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ALLIED PINNACLE FLOUR AND MAIZE MILL

PROPOSED MODIFICATION (DA-318-12-2004)

NOVEMBER 2021

PUBLIC

APPENDIX H

AIR QUALITY IMPACT ASSESSMENT

Allied Pinnacle Pty Ltd

Picton Warehouse Extension

Air Quality Impact Assessment

OCTOBER 2021

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Picton Warehouse Extension
Air Quality Impact Assessment

Allied Pinnacle Pty Ltd

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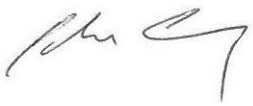
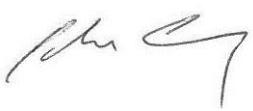
REV	DATE	DETAILS
A	30 September 2020	Draft report
0	6 October 2021	Final report

	NAME	DATE	SIGNATURE
Prepared by:	John Conway	6 October 2021	
Reviewed by:	Mark Tulau	6 October 2021	
Approved by:	John Conway	6 October 2021	

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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Glossary

AAQMS	Ambient Air Quality Monitoring Station
Air NEPM	National Environment Protection (Ambient Air Quality) Measure
AHD	Australian height datum
AWS	Automatic Weather Station
AQIA	Air Quality Impact Assessment
BOD	Biological oxygen demand
BoM	Bureau of Meteorology
CBD	Central business district
CO	Carbon monoxide
EPA	Environment Protection Authority
LGA	Local Government Area
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
PAHs	Polycyclic Aromatic Hydrocarbons
PM	Particulate Matter
$PM_{2.5}$	Particles with an aerodynamic of 2.5 micrometres or less
PM_{10}	Particles with an aerodynamic of 10 micrometres or less
SO_2	Sulphur dioxide
SVOCs	Semi-volatile organic compounds
TSP	Total suspended particulates
VOCs	Volatile organic compounds
WSP	WSP Australia Pty Limited
Units	
ºC	Degree Celsius
km	kilometre
km/h	kilometre per hour
m	Metre
mm	Millimetres
µg/m^3	Microgram per cubic meter

Executive summary

Allied Pinnacle Pty Ltd (Allied Pinnacle) is proposing an extension of its existing Allied Flour Mill in Maldon, NSW (the proposal) requiring a modification to the approved Development Application DA-318-12-2004. This qualitative Air Quality Impact Assessment (AQIA) report was prepared in support of an application for a modification of its existing facility to assess impacts for the construction and operation of the proposal.

The proposal will be constructed directly adjacent to the existing building at the north of the site allowing for an increased production of 3,900 tonnes per annum.

The existing facility is located off Picton Road in Maldon, NSW approximately 3 kilometres (km) south-east of the town of Picton. The facility is situated in a rural environment with the surrounding area comprising of single storey dwellings, small scale agriculture and Boral Cements approximately 500 metres (m) to the west.

The existing environment was characterised in respect of existing land uses, the nearest sensitive receptors, climate information, local meteorological and air quality conditions.

Climate statistical data collected at the Bureau of Meteorology (BoM) Camden Airport automatic weather station (AWS) was reviewed to evaluate the local meteorological conditions. Wind speed and wind direction for the past five years (2016 to 2020 inclusive) were analysed. The data indicates a range of wind directions at the AWS with south-westerly and southerly directions predominating across the five years, a high calm wind frequency of 29.2% and an average wind speed of 2.3 m/s.

The predominant land use of the area is agricultural with single storey dwellings scattered throughout the area. The National Pollutant Inventory (NPI) database review indicated there were fourteen industrial facilities within the Wollondilly Local Government Area (LGA), that reported emissions to the NPI for the 2018/2019 reporting period. These included the Boral Cement Ltd plant located approximately 630 m to the west of the proposal and likely to be a contributor to the local airshed. There are no other significant industrial sources of air emission near to the proposal site.

There is no nearby ambient air quality monitoring station (AAQMS) to the proposal. Ambient air monitoring data collected at Bargo, the nearest operational AAQMS to the proposal, approximately 13.4 km to the south-east. Ambient air monitoring data at the Bargo AAQMS for the past five years (2016 to 2020 inclusive) were analysed and are presented in this report as broadly representative of the proposal site. The results indicate that the annual average PM_{10} concentrations were compliant with the relevant *National Environment Protection (Ambient Air Quality) Measure 2016* (Air NEPM) standard, while there were multiple exceedances of the 24-hour average PM_{10} Air NEPM standards most likely due primarily to bushfires. Except for 2019, there was no exceedances of the annual $PM_{2.5}$ Air NEPM standard for all years analysed. Except for 2017, there were multiple exceedances of the 24-hour $PM_{2.5}$ Air NEPM standard for the years 2018 to 2020, with a maximum of 20 daily exceedances in 2019 due to bushfire smoke. Overall, the air quality at the Bargo AAQMS is broadly representative of that experienced at the proposal site.

Sensitive receptors in the vicinity of the proposal were identified including five residential, one commercial and two industrial receptors. The nearest residential receptor is located approximately 440 m to the south-east of the proposal.

The main types of emissions likely to be generated during construction included dust and combustion emissions from the following sources:

- dust from site establishment and demolition works
- dust from excavations and earthworks,
- dust construction of buildings
- dust from vehicle movements on paved and unpaved roads/routes
- dust from wind erosion from exposed areas and stockpiles
- combustion emissions of engine fuel associated with on-site plant, equipment and vehicles

Potential air emissions sources during operations include:

- odour emissions from the test kitchen hood
- combustion emission from the gas flue powering the hot water system
- odour from the upgraded wastewater management system.

A risk-based approach was used for assessing the potential impacts of air emissions during construction and operation phases of the proposal based on the guidance presented in section 4.4. Initial risk ratings were assigned to each potential air emission source.

With the implementation of site-specific mitigation measures in place for the construction and operational phases of the proposal to minimise potential air quality impacts, residual risks were designated for each source. With control measures in place for all activities and sources during construction and operation of the proposal, there would be a low to negligible impact on the nearest sensitive receptors.

1 Introduction

1.1 Proposal overview

WSP was engaged by Allied Pinnacle Pty Ltd (Allied Pinnacle) to prepare a qualitative Air Quality Impact Assessment (AQIA) for the proposed extension of the Allied Flour Mill located at 330 Picton Road, Maldon, New South Wales (the proposal). This report has been prepared to support a modification to DA-318-12-2004 that was approved under the former Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.2 Site description

The proposal is located at 330 Picton Road, Maldon NSW in the Local Government Area of Wollondilly Shire, about 100 kilometres (km) south west of Sydney's central business district (CBD) and 3 km south-east of the town of Picton. The property (Lot 1, DP 1128013) is bisected by the Main Southern Railway Line and is accessed from Picton Road to the east. The existing mill facility is located north of the Main Southern Railway, and no work is proposed to occur in the portion of the Lot located to the south of the railway. Figure 1-1 shows the location of the Allied Pinnacle site.

