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REVERSE AMENITY DUST ASSESSMENT

MATERIAL CHANGE OF USE (MCU) FOR A RESIDENTIAL DWELLING
10 GOWRIE STREET, TOOWOOMBA CITY

Prepared on behalf of J Pulpara Jose
For Toowoomba Regional Council

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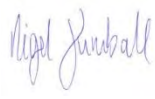
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YARRAMINE CONSULTING PTY LTD



Nigel Kimball
Managing Director &
Principal Environmental Scientist
29 September 2026

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1 Introduction

Yarramine Environmental (Yarramine) was engaged by J Pulpara Jose to undertake a Reverse Amenity Dust Assessment in support of a Material Change of Use (MCU) Development Application for a proposed residential dwelling at 10 Gowrie Street, TOOWOOMBA CITY. The site is formally described as Lot 3 on RP16444 (hereafter referred to as 'the site').

This assessment was commissioned following a request made during a pre-lodgement meeting with Toowoomba Regional Council (TRC) on 4 June 2026. The request arose from the recognition that the proposed development would introduce a new sensitive receptor within an area containing several established commercial and industrial land uses.

As part of the assessment, a simplified quantitative assessment was carried out to evaluate fugitive dust emissions generated by the adjoining Toowoomba Landscape Supplies facility located at 4 Gowrie Street.

Air quality impacts are typically assessed using atmospheric dispersion modelling to predict pollutant concentrations at sensitive receptors. However, given the relatively low-intensity nature of operations at the landscaping supply facility, detailed dispersion modelling was not considered necessary. Instead, the assessment adopted the United States Environmental Protection Agency (USEPA) AP-42 emission factor methodology to estimate dust emissions. This methodology is widely recognised and forms the basis of emission calculations used within Australia's National Pollutant Inventory (NPI).

1.1 Scope of Works

Specifically, the assessment included the following:

- Estimation of fugitive dust emissions associated with operations at the facility, including both wind-generated dust from unsealed surfaces and wheel-generated dust from vehicle movements within laydown, stockpiling and manoeuvring areas, using emission factors derived from the United States Environmental Protection Agency (US EPA) AP-42 methodology.
- Review of available ambient air quality information to establish the existing dust environment within the Toowoomba City locality.
- Prediction of dust emissions, ground-level particulate concentrations and dust deposition rates at the proposed dwelling using a simplified assessment approach based on the calculated emission rates and site-specific operating characteristics.
- Assessment of the predicted dust impacts against relevant air quality objectives and dust deposition criteria commonly applied in Queensland to evaluate both human health impacts and dust nuisance.
- Review of the applicable planning and environmental framework, including relevant provisions of the *Toowoomba Regional Planning Scheme 2012* and associated environmental protection legislation and guidance.

- Identification of practicable dust management and mitigation measures, where required, to minimise potential reverse amenity impacts and support compliance with the adopted assessment criteria.
- Preparation of a technical report documenting the assessment methodology, assumptions, results, conclusions and recommendations to support the development application.

1.2 Codes, Policies & Standards

This assessment has been conducted with reference to the following codes, policies, and standards:

Toowoomba Regional Council

- *Toowoomba Regional Planning Scheme (2012) Version 29* (Commenced 21 July 2026).

Department of Environment, Tourism, Science & Innovation

- *Environmental Protection (Air) Policy 2019* (Current as of 1 September 2019).

Australian Standards & Regulation

- National Environment Protection (Ambient Air Quality) Measure, 2021

International Policies

- USEPA's AP-42 *Compilation of Emission Factors, Chapter 13.2.2, Unpaved Roads* (USEPA, 2006).
- USEPA's AP-42 *Compilation of Emission Factors, Chapter 11.9, Western Surface Coal Mining* (USEPA, 1998).
- USEPA's AP- *Compilation of Emission Factors, Chapter 13.2.4, Aggregate Handling & Storage Piles Wind Erosion* (USEPA, 2006).

2 Site & Development Description

2.1 Site, Use & Locality Description

The site consists of a single lot located at 10 Gowrie Street, TOOWOOMBA CITY, formally described as Lot 3 on RP16444.

Covering an area of 511m², the site is zoned "Mixed Use Zone" (Railway Precinct) under the *Toowoomba Regional Planning Scheme 2012*. It has approximately 20m of frontage to Price Lane along its eastern boundary, with access provided from this same roadway.

The site is currently vacant and contains several established trees along the property boundaries, together with maintained grass cover across the majority of the site.

2.2 Proposed Development

The proponent is seeking a Material Change of Use (MCU) Development Approval for the construction of a two-storey residential dwelling at the site.

Proposal drawings prepared by SP Building Design are presented in Appendix A.

2.3 Surrounding Uses

The site is situated within Toowoomba City, approximately 1 km north of the Toowoomba Central Business District (CBD).

The surrounding area comprises a mixture of commercial, industrial, community and residential land uses. The site is located within the Mixed Use Zone and adjoins the Toowoomba Landscape Supplies premises immediately to the north. Beyond the Mixed Use zoned land, the surrounding locality is predominantly characterised by Low-Medium Density Residential development.

Other nearby land uses include Mort Estate Park, which is located to the west of the site across Gowrie Street and is zoned Open Space.

In addition to Toowoomba Landscape Supplies, nearby commercial land uses include McDonald Printing Group and Smith & Sons Renovations & Extensions Toowoomba East, both of which are located across Price Lane to the east of the site. These businesses were considered during the preliminary review of potential dust sources. However, they were not assessed further as their operations are not typically associated with significant dust generation. While both premises include limited unsealed manoeuvring areas, these areas are substantially smaller than those present at Toowoomba Landscape Supplies and do not incorporate the extensive stockpiling, laydown and material handling activities that have the potential to generate elevated levels of fugitive dust emissions.

Accordingly, the assessment has focused on the Toowoomba Landscape Supplies facility as the most credible and potentially significant source of dust emissions affecting the proposed sensitive land use.

The general location of the site and its environs are shown on the Site Locality Plan presented in Figure 1, while the site and its immediate context is shown on the Site Plan presented in Figure 2.

2.4 Toowoomba Landscaping Supplies

Toowoomba Landscape Supplies is a medium-sized landscaping and garden supply business that provides a range of products for residential and commercial landscaping projects. Products available include garden mulches, garden edging, lawn supplies, soils and potting mixes, logs, sleepers, lattice products, sand, pebbles, decorative rock, pavers, concrete blocks and concrete slabs. The business is understood to have operated from the site for an extended period and forms an established component of the local commercial environment.

A review of publicly available development records maintained by Toowoomba Regional Council did not identify any publicly available development approvals associated with the site.

The business contains a single-storey brick building which accommodates office facilities, sales functions and storage of smaller products. A large industrial shed is also located within the southern portion of the site and appears to be used for the storage of bulk materials and equipment.

Operations involve the use of trailers, trucks, forklifts and other mobile plant used for the movement, loading and unloading of landscaping materials and the fulfilment of customer orders.

The business operates during the following hours:

- Monday to Friday: 7:00 am to 5:00 pm
- Saturday: 8:00 am to 4:00 pm
- Sunday: 9:00 am to 1:00 pm

2.5 Potential Dust Issues

Given the nature of operations at Toowoomba Landscape Supplies, including the presence of unsealed trafficable areas and material stockpiles, the principal dust-generating mechanisms considered in this assessment are:

- Generation of dust through the disturbance and pulverisation of surface materials by vehicle movements within unsealed manoeuvring areas (wheel-generated dust).
- Entrainment of exposed surface materials by wind action across unsealed areas of the site (windblown dust), particularly during periods of elevated wind speeds.
- Dispersion of fine material from stockpiles during loading, unloading and handling activities associated with customer orders.

Wheel-generated dust occurs when vehicle tyres disturb surface materials, causing particulate matter to become airborne. Vehicle movements can also create localised turbulence, which promotes the suspension and dispersion of dust particles. The magnitude of emissions is influenced by factors such as vehicle frequency, vehicle speed, surface material characteristics and moisture content.

Windblown dust is generated when surface wind speeds exceed the threshold velocity required to entrain loose particles from exposed surfaces or stockpiles. The potential for wind erosion is influenced by meteorological conditions, surface disturbance, moisture content and the extent of exposed material.

The transport distance and dispersion characteristics of dust are dependent on a range of factors, including particle size, meteorological conditions, surface characteristics and deposition rates. The potential for dust impacts is strongly influenced by the proximity of sensitive receptors, as fugitive dust emissions typically occur as diffuse area sources rather than concentrated point sources.

Consequently, dust concentrations and deposition rates generally decrease with increasing distance from the source due to atmospheric dispersion and particle settling processes.

Figure 1
Site Locality Plan

Legend

- Subject Site
- Locality Boundary
- State Contolled Roads

Layer Sources: Qld GIS Layers (Qld Gov Information Service 2026)
Aerial - Google Earth 2026

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Figure 2
Site Plan & Sensitive Receptor

Legend

- Sensitive Receptors
- Subject Site
- Cadastre

Layer Sources: Qld GIS Layers (Qld Gov Information Service 2026)
Aerial - Google Earth 2026

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3 Assessment Criteria

3.1 Toowoomba Regional Council Planning Scheme

The Environmental Standards Code contained within the *Toowoomba Regional Planning Scheme 2012* includes a number of performance and acceptable outcomes relating to dust emissions and the location of sensitive land uses in relation to existing lawful activities.

