

Air Quality Management Sub-plan

Western Sydney Airport – Surface and Civil Alignment Works

Project Name	Sydney Metro – Western Sydney Airport, Surface and Civil Alignment Works
Project Number	N81150
Revision Date	29/09/2023
Revision	03
Document Number	SMWSASCA-CPU-1NL-NL000-AH-PLN-000001

Document Approval

Rev.	Date	Prepared by	Reviewed by	Approved by	Remarks
A	26/05/2022				First Draft
B	22/07/2022				See Revision Table
C	11/08/2022				See Revision Table
D	27/08/2022				See Revision Table
01	29/09/2022				Issued for Construction
02	08/09/2023				See Revision Table
03	29/09/23				See Revision Table

Distribution and Authorisation

Document Control

The CPBUI JV Project Director is responsible for ensuring this plan is reviewed and approved. The Project Director is responsible for updating this plan to reflect changes to the project, legal and other requirements, as required.

The controlled master version will be maintained on TeamBinder. All circulated hard copies are deemed to be uncontrolled.

Amendments

The implementation of this Plan is under the authority of the CPBUI Delegated Authority Matrix. All Contract personnel will perform their duties in accordance with this Plan, supporting plans, and related procedures.

Revision Details

Rev.	Details
A	First Draft
B	In response to Sydney Metro and ER comments
C	In response to Sydney Metro, Independent Certifier and ER comments
D	In response to final ER comments prior to endorsement
01	Issued For Construction (All Sydney Metro review comments closed)
02	Revised following internal audit and 6 Monthly Monitoring report
03	In response to Sydney Metro and ER comments on Rev2

Table of contents

Abbreviations and definitions	v
Part A Overview	1
1. Introduction	1
1.1. Purpose and application	1
1.2. Background	1
1.3. Project description	1
1.3.1. SCAW scope of works	2
1.3.2. SCAW construction methodology	2
2. Structure of this Plan	4
2.1. Plan Purpose	4
2.1.1. Other Related Documents	4
2.2. Objectives and Targets	5
2.3. Compliance Record Generation and Management	6
3. Legal and Other Requirements	7
3.1. Relevant Legislation	7
3.2. Guidelines and Standards	7
3.3. Project Compliance Requirements	7
3.3.1. Project Specific Requirements:	8
3.4. Licences and Permits	8
4. Existing Environment	9
4.1. Meteorology	10
4.2. Terrain	10
4.3. Particulate Matter	10
4.4. Existing and Future Air Pollution Sources	12
5. Aspects and Impacts	13
5.1. Risk Assessment	14
6. Air Quality and Dust Management	16
6.1. Air Quality Mitigation Measures	16
6.2. Air Quality and Dust Management Procedure	21
6.3. Meteorological Factors	21
6.4. Earthworks and Construction Works	21
6.5. Plant and Equipment Maintenance	21
6.6. Management of cumulative impacts	22
7. Compliance Management	23
7.1. People and Responsibilities	23
7.2. Training	23
7.3. Complaint management	23
7.4. Monitoring, inspections and audits	23
7.5. Continuous improvement	23
Part B Implementation Plan	24

Elements and Expectations	24
Element 1: Training	24
Element 2: Monitoring and Reporting	25
Element 3: Auditing, Review and Improvement	28
Element 4: Project Specific Requirements	28
Part C Appendices.....	38
Appendix C1 – Air Quality and Dust Management Procedure.....	38
Appendix C2 – Indicative Dust Deposition Sampling Locations	39
Appendix C3 – Consultation Records	41
Appendix C4 – Air Quality Construction Monitoring Program.....	55
1. Purpose.....	57
2. Scope	57
3. Approval and Consultation.....	58
4. Baseline air quality data	58
5. Air Quality Monitoring.....	59
5.1. Meteorological Monitoring	59
5.2. Monitoring Dust Generating Activities.....	59
5.3. Dust Deposition Monitoring	59
5.3.1. Overview.....	59
5.3.2. Baseline Monitoring	60
5.3.3. Performance Criteria.....	60
5.3.4. Monitoring Locations.....	60
5.3.5. Sample Collection and Laboratory Analysis	61
5.3.6. Quality Assurance and Documentation	61
5.4. Real Time Monitoring	61
6. Adaptive management	63
7. Compliance Management	63
7.1. Monitoring Records	63
7.2. Reporting	63
7.3. Non-conformances and exceedances	64

List of figures

Figure 1 – SCAW Project scope	2
-------------------------------	---

List of tables

Table 1 – Abbreviations and definitions	v
Table 2 – Activities during construction	2
Table 3 – Interaction with other project documents	4
Table 4 - CEMF objectives and targets	5

Table 5 – Surrounding environment and potentially sensitive receptors	9
Table 6 – St Marys monitoring location ambient PM10 concentrations (2014-2019)	11
Table 7 – Bringelly monitoring location ambient PM10 concentrations (2014-2019)	11
Table 8 – St Marys monitoring location ambient PM2.5 concentrations (2014-2019)	11
Table 9 – Bringelly monitoring location ambient PM2.5 concentrations (2014-2019)	12
Table 10 – Aspects and potential impacts for SCAW	13
Table 11 - Air quality mitigation measures	17
Table 1: Requirements for the preparation of this Monitoring Program	57
Table 2 – Monitoring Program Agency Consultation	58
Table 3 – Log of engagement or attempted engagement with relevant stakeholders (CoA A6(b))	58

Abbreviations and definitions

Refer to Definitions, Abbreviations and Acronyms, Sydney Metro – Western Sydney Airport Surface Civil and Alignment Works Package

Table 1 – Abbreviations and definitions

Abbreviation	Description
Airports Act	<i>Airports Act 1996</i>
Ancillary facility	A temporary facility for construction of the CSSI including an office and amenities compound, construction compound, material crushing and screening plant, materials storage compound, maintenance workshop, testing laboratory and material stockpile area and parking facilities
AS/NZS	Australian Standard/New Zealand Standard
BOM	Bureau of Meteorology
BS	British Standard
CAP	Construction Area Plan
CEMF	Sydney Metro Construction Environmental Management Framework
CEMP	Construction Environmental Management Plan
CoA	Ministers Condition of Approval
Condition	Planning Minister's Conditions of Approval
Completion of construction	The date upon which construction of the CSSI is completed and all construction related requirements of the Planning Secretary (if any) have been met. If construction is staged, completion of construction is the date upon which construction is completed and all construction related requirements of the Planning Secretary (if any) have been met, in respect of all stages of construction
Construction	Includes all work required to construct the CSSI as described in the documents listed in Condition A1 of the Project Planning Approval, including commissioning trials of equipment and temporary use of any part of the CSSI, but excluding Low Impact Work.
CPB	CPB Contractors Pty Ltd
CPBUI JV	CPB Contractors Pty Limited and United Infrastructure Pty Limited Joint Venture
CSSI	Critical State Significant Infrastructure
DAWE	Department of Agriculture, Water and the Environment
DPE	Department of Planning and Environment
ECM	Environmental Control Maps
EIS	Environmental Impact Statement
EMS	Environmental Management System
Environmental aspect	Defined by AS/NZS ISO 14001:2015 as an element of an organisation's activities, products or services that can interact with the environment.
Environmental impact	Defined by AS/NZS ISO 14001:2015 as any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects.
Environmental incident	An occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance with the terms of the SSI 10051 Planning Approval.

Abbreviation	Description
Environmental objective	Defined by AS/NZS ISO 14001:2015 as an overall environmental goal, consistent with the environmental policy, that an organisation sets itself to achieve.
Environmental policy	Statement by an organisation of its intention and principles for environmental performance
Environmental target	Defined by AS/NZS ISO 14001:2015 as a detailed performance requirement, applicable to the organisation or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW)
EPA	NSW Environment Protection Authority
ER	Environmental Representative. Suitably qualified and experienced person independent of project design and construction personnel employed for the duration of construction. The principal point of advice in relation to all questions and complaints concerning environmental performance.
ESCP	Erosion and Sediment Control Plans
Minister	Minister of the NSW Department for Planning and Public Spaces
NATA	National Association of Testing Authorities
Non-compliance	Failure to comply with the requirements of the Infrastructure Approval or any applicable licence, permit or legal requirements.
Non-conformance	Failure to conform to the requirements of Project system documentation including this CEMP or supporting documentation.
PM10	Particulate Matter 10 micrograms
PM2.5	Particulate Matter 2.5 micrograms
PMS	Project Management Systems
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
Principal, the	Sydney Metro
Project, the	Sydney Metro Western Sydney Airport
REMM	Revised Environmental Mitigation Measure
SCAW	Western Sydney Airport Surface and Civil Alignment Works
SEP	Site Environmental Plan
SM WSA	Sydney Metro Western Sydney Airport
SSI	State Significant Infrastructure
SWMS	Safe Work Method Statement
UI	United Infrastructure Pty Limited
WSI	Western Sydney International

Part A Overview

1. Introduction

1.1. Purpose and application

This Air Quality Sub-plan (this Sub-plan) forms part of the Construction Environmental Management Plan (CEMP) within the NSW state jurisdiction for the Sydney Metro - Western Sydney Airport Surface Civil and Alignment Works (SCAW). CPB Contractors and United Infrastructure Joint Venture (herein referred to as CPBUI JV) were awarded the design and construction of the SCAW project by Sydney Metro in March 2022.

This Sub-plan describes how CPBUI JV will minimise and manage air quality impacts throughout the delivery of SCAW off-airport project. These potential impacts will require management and mitigation in accordance with relevant legislation and government policies.

This Sub-plan must obtain endorsement of the project Environmental Representative (ER) as being in accordance with the SSI Planning Approval and must be submitted no later than one month before the commencement of construction. Construction is not to commence until the CEMP and all required Sub-plans and Monitoring Programs have been endorsed by the ER and/or approved by the Department of Planning and Environment (DPE).

This Sub-plan has been prepared to address the requirements of the:

- Critical State Significant Infrastructure (CSSI) 10051 Planning Approval (dated 23 July 2021)
- Sydney Metro Western Sydney Airport – CSSI Staging Report (Revision 6.0) (Staging Report)
- AS/NZS ISO 14001:2016 Environmental Management Systems – Requirements with guidance for use
- Sydney Metro Construction Environmental Management Framework (CEMF)
- Environmental Impact Statement (EIS) and Revised Environmental Mitigation Measures (REMMs) from Section 7 of the Submissions Report
- Contractual requirements, including the SCAW Design and Construction Deed and General and Particular Specifications
- Applicable legislation.

1.2. Background

The Sydney Metro Western Sydney Airport will become the transport spine for Greater Western Sydney, connecting communities and travellers with the new Western Sydney International (Nancy-Bird Walton) Airport (referred to as Western Sydney International) and the growing region.

The Sydney Metro Western Sydney Airport EIS was prepared in October 2020 to assess the impacts of construction and operation of the Project and was placed on public exhibition between 21 October 2020 and 2 December 2020. The Project was declared a Critical State Significant Infrastructure (CSSI) Project and is listed in Schedule 5 of *State Environmental Planning Policy (State and Regional Development) 2011*.

The Sydney Metro Western Sydney Airport was approved by the Minister for Planning and Public Spaces on 23 July 2021 (SSI 10051) under section 5.19 of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act).

1.3. Project description

The Project will be undertaken on Darug Country and will form part of the future Western Parkland City. The Project involves the construction and operation of a new 23km metro rail line that extends from the existing Sydney Trains suburban T1 western line (at St Marys) in the north to the Aerotropolis (at Bringelly) in the south. The alignment includes a combination of tunnels and civil structures, including viaducts, bridges, and surface and open-cut troughs between the two tunnel sections. The Project also includes six new metro stations, and a stabling and maintenance facility and operational control centre at

Orchard Hills. The SCAW package is the second major contract package to be procured for the Project. The successful and timely completion of the SCAW package is critical to the subsequent construction activities and ultimate completion of the entire Project.

1.3.1. SCAW scope of works

The scope for the SCAW package includes approximately 10.6km of alignment up to the underside of track formation from Orchard Hills to the Western Sydney International (WSI) airport. This includes approximately:

- 3.6 kilometre of viaduct
 - 400 metres of viaduct over Blaxland Creek
 - 660 metres of viaduct over the Patons Lane area and un-named creek
 - 2.5km of viaduct in the Luddenham Road area including across the Warragamba pipeline, at Luddenham Station, across Luddenham Road and across Cosgrove Creek
- 209 metres of bridges
 - A bridge, approximately 187m long, over the proposed M12 Motorway
 - A bridge, approximately 22m long, over the drainage swale on the WSI airport site
- 6.9km of at-grade alignment
 - 600m at Orchard Hills, south of Lansdowne Road
 - 1.6km alongside the stabling maintenance facility in Orchard Hills
 - 900m to the north of the Warragamba pipelines
 - 1.1km north of the proposed M12 motorway
 - 1.4km south of the proposed M12 Motorway on Elizabeth Drive
 - 1.3km within the Airport site from the northern boundary to the Airport Business Park Station
- Temporary and permanent access roads.