1.3 Proposal description

The proposal involves expanding the existing building to the north of the site within the existing and cleared compacted area. The proposal would comprise of the following components:

- circulation, ingredient holding and de-packaging room (within the existing building)
- test kitchen and pre-weigh room (within the existing building)
- complex mix room (within the existing building)
- warehouse extension (warehouse for holding and dispatch of finished product, storage of bulk ingredients)
- office
- sheltered concrete slab
- amenities.

The proposed expansion would increase the total building volume by approximately 5,980 cubic metres (m^3). The volume of material handled would increase by 3,900 tonnes per annum (an additional 15 tonnes per day) above the existing level of 300,000 tonnes annually. Appendix A show the site plan for the proposal.

1.4 Objective

The objective of this AQIA report is to identify and qualitatively assess the potential air quality impacts associated with the construction and operation of the proposal and recommend management and mitigation measures where appropriate.

1.5 Scope of work

- determine the air pollutants expected to be emitted during construction and operation of the proposal
- characterise the existing ambient air quality and meteorological conditions for the proposal using publicly available information,

- identify the nearest sensitive receptors to the proposal site
- identify the main sources of air emissions during construction and operation including type, location, frequency and duration
- undertake a semi-quantitative risk-based assessment identifying the risk level for each construction and operational activity and assigning mitigation measures based on the level of risk.
- develop mitigation and management measures to minimise air quality impacts for both construction and operation
- prepare an air quality impact assessment report in support of a modification to DA-318-12-2004.

1.6 Pollutants of interest

The construction of the proposal would generate dust from demolition works, earth moving activities, construction and movement of vehicles on paved and unpaved roads/surfaces. The combustion of engine fuel from vehicle movements and the operation of on-site plant and machinery has the potential to generate air pollutants. Overall, the following air pollutants likely to be emitted during construction works were identified:

- dust associated pollutants including:
  - total suspended particulates (TSP)
  - particulate matters with an aerodynamic diameter equal to or less than 10 micrometres in diameter (PM_{10})
  - particulate matters with an aerodynamic diameter equal to or less than 2.5 micrometres in diameter ($PM_{2.5}$)
  - deposited dust.
- carbon monoxide (CO)
- oxides of nitrogen (NO_x)
- sulphur dioxide (SO_2)
- volatile organic compounds (VOCs) (e.g., benzene)
- semi volatile VOCs e.g., polycyclic aromatic hydrocarbons (PAHs).

Combustion emissions mainly include PM_{10}, $PM_{2.5}$, CO, NO_x, SO_2, VOCs and PAHs.

During operation of the proposal, there is the potential for odour generation from the test kitchen vent and the wastewater treatment system. Combustion emissions are expected to be emitted from the hot water system flue vent.

Figure 1-1 Location of the Allied Pinnacle site

2 Legislative context

2.1 Commonwealth

2.1.1 National Environment Protection Council Act 1994

The National Environment Protection Council (NEPC) was established under the National Environment Protection Council Act 1994 (NEPC Act). The primary functions of the NEPC are to:

- to prepare National Environment Protection Measures (NEPMs)
- to assess and report on the implementation and effectiveness of the NEPMs in each state and territory.

NEPMs are a special set of national objectives designed to assist in protecting or managing aspects of the environment e.g., air quality.

The NEPM relevant to air quality for this proposal is the:

- National Environment Protection (Ambient Air Quality) Measure 2021 (Air NEPM).

2.1.1.1 National Environment Protection (Ambient Air Quality) Measure 2021

Key pollutants commonly found in ambient air are nationally regulated under the National Environment Protection (Ambient Air Quality) Measure (Air NEPM).

The Air NEPM outlines standards and goals for key pollutants that are required to be achieved nationwide, with due regard to population exposure. The national environment protection standards of this measure are presented Table 2.1.

Commonwealth, State and Territory Environment Ministers have flagged an objective to move to a $PM_{2.5}$ standard of 20µg/m^3 (1-day average) and 7µg/m^3 (1-year average) by 2025 as prescribed in the Air NEPM 2016 amendment.

These standards are not relevant to air emissions from individual sources, specific industries or roadside locations. Air NEPM standards are intended to be applied at performance monitoring locations that represent air quality for a region or sub-region of 25,000 people or more. These performance monitoring stations are operated by the relevant environmental regulatory authority in each State and Territory.

Table 2.1 Air NEPM standards

POLLUTANT	AVERAGING PERIOD	AIR QUALITY STANDARD[1, 2]
PM_{10}	24 hours	50 µg/m^3
	Annual	25 µg/m^3
$PM_{2.5}$	24 hours	25 µg/m^3
		20 µg/m^3
	Annual	8 µg/m^3
		7 µg/m^3

(1) Defined as a standard that consists of quantifiable characteristics of the environment against which environmental quality can be assessed

(2) µg/m^3 – unit of measurement for particulate matter expressed as micrograms per cubic metre.

2.2 State

2.2.1 *Protection of the Environment Operations Act 1997*

The *Protection of the Environment Operations Act 1997* (POEO Act) provides the legislative framework for the protection and enhancement of air quality in NSW. Its primary objectives are to reduce risks to harmless levels through pollution prevention, cleaner production, application of waste management hierarchy, continual environmental improvement and environmental monitoring.

2.2.2 *Protection of the Environment Operations (Clean Air) Regulation 2010*

The Protection of Environment Operations (Clean Air) Regulation 2010 ([POEO (Clean Air) Regulation] provides measures for the control of air emissions from sources including industry, motor vehicles, fuels, wood heaters and open burning. Under Schedule 4, concentration standards for specific pollutants are prescribed for scheduled activities (licensable) for specific industries and general activities and plant.

The POEO Act together with the POEO (Clean Air) Regulation provides a comprehensive framework for regulating activities to minimise their impact on air quality.

2.2.3 *Approved Methods for the Modelling and Assessment of Air Quality in NSW 2016*

The NSW EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales 2016* (Approved Methods) prescribes the statutory methods for modelling and assessing emissions of air pollutants from stationary sources in the state. The Approved Methods lists impact assessment criteria for a number of pollutants and the relevant criteria to this proposal are presented in Table 2.2.

Table 2.2 Impact assessment criteria

POLLUTANT	AVERAGING PERIOD	STANDARDS
TSP	Annual	90 µg/m^3
PM_{10}	24 hours	50 µg/m^3
	Annual	20 µg/m^3
$PM_{2.5}$	24 hours	25 µg/m^3
	Annual	8 µg/m^3
Deposited dust	Annual	2 g/m^2/month (increase) 4 g/m^2/month (cumulative)

2.2.4 *Licensing*

Under the POEO Act, Allied Pinnacle holds an Environmental Protection Licence (Number: 12498, licence version date 9 April 2018) under the Scheduled Activity of agricultural processing.

Condition O3.1 requires that:

'*The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises*'.

In December 2009, an Air Quality Verification study was conducted to sample and analysis 32 emissions points for particulate matter emissions.

Potential air emissions generated during operational activities for the proposal would not trigger the requirement for a licence amendment.

3 Existing environment

3.1 Topography and land use

The proposal site is located on a flat cleared land at an elevation of 142 m Australian Height Datum (AHD), between Picton Road and the Main Southern Railway Line. The area to the north and east of Picton Road is rural comprising of flat valleys rising to elevated ridges (over 250 m AHD) forming part of the Razorback Ridge. This area has been partially cleared and traditionally used for grazing pastures. There are several residences located in undulating areas, in proximity to the proposal site.

