference
		<ul style="list-style-type: none"> Grading; and Wind erosion. 	
Water carts keeping haulage route surface damp (level 2 watering)	75	<ul style="list-style-type: none"> Material haulage. 	(NPI, 2012)
Water sprays	50	<ul style="list-style-type: none"> Loading/unloading. 	(NPI, 2012)
Minimise drop heights	30	<ul style="list-style-type: none"> Loading/unloading. 	(NPI, 2012)
Vehicle speed limits of 15 km·h ⁻¹	85	<ul style="list-style-type: none"> Material haulage 	(NPI, 2012)

2.4. Quantified Estimates of Construction Emissions to Atmosphere

The AQIA completed for the Proposal quantified emissions from two construction scenarios (Stages C1 and C2), to reflect the construction of the Proposal in two Stages (e.g. Stage C1 (Year 1-2), and [approximately] Stage C2 (Year 12) respectively), using the abovementioned activity rates (see Table 3) and control factors (see Table 4). A summary of the emissions inventory for the two scenarios is shown in Figure 4 and Figure 5 respectively.

Based on the estimated emissions for the two scenarios, the emission sources are ranked (highest to lowest) as:

- Haulage
- Wind erosion
- Material handling

Figure 4 Particulate emissions – uncontrolled and controlled – Stage C1 Construction

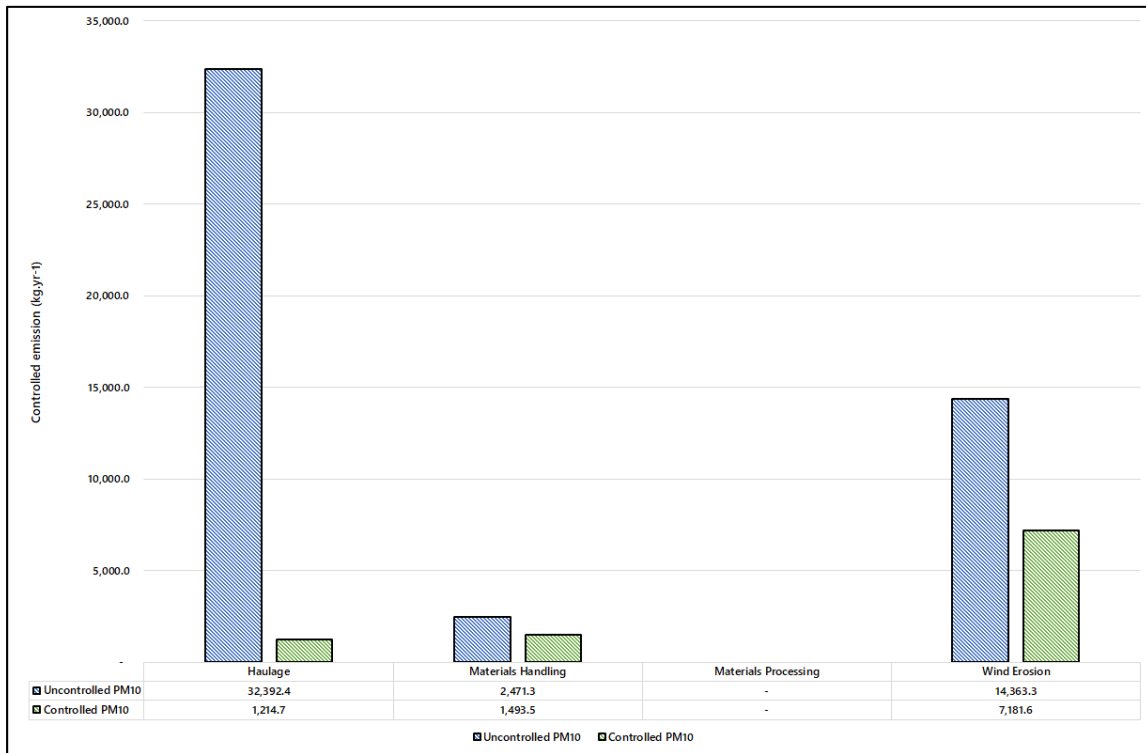
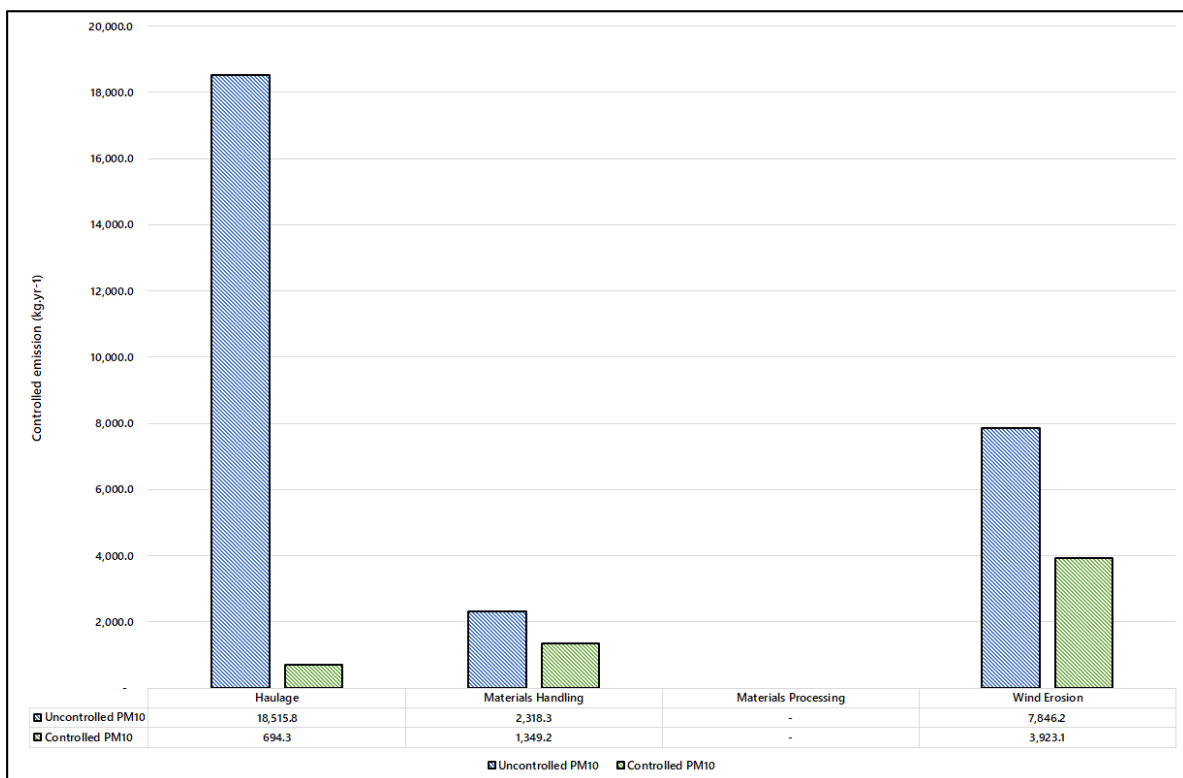


Figure 5 Particulate emissions – uncontrolled and controlled – Stage 2 Construction



3. LEGISLATION, REGULATION AND GUIDANCE

Provided below are the key relevant legislation, guidelines, and other relevant documentation and the anticipated Approval Conditions, as they relate to air quality impacts during construction of the Proposal.

3.1. Legislation

Legislation relevant to the management of air quality for the Proposal includes:

- *Environmental Planning and Assessment Act 1979 (EP&A Act);*
- *Protection of the Environment Operations Act 2022 (POEO Act);*
- *Protection of the Environment Operations (Clean Air) Regulation (POEO CAR) 2022; and,*
- *State Environmental Planning Policy (Western Sydney Employment Area) 2009.*

A detailed discussion of how specific requirements outlined within the abovementioned legislation is applicable to the Proposal with regard to air quality is provided within the AQIA performed as part of SSD-92743706.

