

Victorian Desalination Project



D&C Utilities Environmental Management Plan Attachment I4 – Air Quality Sub Plan

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Table of Contents

Definitions and Acronyms 4

1 Purpose and scope..... 6

2 Objectives and Targets..... 6

 2.1 Performance Requirements 6

 2.2 Air Quality Standards 7

3 Legal regulatory, licence, permits and approval requirements 8

4 Existing conditions and issues 8

 4.1 Air Quality..... 8

 4.2 Meteorology 9

 4.3 Sensitive receptors..... 10

5 Environmental risk11

 5.1 Potential Sources..... 12

 5.1.1 Dust..... 12

 5.1.2 Vehicle emissions..... 13

 5.1.3 Odour 13

6 Control, management and mitigation measures 13

7 Site environmental plans 13

8 Evaluating performance and reporting 14

9 Contingency measures 14

 9.1 Excessive dust 14

 9.2 Odour or other non-dust complaints 17

 9.3 Fire event 17

10 References 18

 10.1 VDP Documents..... 18

 10.2 Technical / legislative documents 18

ATTACHMENT I4.1 AIR QUALITY – CONTROL MEASURES TABLE 19

ATTACHMENT I4.2 AIR QUALITY – DUST MONITORING PROTOCOL..... 20



Definitions and Acronyms

The following and Definitions and Acronyms are used in this document:

AQM	Air Quality Management
BOM	Bureau of Meteorology
CWMS	Construction Work Method Statements
D&C	Design and Construct Phase of the VDP
DEWHA	Department of the Environment, Water, Heritage and the Arts
DSE	Department of Sustainability and Environment
DPI	Department of Primary Industries
DPIW	Department of Primary Industries and Water
EES	Environment Effects Statement
EIRP	Environmental Incident Response Plan
Emergency Response Services	May, as appropriate, mean police, ambulance, fire brigades, state emergency services, hospitals or other specialist groups
EMP	Environmental Management Plan
EMR	Environmental Management Representative
EMS	Environmental Management System
EO	Environmental Officer
EPA	Victorian Environment Protection Authority
EP Act	<i>Environment Protection Act 1970</i>
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
JHA	Job Hazard Analysis
JSEA	Job Safety and Environmental Analysis
NAP	National Action Plan
NEPM	National Environment Protection Measure
PEM	Protocol for Environmental Management
PM2.5	Particulate Matter 2.5 microns or less
PM10	Particulate Matter 10 microns or less
O&M	Operation and Maintenance Phase of the VDP
OHS	Occupational Health and Safety
Performance Criteria	The Performance Criteria outline the overarching requirements based on the environmental objective for each Subject Area of Schedule A of Appendix S3 of the Project Scope and Project Requirements
Pollution of Atmosphere	A person shall not pollute the atmosphere so that the condition of the atmosphere is so changed as to make or be reasonably expected to make the atmosphere—



D&C Utilities EMP Attachment I4 – Air Quality Sub Plan

	<p>(a) noxious or poisonous or offensive to the senses of human beings;</p> <p>(b) harmful or potentially harmful to the health, welfare, safety or property of human beings;</p> <p>(c) poisonous, harmful or potentially harmful to animals, birds or wildlife;</p> <p>(d) poisonous, harmful or potentially harmful to plants or other vegetation; or</p> <p>(e) detrimental to any beneficial use made of the atmosphere.</p> <p>(s.41, Environment Protection Act 1970)</p>
PR	Performance Requirements
PS&PR	Project Scope and Project Requirements
SEP	Site Environmental Plans
SEPP	State Environment Protection Policy
SEPP (AAQ)	State Environment Protection Policy (Ambient Air Quality)
SEPP (AQM)	State Environment Protection Policy (Air Quality Management)
The State	The Honourable Timothy James Holding, MP, in his capacity as the Minister for Water of the State of Victoria for and on behalf of the Crown in the Right of the State of Victoria
TDJV	Thiess Degrémont Joint Venture
TSP	Total Suspended Particulates
Utilities corridor	Construction footprint of the Victoria Desalination Project transfer pipeline, power supply and associated utilities
VDP	Victorian Desalination Project
VDP Utilities	Collective term used to refer to the power supply, transfer pipeline and communications components of the VDP including compensations reaction stations, surge vessels and the booster pump station. Refer to Section 1.4 of the Utilities Area EMP for further description of these utilities.
WAP	Work Area Packages
WP	Work Packs



