Western Sydney Airport

Air Quality
Construction Environmental Management Plan

December 2018

Western Sydney Airport

Document Control

File Name	Document Name	Revision
WSA00-BECHTEL-00400-EN-PLN-000006	WSA Co Air Quality CEMP	1

Revision History

Revision	Date	Description	Author	Reviewer
0	24/09/2018	Approved		
0.1	09/11/2018	Draft update for the Visitor Centre and Site Accommodation phase and Material Importation phase	WSA Co	S Reynolds
0.2	23/11/2018	Draft updated to address comments on inclusion of new scope (Visitor centre, Site Accommodation and Material Importation)	WSA Co	S Reynolds
0.3	07/12/2018	For approval	WSA Co	S Reynolds
1	14/12/2018	Revision update to include the Visitor Centre and Site Accommodation phase and Material Importation	WSA Co	S Reynolds

Plan Authorisation

Position	Name	Signature	Date
Environment Manager	S Reynolds		07/12/2018

Glossary and Definitions

Item	Definition
the Act	*Airports Act 1996* (Airports Act)
Airport	The airport located at the Airport Site. Note: The Airport is referred to in the Act as Sydney West Airport and also commonly known as Western Sydney Airport
Airport Lease	An airport lease for the Airport granted under section 13 of the Act
Airport Lessee Company	The company that is granted a lease over the Airport Site
Airport Plan	Means the airport plan for the Airport Site as determined by the Infrastructure Minister under section 96B of the Airports Act in December 2016 as varied from time to time in accordance with the Airports Act.
Airport Site	The site for Sydney West Airport as defined in the Act
Approver	(a) for Condition 30 of the Airport Plan (Biodiversity Offset Delivery Plan) and any matter relating to the Biodiversity Offset Delivery Plan – the Environment Minister or an SES employee in the Environment Department; and (b) for other matters – the Infrastructure Minister or an SES employee in the Infrastructure Department.
Apron	The part of an airport used for: a. the purposes of enabling passengers to embark/disembark an aircraft; b. loading cargo onto, or unloading cargo from, aircraft; and/or c. refuelling, parking or carrying out maintenance on aircraft
Associated Site	An 'associated site for Sydney West Airport' as set out in section 96L of the Act
Condition	A condition set out in Part 3 of the Airport Plan in accordance with section 96C of the Act
Construction Impact Zone	The part or parts of the Airport Site or an Associated Site on which Main Construction Works are planned to occur, as detailed in the Construction Plan approved in accordance with Condition 1.
Construction Period	The period from the date of commencement of Main Construction Works in any part of the Airport Site until the date of commencement of Airport Operations.
EEW	The Phase of the Stage 1 Development that involves early earthworks as described in section 6of the Construction Plan.
Environment Minister	The Minister responsible for the EPBC Act
ECZ	Environmental Conservation Zone
Environmental Impact Statement	The environmental impact statement prepared in relation to the Airport under the EPBC Act
the EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
Infrastructure Department	The department responsible for administering the Airports Act, currently the Australian Government Department of Infrastructure, Regional Development and Cities
Infrastructure Minister	The Minister responsible for the Act from time to time
Laws	Statutes, regulations, rules, bylaws and other subordinate legislation of the Commonwealth or a state or territory
Main Construction Works	Substantial physical works on a particular part of the Airport Site including large scale vegetation clearance, bulk earthworks and the carrying out of other physical works, and the erection of buildings and structures) described in Part 3 of the Airport Plan, other than TransGrid Relocation Works or Preparatory Activities

Item	Definition
Non-conformance	Failure to conform to the requirements of the Airport Plan (including the SEMF)
Preparatory Activities	The following: a. day-to-day site and property management activities; b. site investigations, surveys (including dilapidation surveys), monitoring, and related works (e.g. geotechnical or other investigative drilling, excavation, or salvage); c. establishing construction work sites, site offices, plant and equipment, and related site mobilisation activities 0ncluding access points, access tracks and other minor access works, and safety and security measures such as fencing, but excluding bulk earthworks); d. enabling preparatory activities such as: (i) demolition or relocation of existing structures 0ncluding buildings, services, utilities and roads); (ii) the disinterment of human remains located in grave sites identified in the European and other heritage technical report in volume 4 of the EIS; and (iii) application of environmental impact mitigation measures; and e. any other activities which an Approver determines are Preparatory Activities
the Project	Western Sydney Airport – Stage 1 development
Stage 1 Development	The Developments described in Part 3 of the Airport Plan
Sydney West Airport	The Airport. Note: this is the name used in the Act. The Airport is also commonly known as Western Sydney Airport
Western Sydney Airport (WSA)	The Airport. Note: Under the Act the Airport is referred to as Sydney West Airport

Acronyms and abbreviations

Item	Definition
AEPR	Airports (Environment Protection) Regulations 1997
ALC	Airport Lessee Company
ALER	Airfield lighting equipment room
ARFFS	Aviation Rescue and Firefighting Services
ATC	Air traffic control
ATCT	Air traffic control tower
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulations 1998
CO	Carbon monoxide
CEMP	Construction Environmental Management Plan
DIPNR	NSW Department of Infrastructure, Planning and Natural Resources (now Department of Planning and Environment)
EIS	Environmental Impact Statement
EPA	NSW Environmental Protection Authority
GSE	Ground support equipment
ha	Hectares
HIAL	High intensity approach lighting
ISO 14001	AS/NZS ISO 14001:2015 – Environmental Management Systems
km	Kilometres
m, m^2 and m^3	Metres, square metres and cubic metres
ML and ML/d	Megalitres and megalitres per day
OEH	NSW Office of Environment and Heritage
OU	Odour unit
POEO Act	*NSW Protection of the Environment Operations Act 1997*
RMS	NSW Roads and Maritime Services
SEMF	Site Environmental Management Framework
SES Officer	An SES employee under the Public Service Act 1999 (Cth)
TSP	Total suspended particulate matter

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1 Introduction

1.1 Background

In April 2014 the Australian Government announced that the Commonwealth-owned land at Badgerys Creek will be the site for a second Sydney Airport. The Badgerys Creek Airport Site was selected following extensive studies completed over a number of decades.

In December 2016 pursuant to the Airports Act, the Minister for Urban Infrastructure determined the Airport Plan, which sets the environmental and planning authorisation for the development of Stage 1 of the Western Sydney Airport (WSA Stage 1). Part 3 of the Airport Plan outlines the conditions for the design, construction and operation of the Stage 1 development of the airport that must be complied with, regardless of who is delivering the works. These include strict environmental standards and implementation of mitigation measures identified in the Environmental Impact Statement (EIS).

The EIS was prepared in accordance with the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the EIS was finalised under the EPBC Act in September 2016, following a public exhibition period during which almost 5,000 submissions were received. The EIS considered potential impacts during construction and operation of the Stage 1 and long-term development of the proposed airport. In determining the Airport Plan the Minister for Urban Infrastructure accepted environmental conditions proposed by the Environment Minister, taking into account the EIS.

In May 2017, the Government announced that it would establish WSA Co, to develop and operate the airport. WSA Co is responsible for constructing and operating Western Sydney Airport in accordance with the Airport Plan.

The Western Sydney Airport is expected to be developed in stages to match demand and include planning for services and amenities that are easily expandable over time, providing scalable capacity for aircraft, passengers, cargo and vehicle movements.

Stage 1 will include major site preparation, removing or relocating infrastructure from the site and earthworks to prepare the Airport Site, establishing the Airport with a single 3,700 metre runway located in the north-western portion of the Airport Site, a terminal and other support facilities to provide an operational anticipated capacity of approximately 10 million regional, domestic and international passengers per year, as well as freight traffic (the Stage 1 development).

The scope of works for the Stage 1 Development is defined in the Airport Plan and will generally include the investigation, design, construction and commissioning of:

- Bulk earthworks to move and redistribute approximately 24 million cubic metres of material on the Airport Site;
- A single 3.7-kilometre runway;
- Aprons, taxiways and other airside pavements;
- A multi-user terminal;
- Appropriate airport and aviation support facilities;
- Drainage and utilities infrastructure; and
- Car parking, on-site roads and other appropriate landside facilities.

Further details with regards to site activities specific to this Air Quality CEMP is provided in Section 2.

1.2 Document context and scope

This WSA Co Air Quality Construction Environmental Management Plan (Air Quality CEMP) (this Plan) has been prepared to satisfy the requirements of the Air Quality CEMP set out in the Conditions for the Stage 1 Development of the Western Sydney Airport detailed in Section 3.10.2 of the Airport Plan. Specifically, Section 3.10.2 Condition 10(1) of the Airport Plan requires that an Air Quality CEMP be approved under the Airport Plan prior to the commencement of Main Construction Works.

This Air Quality CEMP provides the management approach and requirements (including environmental mitigation measures, controls, monitoring and reporting) for managing air quality during construction of the Stage 1 Development. This Plan forms one of nine CEMPs which are collectively covered by the WSA Co Site Environmental Management Framework (SEMF). To ensure the environmental resources, responsibilities and management measures are implemented during the construction activities, the SEMF is contained within the Construction Plan (included as Appendix 2). The implementation of the Construction Plan, including the SEMF, sits adjacent to other Project level management plans including the Community and Stakeholder Engagement Plan and the Sustainability Plan as illustrated in Figure 1.

The Construction Plan, including the SEMF, and nine CEMPs provide the environmental management approach and requirements and therefore should not be read in isolation to each other due to interconnecting management outcomes and objectives. Specifically, for the Air Quality CEMP, it is considered that the following management plan linkages can be made:

- Biodiversity CEMP – Management of dust and air emissions to prevent impact on adjacent vegetation and fauna habitat, including aquatic and terrestrial.
- Soil and Water CEMP – Management of dust emissions often requires the application and use of water for suppression to control release of particulate matter. The use of water on site will need to be undertaken in a manner to ensure the control of runoff is managed and receiving waters are not impacted by the works.
- Waste and Resources CEMP – Water usage is considered a key resource for the suppression and management of dust generation during the construction phase. Where possible, water required for dust generation will be sourced from the on-site storage dams. In the event that the water within the storage dams are insufficient, alternative water sources would be sought as per the Waste and Resources CEMP.
- Visual and Landscape CEMP – Impact on the air quality has the potential to affect the visual amenity and landscape of the receiving environment, particularly with regards to dust generation.
- Community and Stakeholder Engagement Plan – Similar to visual and landscape impacts, it is anticipated that the surrounding community and stakeholders will be highly receptive to air quality impacts, particularly dust generation and the accumulation of particulate matter.
- Sustainability Plan (once approved) – Management and reduction of greenhouse gas emissions and management of impacts with regard to general health, wellbeing, and quality of life for surrounding communities.

Where relevant, linkages to other CEMPs and management objectives have been included in the risk assessment and the environmental control measures, Section 6.2 and Section 7 respectively.

Table 1 below highlights relationships and linkages of this Air Quality CEMP with other CEMPs and management plans, including key cross-referencing to Airport Plan and EIS requirements.

Table 1 Air Quality CEMP relationship with other CEMP documentation

CEMP or Plan	Airport Plan Condition (3.10.2)	EIS Chapter 28 Table: Management area	EIS Chapter 28 Table: Mitigation measures
Aboriginal Cultural Heritage	11	28-12	28-13
Air Quality (this Plan)	**10**	**28-10**	**28-11**
Biodiversity	7	28-04	28-05
Community and Stakeholder Engagement Plan	15	28-20	28-21
European and other Heritage	12	28-14	28-15
Noise and Vibration	6	28-02	28-03
Soil and Water	8	28-06	28-07
Sustainability Plan	29	28-37	28-38
Traffic and Access	9	28-08	28-09
Visual and Landscape	14	28-18	28-19
Waste and Resources	13	28-16	28-17

Key
Moderate to high relevance to this CEMP
Some relevance to this CEMP

The review and document control process for this Plan are described further in Section 9of the WSA Co SEMF.

The context of this Plan in relation to the WSA Co environmental management system is presented below in Figure 1.

1.3 Document purpose

The purpose of this Plan is to provide the foundation for the management of air quality impacts in accordance with best practice and legal requirements (including environmental mitigation measures, controls, monitoring and reporting) during the construction phase of the Stage 1 development based on the assessment undertaken as part of the EIS.

This Plan details the air quality management requirements that must be satisfied in order to demonstrate compliance with the conditions as set out in Condition 10 of Section 3.10.2 of the Airport Plan for the construction of the Stage 1 development of the Western Sydney Airport.

Legal and other requirements are identified and maintained in a register within the SEMF (refer SEMF Appendix C). Mitigation measures (specific to air quality) required to satisfy these requirements are derived from the EIS and through risk assessment processes (refer Section 6.2) and included within this CEMP (refer Section 7).

Implementation of these measures is ensured through monitoring, training and competence, inspection, audit and reporting actions detailed in Section 10 and 11, with the responsibilities for implementation identified in Section 9. Continual improvement processes in relation to compliance with regulatory requirements are detailed in Section 14.

In summary, this Plan sets out to achieve the following:

- Provision of details for the management and mitigation measures to be implemented, including timing and responsibilities;
- Ensuring the commitments of the Conditions (as set out in the Airport Plan) and regulatory requirements are met and satisfied by both WSA Co and contractors;
- Provision of process for monitoring implementation, reporting, and auditing of air quality related management and compliance related issues;
- Commitment to meeting the requirements of ISO 14001 including the need for continual improvement;
- Provision of a process to be implemented for the management of complaints, for stakeholder engagement, and for the management of emerging environmental issues as they arise; and
- Provision of a system including procedures, plans and documentation for implementation by WSA Co personnel and contractors to enable Project completion in accordance with the environmental requirements.

Effective implementation of this Plan will assist WSA Co and relevant contractors to achieve compliance with necessary environmental regulatory and policy requirements in a systematic manner with an outcome of continual environmental management performance.

1.4 WSA Co environmental management system overview

WSA Co operates in general accordance with AS/NZS ISO 14001 – *Environmental management systems.* A copy of the WSA Co environmental policy is provided in Appendix E of the SEMF.

The Stage 1 development will be undertaken in accordance with the Construction Plan including the SEMF and the associated CEMPs (including this Plan).

The SEMF is the overarching management plan for a suite of environmental management documents. It provides a structured and systematic approach to environmental management and provides an expectation and guidance with regards to environmental management for the overall construction of the Stage 1 development.

The structure of the environmental management system for the Project is shown in Figure 1.

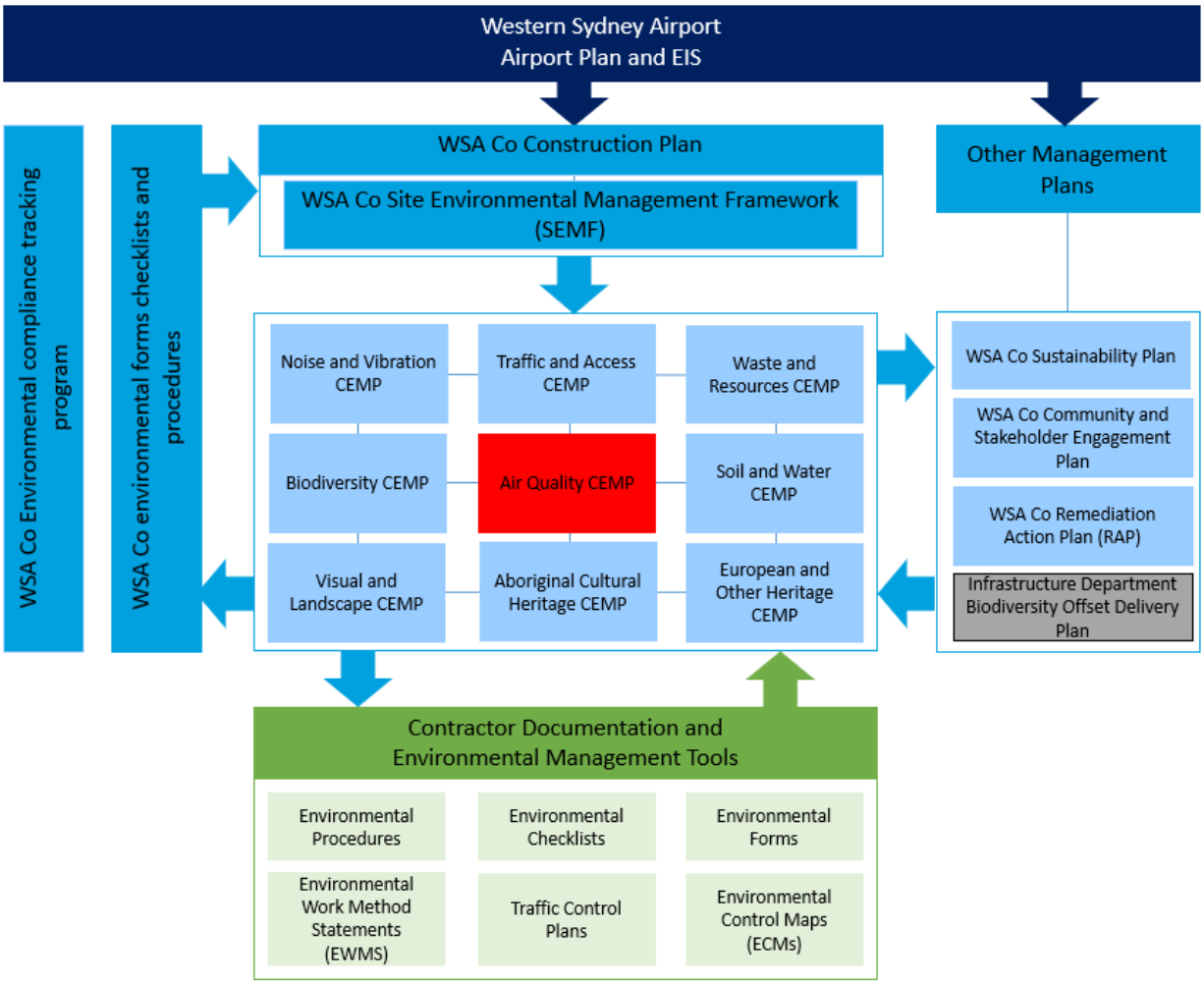


Figure 1 WSA Co Environmental Management System and CEMP context

1.5 Consultation requirements of this Plan

Airport Plan Condition 35 outlines the consultation requirements during the preparation of this CEMP and requires consultation with any NSW Government agencies as specified by the NSW Department of Premier and Cabinet. NSW Government agencies specified by Department of Premier and Cabinet for consultation for this Air Quality CEMP, including the Environment Protection Authority and the Department of Health. Further, Airport Plan Condition 10(3) requires that this Air Quality CEMP take into account Table 28-10 of the EIS which states the CEMP should also be prepared in consultation with the NSW Environment Protection Authority (NSW EPA) and NSW Health.