3.2. Guidelines and Relevant Documents

Guidelines and other documentation relevant to the management of air quality for the Proposal includes:

- NSW EPA Local Government Air Quality Toolkit – Air Quality Guidance Note – Construction sites (NSW EPA, 2024);
- Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (NSW EPA, 2022); and,
- Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024).

3.3. Indicative Regulatory Conditions

At the time of submitting this CAQMP, the Proposal application (SSD-92743706) is 'under assessment', therefore neither the approval nor the approval conditions have been issued.

However, based on approval conditions for other similar data centre proposals in the region, indicative Conditions which may apply to construction phase air emissions are presented in Table 5. It is further noted that a precinct-wide air quality management study may be commissioned for the Mamre Road Precinct, which may also subsequently require additional or changed controls and responsibilities.

This CAQMP is subject to periodic review (refer Section 6) and will be amended to account for the above uncertainties.

Table 5 Indicative Proposal Approval Conditions – air quality

Indicative Conditions	Report reference
Dust Minimisation	
The Applicant must take all reasonable steps to minimise dust generated during all works authorised by this consent.	This document
<p>During construction, the Applicant must ensure that:</p> <ul style="list-style-type: none"> (a) exposed surfaces and stockpiles are suppressed by regular watering or other alternative suppression method; (b) all trucks entering or leaving the site with loads have their loads covered; (c) trucks associated with the proposal do not track dirt onto the public road network; (d) public roads used by these trucks are kept clean; and (e) land stabilisation works are carried out progressively on-site to minimise exposed surfaces. 	Section 5.4
Construction Air Quality Management Plan	
Prior to the commencement of earthworks and construction of each building in the Proposal, the Applicant must prepare a Construction Air Quality Management Plan (CAQMP) to the satisfaction of the Planning Secretary. The CAQMP must form part of the CEMP and must:	This document
(a) be prepared by a suitably qualified and experienced person(s);	This document
(b) detail and rank all emissions from all sources during construction of the Proposal, including particulate emissions;	Section 2.4
(c) describe a program that is capable of evaluating the performance of the construction and determining compliance with key criteria, including installation of real-time air quality monitors on the site boundary;	Section 5.1 Section 5.3
(d) identify the locations of the real-time air quality monitors;	Section 5.3.1
(e) identify the control measures that will be implemented for each emission source;	Section 6.3
(f) nominate the following for each of the proposed controls: <ul style="list-style-type: none"> (I) key criteria; (II) monitoring method; (III) location, frequency, and duration of monitoring 	Section 1.1 Section 5
(g) outline procedures that will be implemented in relation to: <ul style="list-style-type: none"> (I) record keeping. (II) reporting to the Environmental Representative; (III) complaints register. (IV) response procedures; and (V) compliance monitoring. 	Section 6
(h) include a Trigger Action Response Plan (TARP) that must include: <ul style="list-style-type: none"> (I) the objectives of the TARP; (II) triggers for: <ul style="list-style-type: none"> - continuously monitored PM₁₀ concentrations; 	Section 5.3.2

Indicative Conditions	Report reference
<ul style="list-style-type: none"> - meteorological conditions; - visible dust plumes; - on-site activities that have the potential for elevated dust emissions; (III) a procedure to identify likely dust-generating sources; (IV) source-specific actions to reduce dust generation rates; (V) a procedure to determine the effectiveness of the implemented actions; (VI) a procedure to implement additional controls if required, to ensure the Proposal complies with the conditions of this consent; and (VII) a procedure to record evidence / observations of the effectiveness of the implemented actions to manage the triggers, and evidence to demonstrate that the objectives of the TARP have been achieved; and 	
(i) detail contingency measures to be implemented to reduce any exceedances of relevant performance indicators or criteria and include a timetable for implementation.	Section 5.5
Independent Air Quality Audit (IAQA)	
<p>Within three months of the commencement of earthworks and every three months thereafter until the completion of earthworks, the Applicant must commission and pay the full cost of an Independent Air Quality Audit to review the air quality performance of the Proposal. The IAQA must, and:</p>	Section 6.2
(a) be undertaken by a suitably qualified (i.e. CAQP and/or CEnv), experienced and independent expert whose appointment has been endorsed by the Planning Secretary;	
(b) analyse the performance of the CAQMP, including the TARP;	
(c) audit the performance of the CAQMP, including the TARP in achieving its objectives;	
(d) identify any deficiencies in the CAQMP including the TARP in achieving its objectives and propose changes to improve the performance of the CAQMP to achieve those objectives;	
(e) review the air quality monitoring and mitigation requirements and air quality monitoring data for the audit period;	
(f) analyse any incidents, non-compliances and complaints that occurred or were made during the audit period; and	
(g) if necessary, recommend and prioritise measures to improve the air quality controls on-site for subsequent stages of the earthworks program, such that sensitive receivers would be protected against adverse air quality impacts from the Proposal.	
<p>Within 6 weeks of the completion of the IAQA, the Applicant must submit a copy of the audit report to the Planning Secretary with a response to any recommendations contained in the audit report. The response must include a timeframe for implementing the recommendations of the IAQA.</p>	Section 6.2

Indicative Conditions	Report reference
Air Quality Discharges	
The Applicant must install and operate equipment in line with best practice to ensure that the Proposal complies with all load limits, air quality criteria/air emission limits and air quality monitoring requirements as specified in the Protection of the Environment Operations (Clean Air) Regulation 2022 (NSW).	Section 5

3.4. NSW Approved Methods

State air quality guidelines adopted by the NSW Environment Protection Authority (NSW EPA) are published in the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (Approved Methods (NSW EPA, 2022)). The Approved Methods lists the statutory procedures and techniques that are to be used to model and assess emissions of criteria air pollutants from stationary sources across NSW.

The criteria listed in Section 7.1 and Section 7.2 of the Approved Methods are derived from a range of sources (including National Health and Medical Research Council (NHMRC), National Environment Protection Council (NEPC), Department of Environment (DoE), World Health Organisation (WHO), and Australian and New Zealand Environment and Conservation Council (ANZECC)).

It is noted that the primary pollutants of concern associated with the construction of the Proposal are as follows:

- PM₁₀;
- PM_{2.5};
- TSP; and
- Deposited dust.

The impact assessment criteria for the abovementioned pollutants as set out in Section 7.1 of NSW EPA (2022) are presented in Table 6 below. The standards applicable to the monitoring to be undertaken through this CAQMP are highlighted.