1 Purpose and scope

This Air Quality Sub Plan describes the existing air quality conditions and the management measures required to mitigate the potential negative impacts to air quality from the design and construction (D&C) of the Victorian Desalination Project (VDP) transfer pipeline and power supply (collectively referred to as the utilities corridor). This sub plan does not specifically include air quality impacts to worker health and safety, which are addressed in the project-wide OH&S Management Plan.

This sub plan must be read in conjunction with the Environmental Management System (EMS) Manual, D&C Environmental Management Plan (D&C EMP) and the D&C Utilities EMP. This sub plan forms an attachment to the D&C Utilities EMP and addresses requirements listed in the Environmental Compliance Tracker (TDV-0-EV-RP-0001-01), including licence conditions, Performance Requirements (PRs), Performance Criteria (PC) and other obligations which may influence air quality.

Specific management measures from this and other environmental sub plans have been incorporated into Work Area Packages (WAP) and Work Packs (WP) which include Construction Work Method Statements (CWMS), Site Environmental Plans (SEP) and Job Safety and Environmental Analysis (JSEA's) where applicable.

2 Objectives and Targets

The objective of this sub plan is to ensure there are no public health risks or loss of amenity due to emissions of dust, exhaust gases and/or odour to the environment during construction of the transfer pipeline or power supply and to ensure project objectives, targets and obligations, including PRs and associated criteria, are met.

2.1 Performance Requirements

Table 1 outlines the relevant air quality objectives and targets nominated to be achieved during the D&C phase of the VDP. Numbered entries are applicable performance requirements taken from Schedule A of Appendix S3 of the Project Deed. Non-numbered entries in Table 1 have been identified through earlier rounds of agency consultation.

Table 1: Environmental objectives, targets and performance requirements

Issue	Objective/Performance Criteria	Target/Performance Requirement
Air quality – dust	<p>Protect air quality</p> <p>Limit dust emissions (PR#22148) C.</p> <p>Compliance with the State Environment Protection Policy (Air Quality Management) and EPA Best Practice Environmental Management – Environmental Guidelines for</p>	<p>Develop and implement methods and management systems (including monitoring) to maintain air quality during construction consistent with State Environment Protection Policy (Air Quality Management) intervention levels for particulates and EPA Best Practice Environmental Management – Environmental Guidelines for Major Construction Sites (1996) (PR#22150) C.</p>

D&C Utilities EMP Attachment I4 – Air Quality Sub Plan

Issue	Objective/Performance Criteria	Target/Performance Requirement
Air quality – odour and emissions	Major Construction Sites (1996) (PR#22148) C.	Register interest with Parks Victoria fire operation plans to ensure site managers are informed of planned burn offs in the area of any construction works (PR#22151) C.
	Minimise dust impacts on sensitive receiver sites (PR#22148) C.	
	Protect air quality Compliance with the State Environment Protection Policy (Air Quality Management) and State Environment Protection Policy Ambient Air Quality (PR#23153) D,C. Comply with the EPA Works Approval (PR#23154) D,C.	Monitor and report the effect of Project Activities on air quality (PR#23157) C.

D = Design phase requirement; C= Construct phase requirement

All PRs from Project Deed Schedule A of Appendix S3 are contained within the D&C Utilities EMP Attachment G – Environmental Obligations Register. The Environmental Compliance Tracker tracks conformance with these PRs and is updated regularly by the TDJV Environmental Coordinator and Area Environmental Managers.