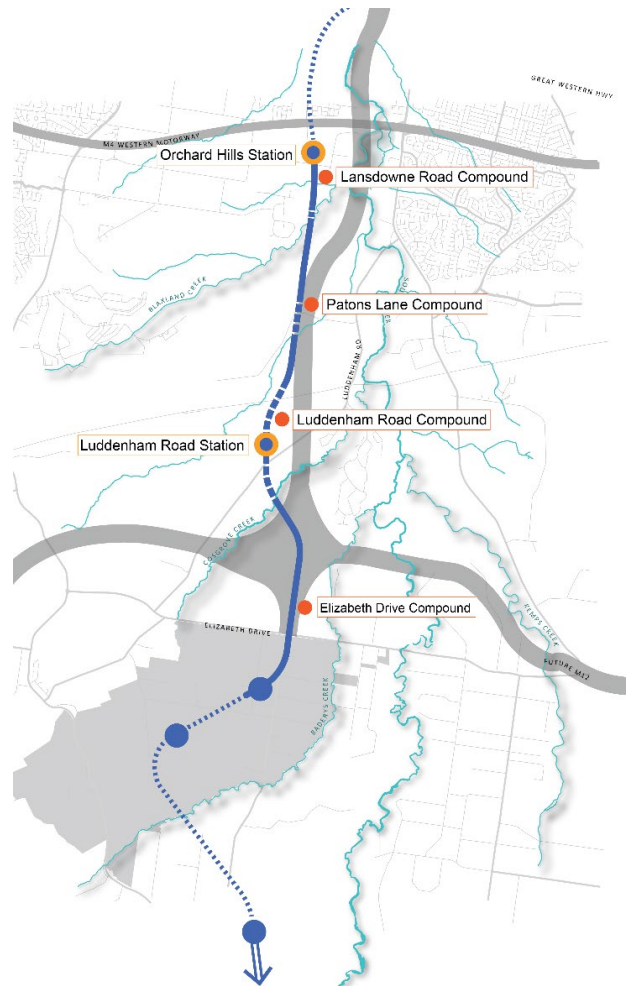


Figure 1 – SCAW Project scope

1.3.2. SCAW construction methodology

Activities that will be undertaken during construction are summarised in Table 2 below.

Table 2 – Activities during construction

Works	Activities
Early works	<ul style="list-style-type: none"> ▪ Investigation works – survey, geotechnical, contamination and utilities ▪ Establishment of temporary ancillary facilities, construction site fencing, signage and lighting ▪ Pre-clearing vegetation surveys and setting up environmental ‘no-go’ zones ▪ Temporary stockpiling of imported spoil for the stabling and maintenance facility
Earth works	<ul style="list-style-type: none"> ▪ Installation of environmental controls ▪ Vegetation clearing

Works	Activities
	<ul style="list-style-type: none"> ▪ Stripping, temporarily stockpiling and management of topsoil and unsuitable material ▪ Embankment and cutting construction, including the improvement layers/treatments, general fill, structural fill zone and capping layers ▪ Importation and reuse of fill materials ▪ Placing, compacting and finishing of rail alignment sub-base and base layers ▪ Dewatering and backfilling farm dams ▪ Preparation of piling pads.
Bridge works	<ul style="list-style-type: none"> ▪ Installation of environmental controls ▪ Substructure construction from cast in-situ construction with the general sequence of: <ul style="list-style-type: none"> – Bored pile construction (mono pile) – Pile cap (four) construction with localised excavation at Luddenham Station – Pier and headstock construction ▪ Construction of the viaduct structures through the placement of precast concrete segments using a crawler crane ▪ Construction of two bridges using precast Super T
Drainage works	<ul style="list-style-type: none"> ▪ Construction of table drains ▪ Installation of culverts and other drainage structures ▪ Construction of temporary diversion channels ▪ Construction of temporary watercourse crossings such as causeways ▪ Installation of scour protection measures.

2. Structure of this Plan

2.1. Plan Purpose

This CEMP Sub-plan forms part of the Project Management System (PMS). It is part of a suite of plans that together outline how the SCAW package will manage Air Quality during construction to ensure an integrated approach to meeting contract requirements.

In addition to the Project Management Plan, other Project Plans that interface with this Sub-plan include:

- CEMP
- Quality Management Plan
- Community Communication Strategy
- Soil and Water Management Sub-plan
- Sustainability Management Plan
- Flora and Fauna Management Plan

This Sub-plan has the following structure:

Part A: Overview	This section clearly defines: Section 1: Introduction Section 2: Structure of This Plan Section 3: Legal and Other Requirements Section 4: Existing Environment Section 5: Aspects and Impacts Section 6: Air Quality and Dust Management Section 7: Compliance Management
Part B: Implementation Plan	This section outlines in detail the key processes and systems to support implementation of environmental management outcomes for the project: Element 1: Training Element 2: Monitoring and Reporting Element 3: Auditing, Review and Improvement Element 4: Project Specific Requirements
Part C: Appendices	This section includes appendices and annexures providing additional detail that support this Sub-plan.

2.1.1. Other Related Documents

Table 3 shows the interrelationships with other project plans and documents.

Table 3 – Interaction with other project documents

Document	Description
Community Consultation Strategy	Details the community and stakeholder consultation including enquiry and complaints management requirements for the project based on the Sydney Metro Overarching Community Consultation Strategy developed to address CoA B1.
Soil and Water Management Sub-plan	Describes erosion and sediment control measures to be implemented during the SCAW Works, some of which will mitigate dust impacts. This includes references to procedures for preparing Erosion and Sediment Control Plans (ESCPs).
Sustainability Management Plan	This Plan includes a carbon and energy management strategy that provides detail on emission reduction strategies.

Document	Description
	<p>The SMP will include a construction logistics plan to manage the sustainable delivery of goods and materials and sustainable group travel for staff and workers.</p> <p>The Sustainability Manager is responsible for all greenhouse gas related accounting and reporting in accordance with applicable legislation.</p>
Air Quality and Dust Management Procedure (Appendix C1 – Air Quality and Dust Management Procedure)	Workflow procedure addressing key requirements for management of air quality by the project delivery team. Includes flow diagrams with required steps to monitor and manage air quality during construction and hold points for implementing controls.
On Airport Construction Environmental Management Plan/s	Details requirements for environmental management on the Western Sydney Airport. This is a suite of aspect-based Sydney Metro documents produced for the works being undertaken on Commonwealth Land.
Flora and Fauna Management Sub-plan	Details mitigation measures to address vegetation removal/management (which will mitigate dust impacts)

2.2. Objectives and Targets

The key air quality objective for the SCAW is to minimise dust and exhaust emissions during construction to maintain ambient air quality that provides for the adequate protection of human health. This objective is consistent with the objective of the Approved Methods for Modelling and Assessment of Air Pollutants in NSW (EPA 2016).

The air quality objectives relevant to SCAW from Section 13.1 of the CEMF are provided in Table 4. Tracking against objectives/KPIs is included in Monthly Progress reporting to Sydney Metro. CPBUI will implement the project requirements detailed in Section 6 and Element 4: Project Specific Requirements to achieve targets related to the management of air quality impacts.

In accordance with Condition C14 the Air Quality Monitoring Program will compare actual performance of construction against the predicted performance. The Air Quality Monitoring Program (Appendix C4 – Air Quality Construction Monitoring Program) details the project monitoring criteria to identify performance indicators including PM2.5 and 10 and deposited dust.

Table 4 - CEMF objectives and targets

CEMF Objective	Target (KPI)	Measurement Tool
Minimise gaseous and particulate pollutant emissions from construction activities as far as practicable	<ul style="list-style-type: none"> 100% of diesel plant on site to have maintenance records and pre delivery inspection report 	<p>Inspections and observations</p> <p>Air Quality Monitoring Program</p>
Identify and control potential dust and air pollutants sources; and	<ul style="list-style-type: none"> 100% of weekly inspections review potential dust and air pollutants sources 100% of air quality related complaints are investigated within 24 hours of receiving 	<p>Inspections and observations</p> <p>Air Quality Monitoring Program</p>
For on-airport works, the Sydney Metro Air Quality CEMP will detail all the air quality management objectives and will be consistent with the WSA Air Quality CEMP including all appendices to the CEMP.	Not applicable to the off-airport works subject to this Sub-plan	This Plan does not address on-airport works.

2.3. Compliance Record Generation and Management

In accordance with Section 13.2(c) of the CEMF the following compliance records will be retained:

- Records of meteorological condition monitoring
- Records of the implementation of additional mitigation measures in response to adverse, windy weather conditions, and
- Records of air quality and dust inspections undertaken.

The details of record keeping and documentation in relation to air quality can be found in Part B Element 2: Monitoring and Reporting of this Sub-plan.

The Sustainability Management Plan will detail the reporting and record management associated with greenhouse gas accounting and reporting.

3. Legal and Other Requirements

3.1. Relevant Legislation

Key legislation relevant to air quality management includes:

- EP&A Act
- Protection of the *Environment Operations Act 1997* (POEO Act)
- *Protection of the Environment Operations (Clean Air) Regulations 2010*
- *National Greenhouse and Energy Reporting Act 2007*¹

Refer to Section 4 of the CEMP for further details of the relevant legislation.

3.2. Guidelines and Standards

Additional guidelines and standards relating to the management of air quality include:

- AS 3570 - Automotive Diesel Fuels
- National Environment Protection Council 1998 - Ambient Air: National Environment Protection Measure for Ambient Air Quality
- NSW EPA 2016 - Approved Methods for the Modelling and Assessment of Air Pollutants in NSW
- Guidance on the assessment of dust from demolition and construction (UK Institute of Air Quality Management (IAQM) 2014)

3.3. Project Compliance Requirements

All works to be delivered for SCAW have been assessed and approved under the EP&A Act for the Critical State Significant Infrastructure application number 10051. The on-airport works are a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999 (Cth)* (EPBC Act) relating to approval EPBC 2019/8541.

There are three (3) principal statutory schemes that govern the planning and assessment process for the Sydney Metro Western Sydney Airport (SM-WSA) project:

Commonwealth:

- SCAW works have been assessed and approved under the Airports Act 1996 (Airports Act) for works located on Commonwealth land within the boundary of the Western Sydney International Airport (on-airport).
- SCAW works have been assessed and approved as a controlled action by the Department of Agriculture, Water and the Environment (DAWE) under Part 9 of the Environment Protection and Biodiversity Conservation Act 1999 was obtained by Sydney Metro on 3 June 2021 (EPBC2020/8687) for the impacts on threatened species and communities and Commonwealth Land (off-airport).

State:

- SCAW works have been assessed and approved via number of applications under Division 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act) and are classified as Critical State Significant Infrastructure (SSI 10051) (off-airport).
- Detailed environmental assessments have been carried out to gain the necessary Commonwealth and State planning approvals.

¹ The NGER Act is addressed in the Sustainability Management Plan

3.3.1. Project Specific Requirements:

The Element 4: Project Specific Requirements contains a summary of the key compliance requirements relevant to air quality management which are applicable to SCAW. This includes relevant CoA, REMMs and CEMF requirements.

3.4. Licences and Permits

CPBUI has an Environment Protection Licence for SCAW (Licence Number 21695). The applicable licence conditions are provided in Element 4: Project Specific Requirements.

4. Existing Environment

This section provides an overview of the existing environment surrounding the SCAW construction sites. This information is based on the EIS (Chapter 22). The existing air quality was established from existing weather stations at St Marys and Bringelly.

Table 5 provides a description of the existing and surrounding environments relevant to the SCAW scope of works identified in Section 1.3.2, and identifies potential sensitive receivers with respect to air quality and dust management. The locations of these sensitive receivers will be shown in the Site Environmental Plan/s.