Table 6 NSW EPA Approved Methods - impact assessment criteria

Pollutant	Averaging period	Units	Criterion	Notes
Particulates (as PM ₁₀)	24 hours	µg·m ⁻³ (A)	50	Numerically equivalent to the Ambient Air Quality National Environment Protection (AAQ NEPM) ^(B) standards and goals.
	Annual	µg·m ⁻³	25	
Particulates (as PM _{2.5})	24 hours	µg·m ⁻³	25	
	Annual	µg·m ⁻³	8	
Particulates (as TSP)	Annual	µg·m ⁻³	90	

Pollutant	Averaging period	Units	Criterion	Notes
Particulates (as dust deposition)	Annual ^(C)	$\text{g}\cdot\text{m}^{-2}\cdot\text{month}^{-1}$	2	Assessed as insoluble solids as defined by AS 3580.10.1
	Annual ^(D)	$\text{g}\cdot\text{m}^{-2}\cdot\text{month}^{-1}$	4	

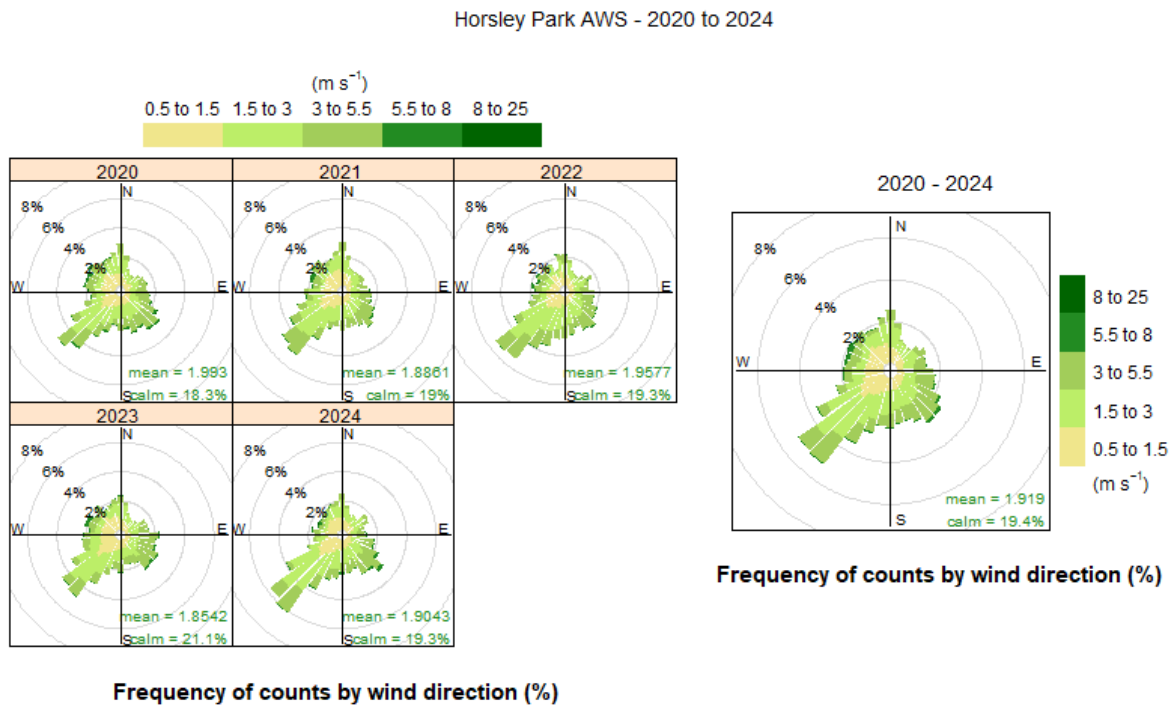
- Notes:**
- (A): micrograms per cubic metre of air
 - (B): National Environment Protection (Ambient Air Quality) Measure
 - (C): Maximum increase in deposited dust level
 - (D): Maximum total deposited dust level

4. EXISTING CONDITIONS

4.1. Meteorology

The meteorology of the area surrounding the Proposal site was characterised in the AQIA submitted in support of the SSD Application (Northstar, 2025) through the use of observations collected by the Australian Government Bureau of Meteorology (BoM) at the Horsley Park Equestrian Centre Automatic Weather Station (AWS) located approximately 6.2 kilometres (km) from the Proposal site. Wind roses showing the frequency of wind speed and direction from 2020 to 2024 are shown in Figure 6.

Figure 6 Annual wind roses Horsley Park Equestrian Centre AWS (2020 to 2024)



The wind roses indicate that from 2020 to 2024, winds at Horsley Park Equestrian Centre show similar patterns across the years, with a predominant south-westerly wind direction.

The majority of wind speeds experienced at the Horsley Park Equestrian Centre AWS between 2020 and 2024 are generally in the range 0.5 meters per second (m·s⁻¹) to 5.5 m·s⁻¹ with the highest wind speeds (greater than 8 m·s⁻¹) occurring from north-westerly directions. Winds of this speed are rare and occur during 0.1 % of the observed hours during the years. Calm winds (less than 0.5 m·s⁻¹) are more common and occur during 19.4 % of hours across the years.

For context in relation to construction dust, the predominant south-westerly wind direction observed at the Horsley Park Equestrian Centre AWS (refer Figure 6) indicates that sensitive receptors to the northeast of the site would be likely to be impacted more often than other receptor locations.

4.2. Air Quality

The air quality of the area surrounding the Proposal site was characterised in the in the AQIA submitted in support of the SSD Application (Northstar, 2025) through the use of observations collected at the Air Quality Monitoring Station (AQMS) located at St Marys operated by the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW).

Particulate matter (as PM_{10} and $PM_{2.5}$) data for the period covering 2020 to 2024 are presented in Figure 7 and Figure 8 respectively. These data indicate that that particulate matter concentrations were significantly higher than the NSW EPA criteria in early 2020. This was predominantly driven by exceptional weather events such as drought conditions and bushfires (NSW DPIE, 2021). The relative frequency of the measured PM_{10} and $PM_{2.5}$ are presented in Figure 9

It is noted that the monitoring program to be adopted for the construction phase of the Proposal as outlined in Section 5 includes real-time monitoring of particulate matter. Correspondingly, the historical data collected at St Marys AQMS presented below would not be considered as part of that monitoring program. However, it has been provided to provide a characterisation of the background air quality environment without consideration of potential impacts generated from the Proposal. For context, it is noted that the area surrounding the Proposal is periodically affected by regional events such as drought conditions and bushfires.