A summary of the stakeholder and government authority consultation completed to date which has informed the preparation of the Air Quality CEMP is presented below in Table 2. Details of consultation is provided in Appendix A.

Consultation will continue with agencies, councils and other relevant stakeholders throughout the Project where there is a change to a CEMP. The outcomes of this consultation will be documented in subsequent revisions of the relevant CEMPs, with details of such consultation included in the applicable document.

To satisfy the above requirement this CEMP (Revision 0) has been provided to the relevant stakeholders for feedback. Details of the Visitor Centre and Site Accommodation phase and Material Importation phase was described in the correspondence to provide context to the stakeholders on the level of impact that would

result from the change. In addition, stakeholders were invited to attend a workshop on 13 November 2018 where an overview of the Visitor Centre and Site Accommodation phase and Material Importation phase was presented and feedback requested. A summary of the consultation is provided in Table 2 and details included in Appendix A.

Table 2 Air Quality CEMP consultation summary

Government authority / stakeholder	Date	Summary
Consultation prior to Rev 0 approval		
NSW EPA	July 2018	NSW EPA response received in consolidated response letter from the NSW Department of Premier and Cabinet. NSW EPA content provided below: The EPA notes the consultation requirements relating to the preparation of a CEMP, however does not approve or endorse these documents. The EPA's role is to set environmental objectives for environmental management, rather than being directly involved in the development of strategies and management plans to achieve those objectives. The EPA provided advice in 2016 regarding environmental objectives during the exhibition of the Environmental Impact Statement. As a general recommendation, the CEMP should outline the measures that will be implemented to manage and mitigate all impacts assessed during the Environmental Impact Statement. All proposed mitigation and management measures in the CEMP should implement best practice to a level that is feasible and reasonable and clearly demonstrate how the proponent will meet the designated environmental objectives.
	September 2018	A letter was issued to NSW EPA acknowledging receipt of their consultation response (as above) and providing further detail how their comments have been considered and where required, incorporated into the CEMP.
NSW Health	July 2018	NSW Health response received in consolidated response letter from the NSW Department of Premier and Cabinet. NSW Health content provided below: A summary of response received is provided below, with further detail, including a copy of the correspondence and WSA Co response to comments, is provided in Appendix A. The air quality CEMP should implement best practice dust and odour mitigation practices, to ensure that air emissions associated with construction works and related activities do not unduly affect the amenity and wellbeing of the community. Earthworks will generate dust emission, and potentially some odour emissions. Fossil fuel powered earth moving equipment, plant, trucks and construction traffic will also impact local air quality. Adequate controls under an appropriate level of management are required to ensure predicted impacts satisfy the air quality criteria at a minimum. All reasonable and feasible measures should be taken to minimise exposure to air pollutants as far as practical. A clear mitigation strategy must be developed to address exceedances of the air quality criteria.

Government authority / stakeholder	Date	Summary
	September 2018	A letter was issued to NSW Health acknowledging receipt of their consultation response (as above) and providing further detail how their comments have been considered and where required, incorporated into the CEMP.
Consultation prior to Rev 1 approval		
NSW EPA	Nov 2018	A general comment applicable to all CEMPs received, refer to Appendix A for details
NSW Health	Nov 2018	There are no additional health considerations involved in construction of the visitor Centre other than its proximity to residents on the north-western boundary. The controls in the existing Construction Environmental Management Plans for Noise and Vibration and Air Quality are adequate and have incorporated previous comments from South Western Sydney Local Health District. No comments were provided in the written submission on the Material Importation phase. Western Area Health attended the November workshop and requested clarification on the dust management measures for the material importation. Details were provided by WSA outlining the process for stabilising the material using a water cart for short term management and a polymer binder for longer periods of stabilisation.
Stakeholder information workshop	13 November 2018	Workshop held on 13 Nov 2018. Attendees presented with a summary of the proposed works. Topics included: • Airport plan condition requirement for consultation • Land-use plan • Site location of works • Visitor Centre and Site Accommodation scope, including images of the concept design • Material importation, including location, distance to closest receiver and site access No comments received at workshop. **Invitees:** Liverpool City Council Western Area Health Penrith City Council NSW Department of Premier and Cabinet Roads and Maritime Services NSW Health NSW Department of Education NSW Aboriginal Affairs NSW Department of Planning and Environment Transport for NSW **Attendees:** NSW Aboriginal Affairs Liverpool City Council Western Area Health

1.6 Certification and approval

This Air Quality CEMP has been reviewed and approved for issue by the WSA Co Environment Manager prior to submission to Western Sydney Unit, Australian Government Department Infrastructure, Regional Development and Cities (Infrastructure Department).

1.7 Distribution

All WSA Co personnel and contractors will have access to this Air Quality CEMP via the Project document control management system. The Approved Plan must be published on WSA Co's website within one month of being approved and be available until the end of the Construction Period. An electronic copy can be found on the Project website - http://wsaco.com.au/Project/index.aspx

This document is uncontrolled when printed. One controlled hard copy will be maintained by the quality manager at the Project office.

2 Project details and scope of works

2.1 Project general features

The Project will be delivered through a packaging strategy with a wide variety of package sizes, risk profiles and contracting entities. Each package will have different levels of environmental risk and environmental obligations, depending on the scope of works, location of works and sensitivity of the receiving environment and relevant statutory requirements and obligations.

The Project is described in the Construction Plan. Stage 1 development of the Project comprises the following key features:

- Site preparation
- Airside precinct
- Terminal
- Utilities
- Ground transport
- Aviation support facilities
- Ancillary developments
- Other building activities

Further details of the overall Project construction activities, programming and methodologies are included the Construction Plan.

2.2 Project site location and layout

The Western Sydney Airport will be developed on around 1,800 hectares of Commonwealth-owned land at Badgerys Creek in Western Sydney (Airport Site). The Airport Site is approximately 50 kilometres from Sydney's central business district.

The Airport Site is bounded by Elizabeth Drive to the north, Willowdene Avenue to the south, Luddenham and Adams Road to the west and Badgerys Creek to the east. The existing terrain is made up of undulating topography, and substantial earthworks are required to create a level surface to allow construction of the runway, taxiways and support services. The Airport Site location is provided in Figure 2 and the construction impact zone is provided in Figure 3

An Environmental Conservation Zone (ECZ), referred to as EC1 in Figure 3 is located within the Airport Site, mostly to the south and south east along with a smaller portion to the west. This is a protected land use due to the occurrence of natural habitats and water flows, including Badgerys Creek. The EC1 also provides for an environmental preservation corridor which has a number of specific objectives and permissible uses in this land use zone as identified in the Airport Plan. Any construction work within the EC1 must be managed appropriately and is to be carried out only with prior approval from the WSA Co Environmental Manager.

Figure 2 Western Sydney Airport site location

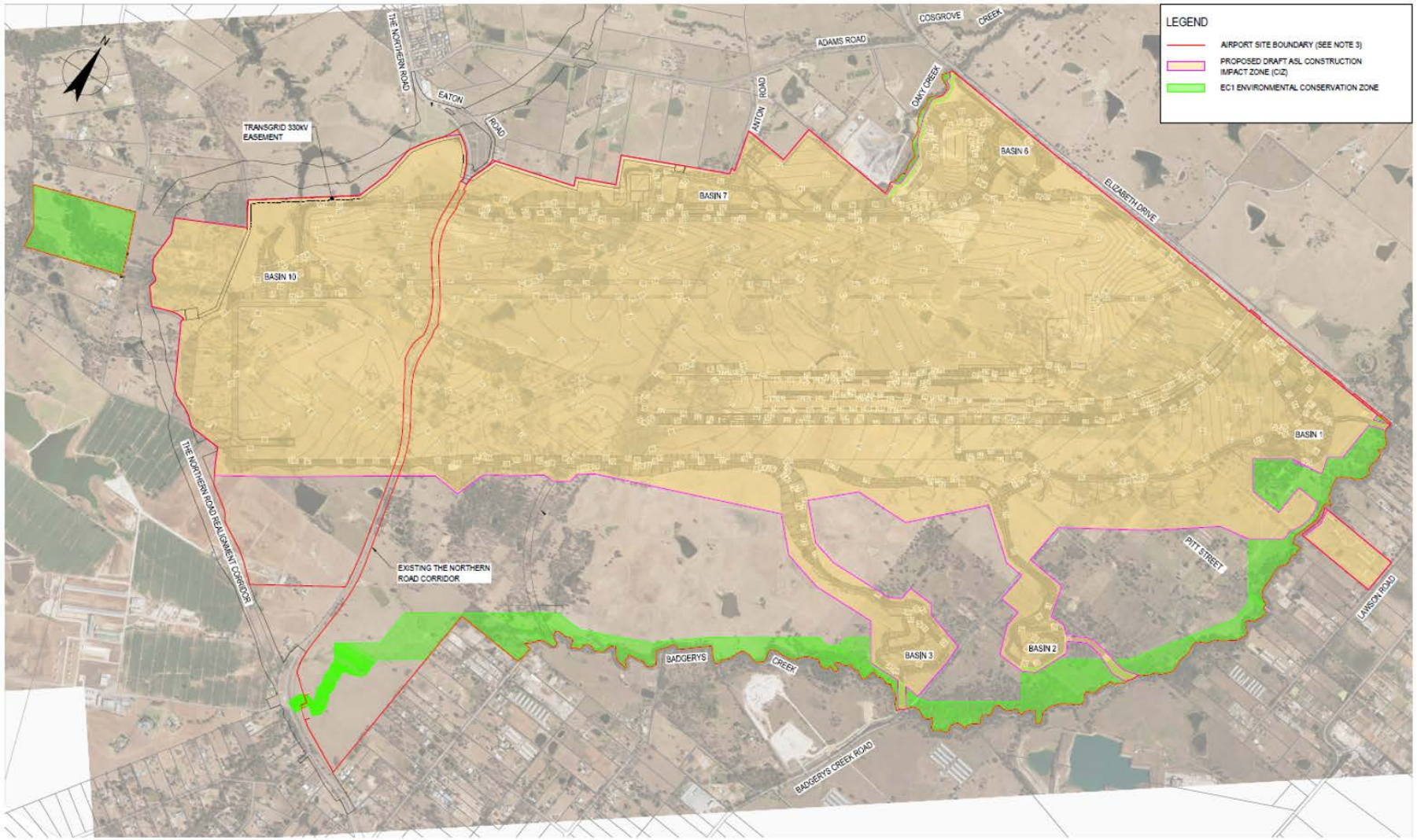


Figure 3 Stage 1 Development Construction Impact Zone

2.3 Project staging and environmental management approach

Section 2 of the Construction Plan provides an overview of the total Project activities to be undertaken. As permitted by Condition 1(5), the Construction Plan identifies that the Stage 1 Development will be undertaken in the following phases:

- Preparatory Activities
- Early Earthworks (EEW)
- Visitor Centre and Site Accommodation
- Material Importation
- Bulk Earthworks and Drainage (P1-A)
- Bulk Earthworks and Drainage (P1-B)
- Runway Pavement / Airside Civil (P1-C)
- Passenger Terminal Complex (P2)
- Landside Civil and Buildings (P3)

At the time of preparing this Air Quality CEMP, the current work phases, and therefore the phases covered by this Air Quality CEMP are included below in Table 3.

A variation to this CEMP will be submitted before work other than Preparatory Activities is undertaken on any other phases of the Project.

Table 3 Works covered by this Air Quality CEMP

Works covered	Reference
Preparatory activities	Refer to section 2.4.1
Early Earthworks	Refer to section 2.4.2
Visitor Centre and Site Accommodation	Refer to Section 2.4.3
Material importation	Refer to Section 2.4.4

As the Project develops, this table will be updated accordingly with further detail to be provided as required in the subsequent sections. Any preparatory activities will not be undertaken inconsistently with this CEMP. Section 2 of the SEMF provides a general overview of the total Project activities to be undertaken, with further specific detail targeting the current works (as indicated in Table 5) provided below in Section 2.4.

2.4 Scope of works

2.4.1 Preparatory activities (General)

Preparatory activities will be ongoing across the Airport Site throughout the Stage 1 Development. The works will be managed in accordance with the Overarching Preparatory Activities Plan which is prepared by the relevant Contractor and approved by WSA Co Environment Manager. The activities must be consistent with the Airport Plan definition for Preparatory Activities, refer to SEMF Section 3.9. Refer to Table 4 for details of proposed activities and indicative timing.

If an Approver determines an activity is a Preparatory Activity for paragraph (e) of the definition of 'Preparatory Activities' as per the Airport Plan and requires that a plan be prepared and submitted, WSA Co will prepare the necessary plan for consideration and approval in accordance with Condition 5 (2) of the Airport Plan. Any Preparatory Activities must not be carried out inconsistently with the approved CEMPs.

A summary of the construction staging for the Preparatory Activities is provided below in Table 4.

Table 4 Construction staging – Preparatory activities

Construction staging	Indicative Timing
Preparatory Works	
• Spatial Survey • Service Investigations • Pre-condition Surveys • Traffic Counting • Biological Pre-Clearance Surveys • Contamination Pre-Clearance Surveys • Aboriginal and European Cultural Heritage Survey and Salvage Works including Topsoil Protocol implementation • Site Security including fencing • Removal of redundant infrastructure including farm fences, power poles, footings/slabs and rubbish • Site compound establishment and roundabout construction • Remediation works including establishment of stockpiles • Construction of temporary sediment basins and installation of erosion and sediment controls • Other activities which an Approver determines are Preparatory Activities.	Aug 2018 – 2026

2.4.2 Early Earthworks package

A breakdown of EEW construction activities are outlined below and are consistent with the activities described in the Airport Plan. The WSA EEW site comprises of 120 ha of the overall site and is bounded by Elizabeth Drive to the north and Badgerys Creek to the east.

The EEW will involve:

- Topsoil Protocol implementation
- Management of contamination in the Early Earthworks area;
- Bulk earthworks in Early Earthworks area;
- Construction of a section of the new realigned Badgerys Creek Road within the Site;
- Construction of a new intersection at Elizabeth Drive; and

- Utility relocations.

In accordance with the Construction Plan Section 6, the early earthworks construction activities will be delivered in several stages. Table 5 outlines each stage and indicative timing for the proposed works and illustrated in Figure 4. This CEMP identifies the aspects and impacts for each key activity and required appropriate mitigation measures based on a risk assessment.

Table 5 Construction staging – Early Earthworks

Construction staging	Indicative Timing
Stage 1	
Involves construction of permanent open drainage, swales and diversions into existing creeks and tributaries. This prevents clean water from outside the site, entering the construction site. Activities include: • Excavate northern end of the bypass channel from the existing Badgerys Creek Road culvert to the existing creek outfall on the north east of the Bio Retention Pond 1; • Construct a temporary channel crossing/culvert to suit the temporary side-track; • Divert overland flows to the partially constructed bypass channel; • Undertake cut to fill operation to develop import stockpile area west of Badgerys Creek road in parallel with stages 1-6; • Demolition of existing house; and • Implementation of the RAP.	Sept 2018 – Jan 2019
Stage 2	
• Excavate Bio Retention Pond 1 for use as temporary erosion and sediment control.	Jan 2019
Stage 3	
Commencement of the cut to fill operation with a focus on getting the earthworks underlying Badgerys Creek Road completed. This enables the construction of new utilities routes, bridge construction and storm water drainage underneath Badgerys Creek road. Activities include: • Earthworks cut and fill to construct Badgerys Creek Road from the south tie-in to the new bridge location as well as fill required for the temporary side-track; • Construct a culvert beneath the temporary side-track to manage runoff from the main fill area; • Earthworks will include the water bypass channel between Badgerys Creek Road and the new bridge; • Drainage and roadworks to permanent and temporary alignments; • Construct bridge over stormwater channel; and • Endeavour Energy utility removal.	Oct 2018 – April 2019
Stage 4	
Completion of drainage diversions and connections to the existing creek network will be undertaken after stabilisation of the new water channels and surrounding surface area to maintain water quality standards.	Nov 2018 - Dec 2018
Stage 5	
Completing the final portion of earthworks on the western side of Badgerys Creek Road and taking it across the road into the main fill. It is expected that Badgerys Creek Road re-alignment has reached the finishing works at this stage. Activities include: • Complete Main earthworks; • Complete south west leg of the bypass channel; • Complete Badgerys Creek Road north of the bridge;	Nov 2018 – Sept 2019

Construction staging	Indicative Timing
• Sydney water utility relocation and removal; and • Telstra relocation and removal.	
Stage 6	
Following RMS approval of the Works Authorisation Deed (WAD), works inside the Elizabeth Drive road corridor can commence to construct the new intersection of Elizabeth Drive and Badgerys Creek Road. Activities include: • Undertake Elizabeth Drive intersection works. • Divert traffic onto the full Badgerys Creek Road alignment; • Endeavour Energy Elizabeth drive works; and • Elizabeth Drive Upgrade works	April 2019 – Dec 2019

2.4.3 Visitor Centre and Site Accommodation

WSA Co will engage a Contractor to complete the enabling works prior to the construction of the visitor centre and office accommodation (refer to Table 6). The site for the visitor centre is located in the north west section of the site at the intersection of The Northern Road and Eaton Road Luddenham. Refer to Figure 4.

The scope of the activities proposed to be undertaken in accordance with this CEMP are outlined in Table 6 and are consistent with the activities described in the Airport Plan.