Performance Outcomes PO21 and PO25, reproduced in Table 1, seek to ensure that proposed sensitive land uses are adequately separated from existing lawful land uses that generate dust or air emissions. The corresponding acceptable outcomes require compliance with the separation distances specified in Table 9.4.2:2 included in the Code.

The adjoining Toowoomba Landscape Supplies operation is not a land use identified in Table 9.4.2:2 and therefore no prescribed separation distance applies. As a result, the suitability of the proposed residential dwelling must be assessed on a case-by-case basis, having regard to the nature and extent of dust emissions generated by the existing lawful use.

Performance Outcome PO_{22} seeks to ensure that development does not result in dustfall quantities likely to adversely affect the health and amenity of surrounding sensitive receptors. Acceptable Outcome $AO_{22.1}$ provides that compliance may be demonstrated where dustfall, averaged over an annual period, does not exceed 133 mg/m²/day when measured at the nearest sensitive receptor.

In addition, PO_{23} requires that air emissions resulting from development do not cause environmental harm, including environmental nuisance. The associated acceptable outcomes reference the air quality objectives established under the now superseded *Environmental Protection (Air) Policy 2008* and provide for the preparation of an air quality impact assessment where necessary.

As the proposed development introduces a new sensitive land use adjacent to an existing lawful commercial activity, the key consideration of this assessment is whether dust emissions from the Toowoomba Landscape Supplies facility are likely to adversely affect the amenity or health of future occupants. Accordingly, this assessment has been undertaken to quantify potential dust impacts and demonstrate whether the proposed dwelling is compatible with the surrounding environment and intent of PO21, PO22, PO23 and PO25.

Table 1: Toowoomba Regional Planning Scheme Chapter 9.4.2:1 - Environmental Standards Code

PERFORMANCE OUTCOMES		ACCEPTABLE OUTCOMES	
Dust			
PO21	Proposed sensitive land uses are adequately separated from existing lawful land uses likely to generate dust emissions such as landfill sites, quarries, cropping land, motor sport facilities and other similar dust generating activities.	AO21.1	Sensitive land uses achieve the separation distances from the nominated uses specified in Table 9.4.2:2.
PO_{22}	Development does not result in dustfall quantities that are likely to impact on the health of surrounding sensitive receivers.	$AO_{22.1}$	Dustfall averaged over an annual period of time does not exceed 133mg/m²/day when measured at the nearest sensitive receiver
General Emissions			
PO23	Air emissions resulting from development do not cause environmental harm (including environmental nuisance).	AO23.1	The development does not result in air emissions that exceed any of the acceptable levels specified within the *Environmental Protection (Air) Policy 2008*.
		AO23.2	Where a type of air emission is not listed within the *Environmental Protection (Air) Policy 2008* the proponent can demonstrate that the level of emission is in compliance with Australian ambient air quality standards; or If Australian standards do not exist, an ambient air quality standard from another country or organisation may be used with appropriate justification.
		AO23.3	Where a development is proposing to generate and release air emissions in excess of current air quality emission standards the proponent will provide an 'air quality impact assessment' which adequately addresses the impact of the release and provides justification as to why the industry cannot mitigate the levels further.
PO25	Proposed sensitive land uses are adequately separated from existing lawful land uses that produce air emissions	AO25.1	Sensitive land uses in relation to air emissions are not located within the separation distances specified in Table 9.4.2:2.

3.2 Air Quality Objectives

Queensland's *Environmental Protection Act 1994* gives DETSI the power to create Environmental Protection Policies that identify and aim to protect environmental values of the atmosphere that are conducive to the health and well-being of humans and biological integrity. The *Environmental Protection (Air) Policy* (Air EPP), first gazetted in 1997 and revised in 2008 and 2019, aims to protect qualities of the air environment that safeguard:

- ecosystem health and biodiversity,
- human health and wellbeing,
- aesthetic values, including property appearance, and
- agricultural uses.

Schedule 1 of the Air EPP specifies air quality indicators and objectives for approximately 93 contaminants. While objectives exist for particulate matter (PM_{10}, $PM_{2.5}$ and TSP), there is no specific air quality objective relating to dust nuisance or amenity impacts arising from coarse particulate matter and dust deposition.

Relevant air quality objectives adopted for this assessment are presented in Table 2. The objectives presented in Table 2 incorporate the amendments introduced by the *Environmental Protection (Air) Amendment Policy 2024*, which updated the air quality objectives for nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2) and $PM_{2.5}$ to ensure Queensland remains consistent with the National Environment Protection (Ambient Air Quality) Measure (NEPM). These objectives provide the basis for assessing potential human health impacts associated with particulate matter emissions from the adjoining landscape supplies operation.

Table 2: Adopted *Environmental Protection (Air) Policy* – Air Quality Objectives

INDICATOR	ENVIRONMENTAL VALUE	AIR QUALITY OBJECTIVE	AVERAGING PERIOD	ALLOWABLE EXCEEDANCE
PM10	Health & Wellbeing	50 µg/m^3	24 hours	-
		25 µg/m^3	1 year	-
PM2.5	Health & Wellbeing	20 µg/m^3	24 hours	-
		7 µg/m^3	1 year	-
TSP	Health & Wellbeing	90 µg/m^3	1 year	-

Note: Air Quality Objectives shown include amendments made by the Environmental Protection (Air) Amendment Policy 2024.

3.3 Dust Deposition Guideline

Dust deposition rate refers to the quantity of dust (mg) settling on a given surface area (m^2) over time and is typically reported as milligrams per square metre per day ($mg/m^2/day$). Unlike PM_{10}, $PM_{2.5}$ and TSP, which are primarily assessed in relation to human health impacts, dust deposition is commonly used to assess nuisance dust and amenity impacts associated with larger particles that settle from the atmosphere.

In Queensland, a dust deposition criterion of 120 $mg/m^2/day$, averaged over a one-month period, is commonly adopted as a guideline for assessing potential dust nuisance impacts at sensitive receptors and has historically been recommended by DETSI as a design consideration for developments. Although this criterion is not prescribed under the *Environmental Protection (Air) Policy 2019* and therefore does not constitute a statutory air quality objective, it is widely applied in environmental impact assessments and regulatory reviews throughout Queensland.

As this guideline is not defined within the Air EPP, it is not directly enforceable unless specifically incorporated as a condition of a Development Permit, Environmental Authority or other regulatory approval.

3.4 Adopted Dust Criteria

The adopted dust criteria for this assessment comprise the Air Quality Objectives presented in Table 2 and a dust deposition criterion of 120 $mg/m^2/day$, averaged over a one-month period.

The Air Quality Objectives for PM_{10}, $PM_{2.5}$ and TSP have been adopted for the assessment of potential health impacts associated with airborne particulate matter emissions.

A dust deposition criterion of 120 $mg/m^2/day$, averaged over one month, has been adopted for the assessment of dust nuisance and amenity impacts. This criterion has been selected in preference to the annual dustfall criterion of 133 $mg/m^2/day$ contained within the *Toowoomba Regional Planning Scheme 2012*, as it is slightly more conservative and better represents potential amenity impacts experienced by sensitive receptors.

4 Dust Assessment

4.1 Existing Air Quality

Assessment of particulate matter emissions requires consideration of existing ambient air quality levels within the locality. These existing levels, commonly referred to as background concentrations, represent the contribution from natural sources and other activities within the regional airshed.

Background concentrations may be determined through site-specific monitoring or by adopting representative data from nearby air quality monitoring stations. Where appropriate, background concentrations are added to predicted concentrations attributable to a source to determine cumulative air quality impacts and assess compliance with relevant air quality objectives.

In addition to airborne particulate matter concentrations, background dust deposition rates may also be considered when assessing potential cumulative dust nuisance impacts.

4.1.1 Ambient Dust Concentration

Historical air quality monitoring data collected by DETSI at the Toowoomba Tor Street monitoring station was adopted as the most representative publicly available dataset for establishing background concentrations of PM_{10} and $PM_{2.5}$ relevant to the site.

The Tor Street monitoring station is located within Toowoomba and forms part of Queensland's ambient air quality monitoring network. Monitoring data collected between 2022 and 2025 were reviewed as these represent the most recent publicly available air quality records for the locality.

Pollutants measured at the station relevant to this assessment include PM_{10} and $PM_{2.5}$. To characterise the existing particulate matter environment within Toowoomba, annual monitoring statistics reported by DETSI have been summarised in Table 3 and Table 4.

Review of the monitoring data indicates that annual average $PM_{2.5}$ concentrations ranged between 4.9 and 6.1 µg/m³, while annual average PM_{10} concentrations ranged between 12.0 and 14.2 µg/m³ over the monitoring period. These concentrations are below the relevant annual Air Quality Objectives of 7 µg/m³ for $PM_{2.5}$ and 25 µg/m³ for PM_{10}.

Similarly, 24-hour average PM_{10} concentrations exceeded the applicable objective of 50 µg/m³ on only one occasion during the monitoring period, while $PM_{2.5}$ recorded three exceedances per year between 2023 and 2025. Overall, the monitoring results indicate that ambient particulate matter concentrations within the Toowoomba locality are generally low and are typically compliant with the adopted air quality objectives.