Figure 7 PM_{10} measurements, St Marys 2020-2024

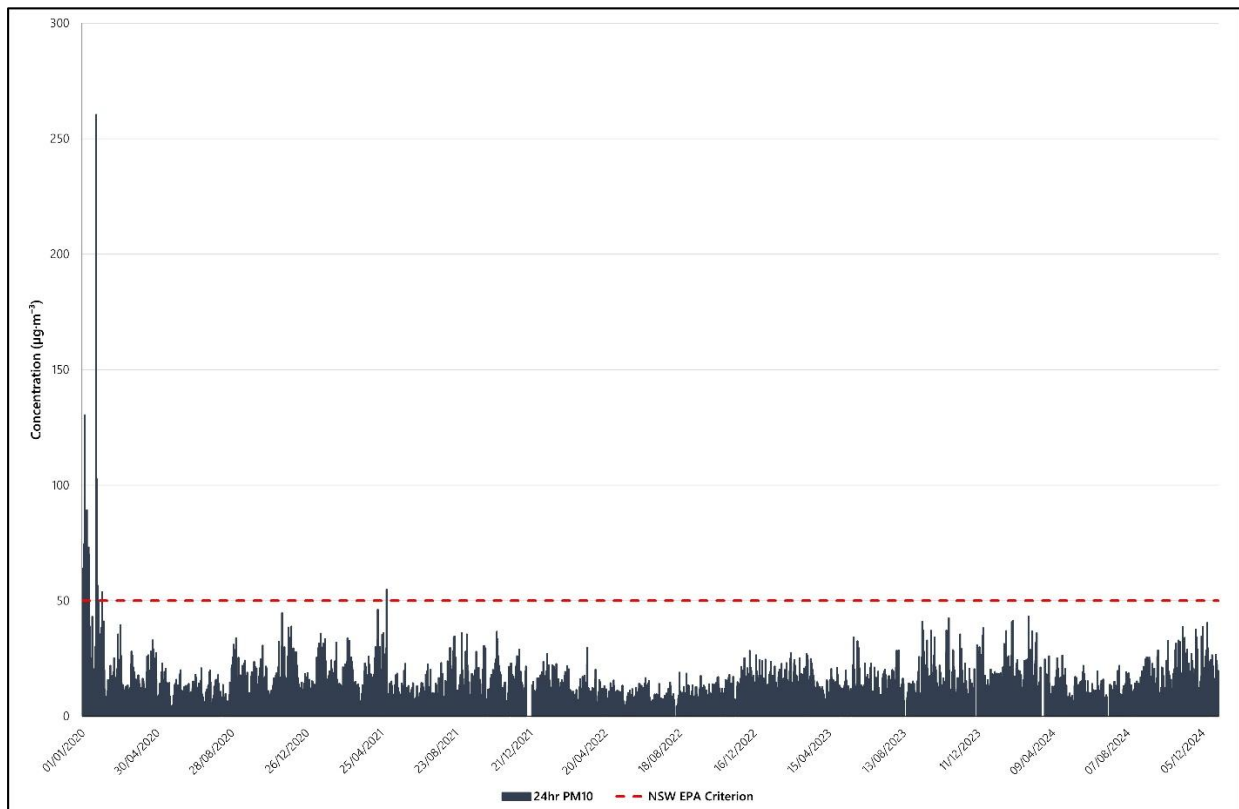


Figure 8 PM_{2.5} measurements, St Marys 2020-2024

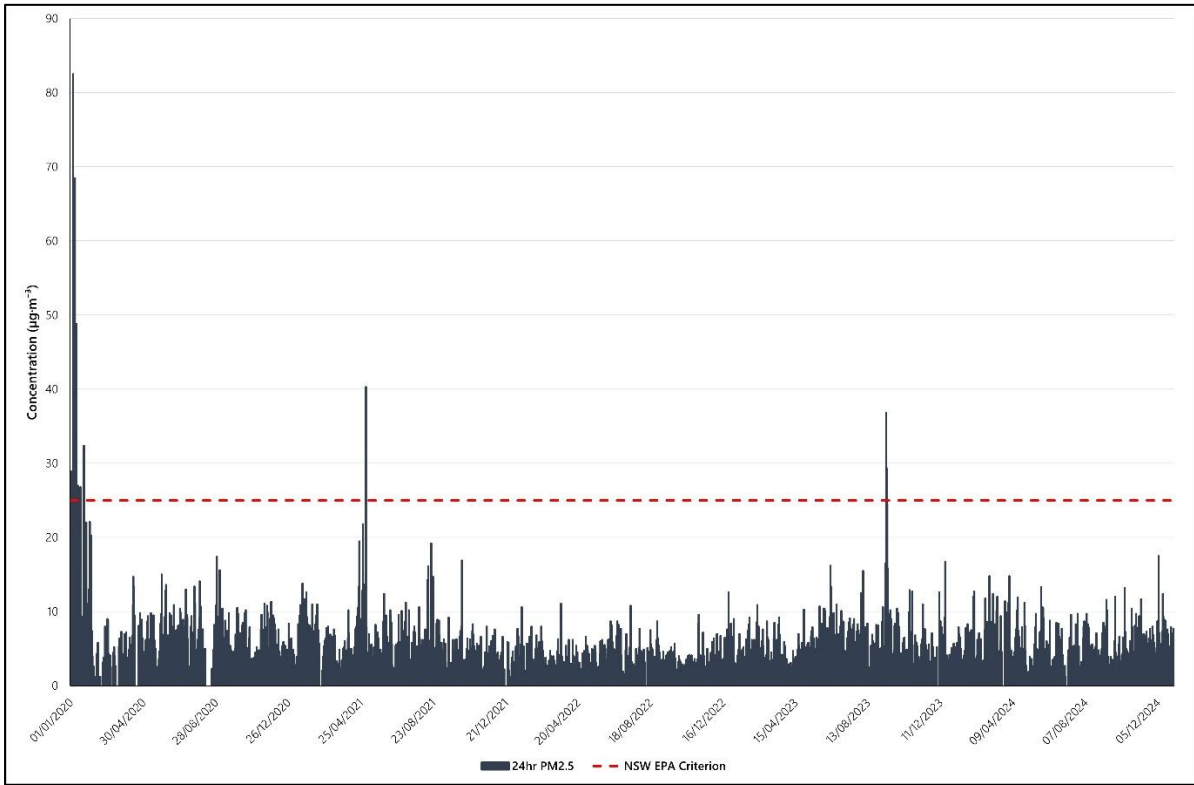
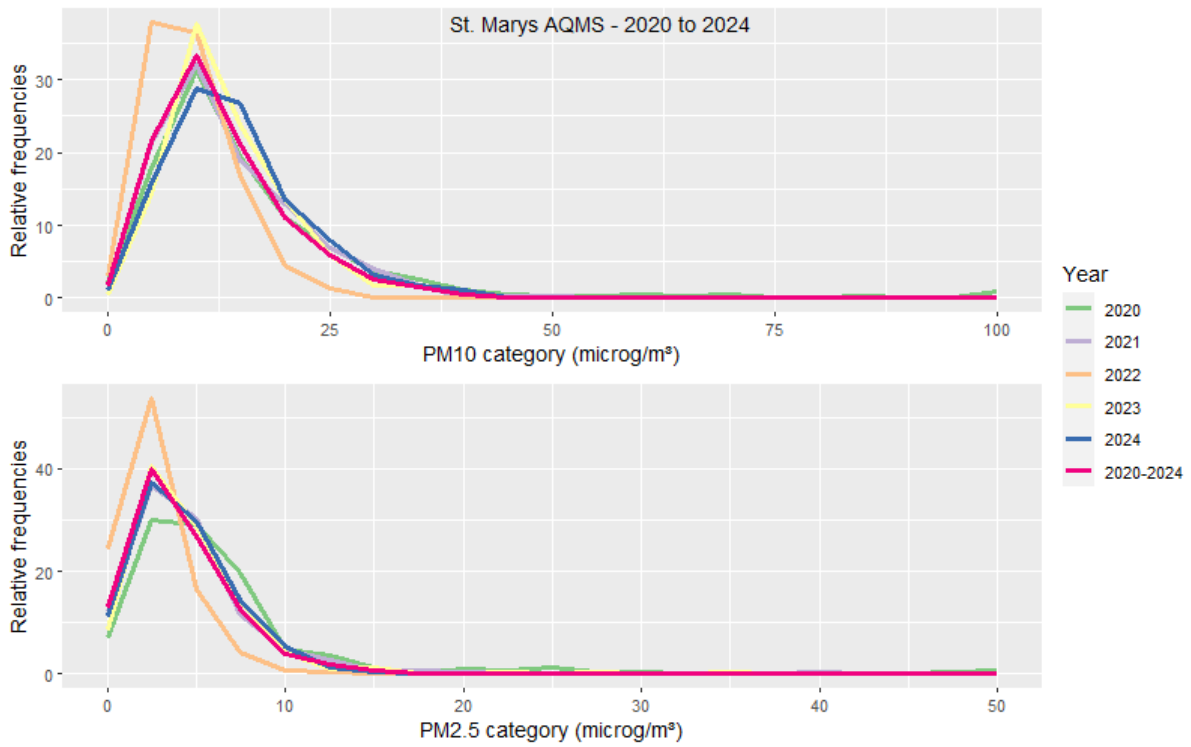


Figure 9 PM₁₀ and PM_{2.5} measurements, St Marys 2020-2024



5. AIR QUALITY MANAGEMENT

The air quality management measures to be adopted during the construction of the Proposal have been determined through the quantification of emissions and the identification of major emissions sources as outlined in Section 2.4. Measures have also been identified through review of the indicative Approval Conditions (see Section 3.3), (NSW EPA, 2022) and (IAQM, 2024).

Key performance indicators (KPI) for the Proposal are provided in Section 1.1. For the CAQMP as a whole, the following is provided, as required by the indicative Approval Conditions:

- Monitoring method.
- Location, frequency and duration of monitoring.
- Record keeping.
- Reporting to the Environmental Representative.
- Complaints register.
- Response procedures.
- Compliance monitoring.