2.2 Air Quality Standards

State Environment Protection Policy (Air Quality Management) (SEPP (AQM)) specifies intervention levels to be used in the assessment of air quality monitoring data to determine whether beneficial uses of the environment are being protected.

SEPP (AQM) defers to EPA's Mining and Extractive Industries Protocol for Environmental Management (Mining PEM) for guidance on assessing results from dust deposition gauge sampling.

As established in the EES process, the relevant dust criteria to gauge off-site impacts are listed in Table 2.

Table 2: Relevant Dust Criteria to Gauge Off-site Dust Impact

Constituent	Criterion	Averaging Period
PM ₁₀ ⁽¹⁾	60µg/m ³	24 hours
PM _{2.5} ⁽¹⁾	36µg/m ³	24 hours
Deposition Rate ⁽²⁾	4 g/m ² /mth	monthly

(1) SEPP – AQM, Schedule B, Intervention Level,

(2) Monitoring requirement only – Mining PEM, Section 4



D&C Utilities EMP Attachment I4 – Air Quality Sub Plan

These criteria are to be met at the nearest sensitive locations to the work area and not necessarily the work area boundary.

3 Legal regulatory, licence, permits and approval requirements

This sub plan has been developed in accordance with the following legislation and standards:

- ~ *Environment Protection Act, (1970)*
 - SEPP AQM
 - State Environmental Protection Policy (Ambient Air Quality) (SEPP AAQ)
- ~ EPA Best Practice Environmental Management – Environmental Guidelines for Major Construction Sites (1996).

The legislative and contractual requirements for the D & C Utilities works are summarised in:

- ~ D&C Utilities EMP – Attachment E – Environmental Legislation Register
- ~ D&C Utilities EMP – Attachment F – Environmental Licence, Permit and Approval Register
- ~ D&C Utilities EMP – Attachment G – Environmental Obligations Register.

The applicable PRs from Project Deed Schedule A of Appendix S3 are provided in Table 1.

Under the Project Deed the D&C EMP, all sub plans and any changes to these must be endorsed by the State, who may refer aspects to relevant agencies.

EPA and any other relevant agencies and stakeholders will be consulted with regard to any specific approval requirements in relation to this sub plan. The requirements of any permits, licences and approvals obtained will be placed in the Environmental Licence, Permit and Approval Register on receipt and updated in the Environmental Compliance Tracker.

4 Existing conditions and issues

4.1 Air Quality

Along the proposed transfer pipeline and power supply alignment, there are a number of man-made and natural sources of existing ambient (background) dust and other emissions. These are:

- ~ Motor vehicles
- ~ Exposed soil
- ~ Industrial processes
- ~ Sea salt
- ~ Heating and power generation
- ~ Fuel reduction burning on agricultural land.

These dust and emissions sources may originate locally, or may be wind-blown from greater Melbourne or the Latrobe Valley. Natural sources of dust are expected to be the most common along the utilities corridor during construction.

D&C Utilities EMP Attachment I4 – Air Quality Sub Plan

The nearest dust monitoring sites to the Bass Coast are metropolitan Melbourne (Port Phillip) and the Latrobe Valley, but the ambient dust levels in the region of the corridor are more comparable to the listed regional Victorian sites in Table 3. Regional sites would have lower ambient levels of respirable dust than the densely populated residential areas of metropolitan Melbourne. The Ballarat and Warrnambool sites represent the closest comparable regional sites, although each has a larger regional population density.

Due to the exposed nature of the Bass Coast, lower population density and distance from major airsheds, a background dust level of less than $20\mu\text{g}/\text{m}^3$ is considered a conservative estimate (especially on and south of the Kilcunda Ridge) of the 70th percentile background PM_{10} concentration for use in the air quality assessment (Environmental Effects Statement (EES), Technical Appendix 65).