Table 6 Construction staging – Visitor Centre and Site Accommodation

Construction staging	Indicative Timing
Stage 1	
Site access and preparation works • Removal of redundant infrastructure including farm fences, power poles, footings/slabs and rubbish; • Site compound establishment; • Site Security; • Construction of temporary sediment basins and installation of erosion and sediment controls; and • Implementation of the RAP.	Nov 2018 – Dec 2018
Earthworks to level the site • Earthworks – Cut and Fill (carting and disposal off-site); and • Site Grading and Benching.	Dec 2018 – Jan 2019
External roadworks* (Eaton Road – North and South from VC Entrance) • Earthworks – Cut and Fill (carting and disposal off-site); • Road pavement installation; • Permanent open drainage (swales formed as part of cut); • Line marking; • Utilities Diversion – relocation of existing light poles (4 each); and Signage – “No Right Turn” signs (2 each).	Dec 2018 – May 2019
Utilities* (Power, Water and Telecommunications) • Substation and connection to HV along The Northern Road; • Connection of water to Sydney Water Main; and • Conduit and pits for telecommunications lead-in cable.	Dec 2018 – May 2019
Stage 2	
Foundation Works and In-Ground Services • Slab on ground for the Visitor Centre; and • Screw Piles for the Site Accommodation.	Jan 2019 – Feb2019
Structure	Feb 2019 – Mar 2019

Construction staging	Indicative Timing
• VC structure shall be a combination of Laminated Veneer Lumber (LVL) columns and roof beams and Cross-Laminated Timber (CLT) ceiling panels solution; and • SA - modular timber framed panels lined with plasterboard internally and cladding externally.	
Finished and Internal Services • Utilities – provision and coordination of connections to external utilities such as potable water, electrical and telecommunications; • Services: - Fire-water and wastewater treatment systems; and - Heating, Ventilation, and Air-Conditioning (HVAC) • ITS (Information Technology Services) • Technical exhibition display and exhibition content • Furniture, Fit-out and Equipment for both VC and SA buildings.	Feb 2019 – May 2019
Testing and Commissioning • Comprehensive and systematic testing and commissioning of all utilities (below and above ground), internal services and systems: - Dry / Dead Testing - Wet / Live Testing • Integrated Testing & Commissioning	Mar 2019 to May 2019
Internal road, car parks and Landscaping • Landscaping; • Security Swipes / Cameras • Fencing / Gates to perimeter boundary and site interior; • Roadworks and carparking, including line marking, road furniture, and site lighting;	Jan 2019 – Mar 2019

*Note: may require approval from NSW government agencies and utility providers.

2.4.4 Material importation

Material will be imported to the site from other Sydney infrastructure sites as contemplated by the EIS starting in April 2019, this will ensure that valuable Sydney sandstone will be re-used in pavement construction potentially saving millions of tonnes of quarry won materials while diverting material from landfill sites in the Sydney area. The approximate stockpile location is shown in Figure 2. Initially 1.0 Million tonnes of sandstone material will be imported with the bulk being imported from April 2019 through to December 2020. It is expected that the stockpiled material will be used during pavement construction starting in mid-2022 and completing by December 2023.

To make the most of opportunities to obtain suitable material generated from other major infrastructure projects in Sydney, import will need to occur both during standard hours and also outside standard construction hours. As such, the processes outlined in the Noise and Vibration CEMP and the Traffic and Access CEMP for the ongoing assessment and environmental management of these works will be applied prior to commencement.

Table 7 Construction staging – Material importation

Construction staging	Indicative Timing
Material importation	
• Haulage of sub-base and capping material to site	April 2019 – December 2020

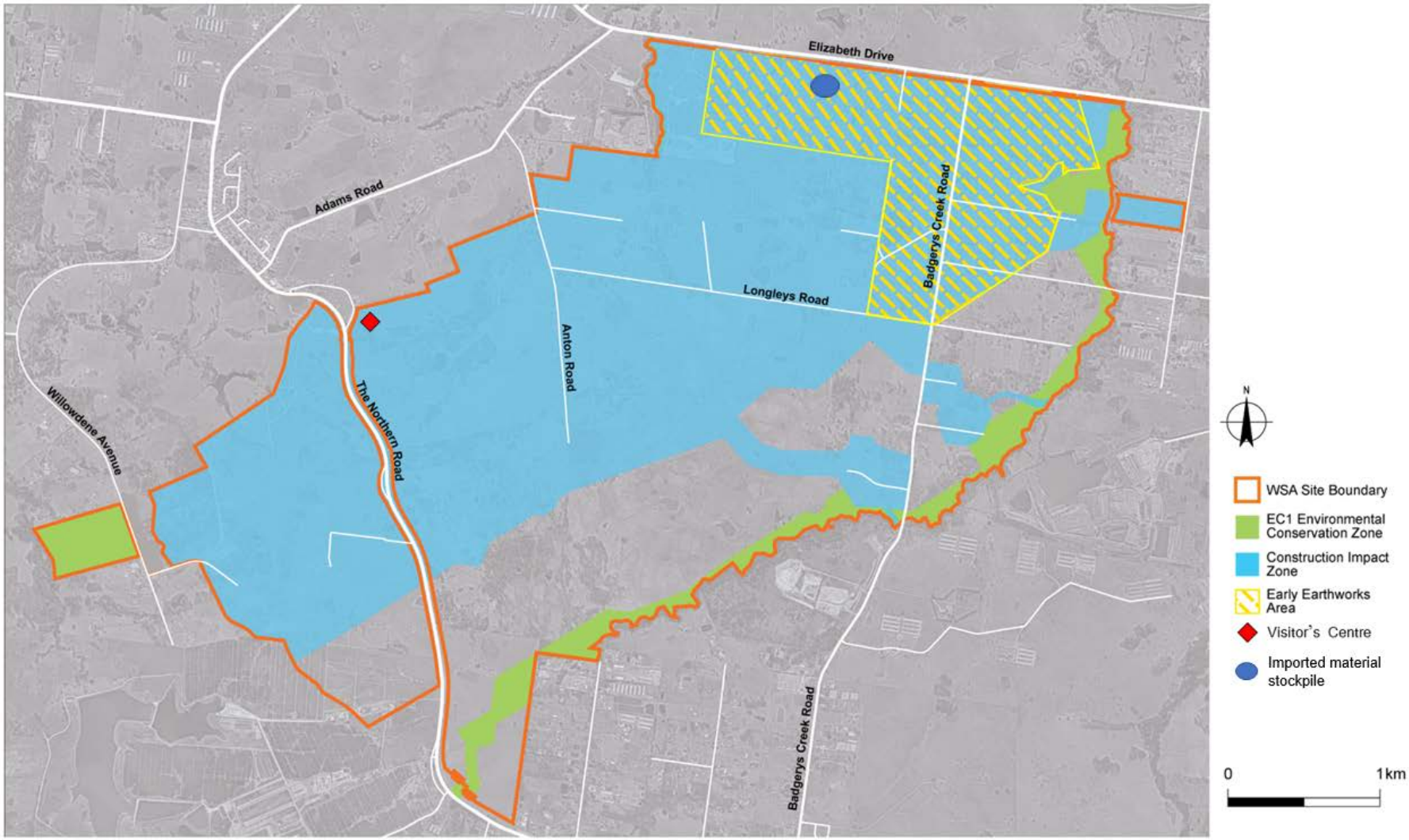


Figure 4 Stage 1 Development construction location plan

3 Objectives and targets

3.1 Objectives

The key objective of this Air Quality CEMP is to ensure that impacts associated with air quality are managed to within permitted air quality criteria as far as practicable, and best practice controls and procedures are implemented during construction activities to maintain ambient air quality at acceptable levels at sensitive receivers surrounding the Airport Site and minimise the risk of dust or odour nuisance impacts on neighbours.

To achieve this objective, the following will be undertaken:

- Ensure emissions are minimised from all plant, equipment and machinery;
- Ensure appropriate measures are implemented to address the management measures detailed in Table 28-10 and the mitigation measures Table 28-11 in Chapter 28 the EIS; and
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Section 3 of this Plan.

3.2 Targets and performance criteria

Air quality specific targets and performance criteria have been established for the management of air quality impacts during the Project which have been, in part, derived from the performance criteria identified in the EIS Table 28-10, as presented below in Table 8.

Table 8 Air quality targets

Objective	Target	Document Reference
Ensure ambient air quality is maintained at acceptable levels at sensitive receptor locations surrounding the airport site	Not exceeding the criteria outlined in Table 21. No dust or odour related complaints	Complaints database
Minimising the risk of dust or odour nuisance impacts on neighbours	No dust or odour related complaints Not exceeding the criteria outlined in Table 21.	Complaints database
Ensure emissions are minimised from all plant, equipment and machinery	All plant and equipment is maintained in accordance with manufacturers requirements Not exceeding the criteria outlined in Table 21.	Plant and equipment log books

The above targets in Table 6 have been set to provide a benchmark performance objective to which WSA Co will endeavour to achieve. Failure to achieve the targets will not be considered a non-conformance, however, will prompt internal review of environmental management (as detailed further in environmental control measures in Table 18) and assessment of potential improvement opportunities.

4 Legal and other requirements

Relevant environmental legislation and other requirements are identified below.

4.1 Relevant legislation and guidelines

As the Western Sydney Airport is to be developed under the Airport Plan determined under the Airports Act, some state laws will not be applicable to the Project (s112 of this Act). Where state law is applicable, this Plan will set out the relevant applicable state legislation and requirements and demonstrate how compliance with those laws including obtaining relevant permits will be achieved. Where state laws are not applicable, there may nonetheless be a requirement to have regard to those laws, for example, through mitigation measures to be incorporated in CEMPs to satisfy conditions under the Airport Plan.

4.1.1 Legislation

Legislation and regulations to this Plan are summarised in Table 9.

Table 9 Principal legislation and relevance

Legislation or regulation	Relevance	CEMP compliance provisions
Commonwealth		
Airports Act	The Airports Act and AEPRs set out the framework for the regulation and management of activities at airports that could have potential to cause environmental harm. This includes offences related to environmental harm, environmental management standards, and incident response requirements. The Airport Plan prepared under the Airports Act covers a number of environmental matters and, in particular, details specific measures to be carried out for the purposes of preventing, controlling or reducing the environmental impact associated with the airport. Criminal offences are applicable if these measures are not complied with.	This CEMP forms part of the overall WSA Co environmental management system which has as a target of full compliance with the Airport Plan. Relevant mechanisms within this CEMP that will contribute to this include but are not limited to: • Section 3.1 – Objectives • Section 4.3 – Airport Plan Conditions • Section 4.4 – EIS Requirements • Section 6.2 – Risk Assessment • Section 7 – Environmental Control Measures • Section 9 – Roles and Responsibilities • Section 10 – Environmental Inspection, Monitoring and Auditing • Section 13 – Environmental Non-conformance and improvement opportunities • Section 14 – Review and improvement
Airports (Environment Protection) Regulations 1997 (AEPR)	Imposes a general duty to prevent or minimise environmental pollution once an airport lease is granted. Promotes improved environmental management practices at airports. Includes provisions setting out definitions, acceptable limits and objectives for air quality, as well as monitoring and reporting requirements.	Refer to commentary on Airport Plan above.

Legislation or regulation	Relevance	CEMP compliance provisions
National Environment Protection (Ambient Air Quality) Measure (NEPM-AAQ)	Sets the national health-based air quality standards for six air pollutants (carbon monoxide, nitrogen dioxide, sulphur dioxide, lead, ozone and PM_{10}) and includes advisory reporting standards for PM2.5.	Section 7 – Environmental Control Measures Section 8 – Air Quality Criteria Section 10 – Environmental Inspection, Monitoring and Auditing
National Environment Protection (Air Toxics) Measure	Sets a nationally consistent approach to monitoring (by reference to 'investigation levels') for five air toxics: benzene, formaldehyde, toluene, xylenes and benzo (a) pyrene (as a marker for polycyclic aromatic hydrocarbons). These are not compliance standards but are for use in assessing the significance of the monitored levels of air toxics with respect to the protection of human health.	Section 8 – Air Quality Criteria Section 10 – Environmental Inspection, Monitoring and Auditing Note: Monitoring of these five air toxics may not be relevant, however, this summary is provided as a trigger for continued consideration of this requirement as delivery of the Airport progresses.
National Environment Protection (National Pollutant Inventory) Measure	The primary goals are to: (a) collect a broad base of information on emissions and transfers of substances and (b) disseminate information to all sectors of the community. This NEPM covers a variety of air pollutants.	Refer to Sustainability Plan
National Greenhouse and Energy Reporting Act 2007	An airport lessee company (ALC) is required to register and report its operational greenhouse gas emissions attributable to the activities over which it has operational control. This is because it is expected that its emissions will exceed relevant thresholds. This may also apply to the construction contractor and other contractors or users of the airport (e.g. airlines).	Section 7 – Environmental Control Measures
Ozone Protection and Synthetic Greenhouse Gas Management Act 1989 and the Ozone Protection and Synthetic Greenhouse Gas Management Regulations 1995	This Act and these Regulations impose controls on the manufacture, import, export and management of substances that deplete ozone in the atmosphere including CFCs 11, 12, 113, 114 and halons 1211, 1301 and 2402.	Section 7 – Environmental Control Measures
NSW		
As the Airport is to be developed under the Airport Plan determined under the Airports Act, 1996 (Cth), some state laws will not be applicable to the project (see for example S 112 of that Act). Where state laws are not applicable, it is still intended to have regards to relevant laws for example through inclusion of mitigations measures incorporated into this CEMP. These laws are identified below.		
Protection of the Environment Operations Act 1997 (POEO Act), and the Protection of the Environment	The POEO Act provides a range of controls with regard to air quality including requirements to maintain plant and equipment in proper and efficient condition and to operate plant and equipment in a proper and efficient manner. This includes the means of processing, handling, moving, storage and disposal of materials.	Section 7 – Environmental Control Measures

Legislation or regulation	Relevance	CEMP compliance provisions
Operations (General) Regulation 2009 (POEO (General) Regulations)		
POEO Act and Protection of the Environment Operations (Clean Air) Regulation 2010 (Clean Air Regulation)	The object of the POEO Act is to achieve the protection, restoration and enhancement of the quality of the NSW environment having regard to the need to maintain ecologically sustainable development. The Clean Air Regulation prescribe standards for certain groups of plant and premises to regulate industry's air emissions and impose requirements on the control, storage and transport of volatile organic liquids.	Section 7 – Environmental Control Measures
Ozone Protection Act 1989	This Act regulates or prohibits the manufacture, sale, distribution, conveyance, storage, possession and use of ozone-depleting substances in NSW.	Section 7 – Environmental Control Measures

4.1.2 Guidelines and standards

Guidelines and standards that are relevant to air quality management and this Plan are summarised in Table 10 below.

Table 10 Relevant guidelines and standards

Guidelines and standards
• AS 2922 Ambient Air Guide for Citing of Sampling Equipment
• AS 3580.1.1-2007 Methods for Sampling and Analysis of Ambient Air – Guide to Siting Air Quality Monitoring Equipment
• AS 3580.10.1-2003 Methods of Sampling Analysis of Ambient Air
• Air Quality Monitoring Criteria for Deposited Dust (DEC Guideline)
• Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (DEC, 2005)
• Clean Air for NSW Consultation Paper (OEH 2016)
• Green Star Rating System (Green Building Council of Australia)
• ISO 14001 – Environmental Management Systems
• Liverpool Local Environmental Plan 2008 (NSW)
• Managing particles and improving air quality in NSW (EPA 2013)

4.2 Approvals and other specifications

Approvals and other specifications relevant to this CEMP include:

- Functional Specifications;
- EPBC Act Part 13 Permit E2017-0138 (included as Attachment A of the Biodiversity CEMP);
- Western Sydney Airport Plan (2016);
- Western Sydney Airport Environmental Impact Statement;

- WSA Co Sustainability Plan;
- WSA Co Community and Stakeholder Engagement Plan; and
- WSA Co Construction Plan.

4.3 Airport Plan Conditions

Conditions relevant to air quality management during construction are provided in Table 11. Compliance with the Airport Plan conditions is a statutory requirement and as such, failure to comply may constitute a criminal offence liable to criminal prosecution under the Airports Act.

Table 11 Conditions relevant to air quality management

Condition No.	Condition	Timing	Responsibility
1.4	The Site Occupier must ensure that no CEMP is inconsistent with the approved Construction Plan	Ongoing	WSA Co
1.5	The approved Construction Plan may provide for Main Construction Works to be carried out in phases that commence at different times for different parts of the Airport Site or an Associated Site. If it does, the Site Occupier may prepare a CEMP in relation to one or more phases, and the criteria for approval of such a CEMP are taken to exclude any matter irrelevant to the phases for which approval is sought. A variation of the CEMP must be submitted for approval in accordance with condition 41 (Variation of Approved Plans) prior to commencement of any new phase.	Ongoing	WSA Co
5.3	In carrying out a Preparatory Activity, the Site Occupier must:	Prior to Main Construction Works	WSA Co
	implement any plan approved in accordance with sub condition (1) or (2), except to the extent that the plan is inconsistent with any subsequently approved CEMP or the approved Construction Plan; and		
	not act inconsistently with any approved CEMP or the approved Construction Plan.		
10.1	The Site Occupier must not:	Prior to Main Construction Works	WSA Co
	Commence Main Construction Works until an Air Quality CEMP has been prepared and approved in accordance with this condition; or		
	Carry out any development described in Part 3 of the Airport Plan inconsistently with the approved Air Quality CEMP		
10.2	The Site Occupier must: Prepare, and Submit to an Approver for approval; an Air Quality CEMP in relation to the carrying out of the developments described in Part 3 of the Airport Plan.	Prior to Main Construction Works	WSA Co
10.3	The criteria for approval of the Air Quality CEMP are that an Approver is satisfied that:	Prior to Main Construction Works	Approver

Condition No.	Condition	Timing	Responsibility
	• in preparing the Air Quality CEMP, the Site Occupier has taken into account Table 28-10 in Chapter 28 of the EIS; and • the Air Quality CEMP complies with Table 28-11 in Chapter 28 of the EIS and is otherwise appropriate.		
35	An Approver must not approve a plan referred to in Chapter 28 of the EIS unless he or she is satisfied that the Plan Owner: in preparing the plan, has: consulted with any NSW Government agencies specified by the NSW Department of Premier and Cabinet; and in the case of the Biodiversity CEMP, Biodiversity, Land and Safety OEMP, Soil and Water CEMP and Soil and Water OEMP, also consulted the Environment Department and OEH; and has provided: the Approver; and each consulted agency, with an explanation of how any responses have been addressed.	Prior to Main Construction Works	Approver
37 to 42	Set out requirements in relation to informing other parties of conditions, keeping records, publishing reports, independent audits, variation to approved plans and publication of approved plans	Ongoing	WSA Co and Approver

4.4 Environmental Impact Statement requirements

The requirements of air quality management to be considered and addressed during the construction phase of the Stage 1 development are included in the EIS, specifically Table 28-10. A summary of these requirements and how they have been addressed in this Air Quality CEMP is presented in Table 12.

