

Macquarie

**Sydney Metro Martin Place
integrated station development**

**North Tower, SSD DA Stage 2:
Air Quality Assessment**

CSWSMP-MAC-SMN-ES-REP-999901

Revision 01 | 23 August 2018

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 247838

Arup
Level 10 201 Kent Street
PO Box 76 Millers Point
Sydney 2000
Australia
www.arup.com

ARUP

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1 Introduction

This report supports a State Significant Development (SSD) Development Application (DA) (SSD DA) submitted to the Minister for Planning (Minister) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on behalf of Macquarie Corporate Holdings Pty Limited (Macquarie), who is seeking to create a world class transport and employment precinct at Martin Place, Sydney.

The SSD DA seeks approval for the detailed design and construction of the **North Site** Over Station Development (OSD), located above and integrated with Metro Martin Place station (part of the NSW Government's approved Sydney Metro project). The northern entrance to Metro Martin Place station will front Hunter Street, Elizabeth Street and Castlereagh Street, with the North Site OSD situated above.

This application follows the approval granted by the Minister for a Concept Proposal (otherwise known as a Stage 1 SSD DA) for two OSD commercial towers above the northern and southern entrances of Metro Martin Place station (SSD 17_8351). The approved Concept Proposal establishes building envelopes, land uses, Gross Floor Areas (GFA) and Design Guidelines with which the detailed design (otherwise known as a Stage 2 SSD DA) must be consistent. This application does not seek approval for elements of the Metro Martin Place Precinct (the Precinct) which relate to the Sydney Metro City and Southwest project, which is subject to a separate Critical State Significant Infrastructure (CSSI) approval. These include:

- Demolition of buildings on the North Site and South Site;
- Construction of rail infrastructure, including station platforms and concourse areas;
- Ground level public domain works; and
- Station related elements in the podium of the North Tower.

However, this application does seek approval for OSD areas in the approved Metro Martin Place station structure, above and below ground level, which are classified as SSD as they relate principally to the OSD. These components are within the Sydney Metro CSSI approved station building that will contain some OSD elements not already approved by the CSSI Approval. Those elements include the end of trip facilities, office entries, office space and retail areas, along with other office/retail plant and back of house requirements that are associated with the proposed OSD and not the rail infrastructure.

This report specifically addresses the potential air quality issues associated with the construction works associated with the development of this site.

Context

The New South Wales (NSW) Government is implementing Sydney's Rail Future (Transport for NSW, 2012), a plan to transform and modernise Sydney's rail network so that it can grow with the city's population and meet the needs of customers in the future.

Sydney Metro is a new standalone rail network identified in Sydney's Rail Future. The Sydney Metro network consists of Sydney Metro Northwest (Stage 1) and Sydney Metro City and Southwest (Stage 2).

Stage 2 of Sydney Metro entails the construction and operation of a new metro rail line from Chatswood, under Sydney Harbour through Sydney's CBD to Sydenham and onto Bankstown through the conversion of the existing line to metro standards. The project also involves the delivery of seven (7) new metro stations, including Martin Place.

This step-change piece of public transport infrastructure once complete will have the capacity for 30 trains an hour (one every two minutes) through the CBD in each direction catering for an extra 100,000 customers per hour across the Sydney CBD rail lines.

On 9 January 2017 the Minister approved the Stage 2 (Chatswood to Sydenham) Sydney Metro application lodged by Transport for NSW (TfNSW) as a Critical State Significant Infrastructure (CSSI) project (reference SSI 15_7400). Work is well underway under this approval, including demolition of buildings at Martin Place.

The OSD development is subject to separate applications to be lodged under the relevant provisions of the EP&A Act. One approval is being sought for the North Site – this application – and one for the South Site via a separate application.

Site Description

The Metro Martin Place Precinct relates to the following properties (refer to Figure 1):

- 50 Martin Place, 9 – 19 Elizabeth Street, 8 – 12 Castlereagh Street, 5 Elizabeth Street, 7 Elizabeth Street, and 55 Hunter Street (North Site);
- 39 – 49 Martin Place (South Site); and
- Martin Place (that part bound by Elizabeth Street and Castlereagh Street).

This application relates **only to the North Site**, being the city block bounded by Hunter Street, Castlereagh Street, Elizabeth Street, and Martin Place (refer to Figure 1).

The South Site (39 – 49 Martin Place) is the subject of a separate Stage 2 SSD DA.