Table 3: Daily PM_{10} concentrations in Victoria – 75th percentiles during 2006

Performance monitoring location	Region	75th percentile ($\mu\text{g}/\text{m}^3$)	Data availability
Alphington	Port Phillip	23.9	87.1
Brighton		19.8	89.9
Dandenong		30.0	100
Footscray		25.8	90.1
Geelong South		26.9	91.0
Mooroolbark		29.1	97.3
Richmond		24.3	97.5
RMIT (CBD)		23.6	78.4
Moe		Latrobe Valley	21.6
Traralgon	22.1		99.7
Ballarat	Regional	20.1	60.5
Mildura		31.2	46.6
Warrnambool		24.0	21.9

Source: EES Volume 3, Chapter 9 (2008)

4.2 Meteorology

Meteorological data has been sourced from climatic weather stations to define conditions that can affect air quality along the utilities corridor. The weather stations are:

- ~ Wonthaggi – representing Bass Coast south of Kilcunda Ridge
- ~ Rhyll – representing the eastern side of Western Port
- ~ Cranbourne – representing the northern and inland side of Western Port.

The rainfall data at the local weather stations show no distinct dry season in the region of the grid connection though the varying topography of the Bass Coast means that areas of the grid connection receive differing quantities of rain. Exposed areas such as Kilcunda Ridge and the Bass Coast receive more rain than low lying inland areas (GHD 2008, Technical Appendix 76). Details on historical wind direction and wind speed in the region of the utilities corridor can be found in EES Volume 5, Chapter 9.

These weather stations will be utilised throughout the project works to obtain climatic weather data.



D&C Utilities EMP Attachment I4 – Air Quality Sub Plan

The project has installed two fixed weather stations along the utilities corridor: one in Pakenham at the northern limit of the project area and one in the Gurdies midway along the utilities corridor. The fixed weather station at the plant site will be used at the southern end of construction. These will provide local weather information that will inform implementation of environmental controls based on weather conditions. In addition 6 portable monitors (Dust Trak units) will be progressively deployed along the corridor which are also linked to weather information.

4.3 Sensitive receptors

A number of receptors located along the utilities alignment, such as schools, residential premises, sports grounds, clinics, hospitals and wetlands, are considered to be sensitive locations in regards to health and amenity impacts due to dust, odour and vehicle emissions. The construction works will generally occur near the rural townships of Wonthaggi, Lang Lang and Koo Wee Rup and will terminate in the residential areas of Berwick and Cranbourne. Prior to works, potential receptors in the vicinity of the construction site need to be identified and an evaluation completed for their potential sensitivity to airborne dust impacts, an inherent risk (before controls) assessed to be high in the risk assessment (D&C Utilities EMP, Attachment C). As the installation of the transfer pipeline and the power supply will occur on a number of fronts, it is anticipated that sensitive receptors will be identified prior to the commencement of works on each front.

The protocol which will be used is outlined in Figure 1.