Table 5 – Surrounding environment and potentially sensitive receptors

Works	Description	Activities with potential to effect Air Quality	Potential sensitive receptors
3.6km of viaduct	<ul style="list-style-type: none"> 400m of viaduct over Blaxland Creek 660m of viaduct over Patons Lane area and unnamed creek 2.5km of viaduct in the Luddenham Road area including across Warragamba pipeline, at Luddenham Station, across Luddenham Road and across Cosgrove Creek 	<ul style="list-style-type: none"> Establishment/demobilisation of work site Excavation associated with local area works and utilities relocations Spoil handling, storage and transport Construction of above ground structures for the facility Piling for footings 	There are 2 sensitive residential receivers within 100 metres of the construction footprint at Luddenham Road, Luddenham.
209m of bridges	<ul style="list-style-type: none"> A bridge approximately 187m long over the proposed M12 Motorway A bridge, approximately 22m long, over the drainage swale on the WSI airport site 	<ul style="list-style-type: none"> Establishment/demobilisation of work site Excavation associated with local area works and utilities relocations Spoil handling, storage and transport Construction of above ground structures for the facility Piling for footings 	There are no sensitive residential receivers within 100 metres of the construction footprint at these locations.
6.9km of at grade alignment	<ul style="list-style-type: none"> 600m at Orchard Hills, south of Lansdowne Road 1.6km alongside the stabling maintenance facility in Orchard Hills 900m to the north of the Warragamba pipelines 1.1km north of the proposed M12 motorway 1.4km south of the proposed M12 Motorway on Elizabeth Drive 1.3km within the Airport site from the northern boundary to the Airport Business Park Station 	<ul style="list-style-type: none"> Establishment/demobilisation of work site Vegetation clearing Excavation associated with local area works and utilities relocations Spoil handling, storage and transport Construction of above ground structures for the facility 	There are 2 sensitive residential receivers within 100 metres of the construction footprint at Lansdowne Road, Orchard Hills.

4.1. Meteorology

Seasonal wind patterns observed at St Marys show a predominant north-south directional pattern for all seasons with slightly higher levels of winds from the east during summer compared to the other seasons. Seasonal wind patterns for Bringelly show predominantly south-southwest winds for autumn and winter, increased levels of wind from the east during spring and predominant stronger easterly winds during summer.

Both areas experience a high proportion of calm winds (winds that are less than 0.5 metres per second) which represent around 25 per cent of winds over a typical annual time frame. The high proportion of calm winds suggests the potential for significant periods throughout the year where the ability of local winds to disperse particulates and other air pollutants is poor.

An analysis of the intraday wind patterns was undertaken by examining the wind roses for the 2014-2019 data for the time periods of 9am to 3pm, midnight to 7am, and 7am to 5pm (typical workday).

The analysis showed the following:

- both St Marys and Bringelly meteorology data showed very high percentages of calm wind speed at night with calm percentages of approximately 45 per cent for both stations. This was very high compared to the daytime percentages which showed calm winds at St Marys and Bringelly of 14 and 12 per cent respectively
- night-time wind direction was predominantly from a south to south-westerly direction, which is consistent with the expected wind direction at night due to the topography sloping down toward the north in the area
- winter and autumn patterns were broadly similar to the patterns observed during summer and spring with northerly, south-westerly and easterly winds dominating the wind patterns
- 9am and 3pm wind roses showed a similar pattern to the overall night-time and day-time calm percentages with approximately 20 per cent calm winds at 9am and very low calm wind percentages (less than five per cent) observed at 3pm.

4.2. Terrain

The project is situated within the Sydney basin approximately nine kilometres east of the Blue Mountains. The terrain is generally flat with minor topographical undulation along the length of the project alignment. Although the local relief surrounding the project area is minor and is not expected to influence the broad scale meteorology in the region, there are localised topographical effects that may influence low wind speed conditions. There is a decrease in elevation as the alignment moves north toward St Marys. This topographical feature has the potential to affect the area under low wind speed conditions with cool air following the low-lying topography toward the north.

4.3. Particulate Matter

Annual air quality data for the period 2014-2019 (Office of Environment and Heritage, 2014-2019) indicates that annual average PM10 concentration around St Marys and Bringelly ranges between 15.1 and 21.2 micrograms per cubic metre (see Table 6 and Table 7). There are a number of recorded exceedances of the 50 micrograms per cubic metre maximum 24-hour concentration criterion, however the exceedances are generally due to exceptional events related to bushfires, hazard reduction burns and dust storms.

Annual air quality data for the period 2016-2019 (Office of Environment and Heritage, 2016-2019) indicates that annual average PM2.5 concentration around St Marys and Bringelly is around 8 micrograms per cubic metre. There are a number of recorded PM2.5 exceedances of the 25 micrograms per cubic metre maximum 24-hour concentration criterion (see Table 8 and Table 9). As with PM10 concentrations, the PM2.5 exceedances were generally due to exceptional events related to bushfires, hazard reduction burns and dust storms. Particulate data from 2019 is heavily skewed by the bushfires that occurred across NSW in November and December 2019. Data from 2019 does not represent normal long-term air quality conditions in the Sydney basin.

Table 6 – St Marys monitoring location ambient PM10 concentrations (2014-2019)

Table 22-1 St Marys monitoring location ambient PM₁₀ concentrations (2014-2019)

Statistic	24-hour average PM ₁₀ concentration - µg/m ³						
	Criteria	2014	2015	2016	2017	2018	2019
Maximum 24-hour concentration	50	45.0	53.0	100.2	49.8	100.5	159.8
24-hour exceedance count	-	0	1	3	0	2	26
Statistic	Annual average PM ₁₀ concentration - µg/m ³						
	Criteria	2014	2015	2016	2017	2018	2019
Annual average	25	16.7	15.1	16.0	16.2	19.3	24.7

Table 7 – Bringelly monitoring location ambient PM10 concentrations (2014-2019)

Table 22-2 Bringelly monitoring location ambient PM₁₀ concentrations (2014-2019)

Statistic	24-hour average PM ₁₀ concentration - µg/m ³						
	Criteria	2014	2015	2016	2017	2018	2019
Maximum 24-hour concentration	50	42.6	57.0	61.6	83.7	92.9	134.0
24-hour exceedance count	-	0	1	3	6	8	24
Statistic	Annual average PM ₁₀ concentration - µg/m ³						
	Criteria	2014	2015	2016	2017	2018	2019
Annual average	25	16.6	15.8	17.0	19.8	21.2	23.6

Table 8 – St Marys monitoring location ambient PM2.5 concentrations (2014-2019)

Table 22-3 St Marys monitoring location ambient PM_{2.5} concentrations (2016-2019)

Statistic	24-hour average PM _{2.5} concentration - µg/m ³				
	Criteria	2016	2017	2018	2019
Maximum 24-hour concentration	25	93.2	38.2	80.5	88.3
24-hour exceedance count	-	5	3	2	21
Statistic	Annual average PM ₁₀ concentration - µg/m ³				
	Criteria	2016	2017	2018	2019
Annual average	8	7.8	8	7.8	9.8

Table 9 – Bringelly monitoring location ambient PM_{2.5} concentrations (2014-2019)

Table 22-4 Bringelly monitoring location ambient PM_{2.5} concentrations (2016-2019)

Statistic	24-hour average PM _{2.5} concentration - µg/m ³				
	Criteria	2016	2017	2018	2019
Maximum 24-hour concentration	25	21.6	52.5	55.6	178.0
24-hour exceedance count	-	0	2	4	27
Statistic	Annual average PM ₁₀ concentration - µg/m ³				
	Criteria	2016	2017	2018	2019
Annual average	8	7.6	7.5	8.0	11.3

4.4. Existing and Future Air Pollution Sources

Existing air pollution sources within and surrounding the study area include:

- Emissions from vehicles using the surrounding road network including the M4 Western Motorway, Elizabeth Drive, The Northern Road and Luddenham Road
- Patons Lane Recycling Centre
- Cleanaway Kemps Creek Resource Recovery Park
- Various small scale agricultural activities.

There are a number of ongoing and planned large scale construction projects within and surrounding the study area which would also be sources of air pollution and may overlap with the construction of the project. These projects include:

- Western Sydney International Stage 1
- The Northern Road
- M12 Motorway
- Western Sydney International Airport
- Sydney Science Park.

Refer to Section 6.6 for measures that will be implemented to manage cumulative impacts.

5. Aspects and Impacts

The EIS assessed the construction activities associated with the Project with the potential to temporarily generate dust and they include:

- demolition of existing structures
- earthworks
- construction
- track-out.

There are two primary emission pathways that could result in air quality impacts during construction being dust generation and gas emissions. Table 10 details the construction activities applicable to SCAW and the potential for these activities to result in dust and/or gas emissions during delivery.

Dust generation is the main air quality environmental risk during construction. During construction there also will be construction related vehicles and machinery. Exhaust emitted from construction vehicles and machinery may reduce the air quality in the localised area but would be transient and temporary in nature. Demolition of buildings and structures within the construction footprint can give rise to temporary windblown dust occurrences and also has potential to give rise to odours from any residual material contaminated with hydrocarbons. Handling of soils to minimise dust and odours would be undertaken as part of a remedial action plan for the worksite (if required) in accordance with the Soil and Water Management Sub-plan would be temporary and not give rise to any long-term impacts.

The key aspects and potential impacts in relation to the overall management of air quality during the SCAW and the key identified risks are listed in Table 10. Section 6 provides mitigation and management measures that will be implemented to avoid or minimise air quality impacts and Section 6.6 addresses the management of cumulative impacts.

Table 10 – Aspects and potential impacts for SCAW

Aspects	Potential Impacts
Worksite establishment	<p>Dust generation due to:</p> <ul style="list-style-type: none"> ▪ Utility works including removal, diversion, protection and connection to SCAW worksites ▪ Demolition of buildings and associated infrastructure (asbestos is not addressed in this plan; refer to the Project WHS Management Plan) ▪ Piling ▪ Clearing and grubbing of existing vegetation ▪ Stockpiling of topsoil and mulched vegetation ▪ Earthworks associated with site levelling including loading of haul trucks ▪ Establishment of internal access roads, hardstand areas and onsite parking ▪ Wind erosion of exposed surfaces and stockpiles ▪ Wheel-generated dust from vehicular traffic on unsealed roads and work site access points <p>Particulate matter (PM2.5/10) generation due to:</p> <ul style="list-style-type: none"> ▪ Operation of construction vehicles and plant ▪ Dust generating activities set out above
Earthworks	<p>Dust generation due to:</p> <ul style="list-style-type: none"> ▪ Operation of excavators, front end loaders, bulldozers, dump trucks and other plant ▪ Piling works

Aspects	Potential Impacts
	<ul style="list-style-type: none"> ▪ Loading/unloading trucks with spoil and aggregate ▪ Stockpiling of material ▪ Wind erosion of exposed surfaces and stockpiles ▪ Wheel-generated dust from vehicular traffic on unsealed roads and work site access points <p>Particulate matter (PM2.5/10) generation due to:</p> <ul style="list-style-type: none"> ▪ Operation of construction plant and vehicles ▪ Dust generating activities set out above
Spoil handling, storage and transport	<p>Dust generation due to:</p> <ul style="list-style-type: none"> ▪ Spoil stockpiles ▪ Spoil haulage ▪ Imported materials stockpiles ▪ Imported materials haulage ▪ Wheel-generated dust from heavy vehicle movements around sites <p>Particulate matter (PM2.5/10) generation due to:</p> <ul style="list-style-type: none"> ▪ Operation of construction vehicles and plant ▪ Dust generating activities set out above
Plant and vehicle emissions movement	<p>Dust generation (wheel generated) from:</p> <ul style="list-style-type: none"> ▪ Construction vehicles ▪ Construction equipment and other plant <p>Particulate matter (PM2.5/10) generation due to:</p> <ul style="list-style-type: none"> ▪ Operation of construction vehicles and plant ▪ Dust generating activities set out above
Odour generated from exposed contaminated soil or materials	<p>Potential for air quality impacts associated with odour generation from:</p> <ul style="list-style-type: none"> ▪ Exposed contaminated material ▪ Emissions from stationary plant or equipment

5.1. Risk Assessment

The potential for dust related impacts during construction was evaluated in the EIS using the risk-based assessment approach developed by the UK Institute of Air Quality Management (UK IAQM). The UK IAQM assessment approach is an evaluation of the risk of dust impacts during construction. Chapter 22 of the EIS noted that the UK IAQM method results in a risk rating for each type of construction activity without mitigation. This risk rating is then used to determine what mitigation and management measures are required to effectively manage these risks.

The EIS concluded that the risk of mitigated dust impacts associated with the construction activities listed in Section 5 are negligible to low. The EIS concluded that risk of mitigated impacts associated with gas emissions as a result of plant and machinery operation are not anticipated.

The potential for impacts has been considered in a SCAW risk assessment provided in Appendix C5 of the CEMP.

During delivery, ongoing risk assessment to identify the risk of dust generation will consider meteorological factors including:

- Wind Direction – determines whether dust and suspended particles are suspended and transported in the direction of sensitive receivers
- Wind Speed – governs the potential suspension and drift distance of particles
- Soil Moisture – increased soil moisture reduces soil or dust erosion potential

- Rainfall or Dew – rainfall or heavy dew which wets the surface of the soil.

These factors will influence the day-to-day risk assessment of dust generation and suspension. Section 6 of this Sub-plan provides mitigation and management measures that will be implemented to avoid or minimise air quality impacts during delivery.

