Macquarie Group

Sydney Metro Martin Place Station

Development Application – Air Quality Assessment

Issue 01 |

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1 Introduction

This report supports a State Significant Development (SSD) Development Application (DA) submitted to the Minister for Planning pursuant to Part 4 of *the Environmental Planning and Assessment Act 1979* (EP&A Act).

Macquarie Corporate Holdings Pty Limited (Macquarie) is seeking to create a World Class Transport and Employment Precinct at Martin Place, Sydney.

The application seeks Stage 1 approval for the establishment of building envelopes, maximum Gross Floor Areas and design parameters for two predominantly commercial office Over Station Development (OSD) towers, located above the site of the future Martin Place Metro Station (part of the NSW Government's Sydney Metro project).

In particular this report addresses Air Quality issues that are considered for the project.

Background

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 & Southwest (Stage 2).

Stage 2 of the Metro entails the construction and operation of a new Metro rail line from Chatswood, under Sydney Harbour through Sydney's CBD to Sydenham and eventually onto to 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 for Planning approved the Stage 2 (Chatswood to Sydenham) Metro application lodged by Transport for NSW (TfNSW) as a Critical State Significant Infrastructure (CSSI) project (reference SSI 15_7400).

TfNSW is also making provision for future Over Station Development (OSD) on the land it has acquired for the Stage 2 Sydney Metro project, including land acquired for the purposes of delivering Martin Place Station. The OSD development is subject to separate applications to be lodged under the relevant provisions of the EP&A Act.

An Unsolicited Proposal submission has been lodged by Macquarie to the NSW Government for the delivery of a single fully integrated station/OSD solution for the new Sydney Metro Martin Place Station.

Site Description

The Sydney Metro Martin Place Station Precinct (the Precinct) project 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).

The land the subject of this application relates only to the North and South Site (refer to **Figure 2**). Each site will accommodate one OSD tower above the future Sydney Metro Martin Place Station (representing the northern and southern entries/gateways to the Sydney Metro station). The land acquired for the Sydney Metro Martin Place Station is the same as for the Macquarie proposal, except that the Macquarie proposal includes the two properties north of Martin Place owned by Macquarie, namely 50 Martin Place and 9-19 Elizabeth Street.

Both the North and South Sites are regular in shape and have area of approximately 6,022m^2 and 1,897m^2 respectively, totalling 7,919m^2.

Figure 1 – Location map of the Precinct
Source: Google maps and JBA

Figure 2 – Aerial photo of the North and South Site
Source: Nearmap and JBA

Located close to the centre of the Sydney CBD, the Precinct comprises of the entire City block bounded by Hunter Street, Elizabeth Street, Martin Place and Castlereagh Street; that portion of Martin Place located between Elizabeth Street and Castlereagh Street and the northern most property in the block bounded by Martin Place, Elizabeth Street, Castlereagh Street, and King Street. Together it constitutes an above ground site area of approximately 9,400 square metres, with a dimension from north to south of approximately 210 metres and from east to west of approximately 45 metres. It incorporates a significant portion of one of Sydney's most revered public spaces – Martin Place.

Martin Place is recognised as one of Central Sydney's great public, civic and commemorative spaces, as well as being a historically valued commercial and finance location of Sydney's CBD. Martin Place and a large number of buildings on, or in close proximity to, Martin Place are identified as heritage items, either as items of National, State or Local significance. Number 50 Martin Place, which forms part of the Macquarie North Site, is one of these major heritage items.

There has been a number of redevelopment and refurbishment proposals in recent years along Martin Place to improve existing assets and recapture their premium commercial

status (e.g. 5 Martin Place, 50 Martin Place, 20 Martin Place, upgrades of the MLC Centre, and 60 Martin Place). The City of Sydney Council has also identified a need to reinvigorate Martin Place and upgrade the public spaces.

The surrounding locality is characterised by a variety of built forms and architectural styles, with many of the buildings, including those of relatively recent years, not complying with the current planning controls with respect to building heights, setbacks and street wall heights.

In terms of land use the area is characterised by a predominance of office uses, with some ground floor retailing, cafés, or restaurants and hotels (most notably the Westin and the Wentworth) to support its primary business centre function.