D&C Utilities EMP Attachment I4 – Air Quality Sub Plan

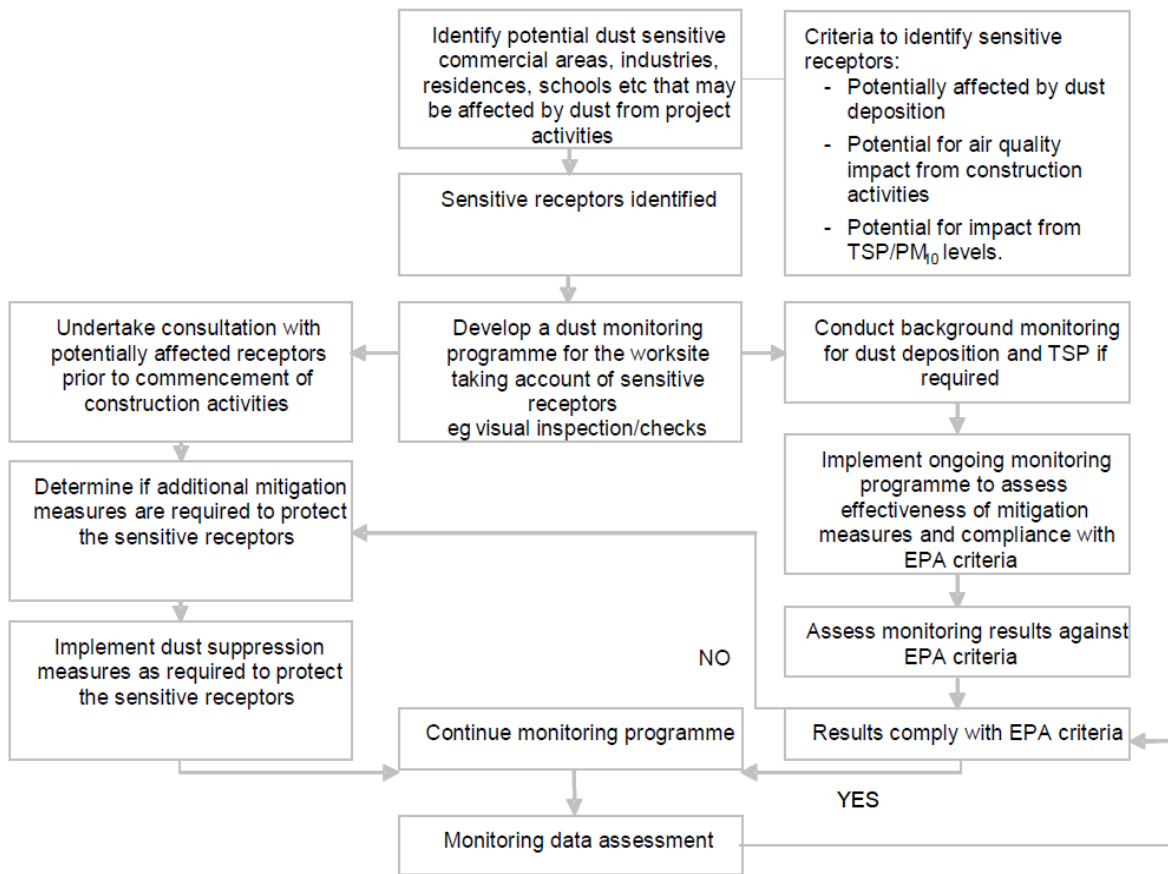


Figure 1: Dust Sensitive Receptor Identification and Monitoring Protocol

TSP = Total Suspended Particulates;

Sensitive receptors for odour or vehicle emissions are identical to those for dust emissions. The approach outlined in Figure 1 will be generally applied to odour or vehicle emissions, should inspections or community complaints indicate the presence of an issue.

5 Environmental risk

An environmental risk assessment has been carried out for the Utilities Corridor. This assessment is contained in the Environmental Risk Register, Attachment C of the D&C Utilities Area EMP. Table 4 summarises the potential hazards from project activities, potential impacts of these hazards and the risk of occurrence as rated by the environmental risk assessment.

Table 4: Summary of utilities risk assessment for Air Quality

Activity posing hazard	Risk/ Potential Impact	Inherent Risk (before controls)	Control Measure Reference (Att I04.1)
Excavation, transfer of material and movement of stockpiles and soils	Potential for Dust disturbance and impacts on sensitive receptors	High	#23-28
Reinstatement establishment activities impacting properties, fences, land, structures or houses	Potential for Dust disturbance and impacts on sensitive receptors	Moderate	#14-20
Extreme hot dry conditions during a weekend or overnight break in construction causing excessive dust emanating from the site	Potential for dust disturbance and impacts on sensitive receptors	High	#29-31
Fire event resulting from construction activities or natural events leading to a fire event	Potential for air quality impacts on sensitive receptors	High	#7, 33-37

Attachment C of the D&C Plant and General Area EMP should be consulted for a comprehensive assessment of these risks.

