

Stage 2: WestConnex M5  
King Georges Road Interchange Upgrade

# **Appendix B6**

# **Construction Air Quality Management**

# **Plan**

JULY 2016



## DOCUMENT CONTROL

File name	CEMP App B6 CAQMP Rev D
Report name	Construction Air Quality Management Plan
Revision number	D

Plan approved by:

*[signed]*

*[signed]*

*Name*

*Name*

Contractor PM

Contractor EM

## REVISION HISTORY

Revision	Date	Description	Approval
D	01/07/2016	Periodic review – no changes	
C	02/07/15	Revised as per DP&E's comments	
B	15/06/15	Revised as per WDA's and ER's comments	
A	12/05/15	Final for submission to WDA	

## DISTRIBUTION OF CONTROLLED COPIES

Copy no.	Issued to	Version
1		
2		
3		
4		

**CONTENTS**

1 Introduction..... 1

1.1 Purpose..... 1

1.2 Background..... 1

1.3 Structure of CAQMP..... 1

1.4 Consultation for preparation of the CAQMP..... 1

2 Legal and other requirements..... 2

2.1 Legislation..... 2

2.2 Guidelines and standards..... 2

2.3 Minister’s Conditions of Approval ..... 3

3 Existing environment ..... 4

4 Environmental aspects and impacts ..... 4

5 Environmental mitigation measures ..... 5

6 Compliance management..... 8

6.1 Roles and responsibilities..... 8

6.2 Training..... 8

6.3 Monitoring and inspections..... 8

6.4 Non-conformances ..... 9

6.5 Complaints ..... 9

6.6 Audits..... 9

7 Review and improvement of CAQMP ..... 9

**APPENDICES**

Appendix A Strong Wind Work Modification Record

**TABLES**

Table 2-2 CoA relevant to this CAQMP ..... 3

Table 5-1 Air quality mitigation measures ..... 6

Table 6-1 Monitoring and inspection..... 8

## GLOSSARY / ABBREVIATIONS

CoA	Conditions of Approval
Ancillary facility	Defined by the Infrastructure Approval as a temporary facility for construction, including for example an office and amenities compound, construction compound, batch plant (concrete or bitumen), materials storage compound, maintenance workshop, testing laboratory or material stockpile area.
CAQMP	Construction Air Quality Management Plan
CEMP	Construction Environmental Management Plan
CRM	Community Relations Manager
CSWQMP	Construction Soil and Water Quality Management Plan
CWMP	Construction Waste Management Plan
DEC	NSW Department of Environment and Conservation
DECC	NSW Department of Environment and Climate Change
DP&E	Department of Planning and Environment
Director General	Director General of the NSW Department of Planning and Infrastructure (or delegate). Now the Secretary of the Department of Planning and Environment.
EA	Environmental Assessment
EEC	Endangered Ecological Community
EPA	Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPL	Environmental Protection Licence
ER	Environmental Representative
EWMS	Environmental Work Method Statements
FM Act	<i>Fisheries Management Act 1994</i>
NEPC	National Environment Protection Council
NERDDC	National Energy Research, Development and Demonstration Council
NOW	NSW Office of Water
OEH	Office of Environment and Heritage
PESCP	Progressive Erosion and Sediment Control Plan
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
RMS	Roads and Maritime Services
Secretary	Secretary of the Department of Planning and Environment
TSP	Total suspended particulates
WDA	WestConnex Delivery Authority
WHO	World Health Organisation



# 1 Introduction

## 1.1 Purpose

This Construction Air Quality Management Plan (CAQMP) describes how Fulton Hogan will manage and control dust emissions during construction of the WestConnex M5 King Georges Road Interchange Upgrade (the Project).

Gaseous emissions from the Project, such as those generated by vehicle exhausts, are not considered to present a significant risk to the environment and community and therefore, are not considered in this CAQMP. Refer to the Construction Waste Management Plan (CWMP) for measures to reduce greenhouse gas emissions during construction.

This CAQMP has been prepared to address the requirements of the Minister's Conditions of Approval (CoA), mitigation measures listed in the WestConnex M5 King Georges Road Interchange Upgrade Environmental Impact Statement (EIS) (Jacobs, October 2014), RMS's Specification D&C G36 Environmental Protection, and applicable guidelines and legislation.

## 1.2 Background

The EIS determined that there is potential for construction dust emissions to cause nuisance impacts where the activities would occur close to sensitive receivers. These impacts, however, will be temporary and generally can be managed through the implementation of appropriate mitigation measures.