To the south of the site, beyond the railway line, the landscape includes open pastures, transitioning to woodland near the Nepean River with the topography dropping to around 80 m AHD. A large cement plant (Boral Cement Works) is located about 500 m to the west of the proposal site, also situated on flat land (150 m AHD) zoned for heavy industry. Apart from the cement plant, surrounding land uses are generally rural.

3.2 Sensitive receptors

The *Approved Methods* describes a sensitive receptor as:

'*A location where people are likely to work or reside; this may include a dwelling, school, hospital, office or public recreational area. An air quality impact assessment should also consider the location of any known or likely future sensitive receptor.*'

The nearest sensitive receptors to the proposed site are presented in Table 3.1 and Figure 3-1.

Table 3.1 Nearest sensitive receptors to proposal site

RECEPTOR ID	ADDRESS	RECEPTOR TYPE	DISTANCE TO PROPOSAL (M)	DIRECTION TO PROPOSAL
R1	1404 Menangle Road, Maldon	Residential	590	North
R2	305 Picton Road, Maldon	Residential/Shed	620	North
R3	460 Wilton Park Road	Residential	1,190	South-west
R4	Maldon Hatchery	Commercial	570	North-east
R5	300 Picton Road (Fitzsimmons Diesels)	Industrial	440	North-west
R6	Boral Cement Works	Industrial	630	West
R7	Off Picton Road	Residential	1,585	South-east
R8	390 Picton Road, Maldon	Residential	400	South-east

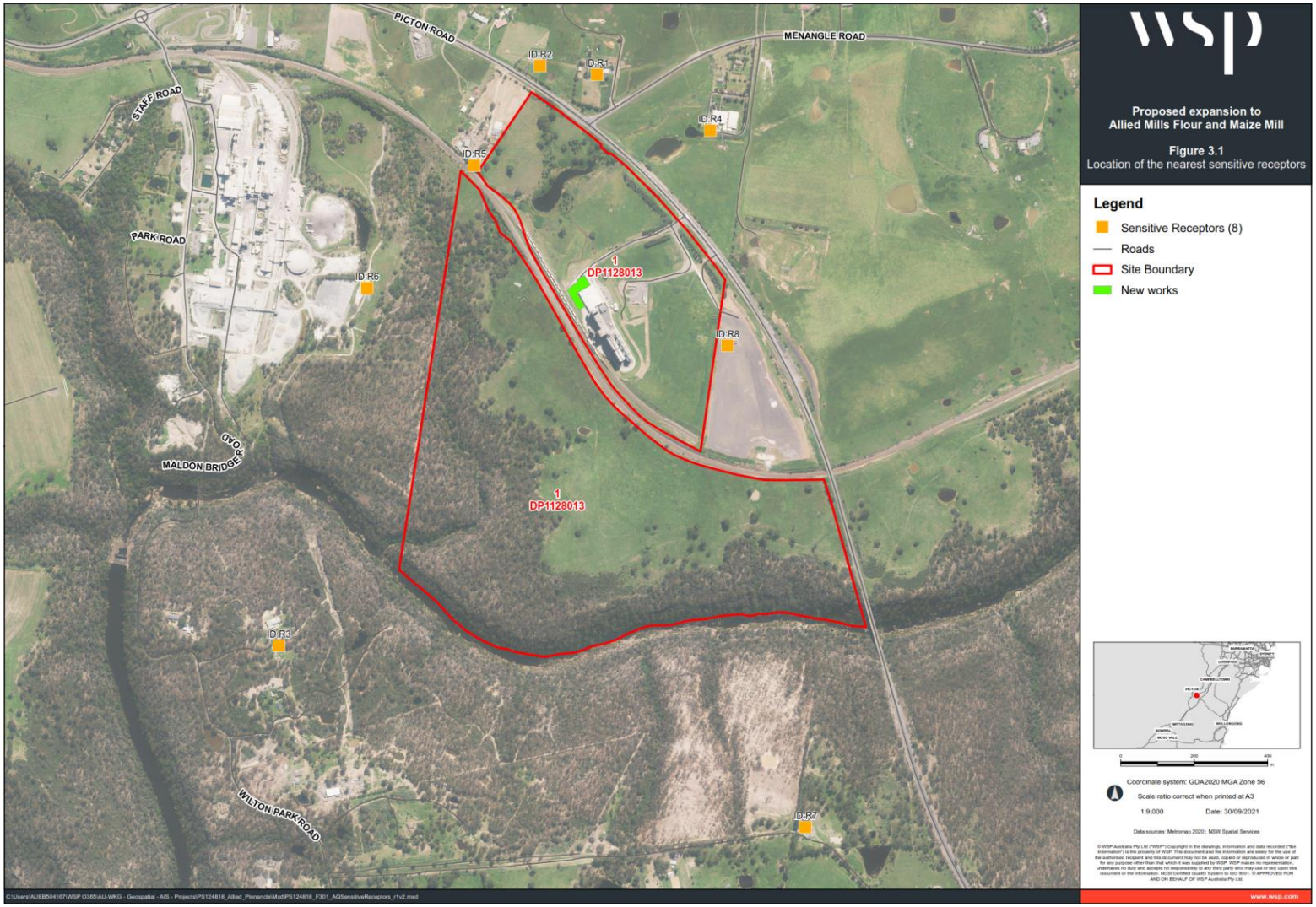


Figure 3-1 Location of the nearest sensitive receptors

3.3 Climate and local meteorology

Meteorological conditions are important for determining the direction and rate at which emissions from a source disperses. The key meteorological requirements for an air quality impact assessment are typically hourly records of wind speed, wind direction, temperature, rainfall and relative humidity. The following section discusses the climactic and local meteorological conditions near the proposal site.

3.3.1 Climactic conditions

The Bureau of Meteorology (BoM) collects meteorological data at Automatic Weather Station (AWS) across Australia and can be used for determining climate statistics over standard periods, such as 30 years, known as climate normal.

The closest BoM station to the proposal that collects meteorological data over a 30-year period, is located at Camden Airport AWS (site number: 068192), approximately 18 km to the north-east and at an elevation of 74 m. The station opened in 1943 and is currently operational.

Climate statistical data for the period 1991 to 2020 recorded at the Camden Airport AWS is presented in Table 3.2.

The local climate at the Camden Airport AWS is characterised by an:

- average maximum temperature of 30.4.0ºC in January
- average minimum temperature of 3.2ºC in July
- annual average rainfall of 698.8 millimetres and an average of 71.9 rainy days (rain ≥ 1 millimetres)
- average maximum 9 am relative humidity of 83% in June
- average minimum 3 pm relative humidity of 45% in November
- average maximum 9 am wind speed of 10 km/hr in October
- average minimum 3 pm wind speed of 18.9 km/hr in September and October.