Table 12 Summary of air quality management requirements

EIS Reference	Topic	Summary	Air Quality CEMP Reference
Table 28-10	Performance Criteria	Compliance with the approved Air Quality CEMP; and	Section 3 – Objectives and targets
		Ensuring that air pollution remains within the accepted limits set out in the AEPR.	Section 3 – Objectives and targets
Table 28-10	Implementation framework	An Air Quality CEMP will be approved prior to commencement of Main Construction Works for the proposed airport. The CEMP will collate measures to mitigate and manage potential impacts on air quality and include cross-references to other environmental management plans where relevant. The Air Quality CEMP will as a minimum:	This Air Quality CEMP
		Detail the management and mitigation measures to be implemented, including those outlined in this Section	Section 6 – Air quality management environmental control measures
		Describe the process for managing complaints, stakeholder engagement, and emerging environmental management issues as they arise	Section 12 – Communications and complaints management
		Specify the process for monitoring implementation, reporting, and auditing	Section 8 – Environmental inspection, monitoring and auditing
		Identify the party responsible for implementing of the Air Quality CEMP	Section 7 – Environmental roles and responsibilities
Table 28-10	Monitoring	General monitoring requirements are set out in the AEPR. These include that:	Note
		Monitoring must take place under direction of an appropriately qualified person;	Section 8 – Environmental inspection, monitoring and auditing
		The results for the monitoring must be kept in a written record	Section 8 – Environmental inspection, monitoring and auditing
		Additional monitoring requirements include that:	Note
		Suitable locations for dust deposition, dust flux, or real-time PM_{10} continuous monitoring have been determined in consultation with the NSW Environment Protection Authority	Section 6 – Air quality management environmental control measures
		Baseline monitoring will commence at least three months before Main Construction Works commence	Section 6 – Air quality management environmental control measures

EIS Reference	Topic	Summary	Air Quality CEMP Reference
		Regular site inspections will be undertaken to monitor compliance with the dust management plan. Inspection results will be recorded and the inspection log made available to the Department of Infrastructure and Regional Development upon request	Section 8 – Environmental inspection, monitoring and auditing
		More frequent site inspections by the person accountable for air quality and dust issues will be conducted onsite when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions	Section 8 – Environmental inspection, monitoring and auditing
Table 28-10	Auditing and reporting	General reporting requirements are set out under AEPR	Note
		In addition, an annual report will be prepared and submitted to the Infrastructure Department in relation to compliance with the Air Quality CEMP for the period until the airport commences operations	Section 8.4 – Environmental reporting
		The community and stakeholder engagement plan provides for the development of a complaints log and includes specific measures for how complaints will be managed	Section 12 – Communications and complaints management
Table 28-10	Responsibility	Responsibilities include:	Note
		The Air Quality CEMP will be prepared in consultation with the NSW Environment Protection Authority and NSW Health	Section 1.4 – Consultation requirements this Plan
		The Air Quality CEMP will be submitted for approval to the Infrastructure Minister or an SES Officer in the Department of Infrastructure and Regional Development	Section 1.5 – Certification and approval
		The design and construct (D&C) contractor will be responsible for implementing site specific environmental procedures and work method statements applicable to the proposed woks in accordance with the requirements of this Air Quality CEMP	Section 2.1 – Purpose Section 7.1.5 – WSA Co contractor roles and responsibilities
		The airport environment officer will be responsible for day to day regulatory oversight of the AEPR compliance at the airport after an airport lease is granted.	Section 7 – Environmental roles and responsibilities

5 Existing environment

The following information is summarised from the EIS and refers to the Airport Site and surrounding environment. Refer to the EIS for more details.

For the purpose of the phase of Main Construction Works covered by this CEMP, the existing environment described herein is considered consistent and acceptable for consideration in the risk assessment process and the identification of suitable environmental mitigation measures and controls - for details with regards to environmental mitigation measures and controls for the management of air quality impacts refer to Section 7.

5.1 Sensitive receptors

Sensitive receptors were identified within about five kilometres of the Airport Site for the purpose of assessing the potential impacts of air emissions at these locations. Due to the density of sensitive receptors in the vicinity of the Airport Site, a representative selection comprising 152 of these sensitive receptors was made, locations for which have been provided in Appendix B. These sensitive receptor types include residences, schools, churches and other community infrastructure. Sensitive receptors from suburbs surrounding the Airport Site at varying distances were also included.

The location of the sensitive receivers in relation to the Airport Site in general, and also specifically to the phase of Main Construction Works covered by this CEMP is included in Figure 4. There have been no additional sensitive receivers identified since the undertaking of the EIS and as such, the existing environment described in the EIS is still considered accurate for the works to be undertaken.

5.2 Air quality records

Existing air quality has been characterised from air quality monitoring data collected over ten years (2005–2014) at monitoring stations operated by the NSW Office of Environmental and Heritage. These monitoring stations included Bringelly, Macarthur/Campbelltown West, Liverpool and Richmond, and recorded parameters such as nitrogen dioxide, particular matter, sulphur dioxide and ozone.

Generally, air quality for the local area is good, with the exception of isolated high pollution days or extreme events such as dust storms and bushfires. Uncontrolled combustion events such as bushfires will influence regional observations of PM_{10} and $PM_{2.5}$, and to a lesser extent, nitrogen oxides.

A summary of monitoring data considered applicable to the work activities covered by this CEMP collated over the period of 2005 to 2014 for the area Sydney West and Southwest is presented below in Table 13.

Table 13 Air quality monitoring results - Bringelly, Macarthur/Campbelltown West, Liverpool and Richmond

Pollutant	Averaging Period	NEPM Goals	Monitoring Results
		Maximum Concentration	Average Recorded Concentration (2005 – 2014)
National standards and goals for ambient air quality			
PM_{10}	1 day	50 µg/m^3	40 - 97 µg/m^3
	Annual	25 µg/m^3	15 - 25 µg/m^3
$PM_{2.5}$	1 day	25 µg/m^3	Liverpool: 22 - 268 µg/m^3 Richmond: 18 - 149 µg/m^3
	Annual	8 µg/m^3	Liverpool: 6 - 9 µg/m^3 Richmond: 4 - 8 µg/m^3
	1 day	228 µg/m^3	Bringelly: 5.1 – 9.2 µg/m^3 C' West: 5.7 – 9.9 µg/m^3
	Annual	60 µg/m^3	Bringelly: 0.3 – 1.2 µg/m^3 C' West: 1.2 – 1.4 µg/m^3

Since the completion of the EIS in 2015, ongoing monitoring has been undertaken. These monitoring stations will continue to be used throughout the construction phase with further details provided in Section 10. A summary of the data collected post-EIS is included in Table 14 below.

Table 14 Comparison on Measured Air Quality Data versus NEPM Goals and Historical Data

Pollutant	Averaging Period	NEPM Goals	Monitoring Results	Recorded Average Daily (µg/m3)			
		Maximum Concentration	Average Recorded Concentration (2005 – 2014)	North	South	East	West
National standards and goals for ambient air quality							
PM_{10}	1 day	50 µg/m3	40 - 97 µg/m3	314.1	80.2	29.4	92.5
	Annual	25 µg/m3	15 - 25 µg/m3	-	-	-	-
$PM_{2.5}$	1 day	25 µg/m3	Liverpool: 22 - 268 µg/m3	22.4	61.3	7	67.6
			Richmond: 18 - 149 µg/m3	-	-	-	-

*Values indicated in red exceed National Environmental Protection Measures (NEPM) air quality standards.

5.3 Wind speed and direction

The average wind speed across the five-year review period (2010-14) was 2.6 metres per second. The percentage of calm period with winds less than 0.5 metres per second during this period was nine per cent.

An analysis of the climatic data suggests that there is no strong relationship between the time of year and the monthly wind speed, although the monthly average wind speeds are generally less during autumn.

On an annual basis, the predominant winds at Badgerys Creek originate from the south-west, followed by the south-south-west and north. Very few winds originate from the north-west. Winds vary across seasons; during winter the majority of winds originate from the south-west while in summer they are more frequently

from the north-east. A copy of the annual and seasonal wind rose for Badgerys Creek for the year 2014 is provided in Figure 5.

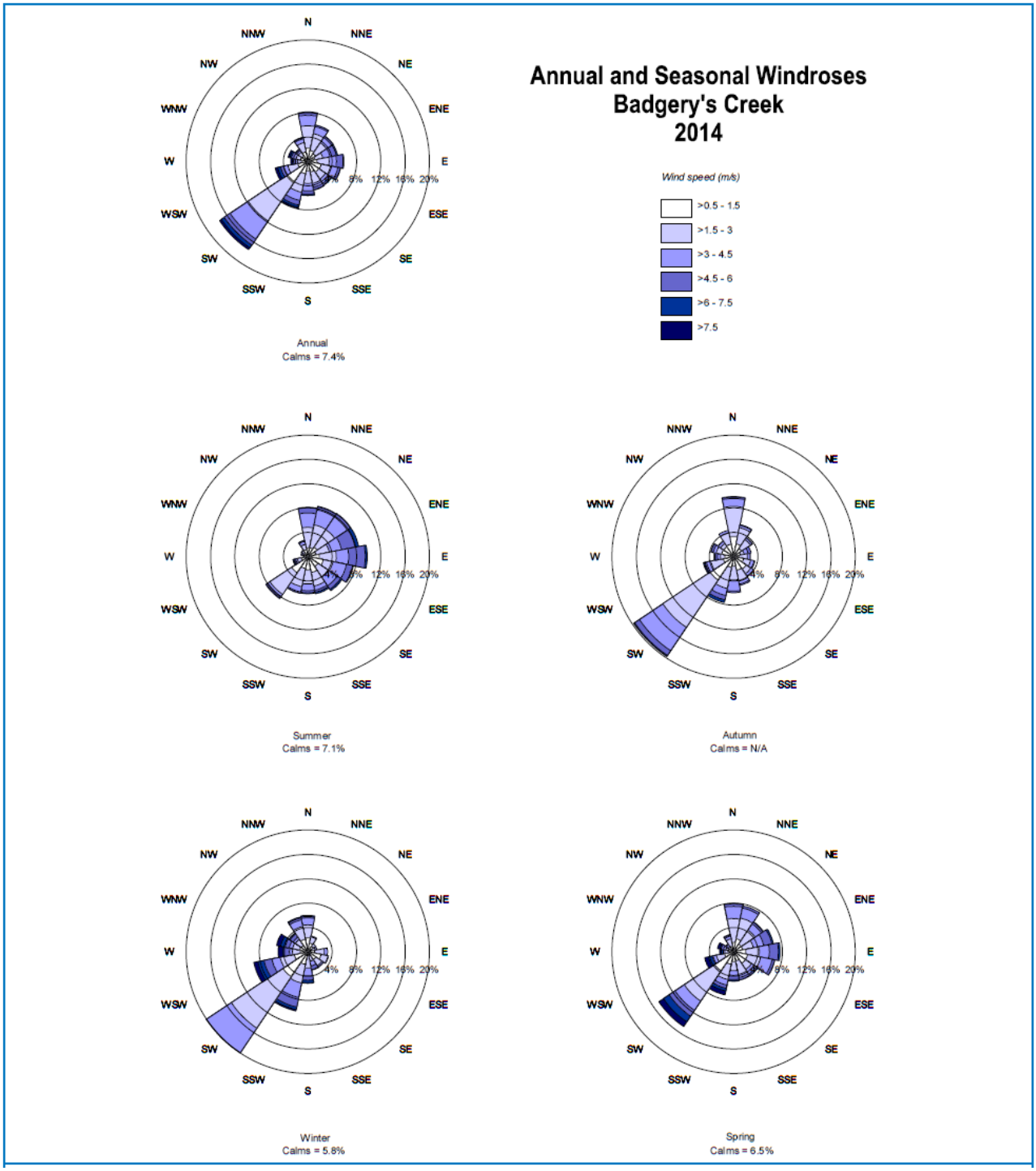


Figure 5 Annual and seasonal wind rose, Badgerys Creek 2014

5.4 Temperature, rainfall and humidity

There is a strong seasonal variation in temperature at Badgerys Creek. During the data collection and review period, January was the hottest month while June and July were the coldest months as presented below in Table 15.

The rainfall data collected indicate that February is the wettest month, with an average rainfall of 114 millimetres while July is the driest month, with an average rainfall of 30 millimetres.

The annual average relative humidity reading at Badgerys Creek was 73 per cent. The month with the highest relative humidity on average was June, at 79 per cent. September and October had the lowest relative humidity.

Table 15 Temperature, rainfall and humidity statistics at Badgerys Creek (source: EIS)

Parameter	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mean temp (deg C)	23	22	20	17	13	11	10	12	15	17	20	21	17
Minimum temp (deg C)	10	11	9	5	1	-2	-1	0	1	5	7	8	-2
Maximum temp (deg C)	45	41	35	30	27	21	24	28	33	36	41	40	45
Mean rainfall (mm)	76	114	106	62	37	80	30	42	35	47	101	85	68
Mean relative humidity (%)	71	76	76	77	76	79	76	69	67	67	73	71	73

5.5 Odour

The Airport Site is mostly isolated from other industry activities that have the potential to be odorous. The exception is the poultry industry with a number of broiler and egg-laying farms in the vicinity, particularly to the east of the Airport Site. Background odour was not included as part of the air quality assessment for the Project.

6 Air quality aspects and impacts

6.1 Construction activities

As discussed in Section 2.4 construction of the Stage 1 development will result in dust emissions generated during both the earthworks and the construction of aviation infrastructure. Specific to the works covered by this CEMP (refer to Table 3), the likely activities that have the potential to impact on air quality include the following:

- Operation of heavy machinery including dozers, scrapers and graders;
- The loading and unloading of materials;
- Hauling on paved and unpaved roads; and
- Exposure of ground surfaces resulting in wind erosion.

In addition to the above, there will also be diesel particulate matter emissions (comprising $PM_{2.5}$ only) from the onsite equipment. Additionally, construction of the Stage 1 development will result in greenhouse gas emissions from the operation of construction equipment and vegetation clearing.

6.2 Risk assessment

A Preliminary Risk Assessment has been undertaken as part of the CEMP. The parts of the overall risk assessment relevant to air quality have been extracted and summarised in Table 18.

The identification of construction activities and associated impacts that could eventuate during construction of the Project is central to the selection of appropriate environmental safeguards.

The risk management process involved an assessment of all specific Project activities/aspects in or near environmentally sensitive areas and resulted in the development of a list of environmental risks (effects and impacts) and a corresponding risk mitigation strategy and risk ranking. Each environmental risk was categorised, based on the following:

- The environmental aspect;
- Relative scale of the potential impact;
- Type of potential impact; and
- Likelihood of occurrence.

The identification of risks included a review of the works, and review of the environmental risks identified by the EIS. The mitigations in the risk assessment are in line with the EIS mitigation measures in chapter 7, Table 14.

The following risk assessment process has been implemented, together with a review of proposed activities and known risks based on past project experience.

6.2.1 Risk Assessment Process

The following tables outline the risk assessment process using three steps to identify the appropriate management measures required.

Table 16 is used to determine the likelihood that the aspect will have an impact on the environment.

Table 17 is used to determine the potential consequence rating of the risk identified.

From these two tables, a risk rating can then be assigned using Figure 6 to determine the potential severity of the risk and the appropriate management response as per Table 18.

Table 16 Likelihood descriptor

	Likelihood	Description
A	Rare / improbable	The event may only occur in exceptional circumstances.
B	Unlikely / remote	The event may occur at some time (about once every five years).
C	Possible	The event is likely to occur at some time (about once every year).
D	Likely	The event will probably occur in most circumstances (at least once every six months).
E	Almost certain	The event is expected to occur in most circumstances (at least once every month).

Table 17 Consequence descriptor

	Consequence (impact)	Description
1	Insignificant/negligible	• Short-term disturbance with minor environmental release or damage that is non-reportable. • No impact outside site boundary. • No community complaints or media reports.
2	Minor/low	• Minor violation of regulation or guideline with minimal damage to the environment and small clean-up. • Immediately contained on site. • Local government action, minor community complaints. • Potential or actual breach of legislation.
3	Moderate	• Violation of regulation or guideline with moderate temporary damage to the environment and significant clean-up costs. • Release of pollution off site. • Detrimental media reports, community concerns and complaints.
4	Major	• Major environmental damage with potentially permanent. • Release of pollution off site. Significant loss of environmental resources. • Detrimental media reports in the national or state media, organised community concern. • High likelihood of fine or court action.
5	Catastrophic	• Long-term environmental harm. • Permanent irreparable damage to the environment. • Sustained detrimental state and national media reports. Sustained community outrage. • Penalty Infringement Notice/court action.