Figure 1: Aerial Photo of the North and South Site of the Metro Martin Place Precinct

Background

Sydney Metro Stage 2 Approval (SSI 15 7400)

The Sydney Metro CSSI Approval approves the demolition of existing buildings at Martin Place, excavation and construction of the new station (above and below ground) along with construction of below and above ground structural and other components of the future OSD, although the fit-out and use of such areas are the subject of separate development approval processes.

On 22 March 2018, the Minister approved Modification 3 to the Sydney Metro CSSI Approval. This enabled the inclusion of Macquarie-owned land at 50 Martin Place and 9-19 Elizabeth Street within Metro Martin Place station, and other associated changes (including retention of the opening to the existing MLC pedestrian link).

Concept Proposal (SSD 17_8351)

On 22 March 2018, the Minister approved a Concept Proposal (SSD 17_8351) relating to Metro Martin Place Precinct. The Concept Proposal establishes the planning and development framework through which to assess the detailed Stage 2 SSD DAs.

Specifically, the Concept Proposal encompassed:

- Building envelopes for OSD towers on the North Site and South Site comprising:
 - 40+ storey building on the North Site (see Figure 2)
 - 28+ storey building on the South Site
 - Concept details to integrate the North Site with the existing and retained 50 Martin Place building (the former Government Savings Bank of NSW)
- Predominantly commercial land uses on both sites, comprising office, business and retail premises
- A maximum total GFA of 125,437m² across both sites
- Design Guidelines to guide the built form and design of the future development
- A framework for achieving design excellence
- Strategies for utilities and services provision, managing drainage and flooding, and achieving ecological sustainable development
- Conceptual OSD areas in the approved Metro Martin Place Metro station structure, above and below ground level¹

¹ Refers to those components within the Metro CSSI approved station envelope that will contain some OSD elements not approved in the CSSI consent. Those elements include the end of trip facilities, office entries, office space and retail areas, along with other office/retail plant and back of house requirements that are associated with the proposed OSD and not the rail infrastructure.

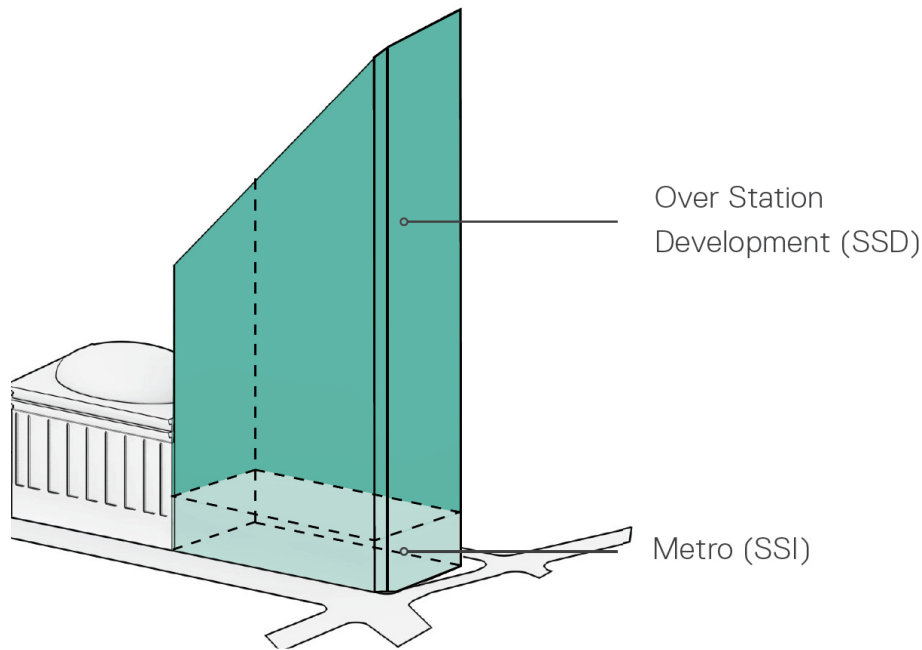


Figure 2: North Site Approved OSD Building Envelope

Planning Proposal (PP_2017_SYDNE_007_00) - Amendment to Sydney LEP 2012

The Planning Proposal (PP_2017_SYDNE_007_00) sought to amend the development standards applying to the Metro Martin Place Precinct through the inclusion of a site-specific provision in the Sydney Local Environmental Plan (LEP) 2012. This site-specific provision reduced the portion of the **South Site** that was subject to a 55 metre height limit from 25 metres from the boundary to Martin Place, to 8 metres, and applies the Hyde Park North Sun Access Plane to the remainder of the South Site, forming the height limit of the tower. It also permits a revised FSR of 22:1 on the South Site and 18.5:1 on the North Site. These amendments were gazetted within Sydney LEP 2012 (Amendment No. 46) on 8 June 2018 and reflect the new planning controls applying to the Precinct.