The implementation of the mitigation measures in this CAQMP will assist to substantially reduce emissions and minimise potential impacts on sensitive receivers.

## 1.3 Structure of CAQMP

This CAQMP is part of Fulton Hogan's environmental management framework for the Project and is supported by other documents such as the *Strong Wind Work Modification Record* and environmental work method statements. The review and document control processes for this CAQMP are described in Chapter 10 of the CEMP.

## 1.4 Consultation for preparation of the CAQMP

This CAQMP has been developed in consultation with the EPA. A summary of consultation undertaken during the preparation of this CAQMP is provided in Appendix A2 of the CEMP.

## 2 Legal and other requirements

### 2.1 Legislation

Legislation relevant to air quality management includes:

- *Environmental Planning and Assessment Act 1979 (EP&A Act)*
- *Protection of the Environment Operations Act 1997 (POEO Act)*
- *Protection of the Environment Operations (Clean Air) Regulation 2010, and*
- *National Greenhouse and Energy Reporting Act 2007.*

Relevant provisions of the above legislation are explained in the register of legal and other requirements included in Appendix A1 of the CEMP.

Matters relating to the *National Greenhouse and Energy Reporting Act 2007* are addressed in the Construction Waste Management Plan (CWMP).

### 2.2 Guidelines and standards

The main guidelines, specifications and policy documents relevant to this CAQMP include:

- National Environment Protection Council's (NEPC) – National Environment Protection Measure (NEPM) for Ambient Air Quality
- AS 3580.1.1:2007 Methods for sampling and analysis of ambient air: Part 1.1: Guide to siting air monitoring equipment
- AS 3580.10.1:2003 Methods for sampling and analysis of ambient air: Method 10.1: Determination of particulate matter – Deposited matter – Gravimetric method
- AS/NZS 3580.12.1:2001 Methods for sampling and analysis of ambient air - Determination of light scattering - Integrating Nephelometer method
- Action for Air (NSW EPA, 1998), and
- Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (Department of Environment and Conservation NSW (DEC), 2005).

## 2.3 Minister's Conditions of Approval

The CoA relevant to this CAQMP are listed in **Table 2-1** below. A cross reference is also included to indicate where the condition is addressed in this CAQMP or other environmental management documents.

**Table 2-1 CoA relevant to this CAQMP**

CoA No.	Condition Requirements	Document Reference
CoA D31	As part of the CEMP for the SSI, the Proponent shall prepare and implement (following approval): (g) a Construction Air Quality Management Plan to detail how construction impacts on air quality will be minimised and managed. The Plan shall be developed in consultation with the EPA and shall include, but not necessarily be limited to :	This CAQMP
	I. the identification of potential sources of dust and other emissions;	CEMP Appendix A3
	II. key performance indicators;	Refer to the objectives and targets for the project in the CEMP Section 3.6
	III. measures to monitor and manage dust emissions, including dust from stockpiles, and materials tracking from construction sites onto public roads;	Chapter 5 Section 6.3
	IV. strategies to minimise air emissions from off road diesel equipment, including but not limited to graders, bulldozers and loaders;	Chapter 5
	V. mitigation measures to be implemented, including measures during weather conditions where high level dust episodes are probable (such as strong winds in dry weather) ;	Chapter 5 Appendix A
	VI. mechanisms and procedures to be implemented in the event that adverse air quality impacts arise;	Section 6.4
	VII. record keeping procedures;	Section 6.3 CEMP Chapter 10
	VIII. methods for assessing compliance against the identified key performance indicators;	Sections 6.3-6.6 CEMP Section 3.6
	IX. mechanisms for reporting against key performance indicators ; and	CEMP Section 3.6
	X. mechanism for the monitoring, review and amendment of this plan.	Chapter 7

### 3 Existing environment

As identified in section 9.6 of the EIS, the Project area has a diversity of land use types, including suburban residential neighbourhoods, community facilities with open space and parkland, commercial use areas, and major transport corridors.

Areas considered sensitive to direct air quality impacts are located within 200 m of the Project. Land uses mainly include low-density residences and community and educational facilities, including:

- Open space, including Richard Podmore Reserve, Robert Gardner Reserve, Windara Reserve, John Mountford Reserve, M5 Linear Park and Canterbury Golf Course
- Beverley Hills North Public School, on the western side of King Georges Road
- Two childcare centres, including Active Kids Childcare, on Penshurst Road, and
- Places of worship, including St Matthews Anglican Church and New Apostolic Church on Shorter Street.