6. Air Quality and Dust Management

6.1. Air Quality Mitigation Measures

Table 11 outlines the standard management and mitigation measures developed for the management of air quality impacts associated with construction of the SCAW. Erosion and Sediment Control Plans (ESCPs) will describe in detail the key air dust controls measures for dust generated as a result of wind-borne erosion, specific to each area – refer to the Soil and Water Management Sub-plan.

Refer to Element 4: Project Specific Requirements which contains the key compliance requirements relevant to air quality management which are applicable to SCAW including relevant CoA, REMMs and CEMF requirements.

Table 11 - Air quality mitigation measures

Ref	Mitigation measure	Responsibility	Source
Pre-Construction			
AQMM1	Identify sensitive land uses/sensitive receivers in Site Environment Plans (SEPs), prior to works commencing	Environmental Coordinator	CEMF 13.2(a)
AQMM2	Incorporate information on dust sources, impacts and mitigation measures into Site Induction and on-going Toolbox Talks	Project Engineers Environmental Coordinators	CEMF 3.11a(iii)
Site Establishment			
AQMM3	Temporary spoil stockpiles during site establishment that have the potential to result in dust generation are to be maintained / covered	Project Engineers Site Supervisors	CoA E1
AQMM4	Wind breaks, which may include site hoardings, may be constructed where construction works are in close proximity to sensitive receivers (where feasible and reasonable).	Environmental Coordinators Project Engineers	CoA E1
AQMM5	Wheel-wash facilities or rumble grids will be provided and used near the site exit points, as appropriate.	Site Supervisors	CEMF 13.3(a)(viii)
AQMM6	Implement appropriate controls in accordance with the Soil and Water Management Sub-plan including erosion and sediment controls.	Site Supervisor Environmental Coordinator	Soil and Water Management Sub-plan
General Construction (applicable to all aspects)			
AQMM7	Undertake on-going monitoring for dust (site inspections) to assess the effectiveness of mitigation measures.	Environmental Coordinators	CEMF 13.2(b)
AQMM8	A sweeper will be used to clean dirt tracked on hardstand, pavements, or roads.	Site Supervisors	CoA E1
AQMM9	Water sprays and/or water carts to be used as required for dampening exposed surfaces to control dust generation.	Project Engineers	CEMF 13.3(a)(vii)
AQMM10	Burning or incineration is not permitted at any of the SCAW Worksites.	Site Supervisors Environmental Coordinators Project Engineers	Best practice

Ref	Mitigation measure	Responsibility	Source
AQMM11	Silt accumulated in sediment control devices (e.g. silt fences and spoon drains) to be removed on a regular basis to prevent dust generation.	Site Supervisors Environmental Coordinators Project Engineers	CoA E1
AQMM12	Dust suppression measures, such as water lines, will be used if concrete/rock cutting is required.	Site Supervisors Environmental Coordinators Project Engineers	CoA E1
AQMM13	Vehicles to maintain appropriate speed on sealed and unsealed roads to minimise dust generation	Site Supervisors	CEMF 13.3(a)(iv)
AQMM14	Building and structural demolition will be managed to minimise dust generation by considering weather conditions before works commence	Site Supervisors Environmental Coordinators Project Engineers Safety Manager	CoA E1
AQMM15	Plant and equipment will be serviced and maintained in good working order to reduce unnecessary emissions from exhaust fumes. All equipment and vehicles are to be regularly maintained and records kept of maintenance.	Site Supervisors Plant Operators	CEMF 13.2(b) CEMF 13.3(a)(i)
AQMM16	Use of erosion control techniques such as geotextiles, organic fibre mats, mulches and soil polymer stabilisers/binders.	Site Supervisors Environmental Coordinators Project Engineers	Soil and Water Management Sub-plan
AQMM17	The engines of all on-site vehicles and plant would be switched off when not in use for an extended period.	Site Supervisors Environmental Coordinators Project Engineers	CEMF 13.3(a)(ii)
AQMM18	Low emission vehicles and plant fitted with catalysts, diesel particulate filters, or similar devices are to be used, where feasible and reasonable.	Site Supervisors Project Engineers Plant Operators	CEMF 13.3(a)(iii)
AQMM19	Haul routes and plant (including generators) to be sited away from sensitive receivers, such as dwellings and schools, where feasible and reasonable.	Site Supervisors Environmental Coordinators Project Engineers	CoA E1

Ref	Mitigation measure	Responsibility	Source
AQMM20	Mains power will be used in favour of diesel- or petrol-powered generators where possible	Site Supervisors Environmental Coordinators Project Engineers	CEMF 13.3(a)(iii)
AQMM21	Workers will be encouraged to use public transport and consider other modes of transport such as car-pooling.	Site Supervisors Environmental Coordinators Project Engineers	CEMF 13.3(a)(vi)
AQMM22	Dust generating activities would be assessed during periods of strong winds and rescheduled, where required.	Site Supervisors Environmental Coordinators Project Engineers	CEMF 13.2(b)
AQMM23	Cutting, grinding or sawing equipment must only be used in conjunction with suitable dust suppression techniques such as water spray or local extraction.	Site Supervisors Environmental Coordinators Project Engineers	CoA E1
AQMM24	Demolition activities will be planned and carried out with adequate dust suppression to minimise the potential for dust generation, e.g.: <ul style="list-style-type: none"> considering weather conditions before works removing or wetting unconsolidated material with dust generating capacity before mechanical demolition utilise misting sprays 	Site Supervisors Project Engineers	CoA E1 IAQM
Excavation and Earthworks			
AQMM25	Water suppression to be used for active earthwork areas, stockpiles, gravel roads to reduce wind-blown dust emissions.	Site Supervisors	CEMF 13.3(a)(vii)
AQMM26	All vehicles carrying loose or potentially dusty material to and/or from the site must be covered.	Site Supervisors Environmental Coordinators Project Engineers	Best practice
AQMM25	The extent of opened and disturbed contaminated soil at any given time would be minimised where practicable. Excavated areas would be covered or odour suppressing agents would be used where practicable.	Site Supervisors Environmental Coordinators	REMM AQ1
Spoil Handling and Transport			

Ref	Mitigation measure	Responsibility	Source
AQMM26	Trucks carrying spoil onto or off site are to be covered. Tailgates, under-rigs, wheels and towing apparatus of all trucks to be checked to ensure they are clean and secure, prior to leaving the worksite.	Site Supervisors Project Engineers Environmental Coordinators	Best practice
AQMM27	Unsealed haul roads must be regularly damped down in dry and windy conditions.	Project Engineers Environmental Coordinators Site Supervisors	CEMF 13.3(a)(vii)
AQMM28	Longer term and/or heavily used haul roads to generally be sealed. The criteria for sealing haul roads would be defined during detailed construction planning. Sealed haul roads would be regularly cleaned.	Senior Project Managers	CEMF 13.3(a)(vii)

6.2. Air Quality and Dust Management Procedure

An Air Quality and Dust Management Procedure (Appendix C1 – Air Quality and Dust Management Procedure) has been developed for the SCAW and will be implemented for the duration of construction activities. The procedure will be available at all sites during construction works and discussed in the SCAW induction and site prestart. The procedure outlines:

- Training via inductions and tool-box talks
- Air quality and dust control implementation
- Visual assessment procedures
- Requirement to undertake an environment inspection and stop work or modify work practices if:
 - Visible dust is leaving the site
 - Winds exceed 30 km/hr on average over 1hr

Management and monitoring details are set out in Appendix C4 – Air Quality Construction Monitoring Program.

6.3. Meteorological Factors

Meteorological factors that need to be considered when evaluating the risk of dust generation include:

- Wind Direction – determines whether dust and suspended particles are suspended and transported in the direction of sensitive receivers
- Wind Speed – governs the potential suspension and drift distance of particles
- Soil Moisture – increased soil moisture reduces soil or dust erosion potential
- Rainfall or Dew – rainfall or heavy dew which wets the surface of the soil.

These factors will influence the day-to-day risk of dust generation and suspension. Wind speed and direction will be monitored and communicated with the wider team. Accordingly, they are to be considered by the Supervisors, in consultation with the Environmental Coordinators, to ensure appropriate mitigation measures are adopted.

6.4. Earthworks and Construction Works

During earthworks and construction works exposed surface areas will be managed to reduce dust emissions using mitigation measures including water sprays, adhesive polymers and covering/protecting exposed surfaces. Wheels of all vehicles leaving site will be checked/cleaned so that material are not spread or carried onto surrounding roads. Sealed roads around construction sites will be monitored and, where necessary, swept to remove any deposited material with the potential to generate dust.

Water will be used to suppress dust particles potentially generated during construction. Earthworks will be kept damp, as required, especially during dry weather and spoil stockpiles will be covered and/or damped as necessary. Water lines will be supplied to cutting and grinding equipment to minimise dust emissions.

Water carts and sweepers will also be utilised to manage sites and roads where required. Where practicable and safe, water on site will be reused for this purpose. Potentially dusty materials will be handled as little as possible, and during handling, the height from which dust generating material is unloaded will be minimised.

6.5. Plant and Equipment Maintenance

The main impacts from plant and vehicle emissions include an increase in greenhouse gases and a general reduction in air quality. The main compounds associated with diesel combustion in plant and equipment include carbon monoxide, sulphur dioxide and nitrogen dioxide. The potential reduction of air quality from plant and vehicle emissions associated with the SCAW is not considered significant in isolation, however, the accumulated impact in conjunction with other adjacent sources (i.e. motor vehicle emissions, commercial businesses and domestic sources have the potential to diminish air quality in the immediate vicinity and region of the project worksites.

To minimise the impacts on local and regional air quality, the exhausts of all major plant shall be fitted with suitable exhaust emission cleaners, such as catalytic converters, maintained in accordance with the

manufacturers' recommendations. Mechanical inspections of plant, equipment and vehicles will also be undertaken to ensure all have appropriate emission control devices and are in good working order.

Vehicles and construction plant and equipment will be maintained in good condition and regularly serviced so that vehicular emissions remain within air quality standards set by the AAQ NEPM. Maintenance areas will be kept free of rubbish and debris and swept regularly. Engines will be switched off when vehicles are not in use and refuelling areas will be located away from areas of public access and sensitive receivers wherever possible.

Regular site inspections will be undertaken by Site Supervisors and Environmental Coordinators to monitor and reduce any unnecessary running of plant and vehicles. These inspections will also be used to detect any plant or vehicles emitting excessive fumes or smoke.

6.6. Management of cumulative impacts

CPBUI will manage the potential for cumulative air quality impacts via coordination and engagement with key stakeholders and other SSI projects in accordance with the Sydney Metro Construction Cumulative Impacts Management Plan (developed in accordance with REMM C1) and the SCAW Community Communications Strategy.

Proposed consultation forums that will facilitate interface during construction and allow for proactive identification and management of cumulative impacts will include:

- Internal construction meetings
- Interface/coordination meetings between other projects, and
- Environment and Planning meetings with Sydney Metro.

If the potential for cumulative impacts are identified, adaptive management will be applied. CPBUI will identify if the controls within this Plan are sufficient to address the potential for cumulative impacts and/or identify if additional measures are required to be applied, including the requirement for increased environmental monitoring.

7. Compliance Management

7.1. People and Responsibilities

Roles and responsibilities applicable to the implementation of this Sub-plan are identified in Table 11 and Appendix C1 – Air Quality and Dust Management Procedure.

Refer to Section 5 of the CEMP for additional detail relating to the roles, responsibilities and reporting lines applicable to the SCAW.

7.2. Training

Environmental training specific to air quality management will include:

- Site induction where the requirements of this Sub-plan will be communicated
- Toolbox talks and awareness – for site specific air quality management actions and tasks
- Pre-starts – Expected unfavourable weather conditions will be communicated via daily pre-start and will be monitored, and communicated where necessary, throughout the day.

Refer to Element 7 of the CEMP for full details on training and awareness for the SCAW including the project induction.

7.3. Complaint management

Dust complaints will be addressed by the Stakeholder and Community Relations Manager and the Environment and Sustainability Manager, in accordance with the complaints handling process in the Community Communications Strategy.

7.4. Monitoring, inspections and audits

The effectiveness of air quality mitigation measures described in this Sub-plan will be reviewed as part of the monitoring, inspection and audit regime described in Element 3 and Element 12 of the CEMP.

In accordance with CEMF Section 13.2(b) air quality and dust monitoring will be undertaken via visual monitoring events and inspections:

- Meteorological conditions
- Visual monitoring of dust generation
- Monitoring for emissions from plant and machinery.

For full detail of the air quality monitoring and inspections to be undertaken during delivery of SCAW, refer to Appendix C4 – Air Quality Construction Monitoring Program.

Records and document management is addressed in Element 11 of the CEMP

7.5. Continuous improvement

This Air Quality Management Plan forms part of the CEMP. Refer to Element 12 of the CEMP for the process on continuous improvement and Sub-plan update and amendment.