Figure 6 Likelihood criteria

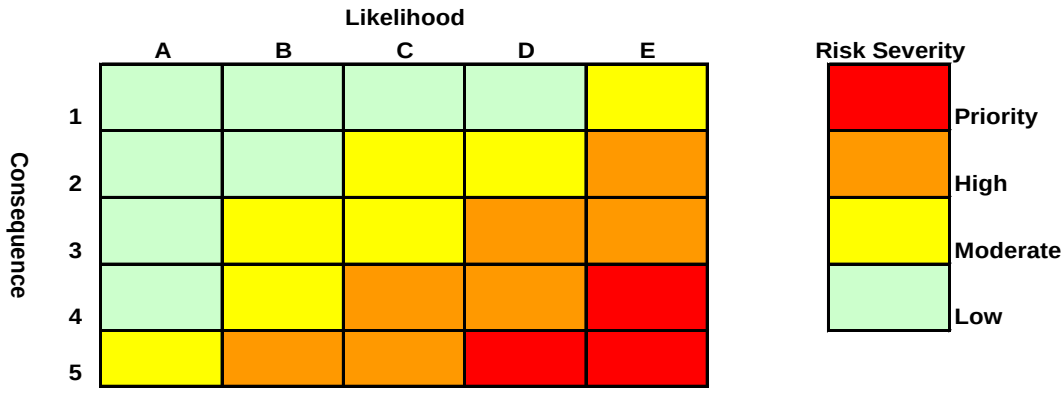


Table 18 Risk severity and management response

Risk severity	Management response
Priority	Immediate and detailed management action required. (e.g. stop or change activity)
High	Priority management action warranted
Moderate	Management action warranted
Low	Management action should be considered, particularly for low-level impacts that nevertheless occur on a continual basis

Table 19 Air quality risk assessment

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
1	Site establishment	Site and delivery vehicles travelling on unsealed roads	Dust generation	Stakeholder complaints and dust on public roads	C2 (Mod)	AQ_01 AQ_05 AQ_07 AQ_18	B2 (Low)	• Waste and Resources CEMP • Air Quality CEMP • EWMS • Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area Erosion and Sedimentation Control Plans (ESCPs) • Environmental Control Map (ECM)
2		Topsoil stripping for compound footprint	Dust generation	Dust leaving site boundary into nearby environmental conservation zone	C2 (Mod))	AQ_01 AQ_05 AQ_07 AQ_09 AQ_11 AQ_12 AQ_17 AQ_20	B2 (Low)	• Air Quality CEMP • Aboriginal Cultural Heritage CEMP (Top Soil Management Protocol) • Biodiversity CEMP • EWMS • Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area ESCPs • ECM
3		Construction and operation of compound	Dust and waste generation	Stakeholder complaints and dust leaving site boundary into	C2 (Mod)	AQ_01 AQ_05 AQ_07	B2 (Low)	• Air Quality CEMP • Biodiversity CEMP • EWMS

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
		buildings and amenities		nearby environmental conservation zone		AQ_18 AQ_22 AQ_24 AQ_25 AQ_26 AQ_27 AQ_32 AQ_33		• Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area ESCPs • ECM
4	Site establishment (continued)	Delivery of heavy plant	Dust generation and sediment tracking	Dust on public roads	D2 (Mod)	AQ_01 AQ_18	B2 (Low)	• Waste and Resources CEMP • Air Quality CEMP • EWMS • Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area ESCPs • ECM
5		Spraying weeds	Chemical drift	Damage to nearby vegetation	C4 (High)	AQ_01 AQ_02 AQ_17	B4 (Mod)	• Air Quality CEMP • Biodiversity CEMP • EWMS • Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area ESCPs

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
								• ECM
6	Site establishment (continued)	General waste handling	Dust and waste materials blowing through site	Stakeholder complaints and dust leaving site boundary into nearby environmental conservation zone	C2 (Mod)	AQ_01 AQ_08 AQ_16	B2 (Low)	• Air Quality CEMP • Biodiversity CEMP • EWMS • Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area ESCPs • ECM
7	Earthworks	Constructing and operating site access roads	Dust generation	Stakeholder complaints and dust leaving site boundary into nearby environmental conservation zone	D2 (Mod)	AQ_01 AQ_05 AQ_07 AQ_09 AQ_11 AQ_12 AQ_17 AQ_18 AQ_20 AQ_21 AQ_22 AQ_28 AQ_29	C2 (Low)	• Air Quality CEMP • Biodiversity CEMP • EWMS • Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area ESCPs • ECM

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
8	Earthworks (continued)	Use of heavy plant / multiple plant use	Emissions	Air pollution and stakeholder complaints	C2 (Mod)	AQ_01 AQ_05 AQ_07 AQ_09 AQ_17 AQ_30 AQ_31 AQ_34 AQ_35 AQ_36 AQ_40	B2 (Low)	• Air Quality CEMP • EWMS • Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area ESCPs • ECM • Dust Management and Vehicle and Equipment Emissions Plan
9		Bulk topsoil stripping	Dust generation	Dust leaving site boundary into nearby environmental conservation zone or local roads	D2 (Mod)	AQ_01 AQ_05 AQ_07 AQ_09 AQ_11 AQ_12 AQ_17	C2 (Mod)	• Air Quality CEMP • Aboriginal Cultural Heritage CEMP (Top Soil Management Protocol) • Biodiversity CEMP • EWMS • Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area ESCPs • ECM
10		Vegetation Clearing	Dust generation	Dust leaving site boundary into nearby environmental	C2 (Mod)	AQ_01 AQ_05 AQ_07	B2 (Low)	• Air Quality CEMP • Biodiversity CEMP • EWMS

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
				conservation zone or local roads		AQ_09 AQ_11 AQ_12 AQ_17		• Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area ESCPs • ECM
11	Earthworks (continued)	Stockpiling materials	Dust generation	Dust from stockpile leaving site boundary into nearby environmental conservation zone or local roads	D2 (Mod)	AQ_01 AQ_07 AQ_09 AQ_12 AQ_14 AQ_17	C2 (Mod)	• Air Quality CEMP • EWMS • Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area ESCPs • ECM
12		Slope or embankment creation / stabilisation processes	Dust generation	Dust leaving site boundary into nearby environmental conservation zone or local roads	C2 (Mod)	AQ_01 AQ_07 AQ_09 AQ_12 AQ_17	B2 (Low)	• Air Quality CEMP • EWMS • Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area ESCPs • ECM
13		Potholing	Dust generation	Dust on public roads	C1 (Low)	AQ_01 AQ_05	B1 (Low)	• Air Quality CEMP • EWMS

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
						AQ_07 AQ_17		• Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area ESCPs • ECM
14	Utility realignment works	Trenching	Dust generation	Dust leaving site boundary into nearby environmental conservation zone or local roads	C1 (Mod)	AQ_01 AQ_05 AQ_07 AQ_09 AQ_12 AQ_17	B1 (Low)	• Air Quality CEMP • EWMS • Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area ESCPs • ECM
15	Bridge construction	Use of heavy plant / multiple plant use	Emissions	Air pollution and stakeholder complaints	C2 (Mod)	AQ_01 AQ_05 AQ_07 AQ_09 AQ_17	B2 (Low)	• Air Quality CEMP • EWMS • Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area ESCPs • ECM
16		Bulk excavation / open excavations	Dust generation	Dust leaving site boundary into nearby	D2 (Mod)	AQ_01 AQ_05	C2 (Mod)	• Air Quality CEMP • EWMS

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
				environmental conservation zone or local roads		AQ_07 AQ_09 AQ_12 AQ_13 AQ_17		• Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area ESCPs • ECM
17	Bridge construction (continued)	Bridge piling	Dust generation	Dust leaving site boundary into nearby environmental conservation zone or local roads	C2 (Mod)	AQ_01 AQ_05 AQ_07 AQ_09 AQ_17	B2 (Low)	• Air Quality CEMP • EWMS • Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area ESCPs • ECM
18		Concrete sawing	Concrete dust generation	Dust leaving site boundary into nearby environmental conservation zone or local roads	D2 (Mod)	AQ_01 AQ_05 AQ_06 AQ_07 AQ_17	B2 (Low)	• Air Quality CEMP • EWMS • Soil and Water CEMP • Traffic and Access CEMP • Complaints Procedure • Induction • Area ESCPs • ECM

1 Refer to Table 20Table 21 for mitigation measures and controls

2 Derived from risk assessment process detailed in Section 6.2.1

6.3 Impacts

The potential for impacts on air quality was considered in Section 12 of the EIS. An assessment was undertaken of the potential sources detailed in Section 6.1. The findings are summarised in the sections below.

In addition to the inherent risks of specific construction activities creating the potential to generate dust, a number of other environment factors also affect the likelihood of dust emissions. These include:

- Wind direction – determines whether dust and suspended particles are transported in the direction of the sensitive receivers. This has been addressed in Section 5.3, with the predominant annual wind direction being from the southwest, particularly during the seasons of winter and autumn;
- Wind speed – governs the potential suspension and drift resistance of particles. This has been addressed in Section 5.3. The strongest winds are typically experienced during the seasons of winter and spring with wind speeds at times exceeding 7 m/s predominantly from the southwest;
- Rainfall or dew – rainfall or heavy dew that wets the surface of the soil and reduces the risk of dust generation. Rainfall patterns in the area of Badgerys Creek is detailed further Section 5.4, indicating higher rainfall expectation within the months of February, March and November with mean averages exceeding 100 mm/month;
- Effectiveness of protective measures; and
- Adjacent land uses and activities that may create dust resulting in a cumulative impact on air quality.

Accordingly, project personnel involved in the activities above need to consider the factors effecting emissions to air in consultation with their environmental representatives to ensure appropriate mitigation measures are adopted.

6.4 Earthworks

The EIS predicted dust impacts during the earthworks will be at or below the air quality assessment criteria for each of the reported air quality parameters, both incrementally as a result of the Project and cumulatively when assessed with background concentrations and modelled inputs of other projects. The assessment found that while the predicted concentrations remain low at all offsite residential receptors, the nature of the plume spread for the 24-hour and annual averaging periods is highest to the north-east and south-west of the Airport Site, consistent with the prevailing winds measured at Badgerys Creek. The modelling was focused primarily on the earthworks, however given the nature of the earthworks associated with the Stage 1 Development construction activities covered by this CEMP (refer to Table 3) being consistent in nature to the earthworks, the impacts are likely to be similar, albeit on a smaller scale.

6.5 Construction greenhouse gas emissions

The EIS reported that the two main sources of greenhouse gas emissions will be the operation of construction equipment and vegetation clearing. Greenhouse gas emissions generated during construction of the Stage 1 development are presented below in Table 20. As above, the greenhouse gas emissions calculations were based on the entire scope for construction activities. The Stage 1 Development construction activities covered by this CEMP (refer to Table 3) are expected to generate smaller impacts consistent with the reduced scale of the works compared to the overall construction phase. The same level of mitigation measures and controls will apply as indicated further below.

Table 20 Summary of greenhouse gas emissions during Stage 1 Development

Scope	Source	Fuel type	Quantity	Emissions (t CO_2-e)
1	Equipment	Transport diesel oil	162 ML	286,111
1	Vegetation clearing	N/A	73.5 kt	134,873
Total				**420,983**

Section 7 provides a suite of mitigation measures that will be implemented to avoid or minimise emissions to air quality.

7 Environmental control measures

Mitigation and management measures that will be implemented during construction are detailed below in Table 21 and are consistent with those provided in Tables 28-10 and 28-11 in Chapter 28 of the EIS, as per Condition 10 (Section 3.10.2) of the Airport Plan. The relevant control measures will be included in the site-specific Environmental Work Method Statement (EWMS) and Environmental Control Map (ECM) – refer to Section 4.3 of the SEMF for further detail.

Table 21 Environmental control measures

ID	Measure / Requirement	When to implement	How to implement	Responsibility	Reference
GENERAL					
AQ_01	Training will be provided to all project personnel, including relevant sub-contractors on sound air quality control practices and the requirements from this Plan through inductions, toolboxes and targeted training.	Pre-construction Construction	All personnel will be inducted before commencing works.	WSA Co Construction Manager / WSA Co Environmental Manager	Good Practice
AQ_02	The application of pesticides will be modified, reduced or controlled during high or unfavourable wind conditions where wind can carry pesticides outside of the defined treatment area.	Construction	Meteorological information will be used to assess wind conditions.	WSA Co Environmental Manager / Contractor	Good Practice
AQ_03	Ensure there is no burning of any materials on site.	Construction	All personnel will be inducted before commencing works.	WSA Co Environmental Manager / Contractor	Good Practice
DUST MANAGEMENT					
AQ_04	Dust management measures will be implemented to mitigate the impacts of dust during construction, including the following:	Pre-construction Construction	Dust Management and Vehicle and Equipment Emissions Plan (Appendix B)	WSA Co Environmental Manager / Contractor	EIS Table 28-11

ID	Measure / Requirement	When to implement	How to implement	Responsibility	Reference
			ECM to include dust management details for specific activities/areas. All personnel will be inducted and provided with ongoing training.		
AQ_05	Avoiding site run-off of water or mud to reduce the potential for track-out dust emissions.	Pre-construction Construction	ECM to include access/egress controls All personnel will be inducted and provided with ongoing training.	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_06	Only using cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays.	Pre-construction Construction	Construction equipment will be scheduled prior to undertaking the works.	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_07	Ensuring adequate water will be made available on the site for effective dust and particulate matter suppression and mitigation, using non-potable water where possible.	Pre-construction Construction	Refer to the Soil and Water Management Plan.	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_08	Using enclosed chutes and conveyors and covered skips where appropriate.	Pre-construction Construction	Where applicable, select appropriate plant/equipment to minimise dust generation. All personnel will be inducted and provided with ongoing training.	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_09	Minimising drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment, and using fine water	Pre-construction Construction	Where applicable, select appropriate plant/equipment to minimise dust generation while moving spoil.	WSA Co Environmental Manager / Contractor	EIS Table 28-11

ID	Measure / Requirement	When to implement	How to implement	Responsibility	Reference
	sprays on such equipment wherever appropriate.		All personnel will be inducted and provided with ongoing training.		
AQ_10	Making equipment readily available on-site to clean up spillages as soon as reasonably practicable after the event	Pre-construction Construction	Equipment will be stocked at different locations across the site. It will be restocked as it is used.	WSA Co Environmental Manager / Contractor	EIS Table 28-11
DUST IMPACTS FROM EARTHWORKS					
AQ_11	Vegetation clearing will be staged where possible to minimise the area and time that surfaces are exposed. Minimise stockpiling of material. Stockpiles will be located away from sensitive receivers where practicable.	Pre-construction Construction	Vegetation clearing will be scheduled ahead of time and will be done in combination with the location of sensitive receivers.	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_12	Exposed surfaces with no scheduled work will be treated to minimise dust generation. Exposed surfaces will be stabilised progressively using the most practical site-specific methods, including watering and geo-fabrics for short-term exposure and emulation spray, spray grass, soil compaction and revegetation for longer term exposed areas or final finishes. Revegetate earthworks and exposed areas or soil stockpiles as soon as practical.	Pre-construction Construction	Surface treatment details to be included on the ECM for the work. This could include the use of hessian, mulches or tackifiers to cover exposed areas as soon as possible after completion of earthworks where it is not possible to re-vegetate or cover with topsoil. All personnel will be inducted and provided with ongoing training.	WSA Co Environmental Manager / Contractor	EIS Table 28-11

ID	Measure / Requirement	When to implement	How to implement	Responsibility	Reference
DUST IMPACTS FROM OTHER MAIN CONSTRUCTION WORKS					
AQ_13	Avoiding scrabbling (roughening of concrete surfaces) where practicable.	Pre-construction Construction	Construction works will be scheduled ahead of undertaking the works.	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_14	Storing sand and other aggregates in bunded areas and not allowing them to dry out unless required for particular purposes.	Pre-construction Construction	Storage areas will be determined in combination with the site layout design and documented on the ECM	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_15	Delivering bulk cement and other fine powder materials in enclosed tankers and storing them in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.	Pre-construction Construction	Deliveries will be organised and scheduled ahead of time. Training will be provided to all drivers and delivery personnel.	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_16	Sealing and appropriately storing bags of any fine powder materials.	Pre-construction Construction	Storage and handling will be documented on the ECM. All personnel will be inducted and provided with ongoing training.	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_17	Construction activities will be modified, reduced or controlled during high or unfavourable wind conditions if they have a potential to increase off-site dust generation.	Construction	Meteorological conditions will be continuously monitored.	WSA Co Environmental Manager / Contractor	Good practice
DUST TRACK OUT					
AQ_18	Using water-assisted dust sweeper(s) on the access and local roads to remove, as necessary, any material tracked out of the site. This may require the sweeper to be continuously in use.	Construction	Access roads and sweeper requirements documented on the ECM. All personnel will undertake inductions and reiterated through ongoing site training.	WSA Co Environmental Manager / Contractor	EIS Table 28-11

ID	Measure / Requirement	When to implement	How to implement	Responsibility	Reference
AQ_19	Avoiding dry sweeping of large areas.	Construction	All personnel will undertake inductions and reiterated through ongoing site training.	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_20	Sealing high use haul roads and regularly inspecting and making necessary repairs to the surface as soon as reasonably practicable.	Construction	Haul roads and maintenance requirements documented as applicable on the ECM. All personnel will undertake inductions and reiterated through ongoing site training.	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_21	Recording all inspections of haul routes and any subsequent action in a site log book.	Construction	Recorded in site diary. All personnel will undertake inductions and reiterated through ongoing site training.	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_22	Regularly cleaning and damping down hard surfaced haul routes with fixed or mobile sprinkler systems or mobile water bowsers.	Construction	Haul roads/surfaces and maintenance requirements documented as applicable on the ECM. All personnel will undertake inductions and reiterated through ongoing site training.	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_23	Implementing a wheel washing system (with rumble grids to dislodge accumulated dust and mud) prior to leaving the site.	Construction	This will be determined in combination with the site design layout and detailed on the ECM.	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_24	Providing an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	Construction	This will be determined in combination with the site design layout and detailed on the ECM.	WSA Co Environmental Manager / Contractor	EIS Table 28-11

ID	Measure / Requirement	When to implement	How to implement	Responsibility	Reference
AQ_25	Locating site access points as far as practicable from sensitive receptors.	Construction	This will be determined in combination with the site design layout and detailed on the ECM.	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_26	Hardstand areas and surrounding public roads will be cleaned, as required, using methods including brooms, bobcat attachments or street sweepers.	Construction	Maintenance requirements will be shown on relevant ECMs. All personnel will undertake inductions and reiterated through ongoing site training.	WSA Co Environmental Manager / Contractor	Good practice
AQ_27	Measures implemented to minimise dust, soil or mud from being deposited by vehicles on public roads. This will be achieved by implementing mitigation measures such as stabilised site access (rumble grids, concrete and/or large aggregate) at entry/exit points. Manual cleaning will also be carried out where appropriate. In the event of any spillage or tracking, the spilt material will be removed immediately and in accordance with the environmental incident classification and reporting procedure.	Construction	Applicable management measures will be shown on ECMs. All personnel will undertake inductions and reiterated through ongoing site training.	WSA Co Environmental Manager / Contractor	Good Practice
AQ_28	Vehicle movement will be confined to designated haul roads and areas. These roads will have speed limits of 40 km/h in order to reduce dust generation. Reduced speed limit may be implemented where dust generation persists.	Construction	A traffic management plan will be prepared to comply with this.	WSA Co Environmental Manager / WSA Co Construction Manager	Good Practice

ID	Measure / Requirement	When to implement	How to implement	Responsibility	Reference
AQ_29	All loaded haulage trucks will be covered where there is a risk of release of dust or other materials and at all times on public roads.	Construction	All personnel will undertake inductions and reiterated through ongoing site training.	WSA Co Environmental Manager / Contractor	Good Practice
VEHICLE AND EQUIPMENT EMISSIONS					
AQ_30	All vehicles will be switched off when not in operation. Where practical lower vibration generating items of excavation plant and equipment shall be used.	Construction	Dust Management and Vehicle and Equipment Emissions Plan (Appendix B) All personnel will undertake inductions and reiterated through ongoing site training.	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_31	Engines of plant parked next to residents will be switched off when not in operation.	Construction	Dust Management and Vehicle and Equipment Emissions Plan (Appendix B). All personnel will undertake inductions and reiterated through ongoing site training.	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_32	Avoid the use of diesel or petrol powered generators and instead use mains electricity or battery powered equipment, where practicable.	Construction	Dust Management and Vehicle and Equipment Emissions Plan (Appendix B). Construction equipment will be ordered before the works are to be undertaken to ensure the appropriate equipment is available.	WSA Co Environmental Manager / Contractor	EIS Table 28-11

ID	Measure / Requirement	When to implement	How to implement	Responsibility	Reference
AQ_33	All site personnel are to be encouraged to car-pool and use public transport where appropriate. Information will be disseminated throughout the site via inductions and tool-box talks to encourage such transport modes and also to gauge the demand for a shuttle bus service from local public transport nodes.	Construction	Induction training Tool box talks	WSA Co Environmental Manager / Contractor	EIS Table 28-11
AQ_34	Daily monitoring of vehicle and plant is to be undertaken as a pre-start inspection.	Construction	Before any vehicles / plant enter the construction site, they have to provide confirmation of their daily pre-start inspection.	WSA Co Environmental Manager / Contractor	Good Practice
AQ_35	Exhaust systems of construction plant, vehicles and machinery will be maintained in accordance with manufacturer's specifications to ensure that excessive visible exhaust emissions do not persist under normal operational loads of the plant and machinery.	Construction	Before any vehicles / plant enter the construction site, they have to provide confirmation of their daily pre-start inspection.	WSA Co Environmental Manager / Contractor	Good Practice
AQ_36	Periodic visual checks will be undertaken to ensure ongoing compliance, typically weekly. Where practicable, vehicles will be fitted with pollution reduction devices	Construction	Before any vehicles / plant enter the construction site, they have to provide confirmation of their daily pre-start inspection.	WSA Co Environmental Manager / Contractor	Good Practice
AQ_37	Material brought to site will be in bulk from the suppliers, where practicable	Construction	Construction material will be ordered before the works are to be undertaken to ensure the appropriate equipment is available.	WSA Co Environmental Manager / Contractor	Good Practice

ID	Measure / Requirement	When to implement	How to implement	Responsibility	Reference
AQ_38	Material will be sourced from local suppliers, where practicable	Construction	Material will be ordered before the works are to be undertaken to ensure the local suppliers are available.	WSA Co Environmental Manager / Contractor	Good Practice
AQ_39	No use of ozone-depleting substances is to occur.	Construction	Procurement processes and checks during inspections. Ensure that the relevant providers of goods and services do not use ozone depleting substances.	WSA Co Environmental Manager / Contractor	Legal requirement
AQ_40	Develop and implement a construction logistics plan to manage the sustainable delivery of goods and materials to the airport site.	Construction	Construction Logistics Plan	WSA Co Environmental Manager/ Contractor	EIS Table 28-11

8 Air quality criteria

The air quality criteria applicable for use as identified in the EIS are principally those defined in the NSW EPA Approved Methods, which accounts for various pollutant criteria and averaging period from multiple sources, including the NEPM-AAQ. They are summarised in Table 22. Where relevant, AEPR criteria are also listed.