Overview of Proposed Development

The proposal by Macquarie is unique and innovative in aligning the aspirations for public transport, civic amenity and the long-term sustainability of Sydney as a financial centre. This will be achieved through a development designed to maximise the opportunities for an improved Metro Station, integration of the existing and new public transport infrastructure, integration of that infrastructure with modern commercial office towers and world class retailing, along with rejuvenating and complimenting some of Sydney's most revered public spaces, and substantially improving station access and connectivity.

More specifically the development will comprise a concept proposal (under section 83B of the EP&A Act) for the OSD for the North and South Sites. It will be designed as a fully integrated Station and OSD project that, subject to approval, will be built and delivered as one integrated project for opening at the same time as the Sydney Metro is commissioned.

The concept proposal establishes the vision and planning and development framework which will be the basis for the consent authority to assess future detailed development proposals (Stage 2 DAs).

<u>The North Site</u>

The Concept Proposal for the North Site is for a new 40+ storey, predominately commercial office building. The proposal seeks to integrate with the existing 50 Martin Place building, supporting large commercial floor plates. No connections to 50 Martin Place are proposed for the basement levels of that building, including the level of the significant heritage Safe Deposit Vault.

<u>The South Site</u>

The Concept Proposal for the South Site is for a new 28+ storey predominately commercial office building.

The detailed design of the OSD is still in its preliminary stages. Critically it requires an integrated design approach to be adopted between the commercial OSD components classified as SSD, and the Station components, which are classified as CSSI and have already been approved. This is to ensure:

- all the operational needs of the Metro Station are accommodated in accordance with TfNSW requirements and the structural and other requirements of the OSD are accommodated within the Station building beneath, in what is essentially one building; and

- a cohesive public domain and built form outcome is achieved for Sydney.

In this regard, OSD uses and structural elements are located within the below ground and lower podium levels, as conceptually approved under the CSSI consent for the Martin Place Station.

The Staged DA will seek consent for, amongst other things, land uses, gross floor area, building envelopes, and vehicle access arrangements.

A more detailed and comprehensive description of the proposal is contained in the Environmental Impact Statement (EIS) prepared by JBA.

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 83B of the EP&A Act a Staged 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 separate parts of the site are to be the subject of subsequent DAs. This SSD DA is a staged development application made under Section 83B of the EP&A Act.

A detailed development application(s) (Stage 2 DAs) will accordingly follow, seeking approval for the detailed design and construction of all or specific aspects of the proposal in accordance with the approved staged development application.

Submitted separately to this SSD DA are applications to modify the CSSI approval together with a Planning Proposal relating to the North Site (FSR only) and South Site (height and FSR).

For clarity, **Figure 3** below is a diagrammatic representation of the suite of applications proposed by Macquarie, to show the relationship of the SSD DA (the subject of this report) to the Planning Proposal and the Martin Place Metro CSSI.

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 relevant.