Table 3.2 Summary of climate statistics at Camden Airport AWS

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN[1]
Daily temperature (1991 to 2020)													
Max (ºC)	30.4	28.9	26.9	24.1	20.8	17.9	17.6	19.2	22.4	25.0	26.7	28.6	24.0
Min (ºC)	17.4	17.1	15.1	11.1	6.7	4.8	3.2	4.0	7.1	10.2	13.2	15.5	10.5
Rainfall (1991 to 2020)													
Mean rainfall (mm)	71.8	108.4	80.6	48.6	31.7	77.1	33.8	33.8	32.7	50.0	69.9	66.4	698.9
Mean days of rain	7.5	7.7	7.3	5.5	4.2	5.9	4.6	4.0	4.7	6.0	7.1	7.4	71.9
Mean 9 am conditions (1991 to 2010)													
Temperature (ºC)	21.9	21.1	19.1	17.1	13.0	9.8	8.9	11.0	14.9	17.9	18.8	20.8	16.2
Relative humidity (%)	72	78	80	77	80	83	82	72	66	61	68	38	74
Wind speed (km/h)	7.3	6.7	6.3	6.9	6.2	6.1	6.5	9.1	9.7	10.0	9.5	9.0	7.8
Mean 3 pm conditions (1991 to 2010)													
Temperature (ºC)	28.1	26.9	25.3	22.5	19.5	16.7	16.2	18.1	20.6	22.8	24.2	26.6	22.3

Relative humidity (%)	48	53	51	50	50	53	51	41	42	44	49	45	48
Wind speed (km/h)	17.5	15.5	14.6	14.2	13.7	14.3	15.0	17.6	18.9	18.9	17.8	18.3	16.4

(1) ANN: Annual

3.3.2 Local wind fields

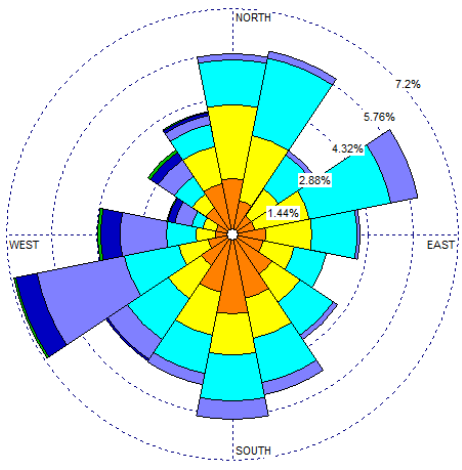
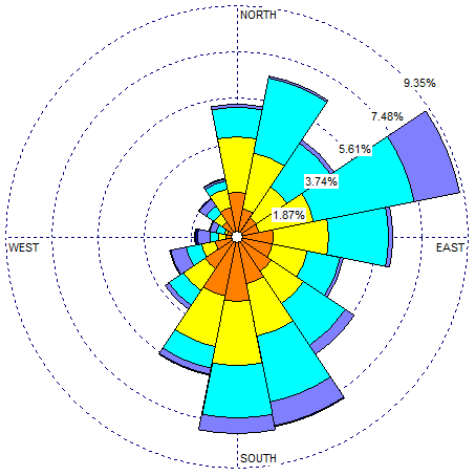
The wind direction and wind speed, during construction activities, can influence whether the extent and magnitude of dust impacts. Adverse impacts can occur in any direction from a site. They are, however, more likely to occur downwind of the prevailing wind direction and in proximity to the proposal site.

The climatic data collected at the Camden Airport AWS only provides 9 am and 3 pm data which are not detailed enough to indicate comprehensive wind conditions. As such, wind speed and wind direction data collected at the Camden Airport AWS were analysed in this section. Figure 3-2 presents the annual and seasonal wind roses for the Camden Airport AWS illustrating the frequency of strength and direction of winds for the years 2016 to 2020.

The wind roses indicate the typical wind fields at Camden Airport AWS are:

- most frequently from a north-easterly and then southerly and south-easterly direction during summer with a calm wind frequency of 22.7% and an average wind speed of 2.5 m/s
- from a range of wind directions including southerly, south-westerly, and then south-easterly, northerly and north-easterly during autumn with a calm wind frequency of 35% and an average wind speed of 1.9 m/s
- predominantly from the south-westerly direction during winter with a calm wind frequency of 32.3% and an average wind speed of 2.3 m/s
- from a range of directions including south-westerly and then southerly, northerly and north-easterly during spring with a calm wind frequency of 26.6% and an average wind speed of 2.6 m/s
- a range of wind directions with south-westerly and southerly directions predominating over the five years with a calm wind frequency of 29.2% and an average wind speed of 2.3 m/s.

Overall, the Camden Airport AWS experiences on average high calm conditions and relatively low wind speeds especially during autumn and winter. Meteorological conditions are likely to be experienced at the proposal site with likely variances due to local topography.