Part B Implementation Plan

Elements and Expectations

Part B of this Sub-plan explains how potential air quality impacts during the SCAW Works will be minimised and managed. Compliance with all elements is required at all times to minimise the likelihood of causing unauthorised environmental harm and maximise the uptake of opportunities to reduce environmental impact.

Part B contains the following:

Environmental Elements and Expectations: These describe what is required of CPBUI JV to implement the objectives of the Environment and Sustainability Policy Statement and system requirements:

Element – Key aspects for managing this function in delivering the SCAW Works

Expectation – The outcomes achieved as part of each Element.

Requirements: These are the specific actions required to demonstrate compliance with the Elements and Expectations.

Responsibility and Key Contributor: Designation of responsibility for achieving compliance with the stated Expectation. Key contributors assist/contribute to achieving compliance.

Deliverables: Tangible outcomes produced to demonstrate compliance with the environmental Elements and Expectations.

Element 1: Training

CPBUI will ensure that SCAW project personnel can competently perform their duties and meet environmental obligations

Expectations		How we will meet the Expectations (minimum requirements)	Responsibility Key Contributor	Deliverables
1.1	All personnel have completed an induction containing relevant environmental information before they are authorised to work on the project	<p>All personnel working on the SCAW will undertake a site induction, which will provide initial training on various environmental aspects, including air quality management. It will cover:</p> <ul style="list-style-type: none"> • Potential sources of dust • Impacts to the environment and surrounding community • Mitigation measures • Hold Points (visible dust has potential to leave site or strong wind) 	<p>Senior HR Advisor Environment Manager Environmental Coordinators</p>	<p>Induction presentation Induction records</p>

Expectations		How we will meet the Expectations (minimum requirements)	Responsibility Key Contributor	Deliverables
1.2	Toolbox talks are used to reinforce key management requirements and lessons learnt	<p>Toolbox talks will be held regularly during site establishment and throughout construction. They will reinforce and reiterate information from inductions. Toolbox talks will be undertaken with key site people on the following procedures:</p> <p>In particular, toolboxes will be undertaken periodically on the Air Quality and Dust Management Procedure (Appendix C1 – Air Quality and Dust Management Procedure)</p>	<p>Environment Manager/Coordinator Site Supervisors Environmental Coordinators</p>	<p>Toolbox presentations Toolbox records</p>

Element 2: Monitoring and Reporting

All staff, employees and subcontractors will actively drive compliant environmental performance of SCAW.

Expectations		How we will meet the Expectations (minimum requirements)	Responsibility Key Contributor	Deliverables
2.1	Worksites are regularly inspected to ensure the adequacy of controls and compliance with the requirements of this Sub-plan	<p>Site Supervisor to undertake daily inspections of worksite to ensure management of air quality controls and will undertake adaptive management where required.</p> <p>Weekly inspection of air quality management controls will be undertaken as part of the weekly Environment and Sustainability Inspection Checklist (undertaken in the Enablon Synergy Mobile App) and Joint Environment Representative Inspections.</p> <p>A regular inspection program for air quality monitoring will be conducted as follows:</p> <ul style="list-style-type: none"> ▪ Details of daily inspections undertaken by the Site Supervisor will be recorded ▪ Routine weekly inspections are to be conducted to monitor air quality and dust mitigation measures in active worksites. Weekly inspections will be documented and summarised in monthly reports. 	<p>Environment Manager Site Supervisors Environmental Coordinators ER</p>	<p>Environment and Sustainability Inspection Checklists Site Diary entries ER Reports</p>

Expectations		How we will meet the Expectations (minimum requirements)	Responsibility Key Contributor	Deliverables
		<ul style="list-style-type: none"> ▪ Environment inspections are to be completed by the Environmental Coordinator and/or Superintendents/ Site Supervisor, and works are to be stopped or modified if: <ul style="list-style-type: none"> ▪ Visible dust is leaving the site ▪ Winds exceed 30 km/hr on average over 1hr ▪ Management and monitoring details are set out in Section 6 and the Air Quality Monitoring Program. ▪ ER inspections will include review of implementation of air quality management and mitigation measures ▪ Regular site inspections will be undertaken by Site Supervisors and Environmental Coordinators to monitor and reduce any unnecessary running, and good working order of plant and vehicles. <p>Effectiveness of water cart usage, and spraying routes to be monitored and adapted progressively.</p>		
2.2	Air Quality Reporting	<p>The following compliance records will be kept:</p> <ul style="list-style-type: none"> ▪ Records of meteorological condition monitoring ▪ Records of the implementation of additional mitigation measures in response to adverse, windy weather conditions, and ▪ Records of air quality and dust inspections undertaken. <p>Dust deposition and air quality monitoring data will be collected and used for recording and reporting purposes.</p> <p>All environmental monitoring and inspections records will be accessible onsite for the duration of the SCAW</p>	Environment Manager Plant Manager Environmental Coordinators Site Supervisor	Air Quality Monitoring Report Site inspections Observations and diary entries

Expectations	How we will meet the Expectations (minimum requirements)	Responsibility Key Contributor	Deliverables
	and retained for a minimum of seven years. Refer to Element 11 of the CEMP for full details on document and record management.		

Element 3: Auditing, Review and Improvement

CPBUI will continually improve its environmental systems and performance by monitoring and reviewing their effectiveness

Expectations		How we will meet the Expectations (minimum requirements)	Responsibility Key Contributor	Deliverables
3.1	Audits are undertaken to ensure compliance with the requirements of this Sub-plan	<p>Procedures for corrective actions are addressed in the CEMP.</p> <p>Audits will be performed in accordance with the CEMP and this Sub-plan. Associated documents or procedures will be updated if required.</p> <p>The ER may participate in or conduct audits to ensure the implementation of this Sub-plan and related documents is compliant with what is stated in the documents and the terms of the planning approvals.</p>	<p>Environment Manager</p> <p>Environmental Coordinators</p> <p>Sustainability Manager</p> <p>ER</p>	<p>Audit Reports</p> <p>Corrective Action Reports</p>
3.2	All non-compliances are reported and actioned	<p>An air quality non-compliance can generally be defined as a failure to comply with the Project Planning Approval.</p> <p>Where a non-compliance is raised as part of an audit or an incident or complaint investigation the audit, incident or complaint report may be used to close out the non-compliance and it is not necessary to raise a separate non-compliance reporting process.</p> <p>Corrective and Preventative Actions may also be raised in accordance with Element 3 of the CEMP.</p>	<p>Environment Manager</p> <p>Sustainability Manager</p> <p>Environmental Coordinators</p> <p>Quality Manager</p>	<p>Audit Reports</p> <p>Corrective Action Reports</p>

Element 4: Project Specific Requirements

No	Requirement	How we will meet the Expectations (minimum requirements)	Responsibility Key Contributor	Timing
CoA C1	Construction Environmental Management Plans (CEMPs) and CEMP Sub-plans must be prepared in accordance with the Construction Environmental Management Framework (CEMF) included in the documents listed in Condition A1 to detail how the performance outcomes, commitments and mitigation	This Sub-plan is required under CEMF 3.5(a)(ix)	Environment Manager	Pre-construction

No	Requirement	How we will meet the Expectations (minimum requirements)	Responsibility Key Contributor	Timing
	measures specified in the documents listed in Condition A1 will be implemented and achieved during construction.			
CoA C2	With the exception of any CEMPs expressly nominated by the Planning Secretary to be endorsed by the ER, all CEMPs must be submitted to the Planning Secretary for approval. Note: The Planning Secretary will consider the assessment of the predicted level of environmental risk and potential level of community concern required under Condition A11(e) when deciding whether any CEMP's may be endorsed by the ER.	NA	NA	NA
CoA C3	The CEMP(s) not requiring the Planning Secretary's approval must be submitted to the ER for endorsement no later than one (1) month before the commencement of construction or where construction is staged no later than one (1) month before the commencement of that stage. That CEMP must obtain the endorsement of the ER as being consistent with the conditions of this approval and all undertakings made in the documents listed in Condition A1.	Section 1.1	Environment Manager	Pre-construction
CoA C5	Of the CEMP Sub-plans required under Condition C1, the following CEMP Sub-plans must be prepared in consultation with the relevant government agencies identified for each CEMP Sub-plan. Details of issues raised by a government agency during consultation (as required by Condition A6) must be provided as part of the relevant CEMP Sub Plan when submitted to the Planning Secretary / ER (whichever is applicable). Where a government agency(ies) request(s) is not included, the Proponent must provide the Planning Secretary / ER (whichever is applicable) justification as to why.	NA	NA	NA
CoA C6	The CEMP Sub-plans must state how: (a) the environmental performance outcomes identified in the documents listed in Condition A1 will be achieved; (b) the mitigation measures identified in the documents listed in Condition A1 will be implemented;	This Sub-Plan The EIS did not identify environmental performance outcomes associated with air quality	Environment Manager	Pre-construction

No	Requirement	How we will meet the Expectations (minimum requirements)	Responsibility Key Contributor	Timing
	(c) the relevant terms of this approval will be complied with; and (d) issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed through SMART principles.	Section 6 Element 4: Project Specific Requirements Section 5		
CoA C7	With the exception of any CEMP Sub-plans expressly nominated by the Planning Secretary to be endorsed by the ER, all CEMP Sub-plans must be submitted to the Planning Secretary for approval.	NA	NA	NA
CoA C8	The CEMP Sub-plans not requiring the Planning Secretary's approval must obtain the endorsement of the ER as being in accordance with the conditions of approval and all relevant undertakings made in the documents listed in Condition A1. Any of these CEMP Sub-plans must be submitted to the ER with, or subsequent to, the submission of the CEMP but in any event, no later than one (1) month before construction or where construction is staged no later than one (1) month before the commencement of that stage.	NA	NA	NA
CoA C10	Construction must not commence until the CEMP and all CEMP Sub-plans have been approved by the Planning Secretary or endorsed by the ER (whichever is applicable), unless otherwise agreed by the Planning Secretary. The CEMP and CEMP Sub-plans, as approved by the Planning Secretary or endorsed by the ER (whichever is applicable), including any minor amendments approved by the ER, must be implemented for the duration of construction.	Section 1.1	Environment Manager	Pre-construction
CoA C13	The following Construction Monitoring Program must be prepared in consultation with the relevant government agencies (as required by Condition A6) identified for each to compare actual performance of construction of the CSSI against the performance predicted in the documents listed in Condition A1 or in the CEMP. Where a government	Appendix C4 – Air Quality Construction Monitoring Program	Environment Manager	Pre-construction

No	Requirement	How we will meet the Expectations (minimum requirements)	Responsibility Key Contributor	Timing						
	<p>agency(ies) request(s) is not included, the Proponent must provide the Planning Secretary / ER (whichever is applicable) justification as to why.</p> <p>Required Construction Monitoring Programs Relevant government agencies to be consulted for each Construction Monitoring Program</p> <table border="1" data-bbox="264 459 1025 667"> <thead> <tr> <th data-bbox="264 459 344 612"></th> <th data-bbox="344 459 611 612">Required Construction Monitoring Program</th> <th data-bbox="611 459 1025 612">Relevant government agencies to be consulted for each Construction Monitoring Program</th> </tr> </thead> <tbody> <tr> <td data-bbox="264 612 344 667">(d)</td> <td data-bbox="344 612 611 667">Air quality</td> <td data-bbox="611 612 1025 667">Relevant Councils</td> </tr> </tbody> </table>		Required Construction Monitoring Program	Relevant government agencies to be consulted for each Construction Monitoring Program	(d)	Air quality	Relevant Councils			
	Required Construction Monitoring Program	Relevant government agencies to be consulted for each Construction Monitoring Program								
(d)	Air quality	Relevant Councils								
CoA C14	<p>Each Construction Monitoring Program must provide:</p> <ul style="list-style-type: none"> (a) details of baseline data available including the period of baseline monitoring; (b) details of baseline data to be obtained and when; (c) details of all monitoring of the project to be undertaken; (d) the parameters of the project to be monitored; (e) the frequency of monitoring to be undertaken; (f) the location of monitoring; (g) the reporting of monitoring results and analysis results against relevant criteria; (h) details of the methods that will be used to analyse the monitoring data; (i) procedures to identify and implement additional mitigation measures where the results of the monitoring indicated unacceptable project impacts; (j) a consideration of SMART principles; (k) any consultation to be undertaken in relation to the monitoring programs; and (l) any specific requirements as required by Conditions C15 to C16. 	Appendix C4 – Air Quality Construction Monitoring Program (Table 1)	Environment Manager	Pre-construction						