The Sydney region is characterised by mild-to-warm summers and cold winters. Meteorological data are collected by the Bureau of Meteorology (BoM), and the closest BoM weather station is located at Sydney Airport, about 8 km to the east of the study area. January is the hottest month, with a mean maximum temperature of 26.5°C, and July is the coldest month with a mean minimum temperature of 7.2°C.

Mean temperatures exhibit variability and seasonal flux across the year. Mean 9am temperatures range from 22.4°C in January to 10.8°C in July. Mean 3pm temperatures vary from 4.8°C in January to 16.1°C in July.

Relative humidity also displays variability over the year. Mean 9am relative humidity levels range from 74 per cent in June to 61 per cent in October. Mean 3pm relative humidity levels vary from 63 per cent in February to 49 per cent in August. June is the wettest month, with an average rainfall of 122.8 mm over 8.8 days. September is the driest month, with an average rainfall of 60.4 mm over 6.8 days.

Maximum wind speeds during the warmer months have a greater variation between the 9am and 3pm conditions compared to the colder months. Mean 9am wind speeds range from

16.3 km/h in October to 12.6 km/h in May and mean 3pm wind speeds range from 25.3 km/h in November to 17.1 km/h in May.

### 4 Environmental aspects and impacts

A risk management approach was used to determine the severity and likelihood of the construction activities' impact on air quality and to prioritise its significance. This process considered potential regulatory and legal risks as well the concerns of the community and other key stakeholders.

The objectives of the risk assessment were to:

- Identify activities, events or outcomes that have the potential to adversely affect the local environment and/or human health/property
- Qualitatively evaluate and categorise each risk item
- Assess whether risk issues can be managed by environmental protection measures
- Qualitatively evaluate residual risk with implementation of measures.

Appendix A3 of the CEMP contains a list of issues, related to air quality aspects and corresponding risks associated with the Project. Measures to mitigate the identified environmental risks are also provided.

## 5 Environmental mitigation measures

The main sources of potential dust impacts during construction of the Project were identified in the EIS and include:

- Clearing of vegetation and topsoil by bulldozers and/or backhoes
- Excavation and levelling of soil by bulldozers, backhoes and/or excavators
- Haulage of soil and fill by dump trucks
- Wind erosion from unsealed surfaces and stockpiles, and
- Construction vehicles travelling on unsealed areas, creating wheel-generated dust.

There is potential for construction dust emissions to cause nuisance impacts given that activities would occur relatively close to sensitive receivers such as dwellings and community facilities

In addition to the Project construction activities, a number of other environmental factors will also affect dust emissions including:

- wind direction – determines whether dust and suspended particles are transported in the direction of the sensitive receivers;
- wind speed – governs the potential suspension and drift resistance of particles;
- soil type - more erodible soil types have an increased soil or dust erosion potential;
- soil moisture – increased soil moisture reduces soil or dust erosion potential; and
- rainfall or dew – rainfall or heavy dew that wets the surface of the soil and reduces the risk of dust generation.

Specific mitigation measures to address dust impacts on air quality are outlined in Table 5-1.

Table 5-1 Air quality mitigation measures

ID	Mitigation Measure	Timing		Responsibility
		PC <sup>1</sup>	C <sup>2</sup>	
<b>GENERAL</b>				
CAQMM1	Provide training to all Project personnel, including relevant sub-contractors on air quality control practices and the requirements from this CAQMP through inductions, toolboxes and targeted training.	✓	✓	Environmental Manager
CAQMM2	Include air quality mitigation measures from this CAQMP in relevant Environmental Work Method Statements (EWMS) and / or Progressive Erosion and Sediment Control Plans (PESCP).	✓	✓	Project / Site Engineer Environmental Officer
<b>DUST</b>				
CAQMM3	Progressively revegetate all disturbed areas and long term stockpiles (unused for longer than 4 weeks) as soon as practicable to minimise wind-blown dust. Stockpiles or areas that may generate dust are to be managed in accordance with the RMS Stockpile Site Management Guideline (2011).		✓	Foreman Project / Site Engineer Superintendent Environmental Officer Construction Manager
CAQMM4	Water unsealed areas, including stockpiles and haul roads, during working hours to minimise wind-blown or traffic generated dust emissions.		✓	Foreman
CAQMM5	Cover unsealed roads with densely graded road base where practicable if dust is excessive.		✓	Foreman
CAQMM6	Restrict speeds of construction traffic to 20km/h or 40km/h for haul roads. Signpost the speed limit.		✓	Foreman
CAQMM7	Restrict construction traffic to designated roadways.		✓	Foreman
CAQMM8	Prevent mud tracking on public roads by installing stabilised access (e.g. Hardstand, rock, rumble grids, or wheel washes) at all access/egress points on site.		✓	Foreman
CAQMM9	Remove mud spilt by construction traffic from public roads as soon as it is identified/reported and at the end of each working day.		✓	Foreman
CAQMM10	Modify or stop construction activities during periods of strong wind (in excess of 40km/h) and in response to strong wind weather forecasts. Record this in the <i>Strong Wind Work Modification Record</i> included in Appendix A.		✓	Foreman Environmental Officer
CAQMM11	Maintain all vehicles and construction equipment in good working order to prevent excessive exhaust emissions in accordance with the manufacturer's specification to comply with all relevant legislation. Where possible, off road diesel		✓	Procurement Manager Foreman