For the purposes of this assessment, representative background concentrations were determined using the average of the annual average concentrations recorded between 2022 and 2025. This approach is considered more representative of long-term ambient air quality conditions than reliance on a single year's monitoring data.

Based on this methodology, background concentrations of 12.8 µg/m³ for PM_{10} and 5.4 µg/m³ for $PM_{2.5}$ have been adopted for cumulative assessment purposes.

Table 3: Percentiles of daily 24-hour average $PM_{2.5}$ concentrations at Toowoomba (Tor St) - 2022-2025

YEAR	DATA AVAILABILITY (% OF DAYS)	NO OF EXCEEDANCES (DAYS)	MAXIMUM (µg/m³)	ANNUAL AVERAGE (µg/m³)	PERCENTILES			
					99th	98th	95th	90th
2022	90.7	0	15.1	5.1	12.3	11.5	9.1	7.7
2023	96.7	3	24.0	6.1	19.8	15.1	10.8	9.0
2024	99.2	3	25.2	5.5	16.4	14.6	11.0	9.0
2025	97.8	3	31.2	4.9	19.7	15.9	10.3	8.28

* Data availability less than 75% for one or more quarters

Id Insufficient data to calculate value

Table 4: Percentiles of daily 24-hour average PM_{10} concentrations at Toowoomba (Tor St) - 2022-2025

YEAR	DATA AVAILABILITY (% OF DAYS)	NO OF EXCEEDANCES (DAYS)	MAXIMUM (µg/m³)	ANNUAL AVERAGE (µg/m³)	PERCENTILES			
					99th	98th	95th	90th
2022	90.7	1	53.9	12.1	24.3	23.9	19.4	17.5
2023	96.7	0	40.6	14.2	33.6	28.3	22.6	19.9
2024	99.2	0	30.8	12.9	27.7	26.7	22.6	19.7
2025	97.8	0	45.3	12.0	34.6	28.7	22.2	18.0

* Data availability less than 75% for one or more quarters

Id Insufficient data to calculate value

4.1.2 Ambient Dust Deposition

Publicly available dust deposition data for Toowoomba is currently available from two dustfall monitoring stations located at Mort Street and Brooks Street. These monitoring stations were established by DETSI following the closure of the former Willowburn monitoring station and were originally intended to monitor dust emissions associated with nearby coal rail operations.

For the purpose of establishing a representative ambient dust deposition rate for the locality, monthly average daily dust deposition data from January 2022 to December 2025 were obtained from the Department's monthly Air Quality Bulletins and reviewed.

Mean monthly dust deposition rates for both the Mort Street and Brooks Street monitoring stations over this period are presented in Figure 3. The monthly average daily deposition data used to prepare Figure 3 are provided in Appendix B.

As the Mort Street monitoring station is located closest to the site, data from this station were adopted as the most representative of local background conditions. Based on the available monitoring records, the average dust deposition rate at the Mort Street station was calculated to be 59 mg/m²/day.

This value has been adopted as the representative ambient dust deposition rate for the locality and reflects the typical level of dustfall that may be expected to occur in the area in the absence of any contribution from the adjoining Toowoomba Landscape Supplies operation.

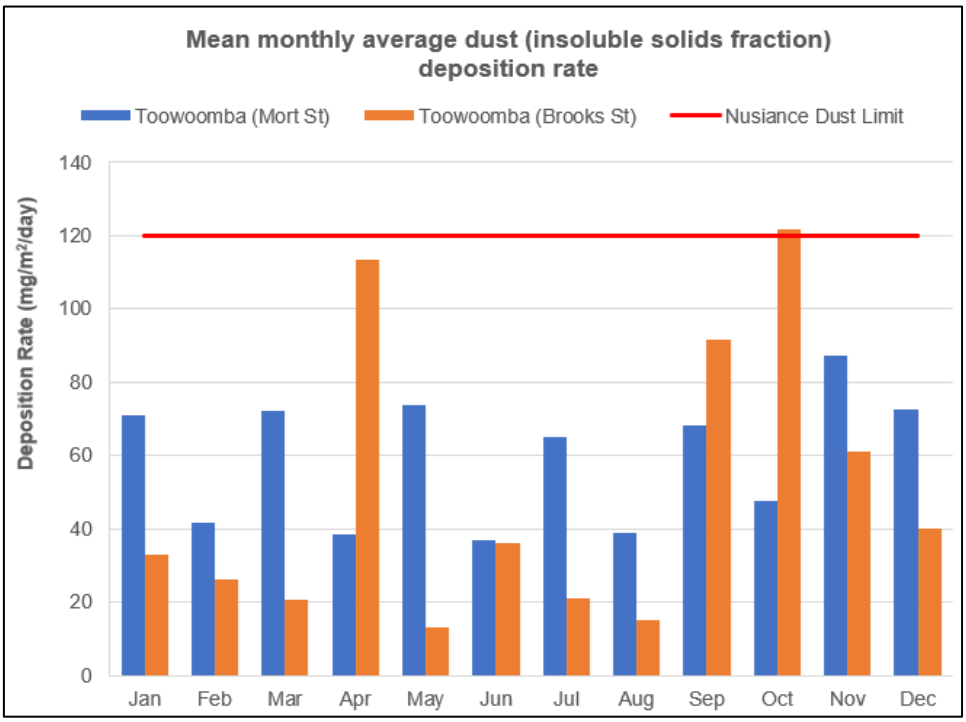


Figure 3: Mean monthly average dust (insoluble solids fraction) deposition rate

4.2 Estimation of Dust Emissions

4.2.1 Wheel Generated Dust

Estimated emission rates for wheel-generated dust associated with vehicle and mobile plant movements within the Toowoomba Landscape Supplies yard were calculated using the *USEPA's AP-42 Compilation of Air Pollutant Emission Factors, Chapter 13.2.2, Unpaved Roads* (USEPA, 2019). Dust-generating activities considered in the assessment include the manoeuvring of heavy vehicles within the yard and the operation of mobile plant, such as front-end loaders, used for material handling and stockpile management.

The AP-42 methodology was used to estimate emissions of TSP, PM_{10} and $PM_{2.5}$ generated from vehicle travel over unsealed surfaces. For the purposes of this assessment, PM_{30} has been adopted as a surrogate for TSP, consistent with common Australian air quality assessment practice.

The equation used to estimate emissions is presented below:

$$E = k \times \left(\frac{s}{12}\right)^{a} \times \left(\frac{W}{3}\right)^{b}$$

Where s = surface material silt content (%)

W = mean vehicle weight (tonnes) and the constants detailed below.

The AP-42 particle size multipliers and constants adopted for the assessment are presented in Table 5.

Table 5: Total Suspended Particles (TSP) estimation figures

CONSTANT	TSP (assumed from PM_{30})	PM_{10}	$PM_{2.5}$
K (lb/VMT)	4.9	1.5	0.15
a	0.7	0.9	0.9
b	0.45	0.45	0.45

Note that the original AP-42 equations are based on imperial units and, accordingly, appropriate conversion factors have been applied where necessary. The activity data and other input assumptions adopted for the emissions calculations are summarised in Table 6.

Table 6: Input assumptions used in the calculation of wheel generated dust emissions

PARAMETER	UNITS	VALUE	COMMENT
Surface Characteristic			
Surface material silt content	%	8.5	Typical mean silt content values specified for construction sites in the USEPA AP-42, S13.2.1, Table 13.2.1-3.
Vehicle & Plant Characteristics			
Body Truck	tonnes	20	Representative loaded body truck delivering or collecting landscaping materials
Front End Loader	tonnes	12	Representative operating weight of a loader used for stockpile management and customer loading activities.
Vehicle Width	m	3	Typical operating weight of wheel loader used for stockpile handling and customer loading
Manoeuvring Characteristics			
Onsite manoeuvring distance	m	75	Estimated travel distance including entry, loading and exit
Traversed surface area	m^2	225	Vehicle width multiplied by manoeuvring distance
Use Intensity			
Total vehicles and plant using yard	No	8	Estimated scale of operation
Vehicle movements per day	No	120	

Wheel-generated dust emissions were estimated for vehicle and mobile plant movements occurring within the unsealed manoeuvring areas of the Toowoomba Landscape Supplies facility. Activities considered in the assessment included customer vehicle movements, body truck deliveries and collections, and front-end loader operations associated with stockpile management and material loading.

Using the AP-42 equation described above, uncontrolled emissions of TSP, PM_{10} and $PM_{2.5}$ were estimated based on a surface material silt content of 8.5%, a representative vehicle weight of 20 tonnes and the activity assumptions presented in Table 6.

The assessment assumed an average manoeuvring distance of 75 m for each vehicle and plant movement within the yard. Based on an estimated 120 vehicle and plant movements per operating day and an operating schedule of 5.5 days per week, total annual vehicle travel over unsealed surfaces was calculated to be approximately 2,574 vehicle kilometres per year.

Application of the AP-42 methodology resulted in uncontrolled emission factors of approximately 2.55 kg/VKT for TSP, 0.73 kg/VKT for PM_{10} and 0.073 kg/VKT for $PM_{2.5}$. Based on the assumed activity levels, uncontrolled wheel-generated dust emissions were estimated to total approximately 6,558 kg/year of TSP, 1,874 kg/year of PM_{10} and 187 kg/year of $PM_{2.5}$.