Table 22 Air quality monitoring criteria applicable to the airport

Pollutant	Criterion[(a)]	Averaging period	Source
Total suspended particulate matter (TSP)	90 µg/m^3	1 year	NSW EPA, AEPR
Particulate matter < 10 µm (PM_{10})	50 µg/m^3	24 hours(c)	NSW EPA, NEPM-AAQ
	25 µg/m^3	1 year	NSW EPA, NEPM-AAQ
Particulate matter < 2.5 µm ($PM_{2.5}$)	25 µg/m^3	24 hours	NEPM-AAQ
	20 µg/m^3 (by 2025)	24 hours	NEPM-AAQ
	8 µg/m^3	1 year	NEPM-AAQ
	7 µg/m^3 (by 2025)	1 year	NEPM-AAQ
Deposited dust – Incremental	2 g/m^2/month	Annual	NERDDC
Deposited dust – Cumulative	4 g/m^2/month	Annual	NERDDC

a. ppm = parts per million; pphm = parts per hundred million; µg/m^3 = micrograms per cubic metre; mg/m^3 = milligrams per cubic metre.

Any exceedance of the above criteria will be reported to the Infrastructure Department in accordance with section 10.4.

9 Environmental roles and responsibilities

The key environmental management roles and responsibilities for the construction phase of the work are detailed in Section 4.5 of the SEMF.

WSA Co will ensure sufficient resources are allocated on an ongoing basis to ensure effective implementation by both WSA Co and the responsible contractors.

Specific responsibilities for the implementation of this Air Quality CEMP are detailed below.

9.1 External roles and responsibilities

Environment Minister (or an SES employee in the Environment Department)

- The Approver for the Biodiversity Offset Delivery Plan.
- On 24 August 2018 the Approver approved the Biodiversity Offset Delivery Plan in accordance with Condition 30 of the Airport Plan.
- Required to be included in the consultation process for the Biodiversity CEMP and the Soil and Water CEMP (in accordance with Condition 35 of the Airport Plan).
- The Environment Department receives notification regarding publication of annual reports under condition 39 and copies of independent audits under condition 40 of the Airport Plan.

Infrastructure Minister (or an SES employee in the Infrastructure Department)

- The Approver for the Construction Plan, CEMPs, the Community and Stakeholder Engagement Plan and the Sustainability Plan.
- Approval for variation of an Approved Plan;
- Review and approve other matters (excluding Biodiversity Offset Delivery Plan); and
- The Infrastructure Department is responsible for administering and enforcing the Airports Act.

Airport Environment Officer

The responsibilities of the Airport Environment Officer (AEO) include the following:

- Monitoring compliance with the AEPRs;
- Facilitate an understanding of the obligations of the AEPRs;
- Ensure the best possible outcomes are achieved;
- Complete site inspections to review monitoring requirements and completion of works;
- Review and comment on CEMPs, incidents, and remedial activities;
- Issue an environmental protection order in accordance with Part 7 of the AEPR; and
- Issue an infringement notice in response to an offence against the AEPR.

9.2 WSA Co roles and responsibilities

WSA Co Executive General Manager

Environmental responsibilities of the WSA Co Executive General Manager include (but are not limited to):

- Provide resources to ensure compliance with this CEMP is achieved;

- Mandate and ensure that environmental protection remains an integral element of all Project activities; and
- Authorise resourcing with regards to the management of visual and landscape impacts.

WSA Co Environment Manager

The WSA Co Environment Manager is responsible for leading the planning, approvals and environmental function and is responsible for the ongoing requirements associated with the management of air quality as follows:

- Coordinate and manage the preparation of the Air Quality CEMP (this Plan) and associated documents / plans / procedures;
- Liaise regularly with the stakeholders and contractors on environmental matters routinely and as required;
- Coordinate ongoing training in environmental awareness for all levels of WSA Co staff as required to implement this Air Quality CEMP;
- Ensure that an appropriate environmental induction and training program is developed such that personnel are aware of their environmental responsibilities under relevant legislation and the contract, including the requirements associated with air quality management;
- Ensure compliance of Stage 1 development activities with this Air Quality CEMP;
- Implement, maintain, monitor, report and advise the Executive General Manager on all environmental matters including those associated with air quality management;
- Liaise with the Infrastructure Department Infrastructure Department Environment Manager on environmental issues, including the written notification of non-conformances;
- Monitor the implementation of all environmental management requirements as detailed in this Plan;
- Provide direction and guidance on implementation of this WSA Co Air Quality CEMP to all levels of the Project, including to the contractors as required;
- Ensure Project contractors comply with all relevant statutes, regulations, rules, procedures, standards and policies as detailed in this Air Quality CEMP;
- Ensure the timely review and assessment of environmental monitoring, auditing and inspection outcomes to ensure identification and implementation of continual improvement with regards to environmental management; and
- Overall reporting of the environmental performance of the Project.

WSA Co Site Environment Officer

The environmental responsibilities of the WSA Site Environment Officer include (but are not limited to):

- Daily interaction and coordination with Project contractor representatives to ensure their environmental management requirements are discharged; and
- Work collaboratively with the WSA Co Environment Manager to ensure desired environmental outcomes are achieved.

Western Sydney Airport Delivery Partner roles and responsibilities

The Western Sydney Airport Delivery Partner is responsible for the coordination and management of contractors ensuring all necessary planning approvals and environmental management activities and documentation are undertaken in accordance with WSA Co requirements.

In summary, the environmental requirements of the Western Sydney Airport Delivery Partner in relation to air quality impact management are as follows:

- Ensure that this Air Quality CEMP is effectively implemented by the contractor as required;
- Ensure that the required air quality monitoring and reporting, including environmental auditing, is undertaken and reported to WSA Co as required;
- Ensure that all necessary planning approvals, licenses and permits are obtained, as required by this Air Quality CEMP, prior to commencement of applicable works;
- Liaise with the WSA Co Environment Manager on air quality related issues, including the written notification of non-conformances;
- Participate in regular workplace inspections to ensure compliance;
- Provide direction and guidance on implementation of the WSA Co Air Quality CEMP; and
- Liaise between contractors and relevant government stakeholders as required and provide notification / information where environmental incidents / events have occurred.

9.3 WSA Co contractor roles and responsibilities

Contractor responsibilities

The responsibilities of the Relevant Contractor with regards to the management of impacts associated with air quality are:

- Identify resources required for implementation of the Air Quality CEMP;
- Report to the WSA Co Environment Manager as required to inform community and stakeholder notifications and to provide information where environmental incidents / events have occurred;
- Report to WSA Co Environment Manager (or delegate) on environmental performance at least monthly or at other times as necessary;
- Ensure that all personnel receive appropriate induction training, including details of the environmental obligations associated with air quality management;
- Ensure suppliers and subcontractors comply with requirements regarding air quality management outlined in this Plan;
- Undertake weekly inspections, ensuring all works comply with relevant regulatory and project requirements, including air quality management objectives;
- Provide other information as required from time to time, in order to demonstrate to WSA Co that environmental management requirements are being met by the contractor;
- Program toolbox talks and daily pre-start meetings to include any relevant air quality management requirements;
- Report any activity that has resulted, or has the potential to result, in an environmental incident immediately to WSA Co Environment Manager;
- Stop activities where there is an actual or immediate risk of harm to the environment as outlined in the risk assessment in Section 6 and advise WSA Co Environment Manager;
- Ensure steps are taken to rectify and prevent future incidents from occurring;
- Ensure that air quality management controls are properly maintained and effective; and
- Carefully select suppliers and subcontractors based upon their ability to meet stated requirements.

10 Environmental inspection, monitoring and auditing

Monitoring, inspection and auditing will be undertaken to measure effectiveness and facilitate continuous improvement of air quality management.

General environmental monitoring, inspection and auditing requirements are summarised in Table 16 of the SEMF.

A summary of the environmental inspection, monitoring and auditing requirements is provided below, with details of how they apply to air quality management where applicable.

10.1 Environmental inspections

WSA Co environmental inspections

Environmental site inspections will be undertaken by the WSA Co Environment Manager (or delegate) on a monthly basis to evaluate the effectiveness of environmental controls implemented by the contractor.

The monthly site inspection is to include a visual check of general construction activities and any air quality mitigation measures and or controls including but not limited to the following:

- Observation of dust generation from specific construction activities including those from vehicle tracking and excavation works;
- Observation of excessive visible exhaust emission from plant and machinery under normal operational loads;
- The presence / generation of any odours associated with the work activities; and
- Plant and machinery left idling whilst unused for extended periods of time (considered to be 10 minutes or greater).

The findings of the WSA Co site environmental inspection will be recorded on a WSA Co Site Environmental Inspection Checklist with an accompanying photographic style inspection report.

Refer to Appendix B of the SEMF for further details with regards to completing the Site Environmental Inspection Checklist.

Contractor environmental inspections

Regular site inspections will be undertaken to monitor compliance with this Plan. Inspection results will be recorded, and the inspection log made available to Infrastructure Department upon request. Any exceedance of air quality criteria will be reported in the monthly report, discussed at the Environmental Coordination meeting and appropriate remedial action will be taken.

More frequent site inspections by the person accountable for air quality and dust issues will be conducted onsite when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

Pre-start inspection

Prior to the commencement of works on each shift, an inspection will be carried out by the relevant contractor and will include a check of relevant environmental controls and resources required to ensure effective operation and maintenance. This is to include an inspection of relevant air quality management mitigation measures and controls where applicable. Works are not to commence unless inspections are found to be satisfactory.

10.2 Air quality monitoring

General environmental monitoring requirements are set out in the AEPR and include the following:

- Monitoring must take place under the direction of an appropriately qualified person, with previous relevant air quality monitoring experience and / or qualifications; and
- The results of the monitoring must be kept in a written record.

Specific air quality monitoring requirements, including timing and responsibilities, are included in Table 23 below.

Table 23 Air quality monitoring requirements

Reference	Requirement	Timing	Responsibility
AQ_M_01	Real time monitoring will be conducted at suitable locations for dust deposition and dust flux. This will be determined in consultation with the NSW EPA. Mobile phone alerts will be delivered to the relevant personnel.	Pre-construction and during construction	Contractor Environment Manager
AQ_M_02	Weather data at the premises, including rainfall measured and recorded in millimetres per 24-hour period at the same time each day from the time that the site office is established	As required	Contractor Environment Manager
AQ_M_03	Baseline monitoring has been undertaken for the past three months as required, prior to commencement of Main Construction Works. Monitoring will continue to be undertaken as detailed in Appendix D.	Pre-construction and during construction	WSA Co Environment Manager
AQ_M_04	Regular site inspections, at a minimum weekly, will be undertaken to monitor compliance with the dust management plan. Inspection results will be recorded included in the monthly report.	During construction	WSA Co Environment Manager and Contractor Environment Manager
AQ_M_05	Daily visual inspection and during high wind events	Pre-construction and during construction	Contractor Environment Manager

Where a non-conformance is detected, or monitoring results are outside of the expected range, the non-conformance process described in Section 13 will be implemented.

The monitoring data will be represented in the air quality register illustrated in Appendix D. This will provide a basis to assess the data against the targets and allow for a simple process in identifying any exceedances. If exceedances are encountered additional measures will be put in place including:

- Review and modify work practices as appropriate;
- Using additional water carts;
- Using adhesive polymer to bind the top surface layer;
- Reducing speeds of site plant; and
- Shutting down earthwork operations where required.

All environmental monitoring equipment will be calibrated as required by the manufacturer's specifications. Certificate of calibration currency can be made available upon request, with specific details to be provided in the annual reporting (refer to Section 10.4).

10.2.1 Additional monitoring for adverse weather

Additional monitoring may be required during adverse weather conditions, such as dry periods and high winds. Real time and forecasted weather conditions will be continuously monitored during the project, with the potential for a need to adjust practices during these periods.

10.3 Environmental auditing

Refer to Section 8.2 of the SEMF for environmental auditing requirements, including internal WSA Co audits, independent audits and audits to be undertaken by contractors.

10.4 Environmental reporting

General environmental reporting requirements are detailed in Section 8.3 the WSA Co SEMF. In addition, a summary of reporting requirements required under this Air Quality CEMP (including environmental reporting requirements under the Airport Plan specific to this Air Quality CEMP) is provided below in Table 24.

Table 24 Air quality reporting and record keeping

Action	Scope	Timing / Frequency	Responsibility
Annual reporting	Unless otherwise agreed in writing by an Approver, an annual report will be prepared in relation to compliance with this Air Quality CEMP. The annual report is to be prepared and managed in accordance with section 6.03 of the AEPR. In accordance with Condition 39 (2) WSA Co will publish each of the annual reports on its website within three months of the end of the period in respect of which the report was prepared, with evidence providing proof of the date of publication to the Infrastructure Department with a copy to the Environment Department. The report must remain on the website for a period of at least 12 months.	Annually	WSA Co Environment Manager
NEPM	Compliance with the air quality criteria as detailed in section 6 (including the relevant NEPM requirements) will be included as part of the Annual Report.	Annually	WSA Co Environment Manager
Greenhouse gas emissions (NGER)	Refer to Sustainability Plan when approved. In the absence of an approved Sustainability Plan, NGERS will be reported in the Annual Report.	Annually	WSA Co Environment Manager -
Compliance reporting	Undertaking monitoring as required by this Air Quality CEMP. Contractor is to provide WSA Co with a monthly summary of all air quality monitoring undertaken and advise of compliance with criteria.	Monthly	Contractor Environment Manager
Complaints reporting	Recording of complaints and stakeholder interactions in accordance with Community and Stakeholder Management Plan.	As required	WSA Co Environment Manager and Contractor Environment Manager

Action	Scope	Timing / Frequency	Responsibility
Environmental Site Register (required under the 6.02(3) of the AEPR)	Environmental Site Register to be kept and maintained to include written record of environmental conditions of the Airport and its environmental management generally. The register is to include the results of monitoring required under section 10.2 and a record of any exceptional incidents that cause excessive pollution and the action taken to resolve the situation.	As required	All
Shut-down inspections	Inspection of contractor works including status of environmental controls prior to shut-down of site for an extended period (i.e. more than 2 days).	Prior to site shut-down	Contractor
General environmental inspection	Inspection of environmental management controls on site and sighting of site documentation as required by the contractor's CEMP.	At least monthly	WSA Co
General environmental inspection	Inspection of environmental management controls and site documentation for contractor works (as required by the contractor's CEMP).	As per Contractor environmental management system (at least weekly)	Contractor
Post-rainfall inspection	Inspection of environmental controls following a rainfall event exceeding 10 mm in any 24-hour period.	Within 24 hours of the rainfall event (excluding Sundays and public holidays)	Contractor
Reporting pollution incidents	For the management and reporting requirements of all environmental incidents, refer to section 6 of the SEMF. Report pollution incidents resulting in offsite impacts to the NSW Environment Protection Authority – refer to WSA Co Environmental Non-conformance Classification and Reporting Procedure.	As required	All
Pollution and or excessive noise reporting	In accordance with the AEPR, WSA Co must give an airport environment officer for the airport, within 14 days, a written report in the event that monitoring results indicate pollution, or excessive noise, occurring as a result of the undertaking of the works associated with the Stage 1 development. The trigger for a 'pollution event' as per the Airports (Environment Protection) Regulations 1997 is provided in the relevant schedules of the AEPR.	As required	WSA Co
Reporting of non-conformances and improvement opportunities	The management and reporting requirements of environmental non-conformances and improvement opportunities will be in accordance with Section 7 of the WSA Co SEMF.	As required	WSA Co and Contractor

10.5 Environmental compliance tracking

In accordance with Condition 38 of the Airport Plan, a Compliance Tracking Program has been developed for the Project and is included in Appendix G of the SEMF. The Compliance Tracking Program will allow WSA Co to track compliance status with the conditions of the Airport Plan (and any other approval requirements) and will allow WSA Co to demonstrate measures taken to implement the Approved Plan. The Compliance Tracking Program will be used as a tool to inform the annual report (as detailed above in Table 20) and will be made available to Infrastructure Department upon request as required. Refer to Section 8.3 of the SEMF for further details regarding the maintenance and implementation of the Compliance Tracking Program.