Overview of the Proposed Development

The subject application seeks approval for the detailed design, construction and operation of the North Tower. The proposal has been designed as a fully integrated station and OSD project that intends to be built and delivered as one development, in-time for the opening of Sydney Metro City and Southwest in 2024. This application seeks consent for the following:

- The design, construction and operation of a new 39 storey commercial OSD tower (plus rooftop plant) within the approved building envelope for the North Site, including office space and retail tenancies.
- Physical connections between the OSD podium and the existing 50 Martin Place building, to enable the use of the North Site as one integrated building.
- Vehicle loading areas within the basement levels.

- Extension and augmentation of physical infrastructure / utilities as required.
- Detailed design and delivery of ‘interface areas’ within both the approved station and Concept Proposal envelope that contain OSD-exclusive elements, such as end of trip facilities, office entries, office space and retail areas not associated with the rail infrastructure.

Planning Approvals Strategy

The *State Environmental Planning Policy (State and Regional Development) 2011* (SEPP SRD) identifies development which is declared to be State Significant. Under Schedule 1 and Clause 19(2) of SEPP SRD, development within a railway corridor or associated with railway infrastructure that has a capital investment value of more than \$30 million and involves commercial premises is declared to be State Significant Development (SSD) for the purposes of the EP&A Act.

The proposed development (involving commercial development that is both located within a rail corridor and associated with rail infrastructure) is therefore SSD.

Pursuant to Section 4.22 of the EP&A Act a Concept DA may be made setting out concept proposals for the development of a site (including setting out detailed proposals for the first stage of development), and for which detailed proposals for the site are to be the subject of subsequent DAs. This SSD DA represents a detailed proposal and follows the approval of a Concept Proposal on the site under Section 4.22 of the EP&A Act.

Submitted separately to this SSD DA is a SSD DA for the South Site (Stage 2 South Site SSD DA). A Stage 1 Amending SSD DA to the Concept Proposal (Stage 1 Amending DA) has also been submitted that has the effect of aligning the approved South Site envelope with the new planning controls established for the South Site (achieved through the site specific amendment to the Sydney LEP 2012).

Figure 3 below is a diagrammatic representation of the suite of key planning applications undertaken or proposed by Macquarie and their relationship to the subject application (the subject of this report).