When expressed as area-normalised emission rates, these emissions equate to approximately 40.4 mg/m²/day of TSP, 11.5 mg/m²/day of PM_{10} and 1.2 mg/m²/day of $PM_{2.5}$. Assuming routine watering and site management measures achieve an overall control efficiency of 80%, the corresponding controlled emission rates reduce to approximately 8.1 mg/m²/day of TSP, 2.3 mg/m²/day of PM_{10} and 0.23 mg/m²/day of $PM_{2.5}$.

Estimated wheel-generated emissions of TSP, PM_{10} and $PM_{2.5}$ are presented in Appendix C.

4.2.2 Wind Erosion of Exposed Areas

Windblown dust emissions from exposed surfaces within the Toowoomba Landscape Supplies facility were estimated using the methodology outlined in the *USEPA's AP-42 Compilation of Air Pollutant Emission Factors, Chapter 11.9, Western Surface Coal Mining* (USEPA, 1998), adapted to account for local rainfall conditions. The adopted equation and input assumptions are presented in Table 7 and Table 8.

This assessment considers wind erosion from exposed ground surfaces within the Toowoomba Landscape Supplies facility and excludes emissions associated with material stockpiles, which are assessed separately.

For the purposes of the assessment, a conservative approach was adopted whereby the entire site area, excluding material stockpiles, was assumed to comprise exposed and potentially erodible surfaces. No allowance was made in the emission calculations for the reduction in wind erosion that would result from existing buildings, sealed parking and access areas and boundary fencing or other site infrastructure.

A control efficiency factor was subsequently applied to the calculated emissions to reflect the influence of existing site conditions on dust transport, including vegetation and other physical barriers located between potential dust sources and the proposed dwelling. These features assist in reducing wind velocities and limiting the transport of entrained dust particles.

As such, the adopted methodology remains conservative and is considered likely to overestimate windblown dust emissions reaching the proposed dwelling.

Using the equation and assumptions presented in Table 7 and Table 8, uncontrolled windblown TSP emissions were estimated to be approximately 0.454 t/ha/year, equivalent to an area-normalised emission rate of approximately 1.44×10^{-6} g/m²/s or 124 mg/m²/day.

A control efficiency factor of 80% was subsequently applied to account for the influence of existing vegetation, buildings, fencing and other site infrastructure on dust transport. Following application of this control efficiency, controlled windblown dust emissions were estimated to be approximately 0.091 t/ha/year of TSP, equivalent to 2.88×10^{-7} g/m²/s or 24.9 mg/m²/day.

In accordance with common Australian air quality assessment practice, PM_{10} emissions were estimated as 50% of TSP emissions, while $PM_{2.5}$ emissions were estimated as 7.5% of PM_{10} emissions. These assumptions are consistent with the National Pollutant Inventory Emission Estimation Technique Manual for Mining and the USEPA AP-42 methodology.

Estimated emissions of TSP, PM_{10} and $PM_{2.5}$ associated with wind erosion of exposed surfaces are presented in Appendix C.

Table 7: Equation used to estimate windblown dust emissions

SURFACE MATERIAL	UNITS	TSP	PM10	PM2.5
Exposed Area	t/ha/year	0.85* Rain Factor	TSP x 0.5*	PM10 x 0.075**

* Assumed from the National Pollution Inventory Emission Estimation Technique Manual for Mining, Version 3.1, January 2012, where a 50 % ratio of TSP to PM_{10} was found.

** Assumed from the AP-42, Chapter 13.2, Industrial Wind Erosion

Table 8: Input assumptions used in the calculation of windblown dust emissions

PARAMETER	UNITS	VALUE	SOURCE
Number of days with rainfall > 0.25mm	number	170	BoM Toowoomba Airport AWS (2026)
Exposed area	ha	0.6250	Total Site Area not under stockpile

4.2.3 Windblown Dust from Material Stockpiles

Windblown dust emissions associated with material stockpiles on-site were estimated using the methodology presented in the *US EPA's AP-42 Compilation of Air Pollutant Emission Factors, Section 13.2.4 Aggregate Handling and Storage Piles*. The assessment considered emissions associated with stockpile handling activities, including loading, unloading and material transfer operations, together with wind disturbance of active stockpile surfaces.

The site contains material stockpiles with an estimated total storage capacity of approximately 500 m^3 and an assumed maximum annual throughput of 3,000 tonnes per annum across all stockpiled material types. To provide a conservative assessment of potential dust impacts, emissions were calculated using the highest anticipated silt content, the lowest likely moisture content and the maximum annual handling rate. These assumptions maximise the predicted emission rate and are therefore expected to overestimate actual stockpile emissions under typical operating conditions.

Based on the adopted assumptions, uncontrolled stockpile emissions were estimated at approximately 0.0032 t/year TSP, 0.0015 t/year PM_{10} and 0.0002 t/year $PM_{2.5}$, equivalent to emission rates of 0.032 t/ha/year TSP, 0.015 t/ha/year PM_{10} and 0.002 t/ha/year $PM_{2.5}$. These emission rates equate to source strengths of approximately 1.03×10^{-7} g/m²/s (TSP), 4.86×10^{-8} g/m²/s (PM_{10}) and 7.36×10^{-9} g/m²/s ($PM_{2.5}$).

A control efficiency of 80% was adopted to account for the implementation of routine dust suppression measures, including stockpile watering, minimisation of unnecessary material handling and general site housekeeping practices. Following application of this control efficiency, estimated emissions were reduced to approximately 0.0006 t/year TSP, 0.0003 t/year PM_{10} and 0.00005 t/year $PM_{2.5}$, equivalent to source strengths of 2.05×10^{-8} g/m²/s (TSP), 9.72×10^{-9} g/m²/s (PM_{10}) and 1.47×10^{-9} g/m²/s ($PM_{2.5}$).

The assessment indicates that emissions from material stockpiles represent only a minor component of the overall site dust inventory and are substantially lower than emissions associated with wheel-generated dust and wind erosion from exposed surfaces.

Estimated emissions of TSP, PM_{10} and $PM_{2.5}$ associated with windblown dust from stockpiles and material handling are presented in Appendix C.

4.2.4 Control Efficiencies

It is standard practice for dust emission rates to be estimated using published emission factors and subsequently adjusted to reflect the effectiveness of dust control measures. Common mitigation measures include reducing the extent of exposed surfaces, stabilising exposed areas using dust suppressants, routine watering of unsealed surfaces and limiting vehicle speeds on unsealed roads.

As the Toowoomba Landscape Supplies facility is an existing lawful use and is not the subject of this development application, the assessment has not assumed the implementation of any dust mitigation measures beyond those currently existing at the site.

Where relevant, control efficiencies have been applied to emission estimates to reflect existing site conditions and operational practices. These include routine dust suppression measures undertaken

as part of normal site operations and physical characteristics of the site that reduce the potential for dust generation and transport.

Accordingly, the assessment is considered representative of existing operating conditions and site characteristics and does not rely on the implementation of future or additional mitigation measures.

4.2.5 Aggregated Emissions

The estimated aggregated dust emissions for the Toowoomba Landscape Supplies facility are presented in Table 9.

Table 9: Estimated aggregated dust emissions (mg/m^2/day)

DUST SOURCE	TSP	PM10	PM2.5
Unmitigated			
Wheel Generated	40.4	11.5	1.2
Exposed Areas	124	62	9
Stockpiles & Handling	8.9	4.2	0.6
TOTAL	**174**	**78**	**11**
Mitigated			
Wheel Generated	8.1	2.3	0.23
Exposed Areas	25	12	2
Stockpiles & Handling	1.8	0.8	0.1
TOTAL	**35**	**16**	**2**

Under an uncontrolled scenario, the aggregated dust deposition rate is estimated to be approximately 173 mg/m²/day as TSP, 78 mg/m²/day as PM_{10} and 11 mg/m²/day as $PM_{2.5}$. Following application of the adopted 80% control efficiency, the aggregated dust deposition rate is reduced to approximately 35 mg/m²/day as TSP, 16 mg/m²/day as PM_{10} and 2 mg/m²/day as $PM_{2.5}$, which is substantially below the adopted nuisance dust guideline value.

Wind erosion from exposed surfaces was identified as the dominant dust source at the site, accounting for approximately 71.4% of the total mitigated TSP emissions, while stockpile handling and wind disturbance contribute approximately 5% of total mitigated dust emissions. Accordingly, management of exposed surfaces represents the most effective means of reducing overall dust emissions at the facility.

4.3 Estimation of Dust Concentrations

To provide an indication of potential ground-level particulate matter concentrations at the proposed dwelling, a simplified Gaussian plume screening assessment was undertaken using the estimated dust emission rates derived in Section 4.2. The assessment considered the combined emissions from wheel-generated dust, wind erosion of exposed surfaces and material stockpiles.

As the emission inventory was initially developed as area-normalised emission rates (g/m²/s), each individual source was converted to a total mass emission rate (g/s) by multiplying the source-specific emission flux by the corresponding source area. The resulting source emission rates were then combined to derive an equivalent site-wide emission rate for use within the Gaussian plume equation.

For the purposes of the assessment, the following conservative assumptions were adopted:

- wind speed of 1.5 m/s;
- Pasquill-Gifford Stability Class F atmospheric conditions;
- flat and unobstructed terrain;
- centreline alignment of the receptor with the source; and
- a receptor separation distance of 6 m from the nearest dust-generating activity.