No	Requirement	How we will meet the Expectations (minimum requirements)	Responsibility Key Contributor	Timing
CoA C18	The Construction Monitoring Programs not requiring the Planning Secretary's approval must obtain the endorsement of the ER as being in accordance with the conditions of approval and all undertakings made in the documents listed in Condition A1. Any of these Construction Monitoring Programs must be submitted to the ER for endorsement at least one (1) month before the commencement of construction or where construction is staged no later than one (1) month before the commencement of that stage.	Appendix C4 – Air Quality Construction Monitoring Program (Section 1)	Environment Manager	Pre-construction
CoA C20	Unless otherwise agreed with the Planning Secretary, construction must not commence until the Planning Secretary has approved, or the ER has endorsed (whichever is applicable), all of the required Construction Monitoring Programs and all relevant baseline data for the specific construction activity has been collected.	Appendix C4 – Air Quality Construction Monitoring Program (Section 1)	Environment Manager	Pre-construction
CoA C21	The Construction Monitoring Programs, as approved by the Planning Secretary or the ER has endorsed (whichever is applicable), including any minor amendments approved by the ER, must be implemented for the duration of construction and for any longer period set out in the monitoring program or specified by the Planning Secretary or the ER (whichever is applicable), whichever is the greater.	Appendix C4 – Air Quality Construction Monitoring Program (Section 1)	Environment Manager	Pre-construction
CoA C22	The results of the Construction Monitoring Programs must be submitted to the Planning Secretary, ER and relevant regulatory agencies, for information in the form of a Construction Monitoring Report at the frequency identified in the relevant Construction Monitoring Program. Note: Where a relevant CEMP Sub-plan exists, the relevant Construction Monitoring Program may be incorporated into that CEMP Sub-plan.	Appendix C4 – Air Quality Construction Monitoring Program (Section 5.3.5)	Environment Manager	Construction

No	Requirement	How we will meet the Expectations (minimum requirements)	Responsibility Key Contributor	Timing
CoA E1	All reasonably practicable measures must be implemented to minimise the emission of dust and other air pollutants during construction.	Section 6	Environment Manager	Construction
REMM AQ1	The Air Quality Management Plan for the project would incorporate the following best-practice odour management measures would be implemented during relevant construction works: <ul style="list-style-type: none"> the extent of opened and disturbed contaminated soil at any given time would be minimised temporary coverings or odour suppressing agents would be applied to excavated areas where appropriate regular odour monitoring would be conducted during excavation to verify that no offensive odours are being generated 	Section 6 Section 7.4	Environment Manager Heritage Consultant	Pre-construction and Construction
REMM HR3	A hazardous materials analysis would be carried out prior to stripping and demolition of structures and buildings which are suspected of containing hazardous materials (particularly asbestos) Hazardous materials and special waste (such as asbestos) would be removed and disposed of in accordance with the relevant legislation, codes of practice and Australian Standards (including the Work Health and Safety and Regulation 2011 (NSW)).	Demolition Management Plan Waste Management Plan	Construction Manager	Construction
CEMF 3.5a	Subject to Section 3.4(b) the Principal Contractors will prepare issue-specific environmental sub plans to the CEMP which address each of the relevant environmental impacts at a particular site or stage of the project. Issue specific sub plans will include as a minimum... (ix) Air quality management... Some of these sub plans may also be informed by other environmental management documents included in the planning approval, for example the Construction Traffic	This Sub-plan	Environment Manager	Pre-construction

No	Requirement	How we will meet the Expectations (minimum requirements)	Responsibility Key Contributor	Timing
	Management Framework or Construction Noise and Vibration Standard.			
CEMF 13.1a	The following air quality management objectives will apply to construction: i. Minimise gaseous and particulate pollutant emissions from construction activities as far as feasible and reasonable;	Section 2.2	Environment Manager	Construction
	ii. Identify and control potential dust and air pollutant sources; and	Section 2.2	Environment Manager	Construction
	iii. For on-airport works, the Sydney Metro Western Sydney Airport Air Quality CEMP will detail all the air quality management objectives and will be consistent with the WSA Air Quality CEMP including all appendices to the CEMP.	Section 2.2	Environment Manager	Construction
CEMF 13.2a	On-airport management of soil and water will be achieved through the implementation of the SMWSA Soil and Water CEMP and Principal Contractors will develop and implement an Air Quality Management Plan for all off-airport works. Both plans will include, as a minimum: i. The air quality mitigation measures as detailed in the planning approval documentation;	Section 6	Environment Manager	Construction
	ii. The requirements of any approval and applicable licence conditions;	Element 4: Project Specific Requirements	Environment Manager	Construction
	iii. Site plans or maps indicating locations of sensitive receivers and key air quality / dust controls;	Section 6 Appendix C2 – Indicative Dust Deposition Sampling Locations	Environment Manager	Construction
	iv. The responsibilities of key project personnel with respect to the implementation of the plan;	Section 6	Environment Manager	Construction
	v. Air quality and dust monitoring requirements; and	Appendix C4 – Air Quality Construction Monitoring Program	Environment Manager	Construction
	Compliance record generation and management.	Section 2.3	Environment Manager	Construction

No	Requirement	How we will meet the Expectations (minimum requirements)	Responsibility Key Contributor	Timing
		Element 2: Monitoring and Reporting		
CEMF 13.2b	Air quality and dust monitoring will involve the following as a minimum: i. Meteorological conditions will be monitored and appropriate responses will be organised and undertaken periodically by the Principal Contractor;	Appendix C4 – Air Quality Construction Monitoring Program (Section 5.1)	Environment Manager Site Supervisor	Construction
	ii. Regular visual monitoring of dust generation from work zones; and	Appendix C4 – Air Quality Construction Monitoring Program (Section 5.2) Appendix C1 – Air Quality and Dust Management Procedure	Environment Manager Site Supervisor	Construction
	iii. Monitoring emissions from plant and construction vehicles to ensure they have appropriate emission controls and are being maintained correctly.	Element 2: Monitoring and Reporting)	Environment Manager Site Supervisor	Construction
CEMF 13.2c	The following compliance records will be kept by the Principal Contractor: i. Records of any meteorological condition monitoring;	Section 2.3	Environment Manager Site Supervisor	Construction
	ii. Records of any management measures implemented as a result of adverse, windy weather conditions; and	Section 2.3	Environment Manager Site Supervisor	Construction
	Records of air quality and dust inspections undertaken.	Element 2: Monitoring and Reporting	Environment Manager Site Supervisor	Construction
CEMF 13.3a	The on-airport Air Quality CEMP and the off-airport Air Quality Management Plan will include the following air quality mitigation measures as well as any relevant Conditions: i. Plant and equipment will be serviced and maintained in good working order to reduce unnecessary emissions from exhaust fumes;	Section 6.1	Environment Manager	Construction
	ii. Plant and equipment to be switched off engines when not in use;	Section 6.1	Environment Manager	Construction

No	Requirement	How we will meet the Expectations (minimum requirements)	Responsibility Key Contributor	Timing
	iii. The avoidance the use of diesel or petrol powered generators and instead using mains electricity or battery powered equipment, where practicable;	Section 6.1	Environment Manager	Construction
	iv. Appropriate vehicle speeds on sealed and unsealed roads;	Section 6.1	Environment Manager	Construction
	v. Development and implementation of a construction logistics plan to manage the sustainable delivery of goods and materials;	Sustainability Management Plan (Section 10.1.3. Materials initiatives)	Sustainability Manger	Construction
	vi. Implementing measures to support and encourage sustainable travel for construction workers to and from the construction sites;	Section 6.1	Environment Manager	Construction
	vii. Water suppression will be used for active earthwork areas, stockpiles, unsurfaced haul roads and loads of soil being transported to reduce wind-blown dust emissions;	Section 6.1	Environment Manager	Construction
	viii. Wheel-wash facilities or rumble grids will be provided and used near the site exit points, as appropriate; and	Section 6.1	Environment Manager	Construction
	Dust extraction and filtration systems will be installed for tunnel excavation works and deep excavation with limited surface exposure.	NA	NA	NA
<u>EPL Condition L6.1</u>	No condition in this licence identifies a potentially offensive odour for the purposes of section 129 of the Protection of the Environment Operations Act 1997.	Section 6.1	Environment Manager	Construction
<u>EPL Condition O3.1</u>	All activities occurring at the premises must be carried out in a manner that will minimise the generation and emission of air pollution from the premises as much to the greatest extent practicable.	Section 6.1	Environment Manager	Construction
<u>EPL Condition O3.2</u>	The premises must be maintained in a condition which minimises the generation and emission of air pollution from the premises to the greatest extent practicable.	Section 6.1	Environment Manager	Construction

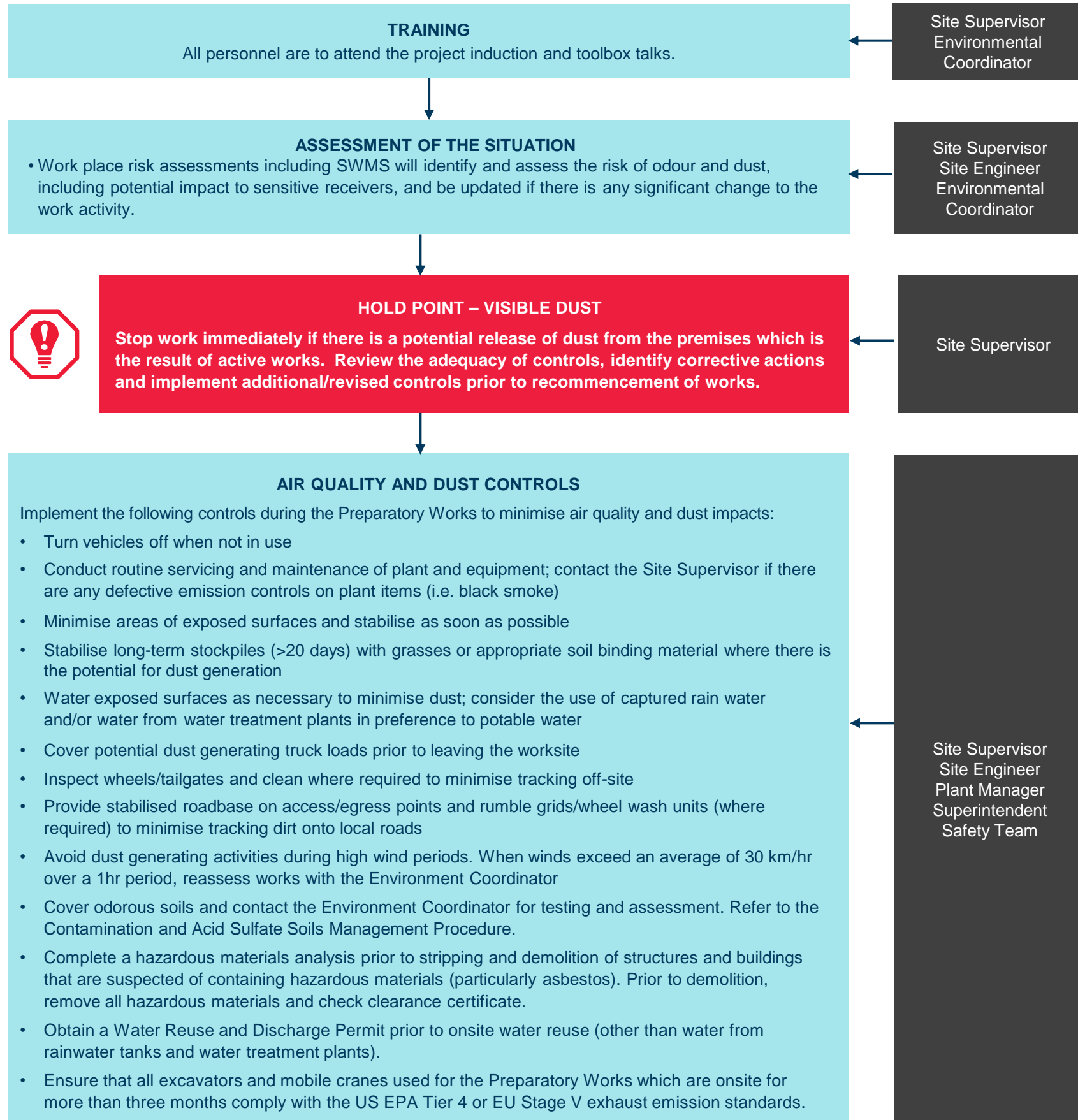
No	Requirement	How we will meet the Expectations (minimum requirements)	Responsibility Key Contributor	Timing
<u>EPL Condition O3.3</u>	The licensee must implement all reasonable and feasible measures to demonstrate compliance with condition O3.1 and O3.2.	Section 6.1	Environment Manager	Construction
<u>EPL Condition O3.4</u>	Trucks entering and leaving the premises that are carrying loads of material with the potential to generate dust must be covered at all times, except during loading and unloading	Section 6.1	Environment Manager	Construction
<u>EPL Condition M5.1</u>	The licensee must monitor and record temperature, wind direction, wind velocity and rainfall at either the project weather station, or through analysis of equivalent weather information obtained from the Australian Bureau of Meteorology. Monitoring must: a) be representative of the premises; b) commence prior to any works that may cause sediment to leave the premises; and c) continue to be operated until soil disturbance activities cease at the premises and the site has been stabilised.	Section 5.3	Environment Manager	Construction

Part C Appendices

Appendix C1 – Air Quality and Dust Management Procedure

AIR QUALITY AND DUST MANAGEMENT PROCEDURE

MANAGEMENT AND RESPONSIBILITY



MONITORING

- Environmental Coordinator to conduct daily monitoring of wind conditions and weather forecast and provide warnings of adverse meteorological conditions.
- Site Supervisor, Site Engineer or Environment Coordinator will visually monitor daily construction activities (including dust generating activities, emissions from plant equipment and any excessive odours) to ensure dust and emission controls are effective.
- Site Supervisor will monitor the effectiveness of emission controls on plant and equipment.
- If visible dust has the potential to leave the site, the Environmental Coordinator will inspect the site and modify construction methods where required.