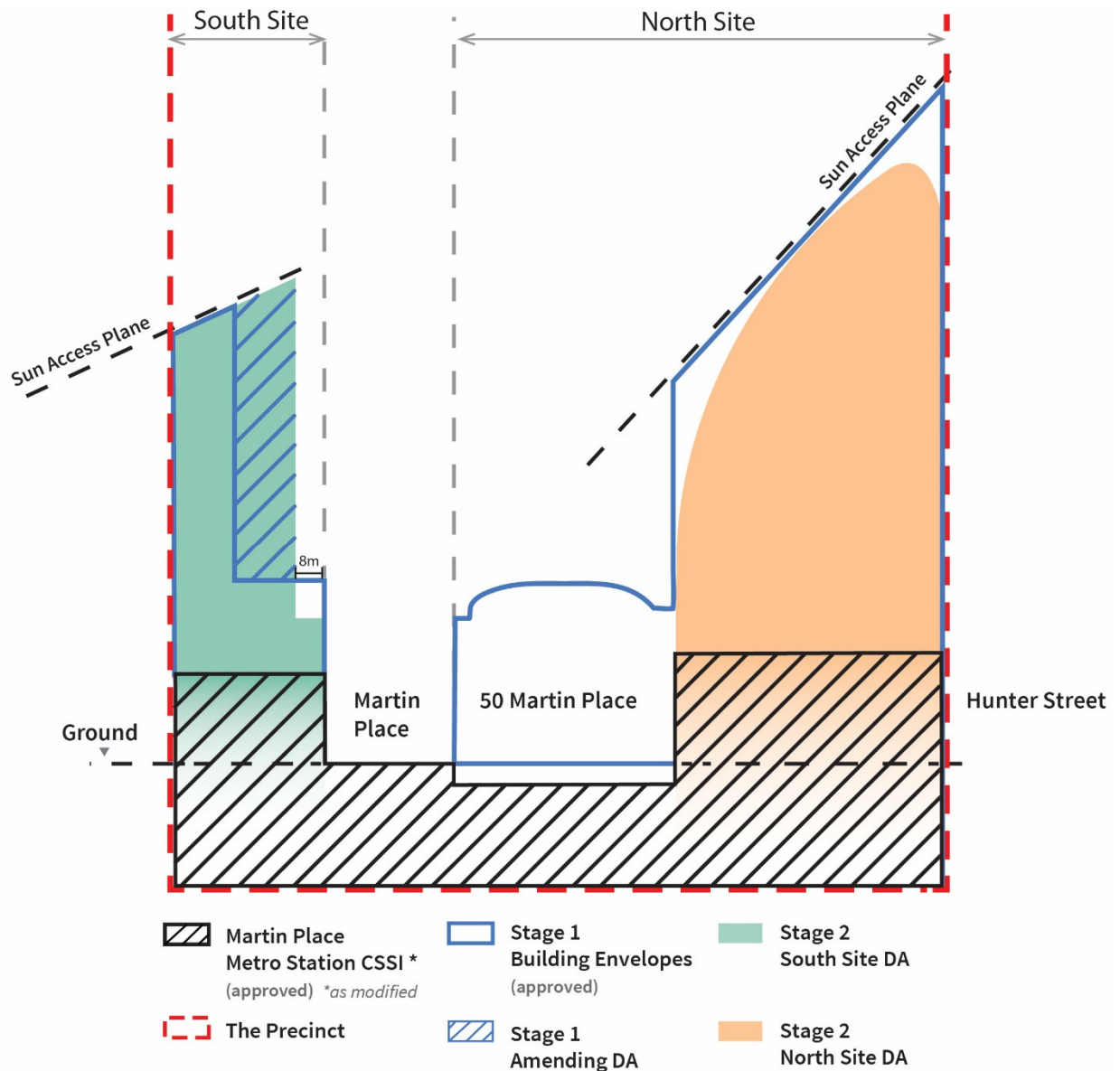


Figure 3: Relationship of key planning applications to the Stage 2 North Site DA (this application)

The Department of Planning and Environment have provided Secretary's Environmental Assessment Requirements (SEARs) to the applicant for the preparation of an Environmental Impact Statement for the proposed development. This report has been prepared having regard to the SEARs as follows:

The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the EP&A Regulation 2000. Provide these as part of the EIS rather than as separate documents.

In addition, the EIS must include the following:

- Air quality assessment.

2 Baseline Conditions

To determine the baseline air quality conditions and evaluate the potential air quality impacts from the proposed construction works, measured ambient pollutant concentrations can be compared to the NSW Environment Protection Authority (EPA) impact assessment criteria relevant to this study.

2.1 Air Quality Criteria

The NSW EPA Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (NSW DEC, 2005) specifies air quality assessment criteria relevant for assessing impacts from air pollution. These criteria are health-based (i.e. they are set at levels to protect against health effects).

Table 1 summarises the air quality criteria for concentrations of particulate matter that are relevant to this study.

Table 1: NSW EPA Impact Assessment Criteria for Pollutants of Potential Concern (NSW DEC, 2005)

Pollutant	Averaging Period	Concentration ($\mu\text{g}/\text{m}^3$)
Total suspended particles (TSP)	Annual	90
PM ₁₀	24 hour	50
	Annual	30

2.2 Existing Environment

No physical measurements or predictions of background ground level concentrations were undertaken for this assessment. The existing background concentration of particulate matter in the Sydney CBD air-shed was characterised using ambient air data recorded by the Office of Environment and Heritage (OEH).

2.2.1 Particulate Matter – PM₁₀

The NSW OEH monitors air quality at several urban background locations around Sydney. The closest OEH urban background monitoring stations to the proposed works are at Randwick (8.3 km to the south east), Rozelle (4.2 km to the west), and Earlwood (8.9 km to the south west).