ID	Mitigation Measure	Timing		Responsibility
		PC <sup>1</sup>	C <sup>2</sup>	
	equipment used must be compliant with Australian Design Rules 80 – Emission Control for Heavy Vehicles.			
CAQMM12	Turn machinery and vehicles off when not in use.		✓	Subcontractors Foreman
CAQMM13	Cover all loads that enter or leave the site.		✓	Subcontractors Foreman
CAQMM14	Use temporary ground covers such as soil stabilisers or hydromulch as much as possible to stabilise batters, stockpiles and large surface areas.		✓	Foreman Environmental Manager

<sup>1</sup> PC means pre-construction

<sup>2</sup> C means construction

## 6 Compliance management

### 6.1 Roles and responsibilities

Fulton Hogan’s Project Team organisational structure and overall roles and responsibilities are outlined in Section 4.1 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in **Table 5-1** of this CAQMP.

### 6.2 Training

All employees, subcontractors and utility staff working on site will undergo site induction training relating to air quality management issues, including:

- Existence and requirements of this CAQMP
- Relevant legislation
- Roles and responsibilities for air quality management
- Air quality mitigation measures.

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in air quality management. Examples of training topics include:

- Planning and preparedness for strong wind events (in excess of 40km/h) / dust risk periods
- Lessons learnt from dusty periods, incidents and other events, e.g. low rainfall / strong wind (in excess of 40km/h).

Further details regarding staff induction and training are outlined in Chapter 5 of the CEMP.

### 6.3 Monitoring and inspections

Regular monitoring and inspections will be undertaken during construction in accordance with Table 6-1. Additional requirements and responsibilities in relation to inspections and monitoring are documented in Sections 8.1 and 8.2 of the CEMP.

**Table 6-1 Monitoring and inspection**

Monitoring details	Area	Record	Responsibility	Frequency	KPI
Meteorological data including daily rainfall, temperature, relative humidity, wind (direction and speed) and barometric pressure	All	Weather forecasts from BOM Daily rainfall records	Environmental Manager	Daily	N/A
Visual observations during daily site inspections, including activities observed outside of the Project that may impact on dust levels near sensitive receivers	All	Strong Wind Work Modification Record, where wind in excess of 40km/h Complaints records	Foreman and Environmental Manager	Daily	Number of pollution complaints per month related to dust or mud on public roads

## 6.4 Non-conformances

Any non-conformances related to air quality will be dealt with and documented in accordance with Section 8.5 of the CEMP.

## 6.5 Complaints

Complaints will be recorded and addressed in accordance with Section 6.3 of the CEMP and the Community Communication Strategy (CCS).

## 6.6 Audits

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental mitigation measures, compliance with this CAQMP, CoA and other relevant approvals, licences and guidelines. Audit requirements are detailed in Section 8.4 of the CEMP.

# 7 Review and improvement of CAQMP

The CAQMP will be reviewed annually to ensure compliance with legislative requirements and its suitability and effectiveness for the project.

The review may be in the form of:

- a formal management review
- a second party audit, and/or
- an inclusion as a separate item at a site meeting.

The Environmental Manager can review and update the CAQMP more regularly where:

- significant changes in construction activities occur
- where targets are not being achieved, or
- in response to audits and nonconformity reports.

Minor changes to the CAQMP will be approved by the Environmental Representative in accordance with section 1.8 of the CEMP.

# **Appendix A**

## **Strong Wind Work Modification Record**

### Strong Wind Work Modification Record

Item	Detail
Date	
Time	
Location	
Wind speed and direction	
Existing controls in place to minimise dust generation	
Modifications to work practices implemented	
Additional controls implemented (e.g. barriers, non-toxic biodegradable polymer binder, mist cannons)	
Outcome	
Any other comments	

Completed by:

Date:     /     /

Related Plan: Construction Air Quality Management Plan