RECORDING

- Site Supervisor will record problematic dust generating activities and control measures implemented in the daily site diary.
- Environmental Coordinators will record inspections on the Environmental Inspection Checklist; actions to be agreed with the Site Supervisor and verified on completion.
- Plant Manager is to keep records of all servicing of plant and construction equipment.

POTENTIAL IMPACTS

- Dust and vehicle emissions can impact human health, fauna and flora.
- Dust can impact personal and public property resulting in community complaints and additional cleaning requirements.
- Dust and vehicle emissions can result in odours that can impact human health.

Appendix C2 – Indicative Dust Deposition Sampling Locations





Appendix C3 – Consultation Records

Meeting Minutes – SCAW Liverpool City Council CEMP Consultation

Location	Microsoft Teams	Project	Surface and Civil Alignment Works (SCAW)
Chair	[REDACTED]	Minutes	[REDACTED]
Date	30 June 2022	Time	10:00 – 10:50
Attendees	[REDACTED]		

Item	Meeting notes	Actions
Acknowledgment of Country	Acknowledged that the SCAW Project will be undertaken on the traditional lands of the Cabrogal People of the Dhurag Nation.	Nil
CPBUI overview	<p>CPB Contractors:</p> <p>Australasian construction company of the CIMIC Group. Launched in January 2016 following the merger of the CIMIC Group construction businesses of Leighton Contractors and Thiess Construction</p> <p>United Infrastructure:</p> <p>A joint venture between Western Sydney Contractors Burton Contractors, JK Williams and Mulgoa Quarries</p> <p>Recent Projects in Western Sydney</p> <ul style="list-style-type: none"> Western Sydney Airport (Early Earthworks, Bulk Earthworks, Airside Pavements) The Northern Road Stage 5 &6 SUEZ Kemps Creek 	Nil
SCAW project overview	<ul style="list-style-type: none"> The Project forms part of the broader Sydney Metro network. It involves the construction and operation of a 23km new metro rail line that extends from the 	Nil

Item	Meeting notes	Actions
	<p>existing Sydney Trains suburban T1 Western Line (at St Marys) in the north and the Aerotropolis (at Bringelly) in the south. The alignment includes a combination of tunnels and civil structures, including viaduct, bridges, surface and open-cut troughs between the two tunnel sections.</p> <ul style="list-style-type: none"> • The scope for the SCAW package includes approximately 10.6km of alignment up to the underside of track formation from Orchard Hills to the Western Sydney International (WSI) airport. This includes approximately: <ul style="list-style-type: none"> • 3.6 kilometre of viaduct • 205 metres of bridges • 6.9km of at-grade alignment • Temporary and permanent access roads • Key Major Project Interfaces are: <ul style="list-style-type: none"> • Station Box and Tunnels (SBT) at Orchard Hills and WSI airport • M12 Motorway at Elizabeth Drive • WSI airport (on Commonwealth land) 	
Planning approvals/ CEMP	<ul style="list-style-type: none"> • Project Approvals <ul style="list-style-type: none"> • SSI 10051 approved by the Minister for Planning and Public Spaces on 23 July 2021 • EPBC Approval 2020/8687 by the Minister of Environment on 3 June 2021 • CPBUI Awarded project by Sydney Metro on 1 March 2022 • Staging Report (current revision 6) • CEMP <ul style="list-style-type: none"> • Two staged approach • Preparatory Works CEMP (commence in August 2022) <ul style="list-style-type: none"> • establishment of ancillary facilities for the stabling and maintenance facility (SMF) compound and the off-airport construction corridor compound at Elizabeth Drive • temporary access road construction 	Nil

Item	Meeting notes	Actions
	<ul style="list-style-type: none"> • delivery of materials and equipment to site • stockpiling of imported material (sandstone) • Main Excavation and Viaduct Works CEMP (commence in October 2022) <ul style="list-style-type: none"> • viaducts and bridges construction • works within riparian zones • bulk excavation 	
<p>Overview of project risks to be managed on the SCAW Project:</p>	<ul style="list-style-type: none"> ○ Erosion and sediment control <ul style="list-style-type: none"> ○ Blaxland, Unnamed and Cosgroves Creek crossings ○ Viaduct crossings limit disturbance footprint ○ Water reuse strategy to reuse sediment basin water with construction – successful management on TNR 5&6 ○ Dust <ul style="list-style-type: none"> ○ Stockpiling activities ○ Successful management of bulk import of material on SM-WSA project ○ Waste management <ul style="list-style-type: none"> ○ Strategy to retain all onsite ○ Traffic <ul style="list-style-type: none"> ○ Cumulative impacts of traffic with other projects ○ OOHW (viaduct crossing over roads) <ul style="list-style-type: none"> ○ Key areas of proposed OOHW <ul style="list-style-type: none"> ○ Viaduct over Patons Lane (nearest sensitive receivers > 500m) ○ Viaduct over Luddenham Road (nearest sensitive receivers > 500m) ○ Bridge over the M12 (project safety considerations) (nearest sensitive receivers > 500m) ○ Bridge over Elizabeth Drive (nearest sensitive receivers > 500m) 	<p>Nil</p>

Item	Meeting notes	Actions
CEMP Sub-plans and Monitoring Programs	<p>Details of CoA C5/C13: CEMP Sub-plans required to be prepared in consultation with Relevant Councils</p> <ul style="list-style-type: none"> ○ Noise and Vibration <ul style="list-style-type: none"> ○ Noise and Vibration Monitoring Plan (C13) ○ Flora and Fauna ○ Soil and Water <ul style="list-style-type: none"> ○ Surface water quality monitoring program (C13) ○ Non-Aboriginal Heritage ○ Air quality monitoring program (C13) 	Nil
Consultation Questions Raised by Council	<p><i>1: Site Establishment Management Plan (Condition A18 and A22 including information as to how performance outcomes under Condition A1 are achieved)</i></p> <p>██████████ – a site establishment management plan is not proposed to be used as part of the SCAW scope. The Preparatory CEMP will cover aspects of site establishment of compounds at Patons Lane and Elizabeth Drive. Other compounds would be established under the main CEMP</p>	Nil
	<p><i>2: If the proposal is to be staged, details as to how the staging is proposed (Condition A35)</i></p> <p>██████████ – A staging report prepared by Sydney Metro and provided to DPE. Is publicly available</p> <p>██████████ – Staging report is prepared and structured to address the Staging Report requirements of SSI 10051 conditions A10 to A16 and outlines how each of the packages (Advanced Enabling Works, SBT, SCAW and SSTOM) will be constructed. The SM-WSA Staging Report is publicly available on the Sydney Metro Document Library: https://www.sydneymetro.info/sites/default/files/2022-03/SMWSA-Staging-Report.pdf</p>	Nil
	<p><i>3. Construction Environmental Management Plan (Condition C5 a – Noise and Vibration, b – Flora and Fauna, c – Soil and Water, d – Non-aboriginal heritage)</i></p> <p>██████████ – note that these have all been provided for reference to LCC</p>	Nil
	<p><i>4. Construction Monitoring Programs (Condition C13 a – Noise and Vibration, b – Surface Water Quality and d – Air Quality)</i></p>	Nil

Item	Meeting notes	Actions
	<p>██████████ – note that these have all been provided within their relevant sub-plans for reference to LCC</p>	
	<p>5. OEMP – Flood Emergency Management Plan (Condition D3)</p> <p>██████████ – these are for operation of the SM-WSA project and not applicable to the scope of works for SCAW being undertaken by CPBUI. These would be prepared at a later date by others</p>	Nil
	<p>6. Reuse of timber (Condition E12)</p> <p>██████████ – the SCAW project will aim to reuse timber where ever practical within the project footprint to allow for fauna crossings. If required during construction, the CPBUI team would reach out to Councils and other agencies if other beneficial reuse options are required</p>	Nil
	<p>7. Critical State Significant Infrastructure flood impact management (Condition E17)</p> <p>██████████ – this condition is subject to detailed design and consultation with LCC would be undertaken at a later date if/when required by this condition.</p>	Nil
	<p>8. Noise mitigation - Operational Noise and Vibration Mitigation Measures, including both an Operational Noise and Vibration Review and provision of information relating to the design of noise barriers (Condition E58)</p> <p>██████████ – these are for operation of the SM-WSA project and not applicable to the scope of works for SCAW being undertaken by CPBUI. These would be prepared at a later date by others</p>	Nil
	<p>9. Place, Urban Design and Corridor Landscape Plan (PUDCLP)</p> <p>██████████ – Consultation is still being set up as the design progresses for the PUDCLP</p>	Nil
	<p>10. Detailed Site Investigation Report(s), Remediation Action Plan(s), Validation Report(s), Site Audit Statement(s) (Condition E97)</p> <p>██████████ – any consultation regarding this condition would be limited to providing Site Audit Statement if contamination is identified on land within the LCC LGA.</p>	Nil at this stage.
Any other questions	<p>██████████ – who is the appropriate regulatory authorities for issues if Council or the community want to raise them during the project.</p>	Nil

Item	Meeting notes	Actions
	<p>██████████ – depending on the type of compliant and the location it will differ. NSW EPA will regulate all works on state jurisdiction for pollution complaints under an EPL. The Department of Planning and Environment (DPE) are also the regulatory authority for the CSSI.</p> <p>On-Airport the regulator will be the Airport Environment Officer (AEO) under the <i>Airports (Environment Protection) Regulations 1997</i></p> <p>Site compounds will be set up with appropriate hording and details of the SCAW project with a 1800 number for community to make complaints/enquiries.</p>	
	<p>██████████ – will the SCAW project cover station fitouts and work around Bringelly and the Aerotropolis?</p> <p>██████████ – no these scopes would be covered in the SBT and SSTOM contracts</p>	Nil

Appendix C4 – Air Quality Construction Monitoring Program

Air Quality Construction Monitoring Program

Western Sydney Airport – Surface and Civil Alignment Works

1. Purpose

This Air Quality Construction Monitoring Program (Monitoring Program) is an appendix of the Air Quality Management Sub-plan and forms part of the Construction Environmental Management Plan (CEMP) for the SCAW. This monitoring program has been prepared to outline how CPBUI propose to undertake air quality monitoring during delivery of the SCAW Project.

The Monitoring Program is required under CoA C13 and in accordance with the SM-WSA Staging Report (Rev 6), this Monitoring Program will be endorsed by the SCAW project independent Environmental Representative (ER) before commencement of construction in accordance with CoA C18. Construction will not commence until the ER has endorsed and/or the Planning Secretary has approved, all of the Construction Monitoring Programs required under CoA C13.

The Air Quality Monitoring Program will be implemented for the duration of construction in accordance with CoA C21.

2. Scope

The Monitoring Program has been prepared in accordance with the requirements of CoA C14 (refer to Table 1). The Monitoring program has been developed considering the SMART principles.

Table 1: Requirements for the preparation of this Monitoring Program

Ref	Requirement	Where Addressed
CoA C14	Each Construction Monitoring Program must provide:	
	(a) details of baseline data available including the period of baseline monitoring;	Section 4
	(b) details of baseline data to be obtained and when;	Section 5.3.2
	(c) details of all monitoring of the project to be undertaken;	Section 5
	(d) the parameters of the project to be monitored;	Table 4
	(e) the frequency of monitoring to be undertaken;	Section 5.3.5
	(f) the location of monitoring;	Appendix C2 – Indicative Dust Deposition Sampling Locations
	(g) the reporting of monitoring results and analysis results against relevant criteria;	Section 7.2
	(h) details of the methods that will be used to analyse the monitoring data;	Section 6
	(i) procedures to identify and implement additional mitigation measures where the results of the monitoring indicated unacceptable project impacts;	Section 6
	(j) a consideration of SMART principles;	Section 6
	(k) any consultation to be undertaken in relation to the monitoring programs; and	Section 3
	(l) any specific requirements as required by Conditions C15 to C16.	n/a

3. Approval and Consultation

Agencies to be consulted for this Monitoring Program are detailed in Table 2.