Spring	**Summer**
	

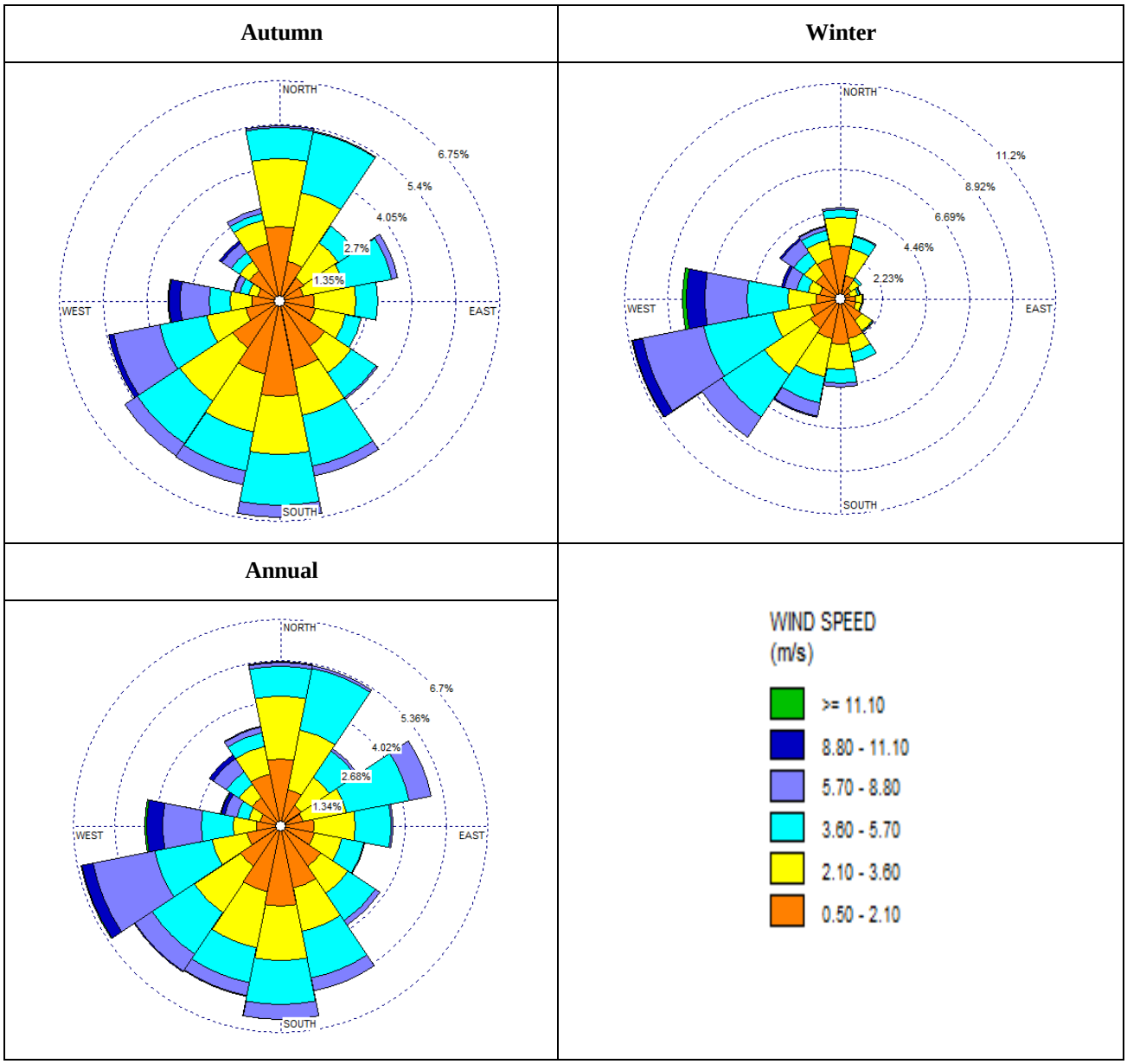


Figure 3-2 Annual and seasonal wind roses at Camden Airport AWS (2016 to 2020)

3.4 Local ambient air quality

3.4.1 Existing air emission sources

The area surrounding the proposal site is predominantly agricultural with single residences scattered throughout the local area. The nearest township of Picton is located approximately 3.1 kilometres (km) to the north-west. Boral Cement Ltd, one of the major contributors to the local airshed, is situated approximately 580 metres (m) to the west.

The main industrial and non-industrial (diffuse) air emission sources contributing to the local airshed include:

- traffic using the local road networks
- Boral Cement Ltd located to the west
- wind-blown dust
- burning (fuel reduction, regeneration and agricultural) and wildfires

- domestic and commercial solvents/aerosols
- domestic solid and liquid fuel burning
- residential activities (e.g., lawnmowers and barbecues)
- agricultural activities
- railway operations
- industrial activities e.g., poultry farming, coal mining, electricity generation, gas supply, cement, lime, plaster and concrete product manufacturing, wastewater treatment plants

These sources give rise to pollutant emissions relevant to the proposal including:

- total suspended particulates (TSP), deposited dust, PM_{10}, and $PM_{2.5}$
- NO_x, CO and SO_2
- volatile organic compounds (VOCs)
- polycyclic aromatic hydrocarbons (PAHs)
- odour.

3.4.2 *Industrial facilities*

A National Pollutant Inventory (NPI) database review was conducted to identify existing industrial emission sources in the Wollondilly Shire Council local government area (LGA). Fourteen facilities emitting 26 substances reported to the NPI for the 2019/2020 reporting year. These facilities included:

- gas supply pipeline and systems
- cement, lime, plaster, and concrete product manufacturing
- fossil fuel electricity generation
- coal mining
- poultry farming
- wastewater treatment
- water treatment

3.4.3 *All air emission sources*

Air emissions from all sources (industrial and diffuse) listed in sections 3.4.1 and 3.4.2 within the Wollondilly LGA for the reporting period 2019/2020 are summarised in Table 3.3. The data indicates that emissions from vehicular traffic contribute to a large proportion of the overall emissions in the Wollondilly LGA.

Table 3.3 NPI reported air emissions for the Wollondilly LGA

POLLUTANT	EMISSIONS TO AIR (KG)		
	INDUSTRIAL	VEHICULAR TRAFFIC[1]	TOTAL (ALL SOURCES)
PM_{10}	170,144	78,270	1,263,799
$PM_{2.5}$	11,250	NA	14,928
NO_x	1,315,092	2,191,547	4,123,472
CO	1,084,822	9,837,165	23,100,000

POLLUTANT	EMISSIONS TO AIR (KG)		
	INDUSTRIAL	VEHICULAR TRAFFIC[1]	TOTAL (ALL SOURCES)
SO_2	0	36,977	98,303
Total VOCs	0	1,140,550	3,743,428
PAHs	0	4,021	6,721

(1) NA: Data not available

(2) Reported motor vehicles emissions for 1999

3.4.4 Background air quality

The NSW Government monitors air quality at 47 AAQMS in metropolitan and regional centres and at 36 rural AAQMS. The nearest AAQMS is located at Bargo approximately 13.4 kilometres to the south-west of the proposal. The Bargo AAQMS is a performance monitoring station located at Silica Road at a height of 365 m. The AAQMS was commissioned in 1996 and measures PM_{10}, $PM_{2.5}$, NO_x, SO_2, O_3 and meteorological parameters.

PM_{10} and $PM_{2.5}$ data collected at the Bargo AAQMS for the years 2016 to 2020 is summarised as follows:

- there were no exceedances of the annual PM_{10} Air NEPM standard for all years analysed
- except for 2019, there was no exceedances of the annual $PM_{2.5}$ Air NEPM standard for all years analysed
- there were multiple exceedances of the 24-hour PM_{10} Air NEPM standard for all years, with a maximum of 21 daily exceedances in 2019 due to bushfire smoke
- 2016 had a limited $PM_{2.5}$ data set (2 to 31 December 2016)
- except for 2017, there were multiple exceedances of the 24-hour $PM_{2.5}$ Air NEPM standard for the years 2018 to 2020, with a maximum of 20 daily exceedances in 2019 due to bushfire smoke.

Given the rural location of the Bargo AAQMS, the air quality at the proposal site is expected to be of similar magnitude or possibly lower. As such, the air quality at the Bargo AAQMS is considered to be broadly representative of the proposal site.

Table 3.4 Ambient air quality data at Bargo AAQMS (2016 to 2020)

YEAR	ANNUAL AVERAGE (µG/M^3)		MAXIMUM 24-HOUR AVERAGE (µG/M^3)		
	PM_{10}	**$PM_{2.5}$**	**PM_{10}**	**$PM_{2.5}$**	**Number and date of maximum exceedances**
2016	14.2	7.2[1]	**58.4**	11.5[1]	PM_{10}: 4 (maximum on 7 May) $PM_{2.5}$: 0
2017	13.9	6.4	**53.5**	20.9	PM_{10}: 1 (maximum on 24 September) $PM_{2.5}$: 0
2018	16.9	6.8	**60.8**	**38.1**	PM_{10}: 4 (maximum on 18 March) $PM_{2.5}$: 2 (maximum on 8 April)
2019	21.2	**10.0**	**188.9**	**139.4**	PM_{10}: 21 (maximum on 30 December) $PM_{2.5}$: 20 (maximum on 30 December)
2020	15.7	6.9	**265.7**	**121.9**	PM_{10}: 6 (maximum on 23 January) $PM_{2.5}$: 9 (maximum on 23 January)
Air NEPM standard	***25***	***8***	***50***	***25***	

(1) Data only available from 2 to 31 December 2016

4 Impact assessment

4.1 Impact assessment

The main air emissions generated during construction and operation of the proposal is expected to be dust, combustion products and odour. Given the small-scale nature of the construction works, with emissions likely to be intermittent and short-term and very low emissions likely to be generated during the operation phase, a risk based qualitative assessment was considered appropriate to evaluate the potential risk of adverse air quality impacts for the proposal.