5.1. Objectives

The objectives of the CAQMP are:

To manage air emissions during construction phase activities on site to minimise the potential for:

- Non-compliance with the 24-hour PM_{10} criterion of $50 \mu g \cdot m^{-3}$ (see Section 3.4);
- Non-compliance with the indicative conditions (see Section 3.3);
- Dust nuisance complaints;
- Visible dust plumes at or beyond the boundaries of the Proposal site;
- Excessive dirt track-out onto public roads.

5.2. Key Performance Indicators

As previously outlined, the key objectives of the CAQMP are to ensure that impacts to air quality associated with the Proposal are minimised and within the scope permitted by the Approval. To achieve these objectives, the summarised targets in Table 1 (replicated in Table 7) have been proposed for the management of air quality impacts during construction as follows.

Table 7 KPI's associated with the management of air quality

Measure	Target / KPI	Timeframe	Responsibility	Documentation
Air quality monitoring indicates triggers activated	<ul style="list-style-type: none"> Any triggers of air quality monitoring actioned immediately. Review controls applied and increase controls or modify activities 	At all times	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
Visible dust emissions leaving the site boundary	<ul style="list-style-type: none"> Any emissions of visible dust leaving the site boundary investigated immediately Review controls applied and increase controls or modify activities 	At all times	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
Spillage or track out onto public roads	<ul style="list-style-type: none"> Any spillage or track out on public roads to be cleaned immediately 	At all times	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
Maintenance of all plant and equipment used on site in a proper and efficient condition Operation of all plant and equipment used on site in a proper and efficient manner	<ul style="list-style-type: none"> All plant and equipment to be maintained in accordance with manufacturer specifications All plant and equipment to be operated efficiently 	At all times	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
Complaints regarding air quality	<ul style="list-style-type: none"> Zero validated complaints Any complaints would be investigated (see Section 5.5) 	At all times	Site supervisor	Complaints register
Meeting Project Approval Conditions regarding air quality	<ul style="list-style-type: none"> Compliance with conditions 	At all times	Site supervisor	Environmental inspection checklist Construction Compliance Report

Air quality impacts during construction are anticipated to be minor and manageable through the implementation of the control measures outlined in Section 5.4. The success of the CAQMP would, in part, be determined through compliance with the KPIs outlined above. To ensure that the Proposal is operated in accordance with the anticipated Approval Conditions, real-time monitoring is proposed at four locations on

the boundary of the Proposal site, for the duration of works. A description of the proposed monitoring program is outlined in Section 5.3.

5.3. Trigger Action Response Plan (TARP)

A Trigger Action Response Plan (TARP) has been developed as part of the CAQMP, which describes the actions to be taken when specific triggers are exceeded. Intrinsic components of the TARP include:

- Real-time PM₁₀ monitoring, with short-term (60-min average) triggers;
- Real-time visible dust plume observations at or beyond the boundary of the Proposal site;
- Reactive controls in anticipation of conditions likely to give rise to increased rates of dust generation and/or propagation; and
- Reactive controls in anticipation of on-site activities that are likely to give rise to increased rates of dust generation and/or propagation.

The monitoring program is designed to enable and facilitate proactive modification of site activities to ensure that unacceptable air quality impacts are not experienced at surrounding receptor locations. In conditions when the background particulate environment is significantly affected by external sources (such as dust storms or bushfire), then modification of activities may not result in any meaningful reductions in off-site impacts associated with the activities on site. However, the TARP has been designed to enable proactive control of the Proposal impact in all conditions and includes wind speed triggers to allow modification of activities in increasing wind speeds.

It is important to note that whilst the TARP is designed to provide alerts to site personnel when short-term particulate concentrations are elevated and likely to be associated with site activities, it is the responsibility of the site personnel to actively identify what the potential causes of those elevated particulate concentrations might be. The air quality monitoring data can only provide the magnitude of any short-term elevated impacts, but cannot identify the source of those impacts, and therefore, an understanding of the activities being performed on site throughout the day is the responsibility of site personnel (daily inspections), which provides areas where additional mitigation measures can be applied to result in the greatest reductions in emissions. The TARP is not designed to be a 'set and forget' system, nor is it a 'one size fits all' approach. The value of the system relies on the selection of the most appropriate mitigation measures, and this CAQMP seeks to provide guidance in that respect.

5.3.1. Monitoring Network

Continuous real-time PM₁₀ data would be collected by the network and provided as 60-minute average values. To meet the objectives of the TARP, 24-hour and long-term (i.e. annual) averages will be obtained. The siting of air quality monitoring would be in accordance with AS 3580.1.1 'Methods for sampling and analysis of

ambient air, Guide to siting air monitoring equipment', as far as practicable, taking into account the objectives of the CAQMP and site constraints.

Continuous real-time meteorological monitoring will be informed to provide site-specific identification of prevailing meteorological conditions that may require the review of activities and/or provision of additional controls. Siting of meteorological monitoring would be performed with reference to AS 3580.14 'Methods for sampling and analysis of ambient air, Meteorological monitoring for air quality monitoring applications', as far as practicable, and taking into account the objectives of the CAQMP and site constraints.

The locations of the air quality and meteorological monitors have been (indicatively) selected to allow the incremental (i.e. construction related) PM_{10} concentration to be calculated in a range of wind directions, taking into account the locations of emissions sources, surrounding sensitive receptor locations and prevailing meteorology. On-site constraints may require the adjustment of the monitoring locations to better meet the requirements of AS 3580.1.1 and AS 3580.14 where feasible.

The monitoring network would consist of a total of five monitors, including three monitors located along the site boundary (M3, M4 and M5), and two monitors at sensitive receptor locations, to allow for the estimation of upwind/downwind impact in all wind directions. A map showing the location of the monitoring equipment is presented in Figure 10.