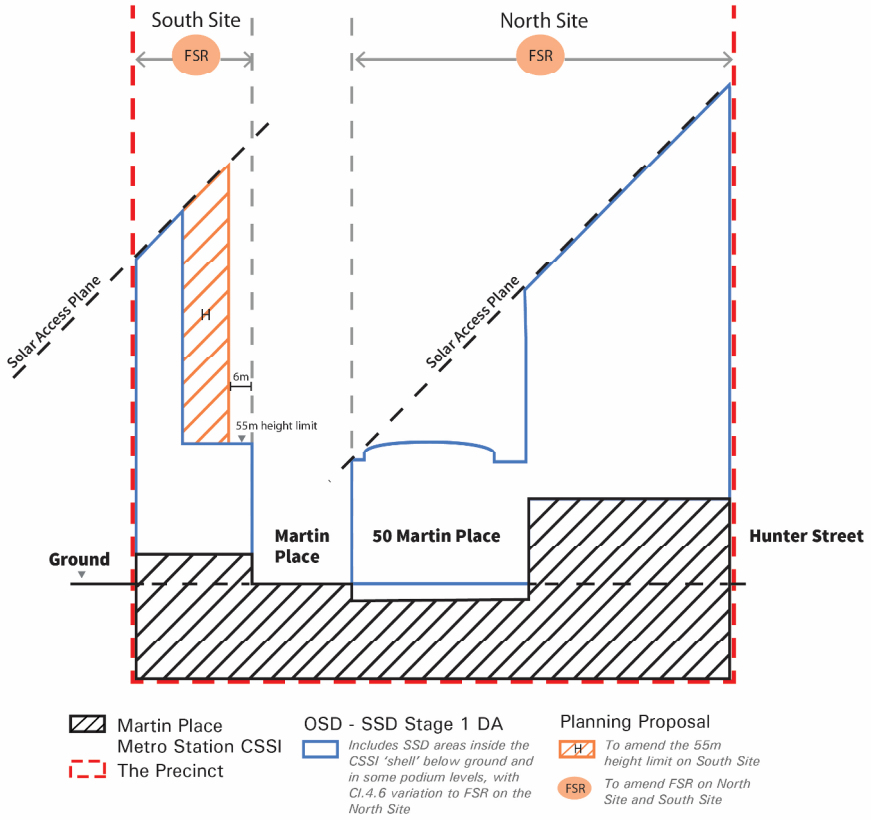


Figure 3 – Relationship of planning applications
Source: JBA

Surrounding Land Use

The surrounding land use, is predominately commercial buildings with the development sitting in a major pedestrian and historical precinct. Located further from the site are residential, parklands of the Domain,

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 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 (µg/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.

2.2.1 Particulate Matter – PM_{10}

The NSW Office of Environment and Heritage (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 to the development area, 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 PM_{10} monitoring results at these stations is presented in Table 2. The maximum 24 hour average concentrations at Rozelle exceeded the criterion of 50 $\mu g/m^3$ 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 $\mu g/m^3$.

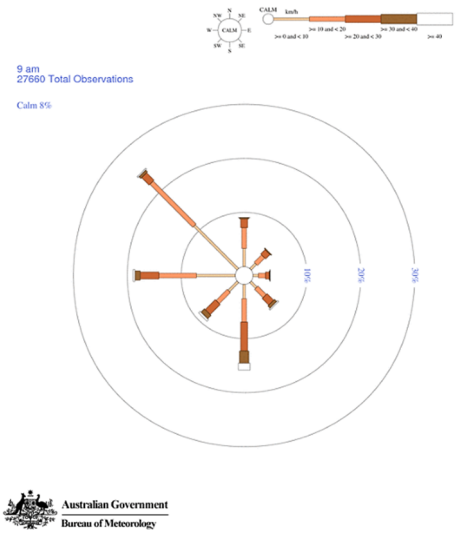
TABLE 2: SUMMARY OF PM_{10} CONCENTRATIONS AT OEH MONITORING SITES IN 2013-2016 (OEH, 2017)

Averaging Period	Year	PM_{10} Concentration ($\mu g/m^3$)		
		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

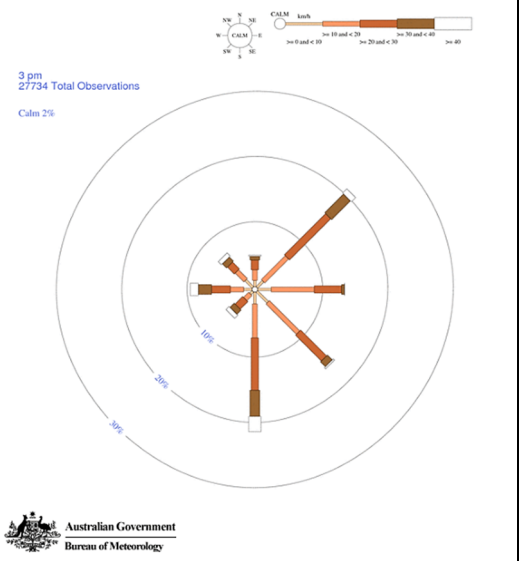
2.3 Meteorology

The closest Bureau of Meteorology 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.



Sydney Airport 9 am (1939 – 2016)



Sydney Airport 3 pm (1939 – 2016)

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 demolition and 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 (PM_{10}), 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 such factors including: 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 discernable 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. 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 is anticipated during the works, which has an insignificant impact on emissions and air quality (see)

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, NOx, VOC and CO emissions were 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 PM_{10}

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 PM_{10} 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.
- PM_{10} – 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. PM_{10} 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 at Martin Place Metro 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.

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 Conclusion

The existing air quality, relevant air quality criteria and likely air quality impacts arising from the future works at the Martin Place Metro Precinct development 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.

7 References

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