The risk based qualitative assessment was carried out as follows:

- identify potential emission sources based on proposed activities (section Table 4.1)
- analyse the likelihood and consequence of air emissions being generated (section Table 4.2)
- based on the likelihood and consequence criteria, assign an initial risk rating (prior to mitigation measures) for the emission sources as presented in the Risk Rating Matrix (section Table 4.3)
- following the implementation of mitigation measures, assign a residual risk rating for each emission source.

Table 4.1, Table 4.2 and Table 4.3 present the likelihood categories, consequence descriptors and risk rating matrix for each emission source.

Table 4.1 Likelihood categories

LIKELIHOOD	DESCRIPTION
Certain	Expected to occur in most circumstances, or 100% chance of recurrence during the course of an activity or the activity lasts years.
Likely	Expected to occur at some time, or 50% chance of recurrence during the course of an activity, or the activity lasts months.
Possible	May happen at some time, or 30% chance of recurrence during the course of an activity, or the activity lasts days to weeks.
Unlikely	May occur within the life of the proposal or 10% chance of recurrence during the course of an activity, or the activity lasts hours.
Rare	Highly unlikely to occur but theoretically possible, 5% chance of recurrence during the course of an activity.

Table 4.2 Consequence descriptor

CONSEQUENCE	DESCRIPTION
Severe	Permanent or long-term serious environmental harm/life threatening or long-term harm to health and wellbeing. Amenity of the regional area permanently negatively altered – functional recovery in greater than 10 years if at all.
Major	Serious environment harm/high-level harm to health and wellbeing. Impacts on amenity to the localised area or regional area that significantly negatively alter perceptions of the area – functional recovery within 5 to 10 years.

CONSEQUENCE	DESCRIPTION
Moderate	Medium level of harm to health and wellbeing or the environment over an extended period of time. Impacts on amenity to the localised area or regional area that negatively alter perceptions of the area – functional recovery within 1 to 5 years.
Minor	Low environmental impact/low potential for health and wellbeing impacts. Short term impacts on amenity to the localised area or regional area – functional recovery within less than 1 year.
Insignificant	No or minimal environmental impact, or no health and wellbeing impacts. Temporary localised impacts on amenity – no lasting effects.

Table 4.3 Risk rating matrix

LIKELIHOOD	CONSEQUENCE LEVEL				
	Insignificant	Minor	Moderate	Major	Severe
Certain	Low	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	High	Extreme
Possible	Negligible	Low	Medium	High	High
Unlikely	Negligible	Low	Medium	Medium	High
Rare	Negligible	Negligible	Low	Medium	Medium

4.2 Construction overview

Construction works would take place over a four-month period commencing in Quarter 4 2021. Construction activities would be undertaken from 7am to 5pm, Monday to Sunday.

Construction stages are proposed as follows:

- site establishment and demolition works
- excavation works
- construction of buildings
- backfilling and demobilization

The following equipment would be used during construction works:

- 5T excavator
- bobcat
- 2.5T forklift
- franna crane
- concrete truck and pump
- 2 x 19 elevated work platforms
- tip truck

The proposal would involve additional traffic movements of 4 to 6 trucks per day (28 to 42 trucks per week) and 10 additional employee vehicles. Construction vehicles would access the proposal site compound and laydown area from Picton Road from the Hume Highway.

Demolition works would occur at the northern and north-western section of the site and include:

- demolition existing walls and door
- demolition existing concrete path
- create openings in existing walls
- cutting back of existing gutter
- removal and relocation of rapid lift door

Approximately 610 tonnes of material would be excavated and stockpiled on-site prior to removal off-site. 70 tonnes of concrete would be used as foundation for the proposal. The warehouse and office would comprise of a concrete slab with steel structure and sandwich panel walls and roof. New sandwich panel walls and ceilings would be installed internally.

4.3 Emission sources

4.3.1 Construction

Activities and equipment involved in construction of the proposal are presented in

The main air emission sources and types during construction include:

- site establishment and demolition work (dust)
- excavations and earthworks (dust)
- construction of buildings (dust)
- vehicle movements on paved and unpaved roads/routes (dust)
- wind erosion from exposed areas and stockpiles (dust)
- combustion emissions of engine fuel associated with on-site plant, equipment, and vehicles

4.3.2 Operation

The proposal is not expected to generate air emissions of significance. The main sources and emission types are anticipated to arise from the following sources:

- odour emissions from the test kitchen hood
- emissions of NO_x and CO from the gas flue powering the hot water system
- odour from the upgraded wastewater management system.

4.4 Risk assessment

4.4.1 Likelihood and consequence of emission occurrence

Occurrence, likelihood and potential impact consequence of each emission during the construction and operation of the proposal were assessed based on the definitions presented in Table 4.1 and Table 4.2 and presented in Table 4.4.

It is noted that the impact consequence was assessed in consideration of nearby sensitive receptors. There are eight sensitive receptors identified in the vicinity of the project.

Table 4.4 Likelihood and consequence analysis of each emission source

PHASE	EMISSION SOURCE	LIKELIHOOD AND CONSEQUENCE
Construction	Dust emissions from site establishment and demolition works	Dust is expected to be generated during demolition of existing walls containing concrete and concrete footpaths. The works would be short-lived, and the dust impacts localised. The likelihood of dust being generated is 'likely' with the consequence 'minor' given the distance to the nearest sensitive receptors.
	Dust emissions from excavation and earthworks	Dust emissions will be generated during excavation and earthworks from operation of plant and machinery moving material on-site. The dust impact would be localised and of short duration. Dust emissions are 'likely' to occur with the consequence 'minor' given the location of sensitive receptors.
	Construction of buildings	Dust emission may occur during building construction. The materials to be used include a concrete slab with steel structure and sandwich panel walls and roof i.e., relatively low dust producing materials. The likelihood of dust generation is 'possible' with the consequence being 'minor'. Building construction is expected to occur over a short period of a couple of months.
	Vehicle movements on paved and unpaved roads/routes	There is the potential for dust generation from vehicles moving on internal paved and unpaved roads/routes. Given the low number of vehicles on-site per day (4-6 trucks on average), the short duration of construction works and the small construction footprint, the likelihood of occurrence is 'possible' with a 'minor' consequence.
	Wind erosion from exposed areas and stockpiles	Wind erosion is only likely to occur during dry and windy days. Stockpiles would be present on-site for short periods during construction. Considering the relatively low annual average wind speeds at Camden Airport AWS, the overall likelihood would be 'possible' and the consequence 'minor' given the distance to the nearest sensitive receptors.