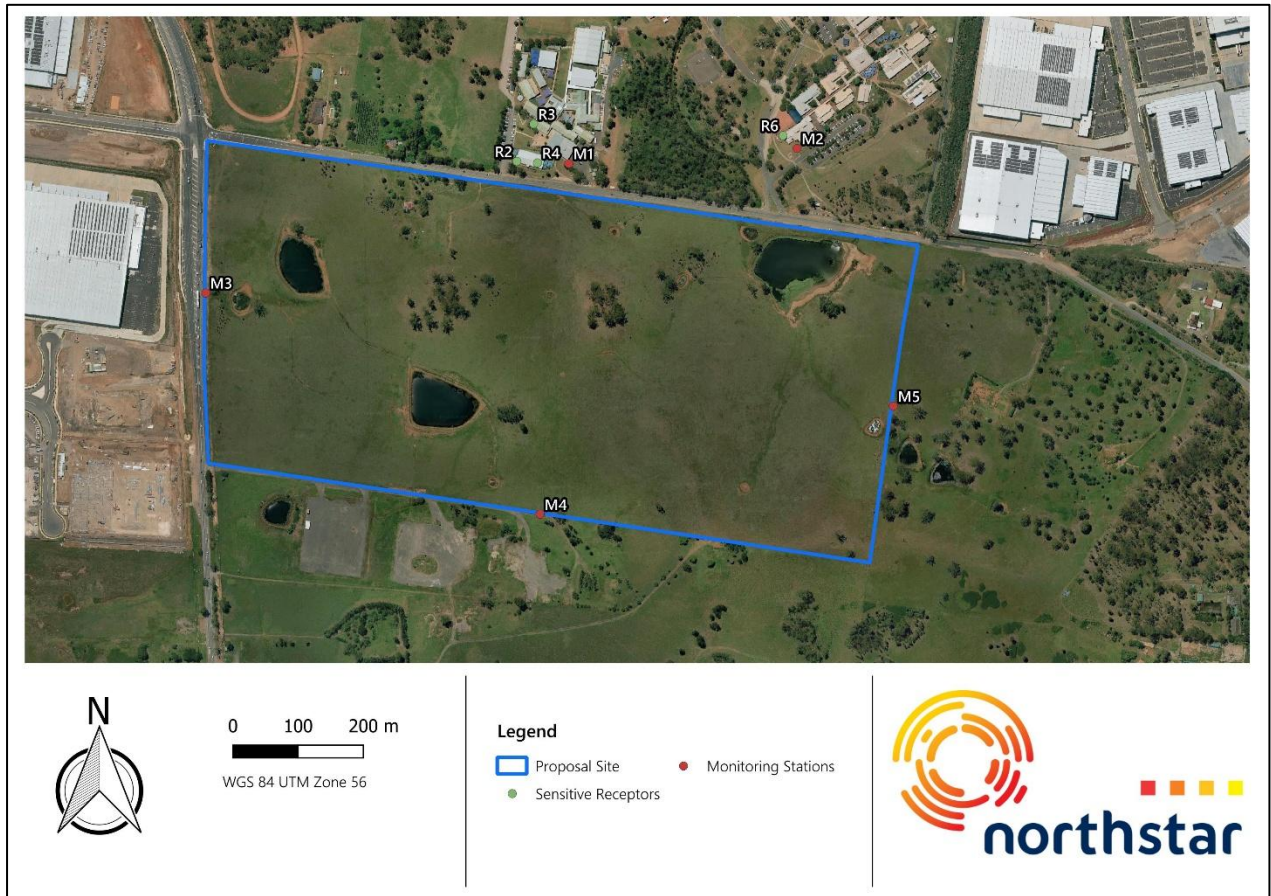
It is noted that non-boundary monitoring locations at receptors R4 and R6 (as identified within the AQIA (Northstar, 2025), identified as monitors M1 and M2 (refer Figure 10).

In case any of the monitors (i.e. M1, M2, M3, M4 or M5) reach trigger values, analysis of wind conditions can inform whether the Proposal site is responsible for high downwind concentrations. For this purpose, wind speed and direction would be measured at one location (nominally location M1).

It is anticipated that generally winds from the south are likely to contribute towards the dust and particulate impacts at the nearest residential receptors to the north of the Proposal site.

It is additionally noted that the relocation of the monitoring stations may be required to respond to changing on-site activities.

Figure 10 Location of monitoring equipment (indicative)



Source: Northstar

The air quality monitoring method / equipment supplier has not yet been selected, although it is recommended that portable, non-mains powered methods would be most suitable, due to its flexibility for use in various locations. Such monitoring systems can often measure several size fractions simultaneously (i.e. PM₁₀, PM_{2.5} and PM₁), in real-time. The range, resolution and accuracy of the selected monitoring system should be as presented in Table 8, where possible.

Table 8 Air quality monitoring parameters, range, resolution and accuracy

Parameter	Range	Resolution	Accuracy
PM ₁₀	0 – 1 000 µg·m ⁻³	1 µg·m ⁻³	±10 % (< 500 µg·m ⁻³)

Wind speed and direction would be measured at one location (nominally location M1). The range, resolution and accuracy of any wind speed and direction measurements would be as outlined in Table 9, where possible.

Table 9 Meteorological monitoring parameters, range, resolution and accuracy

Parameter	Range	Resolution	Accuracy
Wind speed	0 – 60 m·s ⁻¹	0.01 m·s ⁻¹	±0.1 m·s ⁻¹
Wind direction	0 – 360°	1°	±2°

Wind speed and wind direction monitoring would be performed at 10 m AGL, in accordance with best practice.

5.3.2. Trigger Levels

5.3.2.1. Reactive Controls

Table 10 outlines the tiered trigger levels which allows an appropriate management response / action associated with increasing risk of off-site dust impacts. A hierarchy of management and mitigation options would be initiated should the trigger levels be reached. To allow an appropriate management response / action associated with increasing risk of off-site particulate impacts, a 'traffic light' system is proposed, adopting a cascading action level.

Where the measured 1-hour average PM_{10} concentration is greater than $50 \mu\text{g}\cdot\text{m}^{-3}$ at any monitoring station, the Down-Wind Increment (DWI) will be calculated to determine the calculated 'site contribution'.

It is noted that there may be instances where the 1-hour PM_{10} concentration is greater than or equal to $50 \mu\text{g}\cdot\text{m}^{-3}$, but the DWI cannot be calculated (due to lack of data collection or when, based on wind direction, there is no suitable downwind monitor). It is recommended that in this instance, a secondary trigger based on wind speed should be adopted as presented in Table 10.

Additionally, action responses associated with each trigger level are also outlined in Table 10 to identify dust generating activities and apply emissions control methods adopted for the Proposal, as specified in Section 5.4.

The triggers, the implemented checks and observations and the implemented responses will be recorded in the Daily Log.

For clarity, the action responses for each trigger level would require the Site Supervisor to review all activities occurring at the Proposal to identify which emission sources may be contributing to elevated dust concentrations. For the purposes of this TARP, emission sources have been disaggregated into the following categories:

- Wind erosion;
- Materials processing;
- Materials handling; and
- Haulage.

Given that various emissions sources may contribute to elevated dust concentrations on separate occasions, the TARP has been designed so that emissions controls may be deployed with consideration of the dust generating activities occurring at the Proposal during different phases of construction. Therefore, the control methods outlined in Section 5.4 have been assigned an emission source category in accordance with the

categories listed above. In some cases, control methods may act to reduce emissions associated with all categories and as such, those have been labelled as control methods for 'all sources'.

Table 10 Trigger levels

Action level	Primary trigger	Secondary trigger	Action response
None	Concentration at any monitor $< 50 \mu\text{g}\cdot\text{m}^{-3}$ <i>and</i> No visible dust observed leaving the site boundary	Measured or forecast wind speeds $< 5.4 \text{ m}\cdot\text{s}^{-1}$ ($< 19.4 \text{ km}\cdot\text{hr}^{-1}$)	<ul style="list-style-type: none"> No response required beyond the continued implementation of standard dust controls.
Action 1	Concentration at any monitor $\geq 50 \mu\text{g}\cdot\text{m}^{-3}$ <i>and</i> 1-hour average DWI $< 5 \mu\text{g}\cdot\text{m}^{-3}$ <i>or</i> Visible dust observed leaving the site boundary	Measured or forecast wind speeds $\geq 5.5 \text{ m}\cdot\text{s}^{-1}$ ($\geq 19.8 \text{ km}\cdot\text{hr}^{-1}$)	<ul style="list-style-type: none"> Review activities being performed and determine through a visual inspection which activities may be generating elevated dust emissions. Determine whether any additional emission controls (refer to Table 11) can be applied to those activities. Apply additional emission controls appropriate to the identified activities. For example: <ul style="list-style-type: none"> Deploy water carts to haulage routes if wheel generated dust is visibly observed. Cover stockpiles if wind erosion is observed. Closely monitor PM_{10} to determine DWI.
Action 2	Concentration at any monitor $\geq 50 \mu\text{g}\cdot\text{m}^{-3}$ <i>and</i> 1-hour average DWI $\geq 5 \mu\text{g}\cdot\text{m}^{-3}$ and $< 10 \mu\text{g}\cdot\text{m}^{-3}$ <i>or</i> Visible dust observed leaving the site boundary <i>or</i> Receipt of a justified complaint	Measured or forecast wind speeds $\geq 6.8 \text{ m}\cdot\text{s}^{-1}$ ($\geq 24.5 \text{ km}\cdot\text{hr}^{-1}$)	<ul style="list-style-type: none"> Review activities being performed and determine through a visual inspection which activities may be generating elevated dust emissions and reduce rate of activity. Increase the rate of emission control (refer Table 11) where appropriate for example: <ul style="list-style-type: none"> Increase water supply to sprinkler during crushing activities. Further reduce speed limits for vehicles and plant on unpaved surfaces. Further minimise drop heights from trucks and plant during unloading. Closely monitor PM_{10} to determine DWI.