These assumptions maximise predicted ground-level concentrations and therefore provide a conservative screening-level estimate of potential impacts.

The Gaussian plume equation was subsequently used to estimate centreline ground-level concentrations arising from the combined dust source, with the emission rate expressed as a total mass emission rate (g/s). The model assumes steady-state conditions and a fully reflecting ground surface and therefore provides a conservative estimate of short-term particulate matter concentrations at the proposed dwelling.

Predicted concentrations should be regarded as screening-level estimates only. Actual ground-level concentrations are expected to be lower due to variability in meteorological conditions, plume meander, atmospheric mixing and the distributed nature of dust-generating activities across the site.

4.3.1 Separation Distance

A separation distance of 6 m was adopted for the assessment, representing the minimum distance between the principal dust-generating areas of the Toowoomba Landscape Supplies facility and the proposed dwelling.

While the adopted distance represents a conservative receptor location, the assessment should be regarded as a screening-level evaluation only. Dispersion models are generally less reliable in the immediate vicinity of a source, particularly where distances are short and dust emissions are generated from multiple distributed source areas. Accordingly, the results are intended to provide an indication of the likely order of magnitude of concentrations rather than a precise prediction of near-field impacts.

4.3.2 Dispersion Equation

The Gaussian plume equation was used to estimate ground-level concentrations arising from the combined dust emission source. The simplified form applied in this assessment is:

$$C(x) = \frac{Q}{(\pi\, \sigma_y \sigma_z u)} \exp\left(-\frac{H^2}{2\, \sigma z^2}\right)$$

Where:

- C(x) = predicted concentration at distance x downwind (g/m³);
- Q = emission rate from the source (g/s);
- u = mean wind speed (m/s);
- H = effective release height (m); and
- σy and σz = standard deviations of the plume in the lateral (cross-wind) and vertical directions, respectively (m). These parameters represent plume dispersion and are functions of atmospheric stability and downwind distance.

For the purposes of this assessment, Pasquill-Gifford Stability Class F relationships were adopted to determine σy and σz. The combined site emission rate was derived from the aggregated dust emission inventory presented in Section 4.2, with individual area-based emission rates converted to mass emission rates (g/s) using the corresponding source areas.

The Gaussian plume model provides a conservative screening-level estimate of potential ground-level concentrations under steady-state conditions and is intended to indicate the likely order of magnitude of particulate matter concentrations at the proposed dwelling.

4.4 Concentration Results

The calculated ground-level concentrations for each particulate matter fraction at the proposed dwelling are presented in Table 10. The predicted concentrations represent conservative screening-level estimates of the maximum 1-hour average concentrations that may occur at a representative receptor located 6 m from the nearest dust-generating activity under worst-case meteorological conditions.

Table 10: Calculated ground level concentration at proposed dwelling (µg/m³ (1-hour average))

TSP	PM10	PM2.5
Unmitigated		
0.028	0.014	0.002
Mitigated		
0.006	0.003	0.0004

The concentrations presented in Table 10 were derived using a conservative Gaussian plume screening assessment and represent short-term (1-hour average) concentrations. The applicable Queensland Air Quality Objectives for particulate matter are based on 24-hour and annual averaging periods. While a direct comparison between a predicted 1-hour concentration and a 24-hour or annual objective is not strictly equivalent, the assessment is considered conservative as the predicted concentrations represent worst-case operating and dispersion conditions.

The highest predicted PM_{10} concentration under the unmitigated scenario was 0.014 µg/m³, which is approximately 3,600 times lower than the 24-hour Air Quality Objective of 50 µg/m³. Similarly, the highest predicted $PM_{2.5}$ concentration of 0.002 µg/m³ is approximately 10,000 times lower than the 24-hour Air Quality Objective of 20 µg/m³.

For the purposes of assessing cumulative impacts, the predicted concentrations were considered together with the adopted background concentrations for the locality. Background concentrations of 12.8 µg/m³ PM_{10} and 5.4 µg/m³ $PM_{2.5}$ were adopted based on monitoring data from the Toowoomba Tor Street monitoring station. The addition of the maximum predicted concentrations results in cumulative concentrations of approximately 12.81 µg/m³ PM_{10} and 5.40 µg/m³ $PM_{2.5}$, which remain substantially below the annual Air Quality Objectives of 25 µg/m³ PM_{10} and 7 µg/m³ $PM_{2.5}$.

Consistent with the concentration assessment, the mitigated dust emissions inventory estimated an area-normalised TSP emission rate of approximately 35 mg/m²/day. While this value represents a source emission rate rather than a measured dust deposition rate at a sensitive receptor, it is substantially lower than the commonly adopted dust nuisance criterion of 120 mg/m²/day and supports the conclusion that unacceptable dust nuisance impacts are unlikely to occur at the proposed dwelling.

Accordingly, the assessment indicates that particulate matter emissions generated by the existing Toowoomba Landscape Supplies facility are unlikely to result in adverse air quality impacts, unacceptable dust nuisance or loss of residential amenity at the proposed dwelling.

5 Conclusion

This Reverse Amenity Dust Assessment was undertaken to assess the potential for dust emissions generated by the existing Toowoomba Landscape Supplies facility to adversely affect the proposed residential dwelling at 10 Gowrie Street. The assessment considered wheel-generated dust associated with vehicle and mobile plant movements, wind erosion from exposed surfaces and dust emissions associated with material stockpiles and handling activities.

Dust emissions were estimated using recognised US EPA AP-42 methodologies and supported by a review of ambient particulate matter and dust deposition monitoring data representative of the Toowoomba locality. The assessment identified wind erosion from exposed surfaces as the dominant dust source, accounting for approximately 70% of total mitigated TSP emissions. Following application of representative control efficiencies reflecting existing site conditions and operational practices, total site dust emissions were estimated to be approximately 35 mg/m²/day as TSP, 16 mg/m²/day as PM_{10} and 2 mg/m²/day as $PM_{2.5}$. These values are substantially below the commonly adopted dust nuisance criterion of 120 mg/m²/day.

A conservative Gaussian plume screening assessment was subsequently undertaken to estimate potential ground-level particulate matter concentrations at the proposed dwelling. The assessment adopted conservative assumptions, including a separation distance of 6 m, Pasquill-Gifford Stability Class F atmospheric conditions, centreline plume alignment and low wind speed conditions. Predicted maximum concentrations were extremely low, with unmitigated concentrations estimated at approximately 0.028 µg/m³ as TSP, 0.014 µg/m³ as PM_{10} and 0.002 µg/m³ as $PM_{2.5}$. Predicted concentrations were several orders of magnitude lower than the applicable Air Quality Objectives.

When considered together with the adopted background concentrations of 12.8 µg/m³ for PM_{10} and 5.4 µg/m³ for $PM_{2.5}$, cumulative concentrations remain substantially below the relevant annual Air Quality Objectives of 25 µg/m³ for PM_{10} and 7 µg/m³ for $PM_{2.5}$. The assessment therefore indicates that dust emissions generated by the existing operation are unlikely to result in adverse air quality impacts at the proposed dwelling.

The proposed dwelling is located within a mixed-use environment that contains established commercial activities, including the adjoining Toowoomba Landscape Supplies facility. While occasional dust-generating activities may occur during periods of dry weather, elevated winds or increased operational activity, such occurrences are considered characteristic of the existing surrounding land-use environment and are not expected to adversely affect the health or amenity of future occupants.

Accordingly, it is concluded that the proposed residential dwelling is compatible with the existing and lawful operation of Toowoomba Landscape Supplies from a dust and air quality perspective and that the development is consistent with the intent of the relevant provisions of the *Toowoomba Regional Planning Scheme 2012*.

Appendix A

PROPOSAL PLANS PREPARED BY
SP BUILDING DESIGN



NOT FOR CONSTRUCTION

INDEX TO DRAWINGS

1.01	SITE PLAN	08.09.26	B
2.01	FLOOR PLAN LOWER	08.09.26	B
2.02	FLOOR PLAN UPPER	08.09.26	B
3.01	ELEVATIONS	08.09.26	B
3.02	ELEVATIONS	08.09.26	B
4.01	3D VIEWS	08.09.26	B



NEW RESIDENCE

LOT 3 PRICE LN, TOOWOOMBA CITY

SP

BUILDING DESIGN

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ABN 70 650 433 757

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DESIGNER :