PHASE	EMISSION SOURCE	LIKELIHOOD AND CONSEQUENCE
	Combustion emissions associated with vehicles, plant, and equipment	Diesel fuel combustion from vehicle movements and on-site plant, machinery operation and generator would generate particulate matter fractions, CO, NO_x, SO_2 and trace amounts of non-combustible hydrocarbons (i.e., VOCs and PAHs). The likelihood of combustion emissions occurring would be 'likely' with the consequence 'minor, given the distance to sensitive receptors.
Operation	Odour emissions from the test kitchen	Operation of the test kitchen has the potential to generate odour emissions from cooking. The likelihood of this occurring is 'possible' with the consequence 'minor'.
	Combustion emissions from the hot water system flue	Combustion emission (e.g., NO_x and CO) will occur during operation of the hot water system flue. The likelihood of occurrence is 'likely' and the consequence 'minor'.
	Odour emissions from the WWTP	Odour may be generated during operation of the wastewater treatment plant e.g., the grease trap, aeration and settlement tanks. Given the size of the treatment plant, potential odour generation is expected to be contained within the site. The likelihood of odour generation from the WWTP is 'possible' and the consequence 'minor'.

4.5 Risk ratings

Initial risk ratings and residual risk ratings post-mitigation of each potential emission source is presented in Table 4.5.

In summary, with proposed mitigation measures in place (section 5), the generation of dust emission during demolition, excavation and earthworks would have a low residual risk. All other construction activities (e.g., building construction, vehicles on paved road, wind erosion) would pose a negligible risk to the receiving environment. During operations, combustion emissions from the hot water system flue vent would have a low residual risk with odour emissions from the test kitchen vent and the wastewater treatment system posing a negligible risk to the receiving environment.

Table 4.5 Risk register for activities associated with construction and operation of the proposal

RISK NO.	ACTIVITY	INITIAL RISK RATING			MITIGATION MEASURES	RESIDUAL RISK RATING		
		Likelihood	Consequence	Risk rating		Likelihood	Consequence	Risk rating
1	Dust emissions from site establishment/demolition works	Likely	Minor	Medium	Refer to Table 5.1	Possible	Minor	Low
2	Dust emissions from excavation and earthworks	Likely	Minor	Medium		Possible	Minor	Low
3	Construction of buildings	Possible	Minor	Low		Unlikely	Insignificant	Negligible
4	Vehicle movements on paved and unpaved roads/routes	Possible	Minor	Low		Unlikely	Insignificant	Negligible
5	Wind erosion from exposed areas and stockpiles	Possible	Minor	Low		Unlikely	Insignificant	Negligible
6	Combustion emissions associated with vehicles, plant, and equipment	Likely	Minor	Medium		Likely	Insignificant	Negligible
7	Odour emissions from the test kitchen vent	Possible	Minor	Low		Possible	Insignificant	Negligible
8	Combustion emissions from the hot water system flue vent	Likely	Minor	Medium		Possible	Minor	Low
9	Odour emissions from the WWTP	Possible	Minor	Low		Possible	Insignificant	Negligible

5 Mitigation measures

The main air emission sources as discussed in section 4.3 are dust, combustion emissions and odour for both the construction and operation phases of the proposal. Table 5.1 presents proposed mitigation measures to minimise potential air quality impacts during construction and operation.

Table 5.1 Proposed mitigation measures

ITEM	MITIGATION MEASURES
Construction	
General	Advise residents/sensitive receptors of any works outside of the hours outlined in EPA Policy
Dust	Demolition works to occur during favourable weather conditions (light winds (2m/s)). Use water sprays to minimise dust generation during demolition of walls and concrete footpaths
	Restrict/cease activities with high dust generating potential during periods of high winds (> 10 m/s)
	Minimise the extent of exposed and stripped surface areas within the proposal area.
	Ensure an adequate water supply on the site for effective dust suppression/mitigation, using non-potable water where possible and appropriate.
	Keep stockpiles small, bunded, moist or covered to minimise wind erosion. Cover/protect other areas susceptible to significant dust emissions from wind erosion.
	Locate stockpiles as far away from sensitive receptors where practicable
	Restrict vehicle speeds to minimise wheel generated dust on unpaved roads/routes
	Access routes clearly marked out and maintained, with designated parking and turning areas and surfaced appropriately to minimise wheel-generated dust.
	Ensure vehicles remain on designated tracks and adhere to on-site speed limits. Regular watering on unpaved surfaces and unpaved roads/routes, particularly during periods of dry and windy conditions (> 10 m/s).
	Cover or stabilise potentially dust-generating materials during transport to, from and around the construction site
	Limit truck loads to a vertical height no greater than 0.5 m above the side walls of the vehicle
	Control the speed of dumping from tip trucks.
Combustion emissions	Maintain vehicles and equipment to facilitate efficient operation
	Minimise diesel engine idle times i.e., excavator, bobcat, trucks
	Avoid overloading of vehicles
Operation	

ITEM	MITIGATION MEASURES
Odour	Ensure the wastewater treatment plant is appropriately maintained with regular monitoring and analysis of key parameters i.e. total dissolved solids, total nitrogen, total phosphorous, biological oxygen demand (BOD_5) and grease and oil
	The height of the test kitchen vent to be 3 m above the height of the building to ensure adequate odour dispersion
Dust	Restrict vehicle speeds to minimise wheel generated dust on unpaved road
Combustion emissions	The height of the hot water system vent to be 3 m above the height of the building to ensure adequate dispersion of combustion emissions

6 Conclusion

Allied Pinnacle is proposing an extension at the existing Allied Flour Mill in Maldon, NSW. This qualitative air quality assessment was prepared in support of a modification to the approved Development Application DA-318-12-2004.

This report qualitatively assessed potential air quality impacts for the construction and operation of the proposal.

The main types of emissions likely to be generated during construction included dust and combustion emissions from the following sources:

- dust from site establishment and demolition works
- dust from excavations and earthworks,
- dust construction of buildings
- dust from vehicle movements on paved and unpaved roads/routes
- dust from wind erosion from exposed areas and stockpiles
- combustion emissions of engine fuel associated with on-site plant, equipment and vehicles

Potential air emissions sources during operations included:

- odour emissions from the test kitchen hood
- combustion emission from the gas flue powering the hot water system
- odour from the upgraded wastewater management system.

A risk-based approach was used for assessing the potential impacts of air emissions during construction and operation phases of the proposal based on the guidance presented in section 4.4. Initial risk ratings were assigned to each potential air emission source without proposed mitigation measures.

With the implementation of site-specific mitigation measures in place for the construction and operational phases of the proposal to minimise potential air quality impacts, residual risks were designated for each source. With control measures in place for all activities and sources during construction and operation of the proposal, there would be a low to negligible impact on the nearest sensitive receptors.

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NSW Environment Protection Authority (2016) Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales.