Action level	Primary trigger	Secondary trigger	Action response
Action 3	Concentration at any monitor $\geq 50 \mu\text{g}\cdot\text{m}^{-3}$ <i>and</i> 1-hour average DWI $> 10 \mu\text{g}\cdot\text{m}^{-3}$ <i>or</i> Visible dust observed leaving the site boundary <i>or</i> Receipt of a justified complaint	Wind speeds $\geq 8 \text{ m}\cdot\text{s}^{-1}$ ($\geq 28.8 \text{ km}\cdot\text{hr}^{-1}$)	<ul style="list-style-type: none"> Review activities being performed and determine through a visual inspection which activities may be generating elevated dust emissions. Temporarily cease operations associated with those activities such as crushing, excavation or haulage. Closely monitor PM_{10} to determine DWI.

5.3.2.2. Proactive Controls

Daily meteorological forecasts will be reviewed to identify any conditions likely to give rise to the potential for elevated dust generation and propagation. In the instance of forecast wind speeds exceeding the triggers outlined in Table 10, such conditions will be recorded in the Daily Log, and additional controls, particularly the watering of haulage routes and stockpiles considered.

Similarly, in the event that the planned activities are likely to give rise to atypically significant dust generation, such as bulk earthworks, such conditions will be recorded in the Daily Log, and additional controls focussed upon those activities considered.

In either instance, the reactive controls outlined in Section 5.3.2.1 will be applied with increased scrutiny.

5.3.3. Daily Log

The performance of the TARP (refer Table 10) will be recorded in the Daily Log. The daily records will include (as a minimum) the following information:

- **Triggers:** Details of trigger level(s) exceeded and associated action level(s);
- **Triggers:** Observations, including visible dust plumes at or beyond the boundary of the Proposal site;
- **Triggers:** Daily forecasts of meteorological conditions likely to give rise to elevated dust generation or propagation;
- **Triggers:** Daily forecasts of on-site activities likely to give rise to elevated dust generation or propagation;
- **Action:** Contributing factors of the towards exceedance of trigger level (e.g. activities occurring on-site, wind speed and direction). Photographs of the site immediately following trigger level exceedance would assist in further assessment;
- **Response:** Additional emission control measure(s) implemented; and
- **Response:** Review of DWI PM₁₀ concentrations following the implementation of emission control measures to determine impacts are reduced to acceptable levels i.e. PM₁₀ concentrations indicate additional controls are no longer required, or whether controls need to be escalated.

5.4. Emission Control Measures

The emission control measures to be employed at the Proposal site during construction are outlined in Table 11. These are categorised to allow the Site Supervisor to easily select additional measures for implementation, or increase the rate of application if already implemented, should the TARP triggers require (refer Table 10).

Table 11 Air quality management measures adopted during Proposal construction

ID	Control measure	Reference	Responsibility	Monitoring/audit/inspection
Wind Erosion				
AQ1	Watercarts and handheld water sprays on site to control dust, especially on exposed surfaces and stockpiles	Section 2.4	Site supervisor	Environmental inspection checklist Site supervisor’s daily checklist
AQ2	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist
AQ3	Keep site fencing, barriers and scaffolding clean using wet methods.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor’s daily checklist
AQ4	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor’s daily checklist
AQ5	Cover, seed, or fence stockpiles to prevent wind erosion.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor’s daily checklist
AQ6	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor’s daily checklist
AQ7	Bag and remove any biological debris or damp down such material before demolition.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor’s daily checklist
AQ8	Ensure sand and other aggregates are stored in banded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor’s daily checklist
AQ9	Exposed surfaces and stockpiles are suppressed by regular watering or other alternative suppression method.	Approval Conditions	Site supervisor	Environmental inspection checklist Site supervisor’s daily checklist

ID	Control measure	Reference	Responsibility	Monitoring/audit/inspection
AQ10	Land stabilisation works are carried out progressively on-site to minimise exposed surfaces.	Approval Conditions	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ11	Progressive stripping of site ahead of workface to limit the amount of exposed surface.	-	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ12	Dust suppressant / hydromulching to areas where final level achieved.	-	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ13	Sediment and erosion controls as per civil design and Blue Book.	-	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
Materials Processing				
AQ15	Only use cutting, grinding, or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g., suitable local exhaust ventilation systems.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
Materials Handling				
AQ16	Minimise drop heights from truck dumping to 1.5 m.	Section 2.4	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ17	Use enclosed chutes and conveyors and covered skips.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ18	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ19	Avoid dry sweeping of large areas.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist
Haulage				

ID	Control measure	Reference	Responsibility	Monitoring/audit/inspection
AQ20	Watercarts and handheld water sprays on site to control dust, especially on exposed surfaces and stockpiles.	Section 3.4	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ21	Ensure all vehicles switch off engines when stationary - no idling vehicles.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist
AQ22	Impose and signpost a maximum-speed-limit of 25 km·h ⁻¹ on surfaced and 15 km·h ⁻¹ on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate. Speed limits should also be verbally communicated during construction meetings.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ23	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ24	Use water-assisted dust sweeper(s) on the access and local roads to remove, as necessary, any material tracked out of the site.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist
AQ25	Ensure vehicles entering and leaving the site are covered to prevent escape of materials during transport.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ26	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ27	Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	(IAQM, 2024)	Site supervisor	Construction Compliance Report Environmental inspection checklist Site supervisor's daily checklist

ID	Control measure	Reference	Responsibility	Monitoring/audit/inspection
AQ28	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	(IAQM, 2024)	Site supervisor	Construction Compliance Report
AQ29	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the exit, wherever site size and layout permits.	(IAQM, 2024)	Site supervisor	Construction Compliance Report
AQ30	All trucks entering or leaving the site with loads have their loads covered.	Approval Conditions	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ31	Trucks associated with the Proposal do not track dirt onto the public road network.	Approval Conditions	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ32	Public roads used by these trucks are kept clean.	Approval Conditions	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ33	Street sweeping where required.	-	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ34	Truck wash at exit.	-	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
All Sources				
AQ35	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist
AQ36	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/ mitigation, using non-potable water where possible and appropriate.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist

ID	Control measure	Reference	Responsibility	Monitoring/audit/inspection
AQ37	Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ38	Access gates to be located at least 10 m from receptors where possible.	(IAQM, 2024)	Site supervisor	Construction Compliance Report
Administrative				
AQ39	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	(IAQM, 2024)	Site supervisor	Construction Compliance Report
AQ40	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.	(IAQM, 2024)	Site supervisor	Construction Compliance Report
AQ41	Display the head or regional office contact information.	(IAQM, 2024)	Site supervisor	Construction Compliance Report
AQ42	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the relevant regulatory bodies.	(IAQM, 2024)	Note: this document fulfills this measures	
AQ43	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist
AQ44	Make the complaints log available to the local authority when asked.	(IAQM, 2024)	Site supervisor	Construction Compliance Report
AQ45	Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist

ID	Control measure	Reference	Responsibility	Monitoring/audit/inspection
AQ46	Hold regular liaison meetings with other high-risk construction sites within 500 m of the site boundary, to ensure plans are coordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes.	(IAQM, 2024)	Site supervisor	Construction Compliance Report
AQ47	Undertake daily on-site and off-site inspections where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of site boundary.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ48	Carry out regular site inspections to monitor compliance with the CAQMP / CEMP, record inspection results, and make an inspection log available to the local authority when asked.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist
AQ49	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ50	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist
AQ51	Avoid site runoff of water or mud after treatment and cleaning.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ52	Ensure all on-road vehicles comply with relevant vehicle emission standards, where applicable.	(IAQM, 2024)	Site supervisor	Construction Compliance Report
AQ53	Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable.	(IAQM, 2024)	Site supervisor	Construction Compliance Report

ID	Control measure	Reference	Responsibility	Monitoring/audit/inspection
AQ54	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	(IAQM, 2024)	Site supervisor	Construction Compliance Report
AQ55	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	(IAQM, 2024)	Site supervisor	Construction Compliance Report
AQ56	Avoid bonfires and burning of waste materials.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ57	Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ58	Avoid explosive blasting, using appropriate manual or mechanical alternatives.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ59	Record all inspections of haul routes and any subsequent action in a site log book.	(IAQM, 2024)	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist
AQ60	Inspect all plant and equipment regularly to ensure that it is maintained in accordance with manufacturers specifications.	-	Site supervisor	Environmental inspection checklist
AQ61	Inspect the operation of all plant and equipment to ensure that it is being operated in a proper and efficient manner.	-	Site supervisor	Environmental inspection checklist Site supervisor's daily checklist

5.5. Complaints Register

The Developer will operate a telephone complaint register during the operating hours of the Proposal site during construction, with the number publicly notified via the Developer's website. All complaints must be investigated, and feedback will be provided to the complainant or the pertinent agency in a timely manner.

For any complaint received relating to air quality impacts from the construction activities, the following measures will be taken:

- Site Supervisor to review and follow up all the complaints regarding dust within one business day of receiving the complaint.
- Fill out the appropriate complaint form, including location of complaint and noting the time and date of the complaint/s and the identity and contact details of the complainant (if agreed to provide them).
- Perform a site inspection, noting all dust producing activities taking place and the mitigation methods being used. If the complaint was related to an event in the recent past, if possible, note any dust or odour producing activities that were underway at that time and initiate any remedial action necessary.
- As soon as possible, visit the area from where the complaint originated to ascertain if the issue persists.
- It is important to verify if another source of dust other than the construction activities of the project is causing the complaint and collect appropriate evidence of this (photos and/or videos as appropriate).
- Once investigations have been completed, contact the complainant to explain any problems found and remedial actions taken.
- If necessary, update any relevant procedures to prevent any recurrence of problems and record any remedial action taken.

5.5.1. Record Keeping

The Site Supervisor will be required to keep a record of any complaints made to the Proposal site by any person(s) with regard to air quality and dust emissions that may be fugitively released during construction. A complaint register will be maintained and will be produced to any NSW EPA authorised officer, if requested.

Records of individual complaints will include:

- Date and time of complaint.
- Method by which the complaint was made.
- Personal details of the complainant (if provided).
- Nature of the complaint.

- The details of an initial response to the complaint.
- Action taken and any follow up actions.
- If no action was taken, the reason why no action was taken.
- Weather conditions corresponding to the time of the complaint will also be noted in the logbook for assessment purposes.

5.6. Contingency Plan

A contingency plan to manage any unpredicted impacts and their consequences is required to ensure that ongoing impacts reduce to levels below the impact assessment criteria as quickly as possible.

It is considered that the requirement for a contingency plan is fulfilled by the implementation of the TARP as outlined in Section 5.3.

5.7. Training

All personnel, including employees, contractors, and sub-contractors, are required to complete a project induction containing relevant environmental information before they are authorised to work on the Proposal.

Air quality specific information to be covered in the project induction will include:

- Obligations under the anticipated Proposal Approval Conditions including the CAQMP, the identification of potential sources of air pollutants of concern, and relevant mitigation measures (e.g., use of water, cover exposed areas) during weather conditions where high levels of dust are probable;
- Responsibilities relating to the management of air quality under the POEO Act and POEO CAR;
- Typical construction activities that may impact air quality and associated environmental safeguards; and
- Incident response procedures.

6. REVIEW AND IMPROVEMENT

A daily inspection of the Proposal site will be performed by the Site Supervisor and will include relevant checks to ensure that the air quality management measures outlined in Table 11 are achievable. Any identified remedial actions will be promptly addressed and recorded in the Daily Log (see Section 5.3.3).

Visual monitoring of dust emissions will be performed through the daily site inspection and visible observations by the Site Supervisor and site workers. The dust control observations will be made during the morning and repeated as required to adequately account for changing conditions. The Daily Log will be used to record each day's visible dust plume observations, noting any potential sources that may change due to changing conditions or require further observation.

If conditions change significantly on-site subsequent to the performance of the daily check, further 'ad-hoc' checks will also be performed and documented in the same manner.

Training of staff and contractors will include dust management as outlined in Section 5.7.

Through observations made during the site check, or through notification by staff or contractors, the Site Supervisor will have the authorisation to review operations performed on-site and alter site activities and/or additional controls necessary to effectively manage those risks.

Key Performance Indicators for the construction of the Proposal would be associated with the triggers in Table 7.

6.1. Incidents, Non-Compliance, Corrective and Preventive Action

Environmental inspection and observation results are interpreted to identify actual and potential non-conformances and events that may result in nuisance, environmental harm and unacceptable loss of amenity or community complaints. The Environmental Representative and / or a public regulatory authority may also raise a non-compliance or improvement notice.

Where incidents / non-compliances are identified during regular inspections, corrective actions are raised, tracked, and closed out through the inspection records.

Following the identification of an incident / non-compliance, corrective and/or preventative actions will be identified and assigned to the appropriate person with set periods. Timeframes will be set to ensure any damage incurred is rectified and any chance of recurrence is eliminated as soon as practicable. An appropriate register will be used to assign, track and close out corrective actions.

6.2. Independent Air Quality Audit

As required by anticipated Proposal Approval Conditions (tbc), an independent air quality audit (IAQA) must be performed for the Proposal.

6.3. Reporting to the Environmental Representative

The Proposal will provide the Environmental Representative (ER) with all documentation requested to perform their functions, including:

- Air quality monitoring data; and
- Complaints data (as per Section 5.5).

As required by NSW DPHI, air quality monitoring results would be reviewed every three months in accordance with anticipated Proposal Approval Conditions (tbc).

6.4. Compliance with Statutory Requirements

This CAQMP has been provided to ensure that the Proposal will comply with statutory requirements associated with air quality. Specifically, compliance with the NSW EPA air quality standards outlined in Section 3.4 and the anticipated Proposal Approval Conditions (refer Section 3.3).

Correspondingly, if the Proposal fails to comply with statutory requirements, the CAQMP must be reviewed and updated.

6.5. CAQMP Review

This CAQMP will be reviewed and updated upon (in no order)

- Response to Conditions imposed through the Conditions of Approval, Environmental Protection Licence and/or review of the CAQMP
- Instruction from the relevant regulatory bodies to do so;
- Change in circumstances or activities that would need to be addressed in the CAQMP;
- Annual review and update.

7. REFERENCES

AT&L. (2025). *Mamre Road Data Centre Campus, Earthworks Strategy Report*.

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Katestone Environmental. (2011). *NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining*.

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air quality	Northstar specialises in all aspects of air quality, dust, and odour management, covering monitoring, modelling and assessment, due diligence and process specification, licencing and regulatory advice, peer review and expert witness.
environment	Our team has extensive experience in environmental management, covering environmental policy and management plans, licencing, compliance reporting, auditing, data, and spatial analysis.
sustainability	We look beyond compliance to add value and identify opportunities. Our services range from sustainability strategies, ecologically sustainable development reporting and assessment, to bespoke greenhouse gas and energy estimation and reporting.

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