Given that the air quality observations at Rozelle are closest (of the OEH monitoring stations) to the Metro Martin Place Precinct, the observations recorded at this site were considered to be the most representative of the existing air quality in the study area.

A summary of recent PM₁₀ monitoring results at these stations is presented in Table 2. The maximum 24 hour average concentrations at Rozelle exceeded the criterion of 50 µg/m³ in 2014 and 2015. Though these short-term peaks events are likely to have been a result of highly localised events in close proximity to the monitoring station or broader natural events, such as bushfires.

As shown, the annual average of all monitoring locations is well below the NSW EPA criteria of 30 µg/m³.

Table 2: Summary of PM₁₀ concentrations at OEH monitoring sites in 2013-2016 (OEH, 2017)

Averaging Period	Year	PM ₁₀ Concentration (µg/m ³)		
		Randwick	Rozelle	Earlwood
Maximum 24-hour average	2014	46.1	43.8	45.2
	2015	77.4	60.3	66.5
	2016	44.1	58.8	42.9
Annual average	2014	18.2	17.8	18.3
	2015	18.6	16.7	17.2
	2016	17.9	16.8	17.5

Note the assessment noted above is consistent with the method and data sources included in the approved Sydney Metro Chatswood to Sydenham EIS Air Quality report.

2.3 Meteorology

The closest Bureau of Meteorology (BOM) meteorological station is located at Sydney Airport, located approximately 9 km south-south west of the proposed works.

Long term wind roses during the 9 am and 3 pm time periods from the Sydney Airport meteorological station are presented in Figure 4.

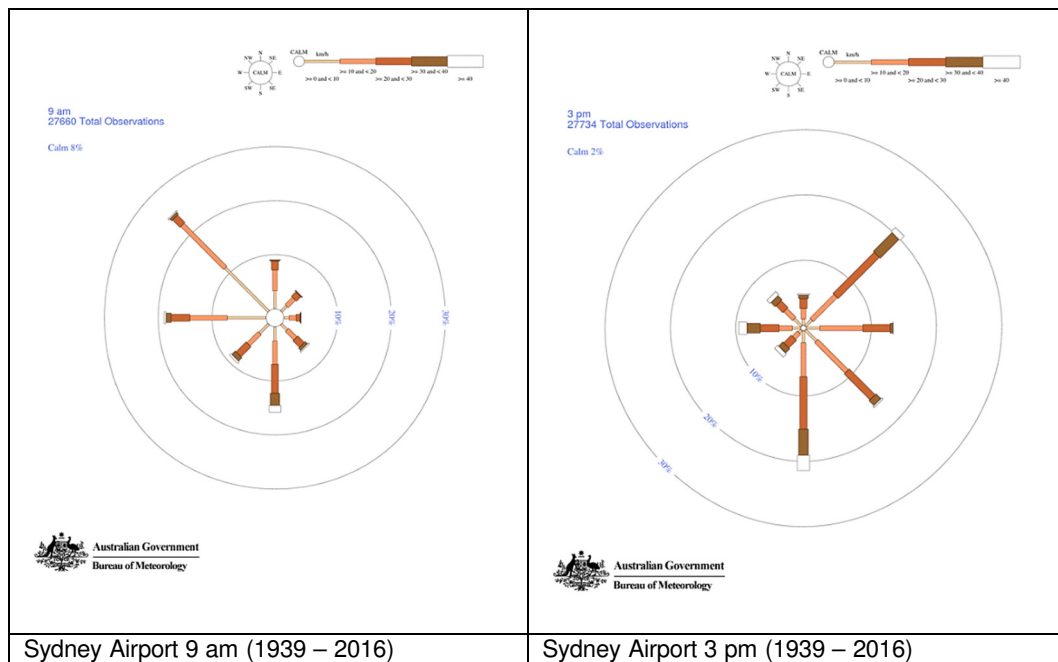


Figure 4: Long Term Wind Roses Recorded at Sydney Airport (BOM, 2017)

The windroses indicate that night-time and early morning winds are best represented by the 9 am windrose. The windrose identifies that the winds during these periods are typically light, dominated by north-westerly, westerly, and southerly components. The 3 pm windrose best represents the daytime and afternoon winds. As expected, there is a much lower percentage of calms (wind speeds less than 0.5 m/s) during this period. That is, the winds are generally stronger and are dominant from the north-east and south.

While the Sydney Airport windroses show a long-term diurnal wind pattern, the development is located within existing high-rise buildings, therefore it is anticipated that the wind conditions at the site will be highly variable.