A. Cooper

REVISION SCHEDULE

A	CONCEPT DWGS	02.09.26
B	CONCEPT DWGS	08.09.26

PROJECT DETAILS

NEW RESIDENCE

LOT 3 PRICE LN,
TOOWOOMBA CITY

SINOJ JACOB

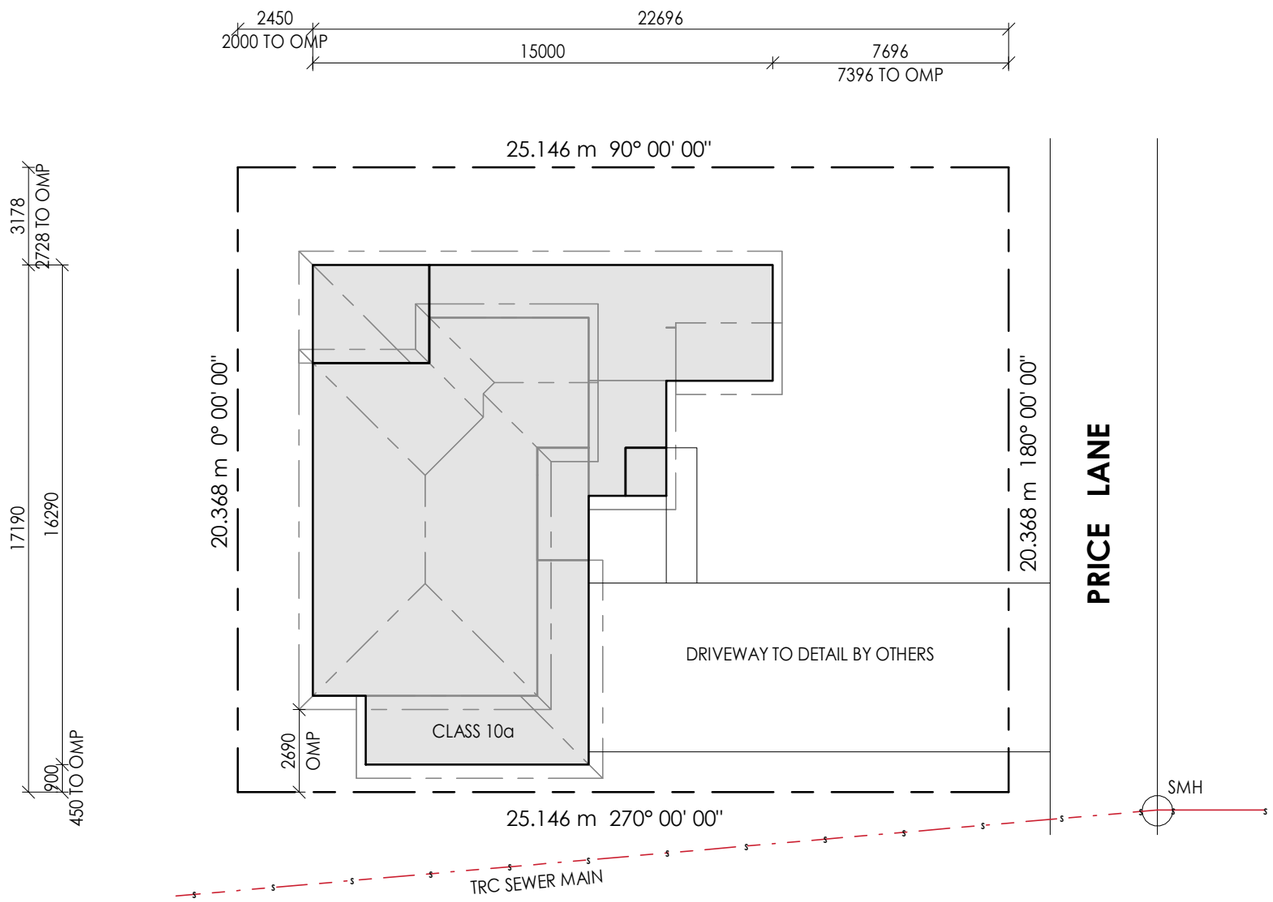
LOT 3 ON RP16444

PROJECT NUMBER : 260712

SHEET SIZE : A3
WIND CATEGORY :

0.00 - B

NOT FOR CONSTRUCTION



1:200 @ **A3**

0 1 2 5 10 20m

SITE PLAN

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DESIGNER :

A. Cooper

REVISION SCHEDULE

A	CONCEPT DWGS	02.09.26
B	CONCEPT DWGS	08.09.26

LEGEND

AG	ABOVE GROUND
CL	CLOTHES LINE
CPC	COMMUNICATIONS PIT COVER
DD	DRAINAGE DROPPER FRAMED OUT
DP	DOWNPIPE
ES	ELECTRICAL SERVICE LINE
EP	ELECTRICAL SERVICE PILLAR
EPC	ELECTRICAL PIT
HSTP	HOME SEWAGE TREATMENT PLANT
OH	OVERHEAD
PP	POWER POLE
RB	REFUSE BIN
RTW	RETAINING WALL
RWT	RAINWATER TANK
SOP	SETOUT POINT
SMH	SEWER MANHOLE COVER
SWMH	STORMWATER MANHOLE COVER
UG	UNDERGROUND
WM	WATER METER
	BEARER AND JOIST CONSTRUCTION
	SLAB ON GROUND CONSTRUCTION
AT	ARTIFICIAL TURF
BFC	BROOM FINISHED CONCRETE
GR	DECORATIVE GRAVEL
PL	IN GROUND PLANTING
E	ELECTRICAL
S	SEWER
SW	STORMWATER
W	WATER

PROJECT DETAILS

NEW RESIDENCE

LOT 3 PRICE LN,
TOOWOOMBA CITY

SINOJ JACOB

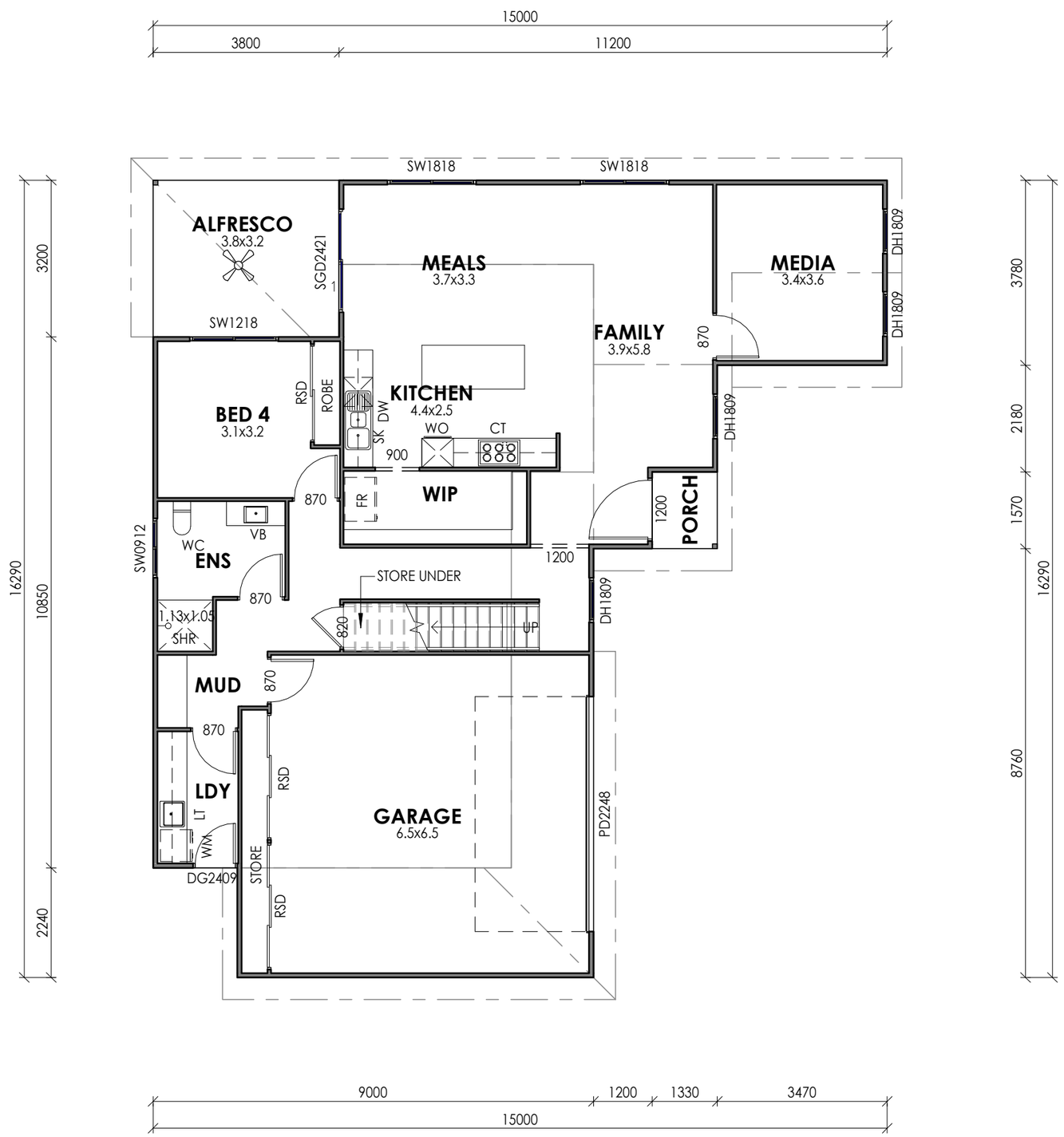
LOT 3 ON RP16444

SIGNATURES	
OWNER/S	
BUILDER	

PROJECT NUMBER : 260712

SCALE : 1 : 200
SHEET SIZE : A3
WIND CATEGORY :

1.01 - B



1:100 @ **A3**

0 1 2 5 10m

FLOOR PLAN LOWER

AREA SCHEDULE	
LOWER LIVING AREA	160.7 m²
LOWER ALFRESCO AREA	12.2 m²
LOWER PORCH AREA	2.1 m²
UPPER LIVING AREA	88.4 m²
UPPER BALCONY AREA	6.2 m²
TOTAL	269.5 m²