11 Competence, training and awareness

To ensure this Air Quality CEMP is effectively implemented, each level of management is responsible for ensuring that all personnel reporting to them are aware of the requirements within. The WSA Co Environment Manager will coordinate the necessary and relevant environmental training in conjunction with other training and development activities.

All competence, training and awareness requirements will be implemented as detailed in Section 5 of the SEMF. A summary of these requirements is provided in the sections below.

11.1 Environmental Project induction

All Project personnel working on the Stage 1 development (including sub-contractors) are required to attend a compulsory Project induction that includes an environmental component prior to commencement of works on site, which will include:

- Dust generating activities; and
- Management and mitigation approaches.

Short-term visitors to site for purposes such as deliveries will be required to be accompanied by inducted personnel at all times. A visitors' induction will also be undertaken for visitor's onsite for short periods as agreed with the WSA Co Safety Manager.

The WSA Co Environment Manager (or delegate) will be responsible for providing the environmental component of the Project inductions, ensuring that the environmental management requirements of this Plan are incorporated.

A WSA Co Induction and Training Register will be maintained at all times including the details of all personnel who have completed the WSA Co Project induction and any other pertinent environmental training and or awareness forums (workshops, presentations etc.).

11.2 Contractor specific site inductions

In addition to the WSA Co Project induction, contractors will develop and implement their own environmental training and induction program relevant to their scope of works. A record of all environment inductions is to be maintained by the contractor and provided weekly to WSA Co.

11.3 Toolbox talks, training and awareness

Toolbox talks or similar will be one method of raising awareness and educating personnel on issues related to aspects of construction including environmental issues. The toolbox talks are used to ensure environmental awareness continues throughout construction.

Toolbox attendance is mandatory, and attendees of toolbox talks are required to sign an attendance form and the records maintained as part of the Induction and Training Register.

Environmental issues associated with air quality management to be considered for toolbox talks may include (but are not limited to):

- Erosion and sedimentation control to prevent sediment tracking and subsequent dust generation;
- Ensuring the correct operation of plant and machinery to reduce excessive exhaust emissions;
- Correct operation of conveyors, loading shovels, hoppers and other loading or handling equipment to ensure dust emissions are minimised;

- Correct usage of fine water sprays on conveyors, loading shovels, hoppers and other loading or handling equipment wherever appropriate;
- Training and awareness of other site or activity specific controls measures to reduce dust generation and mud-tracking; and
- Management of mud tracking.

For activities with high environmental risk (as identified through the risk assessment process undertaken as part of the CEMP), targeted environmental awareness training is to be provided.

The WSA Co Environment Manager will establish a schedule of environmental training.

11.4 Daily pre-start meetings

The pre-start meeting is a tool for informing the workforce of the day's activities, safe work practices, environmental protection practices, work area restrictions, activities that may affect the works, coordination issues with other trades, hazards and other information that may be relevant to the day's work. The pre-start meeting forum should also be adopted in the event that a change in weather conditions is observed by the site personnel and the current works and methods have the potential to generate nuisance dust levels and or other impacts associated with air quality.

Specifically, with regards to this Air Quality CEMP, the daily pre-start forum can be used as an opportunity to discuss the following:

- Forecast inclement weather that may impact on activities and air quality;
- Activity look-ahead to ensure appropriate dust suppression and sediment removal plant and machinery is available if required, such as water cart for dust suppression and street sweeper for sediment tracking;
- Discussion regarding work activities during forecast wet-weather and measures to be implemented to avoid mud / sediment tracking; and
- Recent site observations / learnings with regards to air quality management.

12 Communications and complaints management

All communications and complaints management will be implemented and managed in accordance with Section 7 of the SEMF.

12.1 Complaints management

A Complaints and Enquiries Procedure, consistent with AS 4269: Complaints Handling, has been developed for the work, in accordance with the requirements of Condition 15 (Airport Plan, Section 3.10.2).

All community inquiries and complaints related to the construction activities will be referred to the 24-hour community information line (1800 972 972). A postal address (PO Box 397 Liverpool NSW 2170) and email address (info@wsaco.com.au) has been provided for receipt of complaints and enquiries. The telephone number, the postal address and the email address will be published in newspapers circulating in the local area prior to the commencement of construction and is provided on the Project website.

The Community and Stakeholder Engagement team will take the lead in responding to complainants. Attempts will be made to resolve all complaints in accordance with the Community and Stakeholder Engagement Plan. Timeframes for initial responses to complaints are outlined below.

- Telephone complaints received during work hours will be provided a response within two hours. Complaints received outside of works hours will be provided a response within two hours of the next working day; and
- Email and postal complaints will be responded to within two (2) business days of receipt.

The aim is to resolve the complaint at the first point of contact, by providing a solution or negotiating an agreed course of action. The complainant will be provided updates on the progress of their complaint and a written response will be provided within 10 working days if the complaint cannot be resolved by the initial or follow up verbal response.

The community contacts database will be used as a complaints register. The database will be used to record, track and respond to complaints efficiently. Information on all complaints received, the means by which they were addressed and whether resolution was reached with or without mediation shall be included in the construction compliance reports.

The WSA Co Environment Manager in consultation with the relevant contractor where required, will apply an adaptive approach to ensure that corrective actions are applied in consultation with the appropriate construction staff to allow modifications and improvements in the management of any environmental issues resulting in community complaints.

12.2 Community and stakeholder communication

Construction of the Stage 1 Development will involve a number of interactions with local residents, local councils and NSW Government agencies, among others. To ensure a consistent approach with regards to community and stakeholder management, WSA Co have developed a Community and Stakeholder Engagement Plan to address broader stakeholder engagement objectives during construction and to coordinate engagement activities for all environmental management issues during construction. For further detail with regards to community and stakeholder engagement, refer to Section 7.3 of the SEMF.

13 Environmental incidents, non-conformance and improvement opportunities

The management and reporting requirements of environmental non-conformances and improvement opportunities will be in accordance with Section 8.1 of the WSA Co SEMF. The management and reporting of environmental incidents shall be undertaken by the appropriate person as detailed in Section 6 of the SEMF.

It should be noted that the management and reporting requirements associated with major accidents and emergency situations (for example a major chemical or hydrocarbon spill, fuel storage tank failure, surface fires, sediment basin failure) should be undertaken in accordance with the WSA Co Emergency Preparedness and Response Procedure.

14 Review and improvement

14.1 Continuous improvement

Continuous improvement of this Plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement. This process is detailed in Section 8 of the SEMF.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance;
- Determine the cause or causes of non-conformances and deficiencies;
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies;
- Verify the effectiveness of the corrective and preventative actions;
- Document any changes in procedures resulting from process improvement; and
- Make comparisons with objectives and targets.

14.2 Change management

Further refinements to the Stage 1 Development may result from detailed design refinement or changes identified during the construction phase of the works. Any design changes or changes in scope of works will be communicated to the WSA Co Environmental Manager.

WSA Co would be responsible for assessing any potential inconsistencies with the Airport Plan and formally seeking approval from the Infrastructure Minister for any project modifications as required, prior to commencement of the scope of works in question.

14.3 Variation of approved Plans

WSA Co will seek approval for variation of an Approved Plan from the Infrastructure Minister or an SES Officer (SES employee under the *Public Service Act 1999*) in the Infrastructure Department by submitting a version of the plan with the proposed variation clearly marked. All variations to an Approved Plan must be approved in accordance with Condition 41 of the Airport Plan. As each package of work is developed the SEMF and associated CEMPs documents will be reviewed and where applicable updated to ensure the environmental aspects of the work package are managed. Where necessary the document will be updated and submitted for approval in accordance with the Airport Plan prior to the work commencing. A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure, including update of the publicly available copy of the document on the Project website.

The Infrastructure Minister or an SES Officer in the Infrastructure Department may vary an Approved Plan or request WSA Co prepare and seek approval for a specified variation if the Infrastructure Minister or an SES Officer in the Infrastructure Department believes on reasonable grounds that:

- A Condition has been contravened and the nature of the contravention is relevant to the subject matter of the Approved Plan;
- The variation will address the contravention; and
- WSA Co will comply with any such request within three months.

14.4 Review of approved plans

WSA Co will review each approved plan at least every five years (from the date of approval) as required by the Airport Plan. A review will also be completed annually to ensure that it continues to meet the approval criteria. Details of the review will be included in the annual report (refer to Section 8.3 of the SEMF). If the review identifies areas where the plan does not continue to meet the approval criteria for that plan, a variation to the approved plan will be prepared and submitted for approval.

WSA Co may initiate reviews of Approved Plans at other times in response to improvement opportunities, non-conformances, and changes to scope of work or construction methodology or alterations to legal or contractual requirements.

Any changes identified and implemented through the variation and review process identified above will be communicated to relevant contractors through re-issue of the revised WSA Co Approved Plan and subsequent training and awareness (refer to refer to Section 5 of the SEMF).

15 References

Commonwealth Department of Infrastructure and Regional Development, 2016. *Airport Plan (December 2016)*

Commonwealth Department of Infrastructure and Regional Development, 2016. *Western Sydney Airport Environmental Impact Statement, 2016*

NSW Department of Environment and Conservation (DEC) (now NSW Department of Planning and Environment), 2005. *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW*

NSW Office of Environment and Heritage (OEH), 2016. *Clean Air for NSW Consultation Paper*

Standards Australia 2001. *Australian and New Zealand environmental management international standard (AS/NZS ISO 14001).*

Appendix A

WSA Co Air Quality CEMP Consultation

A1 Stakeholder consultation – NSW Environment Protection Authority

Table A1 NSW Environment Protection Authority CEMP consultation summary

Input	Response / where addressed
Consultation prior to Rev 0 approval	
A response to an invite for comment on the Air Quality CEMP was received from NSW Environment Protection Authority (NSW EPA) on 26 July 2018. The relevant comments were addressed and considered in the preparation of the CEMP. Details with regards to how the NSW EPA comments were addressed are provided in Table A1 below. *A letter acknowledging receipt of the review comments from NSW EPA and how the comments were addressed was prepared and issued from WSA Co to NSW EPA on 21 September 2018.*	
The EPA notes the consultation requirements relating to the preparation of a CEMP, however does not approve or endorse these documents. The EPA's role is to set environmental objectives for environmental management, rather than being directly involved in the development of strategies and management plans to achieve those objectives.	Noted
The EPA provided advice in 2016 regarding environmental objectives during the exhibition of the Environmental Impact Statement. *As a general recommendation, the CEMP should outline the measures that will be implemented to manage and mitigate all impacts assessed during the Environmental Impact Statement. All proposed mitigation and management measures in the CEMP should implement best practice to a level that is feasible and reasonable and clearly demonstrate how the proponent will meet the designated environmental objectives.*	All CEMP documentation includes measures that will be implemented to manage and mitigate identified impacts assessed during the Environmental Impact Statement. Risk assessment approach has been adopted for the implementation of the CEMP documentation, with linked reference to applicable mitigation measures and controls as required under the Airport Plan (and EIS) in addition to known implementation of a 'best-practice' approach.
Consultation prior to Rev 1 approval	
A request to provide comments on the CEMPs (Revision 0) was submitted to the NSW Department of Premier and Cabinet (DPC) on 30th October 2018. The request included an outline of the Visitor Centre and Site Accommodation phase and Material Importation phase. A response to the invitation for comment on the Air Quality CEMP was received from NSW EPA and summarised in Table A1. The relevant comments were noted and considered in the preparation of the CEMP. *A letter acknowledging receipt of the review comments from NSW EPA and how the comments (if applicable) were addressed was prepared and issued in December 2018.*	
The NSW Government provided a detailed submission on the Western Sydney Airport (WSA) EIS that included advice on the environmental aspects of the proposal. The EPA also provided a response to a request from WSA for comments on monitoring locations in the CEMPs and on the illegal dumping strategy, dated 13 September 2018. This information should be considered for the VSA.	Noted

A2 Stakeholder consultation – NSW Health

Table A2 NSW Health CEMP consultation summary

Input	Response / where addressed
Consultation prior to Rev 0 approval	
A response to an invite for comment on the Air Quality CEMP was received from NSW Health on 26 July 2018. The relevant comments were addressed and considered in the preparation of the CEMP. Details with regards to how the NSW Health comments were addressed are provided in Table A2 below. *A letter acknowledging receipt of the review comments from NSW Health and how the comments were addressed was prepared and issued from WSA Co to NSW Health on 21 September 2018.*	
The air quality CEMP should implement best practice dust and odour mitigation practices, to ensure that air emissions associated with construction works and related activities do not unduly affect the amenity and wellbeing of the community.	The Air Quality CEMP has adopted a risk assessment-based approach with regards to environmental management, including the implementation of environmental management measures. The mitigation measures prescribed for dust management are a combination of required measures from the Airport Plan (and EIS) in addition to known good practice. The environmental risk assessment and mitigation measures and controls are detailed in Sections 6 and 7 respectively. Dust management measures will include a combination of source management, surface stabilisation, sediment removal from plant machinery prior to entering local road networks and water suppression. The effectiveness of the management measures will be continually monitored and inspected as required under Section 10 of the CEMP.
The air quality CEMP should implement best practice dust and odour mitigation practices, to ensure that air emissions associated with construction works and related activities do not unduly affect the amenity and wellbeing of the community.	
Adequate controls under an appropriate level of management are required to ensure predicted impacts satisfy the air quality criteria at a minimum. All reasonable and feasible measures should be taken to minimise exposure to air pollutants as far as practical.	
A clear mitigation strategy must be developed to address exceedances of the air quality criteria.	The appropriate criteria have been set for the purposes of air quality monitoring. Response to exceedances and potential pollution events are included in Section 10 and 13.
Consultation prior to Rev 1 approval	
A request to provide comments on the CEMPs (Revision 0) was submitted to the NSW Department of Premier and Cabinet (DPC) on 30th October 2018. The request included an outline of the Visitor Centre and Site Accommodation phase and Material Importation phase. A response to the invitation for comment on the Air Quality CEMP was received from NSW Health and summarised in Table A2. The relevant comments were noted and considered in the preparation of the CEMP. *A letter acknowledging receipt of the review comments from NSW Health and how the comments (if applicable) were addressed was prepared and issued in December 2018.*	
There are no additional health considerations involved in construction of the visitor Centre other than its proximity to residents on the north-western boundary. The controls in the existing Construction Environmental Management Plans for Noise and Vibration and Air Quality are adequate and have incorporated previous comments from South Western Sydney Local Health District.	Noted

Appendix B

Dust management and vehicle and equipment emissions plan

Assess the Situation

- Review weather forecast daily for potential high winds (>20km/hr) at Horsley Park (www.weatherzone.com.au) [EC].
- Consult with SS and other subcontractors for strategies to minimise dust [EC].
- The need for and type of dust controls will be assessed prior to works being undertaken [SS].
- The implementation of dust and emission controls will be progressive and continual during the various stages of construction of the temporary site facility [SS/EC].

STOP DUST GENERATING WORK if winds exceed 20km/hr (10min average) and air quality controls are not sufficient to mitigate dust generation.

Legend

Responsibilities
SS – Site Supervisor
EC – Environmental Coordinator
EM – Environment Manager

Re-assess the situation

Implement Air Quality Controls

Dust management plan [SS]

- Avoiding site runoff of water or mud to reduce the potential for track-out dust emissions
- Only using cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays
- Ensuring adequate water will be made available on the site for effective dust and particulate matter suppressions and mitigation, using non-potable water where possible
- Using enclosed chutes and conveyors and covered skips
- Minimising drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment, and using fine water sprays on such equipment wherever appropriate
- Making equipment readily available on-site to clean up spillages as soon as reasonably practicable after the event
- Measures to reduce dust impacts from earthworks and other works, as outlined in Table 7-1 of this plan, including but not limited to:
  - Vegetation clearing will be staged where possible to minimise the area and time that surfaces are exposed.
  - Minimise stockpiling of material. Stockpiles will be located away from sensitive receivers where practicable.
- Measures to reduce dust track out, as outlined in Table 7-1 of this plan, including but not limited to:
  - Sealing high use haul roads, regularly inspecting and making necessary repairs to the surface as soon as reasonably practicable.
  - Implementing a wheel washing system (with rumble grids to dislodge accumulated dust and mud) prior to leaving the site.
  - Avoiding dry sweeping of large areas.

Vehicles and equipment emissions plan

- Requiring vehicle operators to switch off engines when not in use
- Avoiding the use of diesel or petrol powered generators and instead using mains electricity or battery powered equipment, where practicable
- Considering appropriate vehicle speeds on sealed and unsealed roads
- Construction logistics plan to manage the sustainable delivery of goods and materials to the airport site, includes the following measures:
  - Material brought to site will be in bulk from the suppliers, where practicable
  - Material will be sourced from local suppliers, where practicable.

  Further sustainable practices to manage the delivery of goods and material to the airport site are detailed in the Sustainability Plan
- Measures to support and encourage sustainable travel for construction workers to and from the airport site, including public transport, shuttle buses, cycling, walking, and car-sharing are outlined in Section 2.2.2: Vehicle Movement Plans of the Traffic and Access CEMP
- Measures to reduce vehicle and equipment emissions, as outlined in Table 7-1 of this plan.

Observe Effectiveness of Controls

- If visible dust observed leaving site, re-assess the situation and potentially implement additional controls. [SS]
- If a dust complaint is received, re-assess the situation and potentially implement additional controls. [SS/EM]
- Bring any significant air quality issues to the attention of the EC (in the first instance) or the EM [SS]

Monitoring & Recording

- SS to monitor daily for tracking of mud on public roads, ensuring the integrity of the access/egress points and haul roads to ensure loose material not being tracked out. Outcomes of this monitoring are to be recorded in the SS daily diary (or similar).
- SS to record details of observations regarding visible dust emissions in SS daily diary (or similar).

1. Introduction

Objectives

- To describe the minimum mandatory requirements for the management of air quality associated with construction activities.

Training

- All personnel are to undertake Project inductions identifying their environmental and compliance obligations under the Conditions for the Project.
- Obligations and responsibilities relevant to air quality management will also be included in daily pre-start or activity-specific pre-start briefings, toolbox talks or targeted environmental training as appropriate.