3 Assessment of Impacts

It is very difficult to quantify dust emissions from construction activities. However in a general, the listed emissions should be controlled to minimise the potential for adverse environmental effects:

- Exhaust emissions from site plant, equipment and vehicles; and
- Fugitive dust emissions from site activities.

Weather conditions are highly variable, and hence, it is difficult to predict what the conditions may be when specific construction activities are undertaken. Any effects of construction activities on airborne particle concentrations are generally temporary and relatively short-lived. Moreover, mitigation procedures should be straightforward, as most of the necessary measures are routinely employed as 'good practice' on construction sites. Therefore in most cases, a qualitative assessment of potential dust impacts is provided, as outlined in the sections to follow.

3.1 Vehicle Exhaust Emissions

The pollutants oxides of nitrogen (NO_x), particulate matter (PM₁₀), volatile organic compounds (VOCs) and carbon monoxide (CO) are generated by internal combustion engines in vehicles and equipment. The amount emitted by these sources is dependent upon factors such as engine type, service history, pattern of usage and composition of fuel.

The equipment fleet required for the works will result in these pollutants being emitted into the atmosphere, at relatively unquantified levels. Given the existing road traffic in the Sydney CBD, the increase in combustion emissions from the project is not expected to result in a discernible difference to background air quality.

There is a potential for traffic generated from the works to impact receptors located in close proximity to the traffic routes. Sensitive receptors may include residential, schools, day-care, medical facilities, places of worship etc.

Potentially sensitive receivers identified by the TSE Contractor for the Martin Place Precinct (refer SMCSWTSE-JCG-TPW-EM-PLN-002018 Rev 04 21 November 2017) include the following, however it should be noted that a project-specific assessment of receivers will be conducted prior to construction of the North Tower:

- The Sydney Eye Hospital located around 150 metres to the east of the site
- Chifley Square
- Commonwealth Bank
- Macquarie Group
- BNP Paribas
- Channel 7

- Reserve Bank of Australia
- War Memorial
- MLC Centre
- Cafes and food trucks with outdoor seating at 8 Chifley Place, Corner of Bligh Street and Hunter Street, MLC Centre and Martin Place
- Residents in O'Connell Street
- Hotels and serviced apartments – Sofitel Wentworth; Radisson Blu Plaza; Medina (sic. Formerly Medina, now Adina / Aston Apartments) serviced apartments; Commercial Travellers' Association Hotel

The primary construction activities with potential transportation implications are:

- Removal of materials;
- Delivery of materials for new development; and
- Movement of heavy plant.

A small increase in vehicle movement, measured in passenger car units (PUCs) per hour is anticipated during the works, which has an insignificant impact on emissions and air quality (refer Table 3)

Table 3: Demand flow (PCUs per hour), adopted from Table 3 of 19 *Sydney Metro C2S SPIR Appendix F Traffic and Transport*

Demand flow (PCUs per hour)	Base	With project*	Increase
Total AM	11,930	12,168	238
Total PM	11,276	11,514	238

*including O'Connell Street construction site

With the exception of PM10, combustion emissions are generally considered to be minor and insufficient to affect any sensitive off-site receptors. Therefore, NO_x, VOC and CO emissions were not considered further in this assessment.

3.2 Fugitive Dust Emissions

Dust (particulate matter) is the principal pollutant emitted during demolition and construction activities. Any fugitive dust emissions from the works would be variable and depend upon the period of the activity, the soil type and moisture content, road surface conditions and weather conditions.

During the summer periods, soils are typically drier, and when combined with higher than average winds, there is the potential that greater amounts of dust can

be generated. The following activities on site have the potential to produce significant dust emissions:

- Additional clearing and local excavation associated with construction;
- Haulage and heavy plant equipment; and
- Wind erosion.

Although the surrounding land uses are predominately commercial, if not controlled effectively, fugitive dust emissions can become a nuisance for the impacted receptors. The activities outlined above can be controlled by mitigation measures to reduce the risks of any impacts.