SIGNATURES	
OWNER/S	
BUILDER	

NOT FOR CONSTRUCTION

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DESIGNER :

A. Cooper

REVISION SCHEDULE

A	CONCEPT DWGS	02.09.26
B	CONCEPT DWGS	08.09.26

LEGEND

AC	AIR CONDITIONER
B	BATHTUB
CA	CEILING ACCESS
CL	CLOTHES LINE
CT	COOK TOP
CU	AC CONDENSER UNIT
DP	DOWNPIPE
DPS	DOWNPIPE SPITTER
DRY	DRYER
DW	DISH WASHER SPACE
FR	FRIDGE SPACE
FRZ	FREEZER SPACE
FSB	FREE STANDING BATH
FW	FLOOR WASTE
GC	GAS CYLINDERS
HC	HOSE COCK
HW	HOT WATER STORAGE UNIT
LT	LAUNDRY TUB
MB	METER BOX
MW	MICROWAVE SPACE
MV	MECHANICAL EXHAUST FAN
OHC	OVERHEAD CUPBOARDS
PTY	PANTRY
RH	RANGE HOOD
SA	INTERCONNECTED SMOKE ALARM
SC	SCREEN
SF	SHELF
SHR	SHOWER
SK	SINK
SKL	SKY LIGHT
UBO	UNDER BENCH OVEN
WC	WATER CLOSET
WM	WASHING MACHINE
WO	WALL OVEN
VB	VANITY BASIN

PROJECT DETAILS

NEW RESIDENCE

LOT 3 PRICE LN,
TOOWOOMBA CITY

SINOJ JACOB

LOT 3 ON RP16444

PROJECT NUMBER : 260712

SCALE : 1 : 100
SHEET SIZE : A3
WIND CATEGORY :

2.01 - B

NOT FOR CONSTRUCTION



1:100 @ **A3**

0 1 2 5 10m

FLOOR PLAN UPPER

AREA SCHEDULE	
LOWER LIVING AREA	160.7 m²
LOWER ALFRESCO AREA	12.2 m²
LOWER PORCH AREA	2.1 m²
UPPER LIVING AREA	88.4 m²
UPPER BALCONY AREA	6.2 m²
TOTAL	269.5 m²

SIGNATURES	
OWNER/S	
BUILDER	

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DESIGNER :

A. Cooper

REVISION SCHEDULE

A	CONCEPT DWGS	02.09.26
B	CONCEPT DWGS	08.09.26

LEGEND

AC	AIR CONDITIONER
B	BATHTUB
CA	CEILING ACCESS
CL	CLOTHES LINE
CT	COOK TOP
CU	AC CONDENSER UNIT
DP	DOWNPIPE
DPS	DOWNPIPE SPITTER
DRY	DRYER
DW	DISH WASHER SPACE
FR	FRIDGE SPACE
FRZ	FREEZER SPACE
FSB	FREE STANDING BATH
FW	FLOOR WASTE
GC	GAS CYLINDERS
HC	HOSE COCK
HW	HOT WATER STORAGE UNIT
LT	LAUNDRY TUB
MB	METER BOX
MW	MICROWAVE SPACE
MV	MECHANICAL EXHAUST FAN
OHC	OVERHEAD CUPBOARDS
PTY	PANTRY
RH	RANGE HOOD
SA	INTERCONNECTED SMOKE ALARM
SC	SCREEN
SF	SHELF
SHR	SHOWER
SK	SINK
SKL	SKY LIGHT
UBO	UNDER BENCH OVEN
WC	WATER CLOSET
WM	WASHING MACHINE
WO	WALL OVEN
VB	VANITY BASIN

PROJECT DETAILS

NEW RESIDENCE

LOT 3 PRICE LN,
TOOWOOMBA CITY

SINOJ JACOB

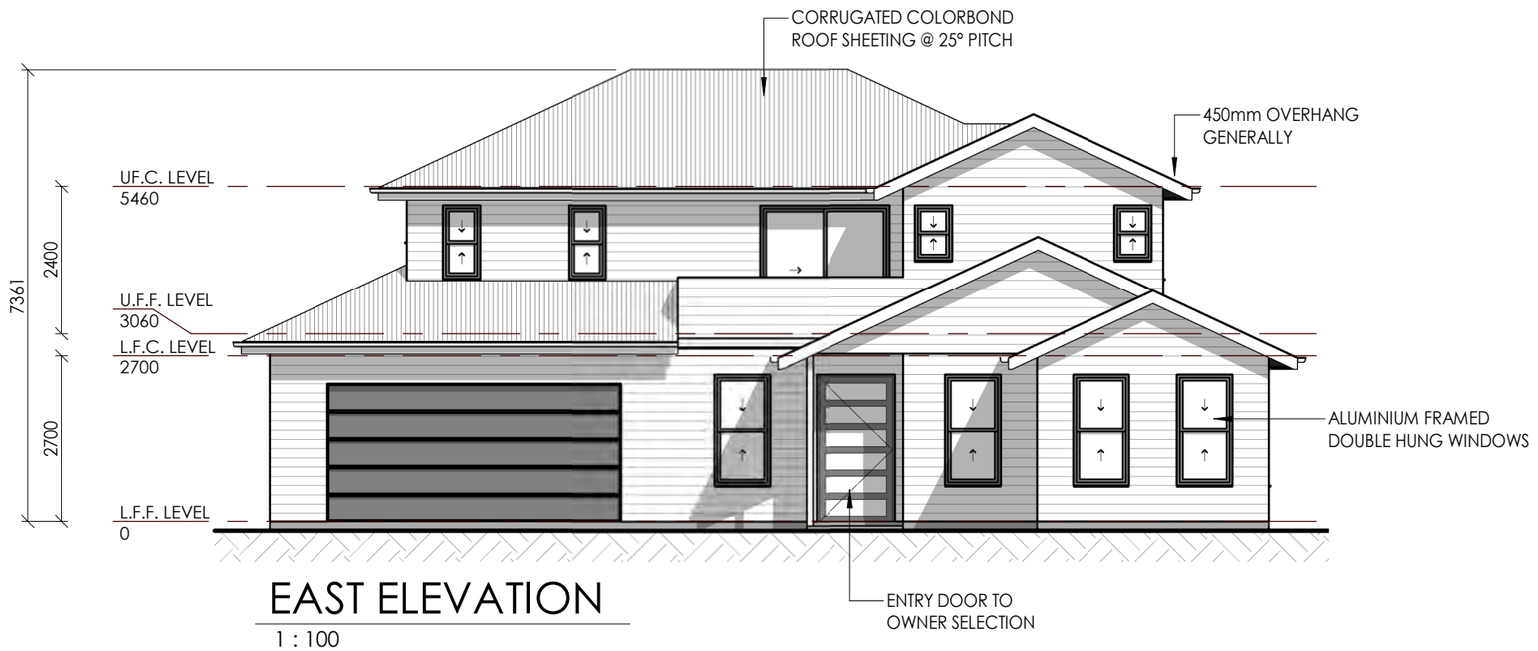
LOT 3 ON RP16444

PROJECT NUMBER : 260712

SCALE : 1 : 100
SHEET SIZE : A3
WIND CATEGORY :

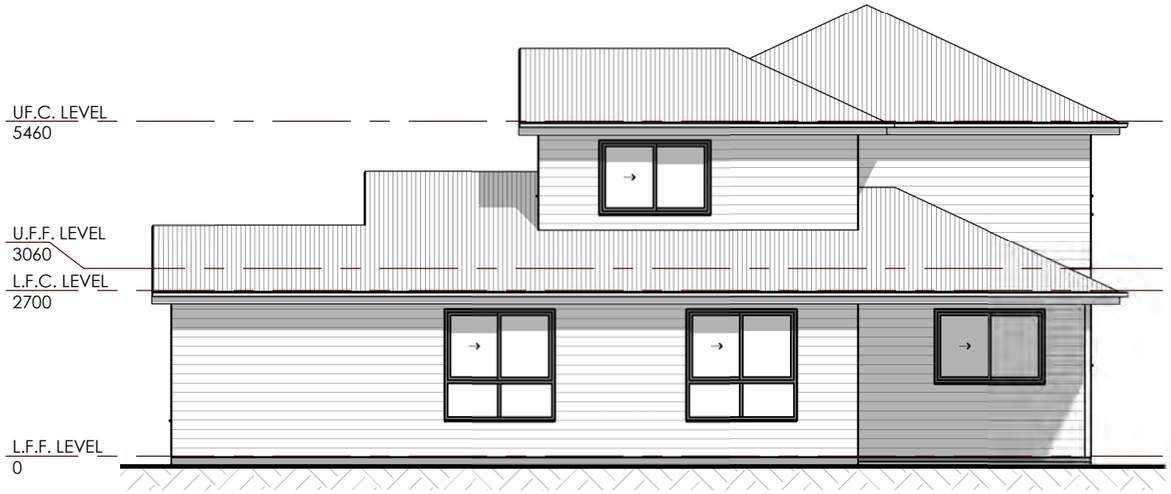
2.02 - B

NOT FOR CONSTRUCTION



EAST ELEVATION

1 : 100



NORTH ELEVATION

1 : 100

NOTES

F.F.L. DENOTES FINISHED FLOOR LEVEL
F.C.L. DENOTES FINISHED CEILING LEVEL

1:100 @ **A3**

0 1 2 5 10m

ELEVATIONS

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DESIGNER :