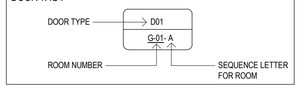
Appendix A

Site plan

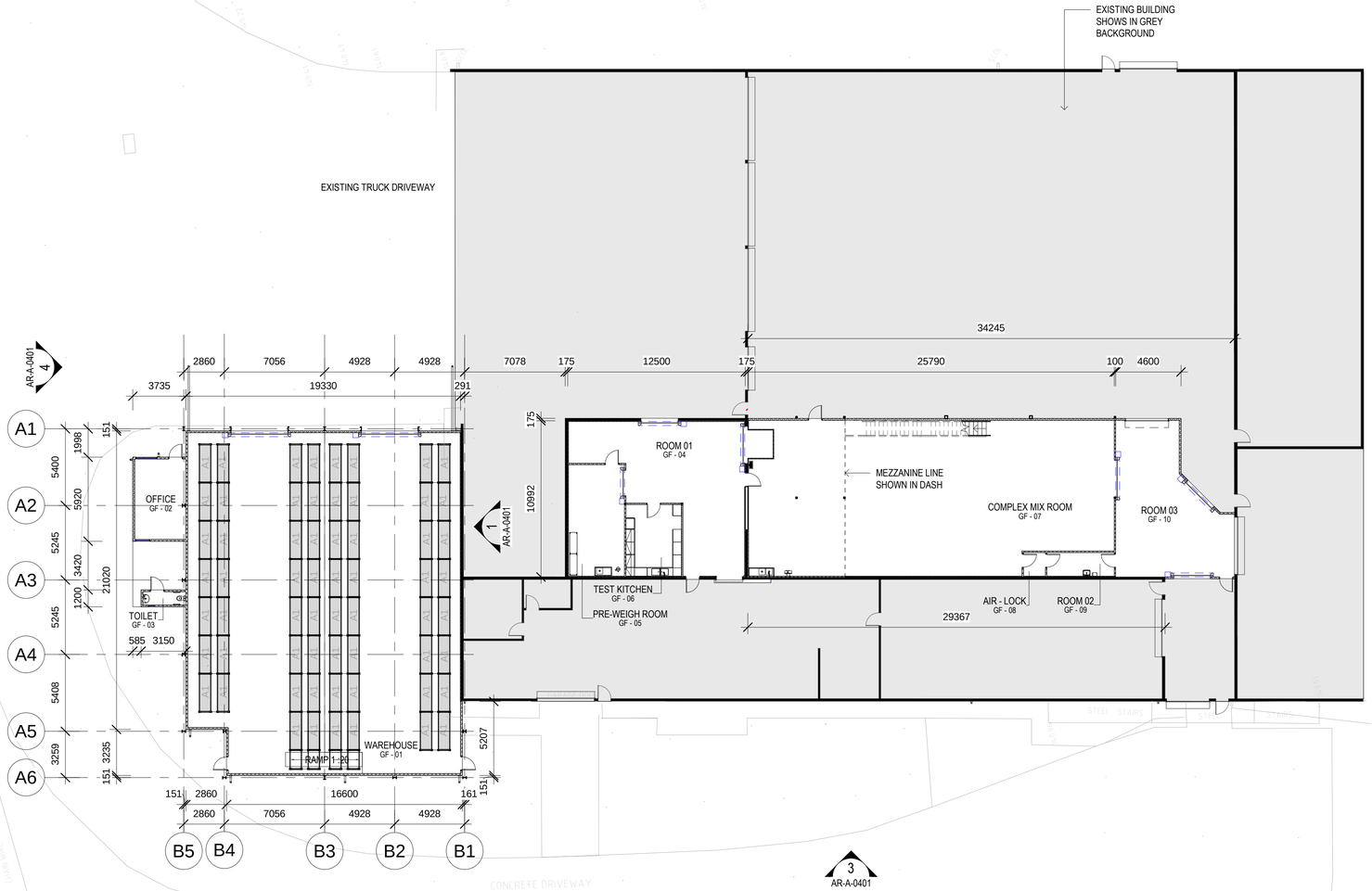
ROOM AREA - PHASE 1			
ROOM NAME	ROOM NO.	AREA	VOLUME
WAREHOUSE	GF - 01	451 m²	3518.73 m³
OFFICE	GF - 02	20 m²	53.22 m³
TOILET	GF - 03	3 m²	6.89 m³
ROOM 01	GF - 04	81 m²	364.75 m³
PRE-WEIGH ROOM	GF - 05	30 m²	136.88 m³
TEST KITCHEN	GF - 06	19 m²	87.53 m³
COMPLEX MIX ROOM	GF - 07	266 m²	1305.86 m³
AIR - LOCK	GF - 08	3 m²	10.39 m³
ROOM 02	GF - 09	8 m²	31.73 m³
ROOM 03	GF - 10	71 m²	282.07 m³
MIXER 01	MZ - 01	36 m²	92.53 m³
MIXER 02	MZ- 02	37 m²	88.04 m³
Grand total: 12		1025 m²	5978.61 m³

NOTE:
1. ALL LOADBEARING WALLS TO BE FULL HEIGHT.
   ALL INTERNAL WALLS EXCEPT FULL HEIGHT WALLS TO EXTEND 200mm ABOVE THE CEILING LEVEL.
   STUD WALLS TO EXTERNAL BRICK VENEER TO EXTENT TO UNDERSIDE OF ROOF SHEETING WITH INSULATION.
   REFER TO A200 SERIES WALL SETOUT DRAWINGS FOR INFORMATION FOR SETOUT, WALL TYPES AND HEIGHTS.
2. FIRE WALLS TO EXTEND TO UNDERSIDE OF ROOF SHEETING AND FULLY SEALED U.N.O.
3. DIMENSIONS PROVIDED ARE TO THE STRUCTURAL FACE OF NEW WALLS OR TO THE FINISHED FACE OF EXISTING WALLS.
4. REFER TO A900 SERIES DRAWINGS FOR ROOM LAYOUT PLANS AND ELEVATIONS.
5. REFER TO LANDSCAPE AND SITE DRAWINGS FOR SETOUT AND LEVELS OF EXTERNAL PAVEMENTS, COVERED LINKS AND ANCILLARY STRUCTURES.
6. VERIFY DIMENSIONS ON SITE, PRIOR STARTING WORK

DOOR TAG :



NO	DATE	AMENDMENT	CHECKED
A	27-04-2021	FOR CLIENT REVIEW	MC
B	07-05-2021	FOR CLIENT REVIEW	MC
C	10-05-2021	ISSUE FOR CONSULTANT	MC
D	14-05-2021	FOR CLIENT REVIEW	MC
E	18-05-2021	ISSUE FOR CONSULTANT	MC
F	27-05-2021	FOR CLIENT REVIEW	MC
G	03-06-2021	ISSUE FOR CONSULTANT	MC
H	10-06-2021	FOR CLIENT REVIEW	MC
I	25-06-2021	REVISION AS CLOUDED - WALL THICKNESS UPDATED	MC
J	05-07-2021	ISSUED FOR PLANNING APPLICATION	MC



1 GROUND FLOOR PLAN - OVERALL
1 : 200

PRELIMINARY
NOT FOR CONSTRUCTION

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Nominated Architect:
Michael Cook NSW Reg. No. 7397

PROJECT: **ALLIED MILL PICTON**

PHASE 1

FLOOR PLAN OVERALL

DRAWN	ZI	DESIGNED	MC
APPROVED		REDUCTION	0 25
CHECKED	BC		
SCALE @ A1	As indicated	DATE	05-07-2021
PHA DRAWING No.	AR-A-0201	REV.	J
PHA Project No.	2113		
CLIENT DRAWING No.		REV.	J

THIS IS A CAD DRAWING - DO NOT AMEND MANUALLY

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PLOT DATE: 5/07/2021 4:01:56 PM

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