2. Standards and Guidelines

- Air Quality Construction Environmental Management Plan (AQCEMP)
- NSW EPA Local Government Air Quality Toolkit, Visual Guide: Dust from urban construction sites

3. Air Quality Management

The following are mitigation and management measures to address impacts on air quality from dust and vehicle and equipment emissions.

Dust Management Plan

- Avoiding site runoff of water or mud to reduce the potential for track-out dust emissions;
- Only using cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays;
- Ensuring adequate water will be made available on the site for effective dust and particulate matter suppressions and mitigation, using non-potable water where possible;
- Using enclosed chutes and conveyors and covered skips;
- Minimising drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment, and using fine water sprays on such equipment wherever appropriate;
- Making equipment readily available on-site to clean up spillages as soon as reasonably practicable after the event;
- Measures to reduce dust impacts from earthworks and other works, as outlined in Table 7-1 of this plan, including but not limited to:
  - Vegetation clearing will be staged where possible to minimise the area and time that surfaces are exposed; and
  - Minimise stockpiling of material. Stockpiles will be located away from sensitive receivers where practicable.
- Measures to reduce dust tracking out, as outlined in Table 9 of this plan, including but not limited to:
  - Sealing high use haul roads, regularly inspecting and making necessary repairs to the surface as soon as reasonably practicable;
  - Implementing a wheel washing system (with rumble grids to dislodge accumulated dust and mud) prior to leaving the site; and

- Avoiding dry sweeping of large areas.

Vehicle and Equipment Emissions Plan

- Requiring vehicle operators to switch off engines when not in use;
- Avoiding the use of diesel- or petrol-powered generators and instead using mains electricity or battery powered equipment, where practicable;
- Considering appropriate vehicle speeds on sealed and unsealed roads;
- Construction logistics plan to manage the sustainable delivery of goods and materials to the airport site, includes the following measures:
  - Material brought to site will be in bulk from the suppliers, where practicable; and
  - Material will be sourced from local suppliers, where practicable.

  Further sustainable practices to manage the delivery of goods and material to the airport site are detailed in the Sustainability Plan.
- Measures to support and encourage sustainable travel for construction workers to and from the airport site, including public transport, shuttle buses, cycling, walking, and car-sharing are outlined in Section 2.2.2: Vehicle Movement Plans of the Traffic and Access CEMP; and
- Measures to reduce vehicle and equipment emissions, as outlined in Table 9 of this plan.

4. Complaints Management

Record all dust and air quality complaints in accordance with the complaints management system.

5. Incident Management

Any exceptional incident which causes dust/emissions, either on-site or in close proximity to the site, is to be recorded in the Foreman's daily diary and immediately reported to the SS. The SS to report the matter to the EM and Construction Manager.

Appendix C

Sensitive receptors

Figure C1 Sensitive receptors

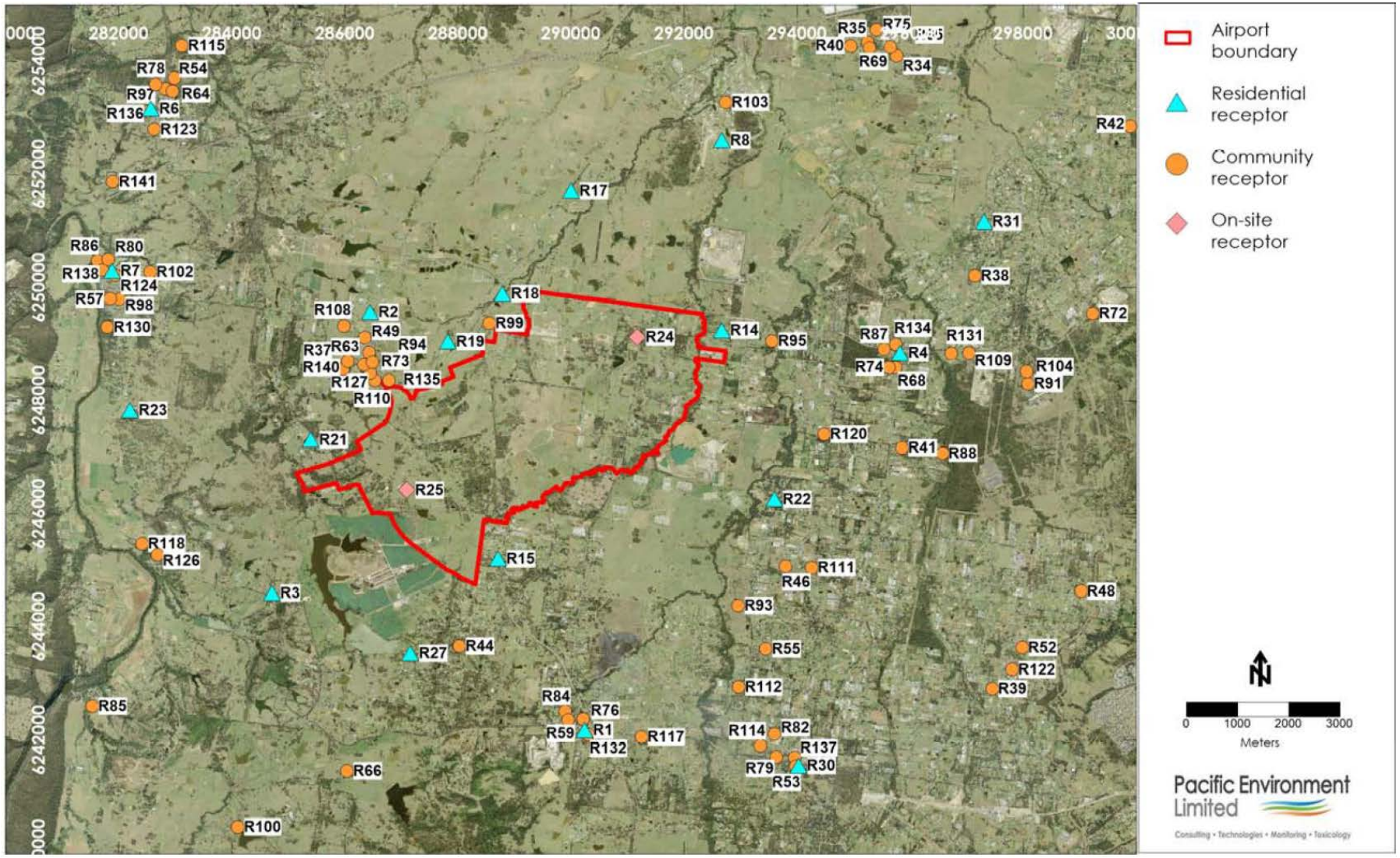


Table 25 Sensitive receptors

ID	Receptor location	Type	ID	Receptor location	Type
R1	Bringelly	Residential	R75	Trinity Catholic Primary School	Community
R2	Luddenham	Residential	R76	Bringelly Public School	Community
R3	Greendale, Greendale Road	Residential	R78	Mulgoa Public School	Community
R4	Kemps Creek	Residential	R79	Rossmore Public School	Community
R6	Mulgoa	Residential	R80	Wallacia Public School	Community
R7	Wallacia	Residential	R82	Bellfield College - Junior Campus	Community
R8	Twin Creeks, Cnr Twin Ck Drive & Humewood Place	Residential	R84	Bringelly Park	Community
R14	Lawson Road, Badgerys Creek	Residential	R85	Bents Basin State Conservation Reserve and Gulguer Nature Reserve	Community
R15	Mersey Rd, Greendale	Residential	R86	Blaxland Crossing Reserve	Community
R17	Luddenham Road	Residential	R87	Bill Anderson Reserve	Community
R18	Cnr Adams & Elizabeth Drive	Residential	R88	Kemps Creek Nature Reserve	Community
R19	Cnr Adams & Anton Road	Residential	R91	Western Sydney Parklands	Community
R21	Cnr Willowdene Ave and Vicar Park Lane	Residential	R93	Rossmore Grange	Community
R22	Rossmore, Victor Ave	Residential	R94	Freeburn Park	Community
R23	Wallacia, Greendale Rd	Residential	R95	Overett Reserve	Community
R24	Badgerys Creek 1 NE	On-site	R97	Mulgoa Park	Community
R25	Badgerys Creek 2 SW	On-site	R98	Wallacia Bowling and Recreation Club	Community
R27	Greendale, Dwyer Rd	Residential	R99	Hubertus Country Club	Community
R30	Rossmore residential	Residential	R100	Sugarloaf Cobbitty Equestrian Club	Community
R31	Mt Vernon residential	Residential	R102	Panthers Wallacia	Community
R34	Emmaus Residential Aged Care	Community	R103	Twin Creeks Golf and Country Club	Community
R35	Mamre After School and Vacation Care	Community	R104	Sydney International Shooting Centre	Community
R36	Head Start After School Care	Community	R108	Luddenham Showground	Community
R37	Schoolies at Mulgoa	Community	R109	Kemps Creek Sporting and Bowling Club	Community
R38	Do-re-mi Day Care Centre	Community	R110	St James Luddenham	Community
R39	Little Amigos Austral Early Learning Centre	Community	R111	Lin Ying temple	Community
R40	Little Smarties Childcare Centre	Community	R112	Vat Ketanak Khmer Kampuchea Krom	Community
R41	The Grove Academy	Community	R114	Anglican Church Sydney Diocese	Community
R42	Horsley Kids	Community	R115	Anglican Parish of Mulgoa	Community
R44	Bringelly Child Care Centre	Community	R117	Bringelly Vineyard Church	Community
R46	Clementson Drive Early Educational Centre	Community	R118	Free Church of Tonga	Community
R48	Kids Korner West Hoxton Early Learning Centre	Community	R120	Our Lady Queen of Peace	Community
R49	Luddenham Child Care Centre	Community	R122	St Anthony	Community
R52	The Frogs Lodge	Community	R123	St Marys Church	Community
R53	Rossmore Community Preschool	Community	R124	Wallacia Christian Church	Community
R54	Mulgoa Preschool	Community	R126	St Francis Xavier Church	Community

Table 24 Sensitive receptors (continued)

ID	Receptor location	Type	ID	Receptor location	Type
R55	Jillys Educational Childcare Centre	Community	R127	Luddenham Uniting Church	Community
R57	Wallacia Progress Hall	Community	R130	Hopewood Health Retreat	Community
R59	Bringelly Community Centre	Community	R131	Science of the Soul Study Centre	Community
R63	Luddenham Progress Hall	Community	R132	Bringelly shops	Community
R64	Mulgoa Hall	Community	R134	Kemps Creek shops	Community
R65	Emmaus Catholic College	Community	R135	Luddenham shops	Community
R66	University of Sydney Farms	Community	R136	Mulgoa shops	Community
R68	Christadelphian Heritage College Sydney	Community	R137	Rossmore shops	Community
R69	Mamre Anglican School	Community	R138	Wallacia Shops	Community
R72	Irfan College	Community	R140	Holy Family Catholic Primary and Church	Community
R73	Luddenham Public School	Community	R141	Edmund Rice Retreat and Conference Centre	Community
R74	Kemps Creek Public School	Community			

Appendix D

Monthly air quality monitoring

Air Quality monitoring program

Air quality monitoring has been undertaken since October 2017 up until the present at the Airport Site for the purpose of obtaining baseline air quality data. Details of the methodology and sampling locations (Air Quality Monitoring Program) are provided in the sections below.

WSA Co will continue to implement the Air Quality Monitoring Program on a monthly basis in addition to any contractor specific monitoring as detailed in Section 10.2.

1. Dust deposition

Deposited matter refers to any dust that falls out of suspension in the atmosphere. Deposited dust is measured in accordance with AS/NZS 3580.10.1:2016 - *Methods for sampling and analysis of ambient air Method 10.1: Determination of particulate matter—Deposited matter—Gravimetric method*. A five-litre gauge with a 150 mm funnel is places on a two-metre high stand. The gauge is left onsite for approximately one (1) month (30 days +/- two days) and then the sample is sent to a laboratory for analysis. The amount of insoluble solids over the monitoring period are reported by the laboratory.

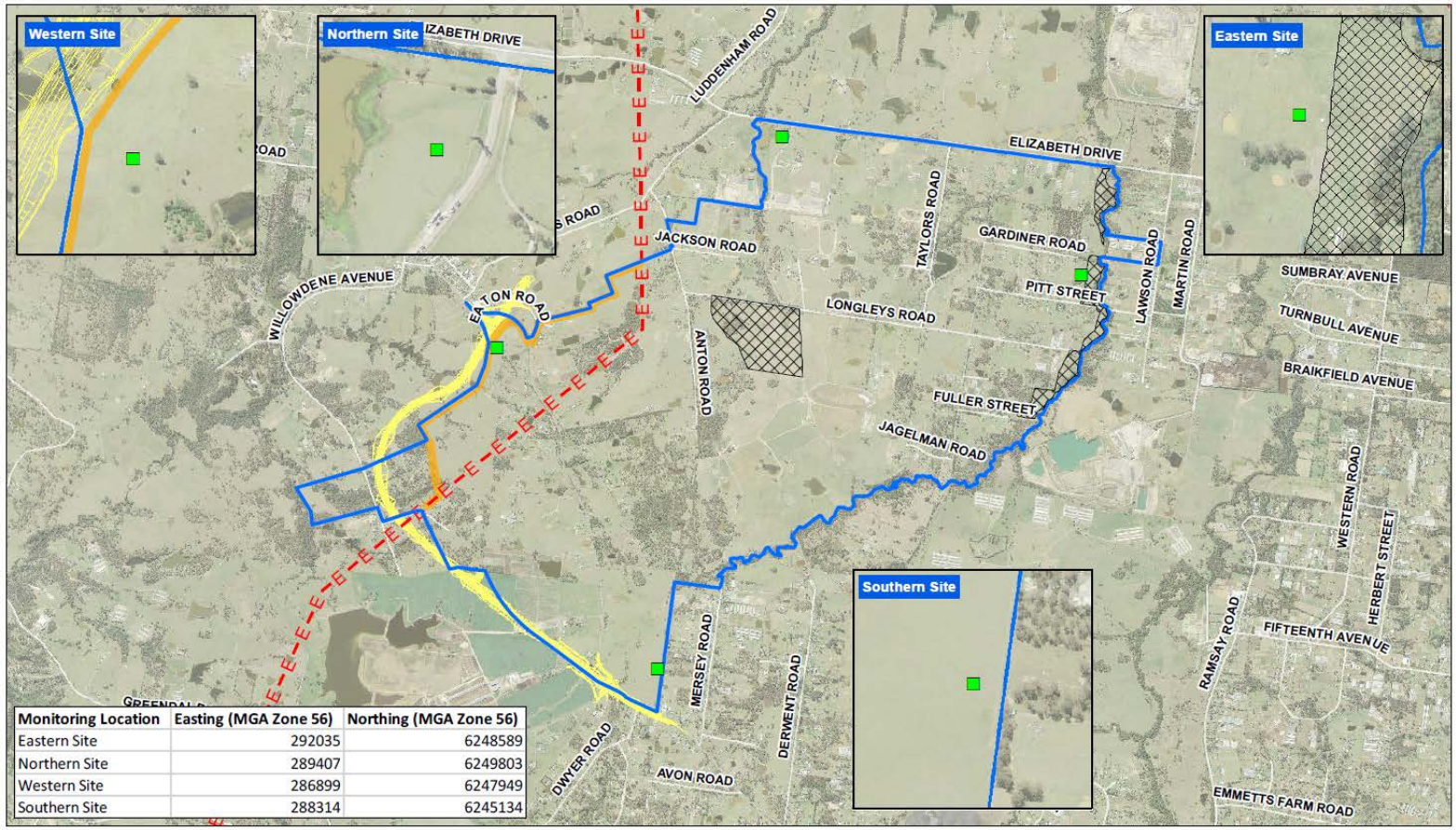
2. Particulate concentration

DMP 7200 real time particle counters sample real time $PM_{2.5}$ and PM_{10}. The DMP adopts two methods for measuring particulate mass concentration: particle counting and gravimetric analysis. The units measure the particulate concentration through 90º Mie scattering principle.

3. Air quality monitoring station locations

The location of the air-monitoring stations are provided overleaf in Figure D-1.

Figure D-1 Air quality monitoring station location plan



Monitoring Location	Easting (MGA Zone 56)	Northing (MGA Zone 56)
Eastern Site	292035	6248589
Northern Site	289407	6249803
Western Site	286899	6247949
Southern Site	288314	6245134

0 250 500 1,000
Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

LEGEND

- Air Quality and Noise Monitoring Stations
- Airport site boundary
- Proposed hazard reduction burn areas Sept 2017
- Existing TransGrid 330kV Overhead Line
- Proposed TransGrid 330kV Underground Easement
- Realignment of The Northern Road

DIRD
WSA

Job Number 21-26728
Revision A
Date 06 Oct 2017

Air Quality and Noise Monitoring Stations

Appendix A

G:\21\26728\GIS\Maps\Deliverables\21_26391_26728_Z001_NOISE.mxd

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au

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Data source: Aerial Imagery, NSW Department of Lands 2009. Created by:apmiller

4. Air quality monitoring station details

Site	Equipment	Serial Number	Calibration	Photo
Northern	DMP7200	07.0917.180	Flow Meter: 23/11/18 Thermometer & Barometer: 04/03/18 Flow checks undertaken on the 09/01/18	
	Dust Deposition Gauge	DDG_N	Laboratory analysis	

Site	Equipment	Serial Number	Calibration	Photo
Southern	DMP7200	07.0917.181	Flow Meter: 23/11/18 Thermometer & Barometer: 04/03/18 Flow checks undertaken on the 9/1/18.	
	Dust Deposition Gauge	DDG_S	Laboratory analysis	

Site	Equipment	Serial Number	Calibration	Photo
Eastern	DMP7200	07.0917.182	Flow Meter: 23/11/18 Thermometer & Barometer: 04/03/18 Flow checks undertaken on the 09/01/18.	
	Dust Deposition Gauge	DDG_E	Laboratory analysis	

Site	Equipment	Serial Number	Calibration	Photo
Western	DMP7200	07.0917.183	Flow Meter: 23/11/18 Thermometer & Barometer: 04/03/18 Flow checks undertaken on the 09/01/18.	
	Dust Deposition Gauge	DDG_W	Laboratory analysis	

5. Meteorological station

The meteorological monitoring station is a Lufft WS501 Smart Weather Sensor and the WTB Tipping Bucket Rain Gauge.

- The meteorological monitoring station is located on the southern site.
- The sensors measure the following parameters:
  - air temperature
  - relative humidity
  - wind direction
  - wind speed
  - precipitation.