A. Cooper

REVISION SCHEDULE

A	CONCEPT DWGS	02.09.26
B	CONCEPT DWGS	08.09.26

LEGEND

AJ	ARTICULATION JOINT
RTW	RETAINING WALL
WH	WINDOW HOOD
OBS	OBSCURE GLASS
x	SLIDING PANEL
o	FIXED PANEL

PROJECT DETAILS

NEW RESIDENCE

LOT 3 PRICE LN,
TOOWOOMBA CITY

SINOJ JACOB

LOT 3 ON RP16444

PROJECT NUMBER : 260712

SCALE : 1 : 100
SHEET SIZE : A3
WIND CATEGORY :

3.01 - B

SIGNATURES
OWNER/S
BUILDER

NOT FOR CONSTRUCTION



WEST ELEVATION

1 : 100



SOUTH ELEVATION

1 : 100

NOTES

F.F.L. DENOTES FINISHED FLOOR LEVEL

F.C.L. DENOTES FINISHED CEILING LEVEL

1:100 @ **A3**

0 1 2 5 10m

ELEVATIONS

BUILDING DESIGN

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ABN 70 650 433 757

Designers shall not be responsible for the structural design of the building. Do not scale this drawing. Verify all dimensions, details and notations prior to construction.

DESIGNER :

A. Cooper

REVISION SCHEDULE

A	CONCEPT DWGS	02.09.26
B	CONCEPT DWGS	08.09.26

LEGEND

AJ	ARTICULATION JOINT
RTW	RETAINING WALL
WH	WINDOW HOOD
OBS	OBSCURE GLASS
x	SLIDING PANEL
o	FIXED PANEL

PROJECT DETAILS

NEW RESIDENCE

LOT 3 PRICE LN,
TOOWOOMBA CITY

SINOJ JACOB

LOT 3 ON RP16444

PROJECT NUMBER : 260712

SCALE : 1 : 100
SHEET SIZE : A3
WIND CATEGORY :

SIGNATURES
OWNER/S
BUILDER

3.02 - B

NOT FOR CONSTRUCTION





3D VIEWS

SP

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REVISION SCHEDULE

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SIGNATURES	
OWNER/S	
BUILDER	

PROJECT DETAILS

NEW RESIDENCE

LOT 3 PRICE LN,
TOOWOOMBA CITY

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LOT 3 ON RP16444

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SHEET SIZE : A3
WIND CATEGORY :

4.01 - B

Appendix B

AMBIENT DUST DEPOSITION DATA

AMBIENT DUST DEPOSITION DATA

10 Gowrie Street - Resdeitnial Dwelling - Reverse Amenity Dust Assesment

Monthly average dust (insoluble solids fraction) deposition rate (mg/m^2/day), January 2022 to March 2025

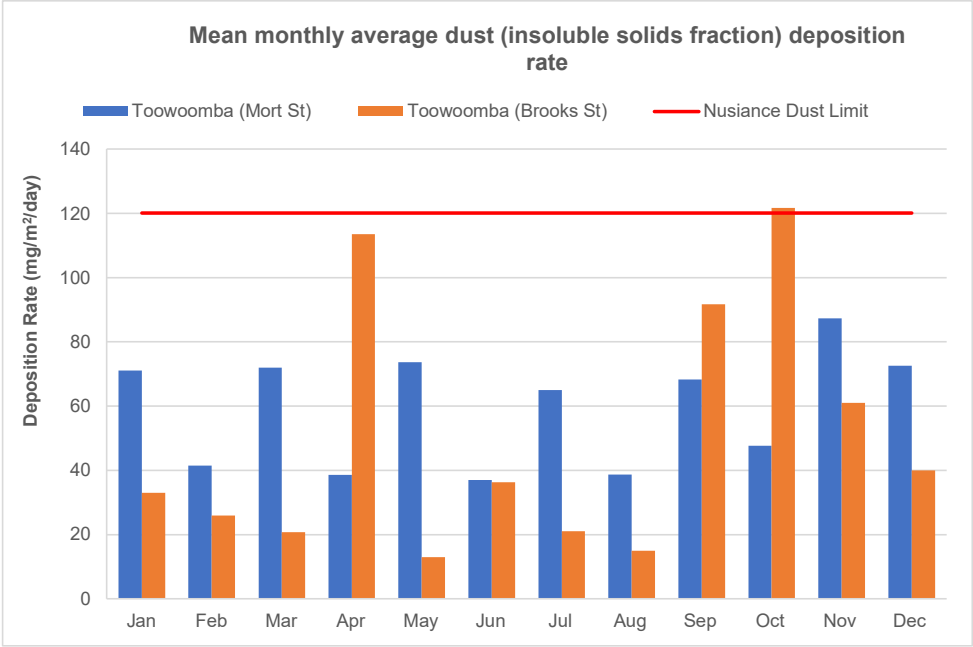
	2022												2023												2024														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Toowoomba (Mort St)	115	33	38	29	124	40	105	55	134	n.d.	40	25	48	29	127	28	1	32	5	3	64	42	54	59	31	26	71	48	96	28	87	39	43	53	116	178	90	78	52
Toowoomba (Brooks St)	12	13	22	8	9	57	8	17	98	30	27	17	16	47	26	52	3	40	7	1	14	242	9	55	32	10	13	330	25	33	50	35	163	n.d.	105	12	72	34	22

Mean monthly average dust depostion rate

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Toowoomba (Mort St)	71	42	72	39	74	37	65	39	68	48	87	73
Toowoomba (Brooks St)	33	26	21	114	13	36	21	15	92	122	61	40
Nusiance Dust Limit	120	120	120	120	120	120	120	120	120	120	120	120

Average mean monthly average dust depostion rate for Mort St

59



Appendix C

FUGITIVE DUST EMISSION RATES & FACTORS

C

FUGITIVE DUST EMISSION CALCULATIONS

10 Gowrie Street - Residential Dwelling - Reverse Amenity Dust Assessment

ONSITE HEAVY VEHICLE MANOEUVERING				
SOURCE	**TSP**	**PM10**	**PM2.5**	**UNITS**
Wheel Generated Emissions	9.0390	2.5826	0.2583	lb/VMT
	2.5478	0.7279	0.0728	kg/VKT
	6557.9178	1873.7372	187.3737	kg/yr
	1.48E-01	4.22E-02	4.22E-03	t/ha/yr
	4.68E-07	1.34E-07	1.34E-08	$g/m^2/s$ - Unmitigated
	9.35E-08	2.67E-08	2.67E-09	$g/m^2/s$ - Mitigated
	40.4	11.5	1.2	$mg/m^2/day$ - Unmitigated
	8.1	2.3	0.23	$mg/m^2/day$ - Mitigated

INPUT PARAMETERS		
Surface Silt Content	8.5	%
Mean Vehicle Weight	20	t
Days Per Week	5.5	
Vehicle Movements Per Day	120	
Distance Per Manourvre	75	m
Total Vehicle Kilometres Per Year	2574	km
Vehicle Width	3	m
Traversed Surface Area	225	sqm
Control Efficiency	80%	%

WINDBLOWN DUST FROM EXPOSED AREAS				
SOURCE	**TSP**	**PM10**	**PM2.5**	**UNITS**
Exposed Areas	0.4541	0.2271	0.0341	t/ha/yr
	1.44E-06	7.20E-07	1.08E-07	$g/m^2/s$ - Unmitigated
	2.88E-07	1.44E-07	2.16E-08	$g/m^2/s$ - Mitigated
	124	62	9	$mg/m^2/day$ - Unmitigated
	25	12	2	$mg/m^2/day$ - Mitigated

INPUT PARAMETERS		
Mean Rainfall Days ≥ 0.25mm	170	
Exposed Area	0.6250	Ha
Control Efficiency	80%	%

WINDBLOWN DUST FROM STOCKPILES & HANDLING				
SOURCE	**TSP**	**PM10**	**PM2.5**	**UNITS**
Stockpiles & Handling	0.0032	0.0015	0.0002	t/yr
	0.032	0.015	0.002	t/ha/yr
	1.03E-07	4.86E-08	7.36E-09	$g/m^2/s$ - Unmitigated
	2.05E-08	9.72E-09	1.47E-09	$g/m^2/s$ - Mitigated
	8.9	4.2	0.6	$mg/m^2/day$ - Unmitigated
	1.8	0.8	0.1	$mg/m^2/day$ - Mitigated

INPUT PARAMETERS		
Annual Throughput	3000	t/yr
Area under Stockpile	1000	sqm
Moisture Content	5	%
Wind Speed	5.5	m/s
Handling Events	9000	pa
Control Efficiency	80%	%

AGGREGATED DUST EMISSIONS				
	TSP	**PM10**	**PM2.5**	**UNITS**
	2.01E-06	9.02E-07	1.29E-07	$g/m^2/s$ - Unmitigated
	4.02E-07	1.80E-07	2.57E-08	$g/m^2/s$ - Mitigated
	174	78	11	$mg/m^2/day$ - Unmitigated
	35	16	2	$mg/m^2/day$ - Mitigated

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