3.2.1 Particulate Matter – TSP and PM₁₀

Particulate matter has the capacity to affect health and to cause nuisance effects, and is categorised by size and/or by chemical composition. The potential for harmful effects depends on both. The particulate size ranges for TSP and PM₁₀ are commonly described as:

- TSP – refers to all suspended particles in the air. In practice, the upper size range is typically 30 µm to 50 µm.
- PM₁₀ – refers to all particles with equivalent aerodynamic diameters of less than 10 µm, that is, all particles that behave aerodynamically in the same way as spherical particles with diameters less than 10 µm and with a unit density. PM₁₀ are a sub-component of TSP.

Evidence suggests that health effects from exposure to airborne particulate matter are predominantly related to the respiratory and cardiovascular systems (WHO, 2011). The human respiratory system has in-built defensive systems that prevent larger particles from reaching the more sensitive parts of the respiratory system. Particles larger than approximately 10 µm, while not able to affect health, can soil materials and generally degrade aesthetic elements of the environment. For this reason, air quality criteria make reference to measures of the total mass of all particles suspended in the air. This is referred to as TSP. In practice, particles larger than 30 to 50 µm settle out of the atmosphere too quickly to be regarded as air pollutants.

Particulate matter emissions from the works at the site may have the potential to contribute to short-term local particulate matter concentrations if not adequately managed and mitigated.

4 Mitigation

The predicted dust emissions from the works are expected to be minor and transient. Although the land surrounding the development is predominantly commercial, during worst-case meteorological conditions and high-intensity activities on site, there is the possibility of dust generation causing nuisance and potential health impacts.

Therefore the standard construction dust mitigation methods listed should be implemented where practical to avoid dust generation:

Site general works:

- Identify person responsible for upholding mitigation methods;
- Erect appropriate barriers around dusty activities and site boundary;
- If practical, ensure machinery, fuel and chemical storage and dust generating activities are not located in close proximity to site boundaries and sensitive receptors (such as pedestrian walkways, air conditioning intakes and businesses);
- Ensure communication is established with neighbouring properties prior to undertaking works in proximity to their premises; and
- Establish a complaints register to record details on the time and extent of any reasons for air quality based complaints.

Construction traffic:

- All vehicles to switch off engines when not in use (i.e. no idling);
- Ensure all vehicles have satisfactory exhaust systems and emission control technologies;
- Where practical, clean or wash all vehicles effectively before they leave a site; and
- Ensure that all loads entering and leaving site are covered.

Use of stockpiles:

- Ensure that stockpiles are enclosed or securely sheeted and kept on-site for the shortest possible period;
- Avoid building steep sided stockpiles or mounds or those that have sharp changes in shape; and
- Whenever possible, keep stockpiles or mounds away from the site boundary, sensitive receptors, watercourses and surface drains.

Cutting and grinding:

- All equipment should use water suppressant or suitable local exhaust ventilation systems;
- Use dust extraction techniques where available;
- All other equipment should be fitted with water suppressant systems;
- Use local exhaust ventilation; and
- Service all fans and filters regularly to ensure they are properly maintained.

Use of chutes and skips:

- Securely cover skips;
- Minimise drop heights to control the fall of materials;
- Regularly damp down surfaces with water;
- Completely enclose skips whenever possible; and
- If possible, reduce drop heights by using variable height conveyors or chutes.

At the appropriate stage, a Construction Environmental Management Plan will be developed which will address the specific requirements of the site based on the proposed construction methodology.

5 Residual Impacts

The potential for adverse air quality impacts from the proposed works has been outlined in Section 4, where it is anticipated that at times, there may be intermittent impacts on sensitive receptors around the development area. However with the implementation of the outlined mitigation measures, it is expected that any potential impacts will be transient in nature and not result in any long term effects on the surrounding environment or air shed.

6 Agency consultations

Consultation has been undertaken on this SSD DA Stage 2 proposal with Sydney Metro and other relevant agencies as detailed in the Stakeholder and Community Engagement Summary Report, prepared by Ethos Urban.

7 Conclusion

The existing air quality, relevant air quality criteria and likely air quality impacts arising from the future works associated with the North Site OSD have been investigated in this study. It is considered that construction related activities are expected to have limited, and transient impacts on air quality. Further, any impacts will only occur as short-term peak events. The best-practice mitigation measures proposed will act to reduce any potential dust emissions from the activities on site.

It is anticipated that with the application of the mitigation measures, sensitive receptors in the vicinity of the development will not experience significant air quality impacts as a result of the proposed works. This conclusion is in regard to SSD DA OSD works only. All demolition of existing buildings and excavation works on the North Site are covered by separate CSSI approval.

8 References

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