Table 2 – Monitoring Program Agency Consultation

Subject	Agency Consultation
Air Quality Monitoring Program (CoA C13)	Relevant Councils (Penrith City Council, Liverpool City Council)

CPBUI JV have engaged with these agencies in developing and finalising this Monitoring Program. Records of consultation in accordance with CoA A6 are provided in Table 3 and AQMP Appendix C3 – Consultation Records.

Table 3 – Log of engagement or attempted engagement with relevant stakeholders (CoA A6(b))

Agency	Date	Person Contacted	Comment	CPBUI Response
Penrith City Council	10/06/2022	Penrith City Council representative	Penrith City Council staff had no comment on the Air Quality Monitoring Program	Noted. No further action required.
Liverpool City Council	10/06/2022	Liverpool City Council representative	No written response received from Liverpool City Council as of 22/07/2022.	A meeting held with representatives of Liverpool City Council, CPBUI and Sydney Metro on 28/06/2022 to discuss the SCAW project and environmental management. No issues were raised during the meeting that required addressing in the Air Quality Construction Monitoring Program

4. Baseline air quality data

Baseline ambient air quality data was collected as part of the EIS through between 2016 and 2019 at various location across NSW including at St Marys and Bringelly (ambient air quality data is provided in Section 4 of the Air Quality Management Sub-plan).

The data indicates that annual average PM10 concentration around St Marys and Bringelly ranges between 15.1 and 21.2 micrograms per cubic metre. There are a number of recorded exceedances of the 50 micrograms per cubic metre maximum 24-hour concentration criterion, however the exceedances are generally due to exceptional events related to bushfires, hazard reduction burns and dust storms.

The data indicates that annual average PM2.5 concentration around St Marys and Bringelly is around 8 micrograms per cubic metre. There are a number of recorded PM2.5 exceedances of the 25 micrograms per cubic metre maximum 24-hour concentration criterion. As with PM10, the exceedances are generally due to exceptional events.

5. Air Quality Monitoring

5.1. Meteorological Monitoring

Monitoring local meteorological conditions will provide information on the risk of dust becoming airborne and mobilised from onsite construction activities and any exposed areas. The use of predetermined alert values for some meteorological parameters can be used to trigger specific mitigation measures or action plans to prevent and/or minimise dust and impacts to air quality.

Weather data including daily weather conditions and forecasts may be obtained from the project automatic weather station and the Bureau of Meteorology (BOM) website (<http://www.bom.gov.au/places/nsw>). In the absence of electronic meteorological information, the Site Supervisor, Site Engineers and Environmental Coordinator/Advisor will monitor local wind conditions onsite in relation to current works and apply the mitigation measures in Table 11 of the Air Quality Management Sub-plan as required. In accordance with the CEMF Section 13.2(c)(i) records of all meteorological condition monitoring will be retained. Refer to Element 11 of the CEMP for full details on record and document management.

5.2. Monitoring Dust Generating Activities

Monitoring the impacts from dust generating activities will be undertaken using visual inspections of onsite construction activities in conjunction with the prevailing and forecasted meteorological conditions. This risk-based approach will highlight the effectiveness of implemented dust controls and the need for any additional measures such as stopping work in windy conditions.

Visual inspections will be undertaken by Site Supervisors, Site Engineers and Environmental Coordinators/Advisors periodically to ensure construction activities are not generating excessive amounts of dust with the potential to adversely impact nearby receivers. This includes monitoring the following key mitigation measures:

- Dust covers on haulage trucks are in place prior to leaving the construction site and whenever the load is in transit
- Stockpiles, spoil movements and cleared areas are being managed in accordance with the Construction Soil and Water Management Sub-plan
- Inspection of public roads adjacent to construction worksites for tracked dust or mud
- Vehicle speeds
- Communication of weather conditions and air quality mitigation measures at toolboxes and site prestarts.

If dust has potential to leave site, the construction activities causing this will be assessed. Construction activities may be suspended, relocated, or modified to minimise the emission of dust from the premises to the greatest extent practicable.

5.3. Dust Deposition Monitoring

5.3.1. Overview

Dust deposition gauges record airborne dust which can be derived from construction activities and provide a useful measure of changing local air quality. A network of six dust deposition gauges will be installed to monitor the SCAW Project.

Data from these gauges enables determination of dust deposition levels as a result of adjacent construction works. Data will be collected on a monthly basis, and results for dust deposition will be compared against the criterion outlined in this Monitoring Program and reported in the SCAW Monthly Progress Reports and 6-Monthly Construction Monitoring Reports.

5.3.2. Baseline Monitoring

CPBUI will collect baseline data and will install deposition gauges at least one month prior to commencement of earthworks and each stage of Construction to collect baseline data on ambient dust deposition levels in the vicinity of the Project.

5.3.3. Performance Criteria

The acceptable increment in annual dust deposition depends on the existing deposition level. Table 4 details the air quality monitoring criteria for deposited dust for the Project. The criteria in Table 5 relates to total cumulative concentration of dust in the air and not just contributions from Project-specific sources. As such, ambient dust concentrations will also be considered when evaluating against these criteria. Monitoring will be undertaken on a monthly basis for the duration of construction.

Table 4: Long-term impact assessment criterion for deposited dust

Pollutant	Averaging Time	Criteria	Source
Deposited Dust	Annual (max total ¹)	4 g/m ² /month	NSW EPA, 2017
	Annual (max increase ²)	2 g/m ² /month	NSW EPA, 2017

1. Total impact i.e. concentrations due to the Project plus background concentrations due to other sources

2. Total increase from project specific baseline data

5.3.4. Monitoring Locations

Monitoring will be undertaken using dust deposition gauges located at each of the locations identified in Appendix C2 – Indicative Dust Deposition Sampling Locations. These locations are adjacent to the larger scale Project work areas.

The specific locations for each of the sampling locations will be selected in accordance with AS/NZS 3580.1.1 2016, Methods for Sampling and analysis of ambient air – Guide to siting air monitoring equipment, as far as practicable. The requirements for AS/NZS 3580.1.1 2016 are outlined in Table 5.

Table 5 - AS/NZS 3580.1.1 2016 dust monitoring requirements

Pollutant	Type of Monitoring Station	Height above ground	Other locating criteria (minimum requirements) *
Deposited matter	Peak, neighbourhood and background	1.8 – 2.2m	<ul style="list-style-type: none"> ▪ Clear sky angle 120° ▪ Unrestricted airflow of 360° around sample gauge ▪ 10m from nearest object or tree dripline ▪ 5m from road ▪ No boiler or incinerator flues nearby

* As detailed in AS/NZS 3580.1.1 2016, where these distances are not possible, justification will be provided as to site selection.

5.3.5. Sample Collection and Laboratory Analysis

The dust deposition gauges will be collected, and replaced, from site every 30 ± 2 days and analysed for insoluble solids.

Analysis will be undertaken by a National Association of Testing Authorities (NATA) accredited laboratory. Monitoring for depositional dust will comply with AS/NZS 3580.10.1 2016, Methods for sampling and analysis of ambient air – Determination of particulates – Deposited Matter – Gravimetric Method and the NSW EPA Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (2016).

5.3.6. Quality Assurance and Documentation

All samples to be sent to a laboratory will be subject to quality assurance protocols. Quality assurance and control protocols during sampling and recording parameters will be undertaken with each sampling event in accordance with AS/NZS 3580.10.1 2016, Methods for sampling and analysis of ambient air – Determination of particulates – Deposited Matter – Gravimetric Method to ensure the integrity of the dataset.

Samples are to be transported to a NATA-accredited laboratory under documented chain-of-custody protocols and Monitoring records will be maintained in accordance with the appropriate standard.

5.4. Real Time Monitoring

The real time monitors provide an indication of the likely PM₁₀ & PM_{2.5} levels (measured instantaneously with a light scattering measurement device), which is a useful management tool as results can be reviewed as they occur and provides the opportunity to implement dust management measures in response to elevated levels.

Real time monitoring locations would be selected on a case by case basis, based on meteorological conditions, construction activities at that time and nature of complaint/s. The data from the real time monitoring stations will be linked to a web-based platform (SiteHive), which enables project staff to quickly review the measured air quality results. The SiteHive system set up with SMS alerts which are sent to key personnel to prompt staff to review elevated air quality results and implement management responses to ensure dust levels are appropriately controlled.

Whilst real time monitoring provides useful data for air quality management, it is not an approved method for assessing against the compliance criteria, according to Schedule 3 of the National Environment Protection (Ambient Air Quality) Measure and the Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales and therefore the data captured through real time analysis of air pollutants is indicative and should be utilised as a management tool only.

CPBUI will continue to monitor results and investigate elevated air quality levels. Investigations could include a review of climatic conditions, site observations or attended dust monitoring.

A summary of the monitoring to be adopted during delivery for the SCAW is provided in Table 6.

Table 6– Summary of air quality monitoring and inspections

Details	Frequency	Test Procedure	Responsibility
Monitoring			
Wind and weather	Daily	Weather conditions and forecast data will be obtained from the Bureau of Meteorology (BOM) website Daily rainfall monitoring from project weather station	Environmental Coordinator Site Supervisor
	Hourly	Temperature and humidity data will be obtained from project automatic weather station and/or Bureau of Meteorology (BOM) website	Environmental Coordinator
Suspended particles (PM2.5/PM10 concentrations)	Real time	Real time monitoring undertaken to support deposited dust data for the purpose of Air Quality Management during construction	Environmental Coordinator
Deposited dust	Monthly	Deposited dust data to be collected from project dust deposition gauges	Environmental Coordinator
Odour	Daily during odour generating works, upon a complaint	No detectable odour to extend beyond the project boundary	Site supervisor
Inspections			
Visual surveillance	Daily	Confirm effectiveness of dust control mitigation	Site Supervisor Environmental Coordinator
Investigation	In response to a complaint	Response to complaints in accordance with Community Communication Strategy	Site Supervisor Environmental Manager Environmental Coordinator

6. Adaptive management

Monthly monitoring results for dust deposition will be compared with the criterion identified in Table 4 and with results previously recorded on the Project.

Should dust deposition monitoring results activities exceed the criteria set out in Table 4 of this Monitoring Program, the following steps will be undertaken:

1. Analysis of the results by the CPBUI Environmental Coordinator/Advisor in more detail with a view of determining the significance of the exceedance and possible causes
2. Assess the available dust deposition data, recent weather and recent activities or air quality incidents that may have occurred at the monitoring location
3. Review the applied mitigation measures (outlined in AQMP Section 6.1) to ensure dust from project works are being minimised to the largest extent possible
4. Identifying and agreeing on actions and/or additional mitigation measures to resolve or mitigate the exceedance.
5. Implementing actions to rectify or mitigate the exceedance, including any additional mitigation measures.

This process considers SMART principles in that the actions are specific and measurable, the outcomes are achievable and realistic, and all steps are time-focussed.

7. Compliance Management

7.1. Monitoring Records

The following information will be recorded for each monitoring event:

- Date and time of measurement
- Measurement location
- Measured parameters as reported by the laboratory.

In accordance with the CEMF, records of monitoring results will be recorded and kept (Refer to Element 6 of the CEMP). The results of the monitoring must be readily available to the construction team, Sydney Metro and the ER.

The Planning Secretary and EPA must be provided with access to the results on request.

7.2. Reporting

Reporting requirements and submission timeframes associated with this Monitoring Program for the construction phase are presented in Table 7 below.

Table 7 – Reporting requirements

Report	Requirements	Recipient	Timing
Monthly Progress Report	Information to be detailed in the reports include: <ul style="list-style-type: none"> ▪ Results summary and analysis of environmental monitoring conducted in accordance with this Program. 	Sydney Metro ER	Monthly
6-Monthly Construction Monitoring Report	Information to be detailed in the report will include, but not be limited to, the following information: <ul style="list-style-type: none"> ▪ The date(s) and time at which the monitoring was undertaken ▪ The locations and description of monitoring undertaken ▪ Tabulations of monitoring data 	Planning Secretary ER EPA	Within 60 days of the end of the reporting period.

Report	Requirements	Recipient	Timing
	<ul style="list-style-type: none"> ▪ Compliance monitoring results with dust deposition criteria as identified in Table 4. ▪ Identification of exceedances of the nominated criteria and descriptions of the causes of these exceedances 		

7.3. Non-conformances and exceedances

In the event that the dust deposition criteria are exceeded, CPBUI will implement the adaptive management approach outlined in Section 6 of this Monitoring Program.

Details of exceedances will be provided in the Monthly Environmental Reports and Six-monthly Construction Monitoring Reports.