Excessive smoke from vehicle exhausts and odours emitted from excavation in fill areas (which may expose buried organic or putrescible material) were not deemed as significant in the environmental risk assessment, but are included below for completeness.

Situations that could lead to a fire event and how to respond to it are detailed in Section 9 Contingency Measures.

5.1 Potential Sources

Emissions from construction activities associated with the transfer pipeline and power supply will be related to surface works including site clearance, earthworks, excavation, spoil stockpiling and management, vehicle movements, pipejacking and tunnelling activities.

5.1.1 Dust

The major potential dust sources during construction activity are expected to include, but not be restricted to:

- ~ General surface earthworks particularly during worksite establishment
- ~ Open excavation works, piling, rock crushing/hammering and trenching works
- ~ Spoil handling – including stockpiling, placement, compaction and spoil loading/unloading activities
- ~ Wind erosion of exposed areas of worksite including topsoil and temporary spoil stockpiles
- ~ Vehicular movements on the worksite over unsealed areas.

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

- ~ Wind Direction – determines whether dust and suspended particles are transported off site and in what direction

D&C Utilities EMP Attachment I4 – Air Quality Sub Plan

- ~ Wind Speed – governs the potential suspension and drift distance of particles
- ~ Soil Moisture – increased soil moisture reduces soil erosion and dust generation potential
- ~ Rainfall or Dew – rainfall or heavy dew will reduce potential for dust suspension
- ~ Area of exposed or cleared land.

These factors will significantly affect the day to day risk of dust generation and suspension. Accordingly, they are to be considered by the Environmental Officer to ensure the implementation of suitable management measures, such as water spraying, road cleaning and covering of temporary stockpiles to minimise dust generation. These measures should be undertaken in conjunction with, and notwithstanding the Water Quality and Erosion Management Sub Plan, which outlines the management of clean and wastewater on site.

5.1.2 Vehicle emissions

The major potential vehicle emissions are anticipated to include, but not be restricted to:

- ~ Equipment (including generators and static plant) and vehicle exhaust emissions at start up and during construction activities, especially during trenching operations
- ~ Machinery and vehicles running or idling when not in use
- ~ Transport of pipes, material and personnel to the construction work front.

5.1.3 Odour

The potential odour sources may include, but not be restricted to:

- ~ Excavation or exposure of Acid Sulfate Soils including the Powlett River, Yallock Creek and the Holden Proving Ground.

6 Control, management and mitigation measures

Attachment I4.1 describes a range of mitigation and control measures that will be used to minimise and manage potential air quality impacts.

The measures in Attachment I4.1 are designed to address potential impacts from the risks outlined in Section 5 as well as deliver on the objectives, targets and in particular the PRs listed in Section 2. They include requirements and responsibilities for design, construction, evaluating performance and reporting.

Attachment I4.1 also references Design Packages (DPs) in design-related control measures. PRs that relate to design are addressed in accordance with the Design Management Plan (PL-TDV-PM-0-X-000-0011-0-00).

7 Site environmental plans

Site Environmental Plans (SEPs) have been developed for specific worksites (or spreads) along the transfer pipeline or power supply works that detail practical environmental management measures implemented to minimise potential impacts of construction activity on the environment and community.

The information contained in the SEPs is presented in pictorial and tabular drawing format. This is to make them easy to use by all site personnel, consultants and subcontractors. SEPs are updated to reflect operating practices on a regular basis.



D&C Utilities EMP Attachment I4 – Air Quality Sub Plan

The air quality management controls set out in the SEPs are drawn from this sub plan

SEPs are held by Area Environment Managers.

8 Evaluating performance and reporting

Dust impact on sensitive receptors has been identified by the environmental risk assessment as the highest risk to air quality from construction activities along the utilities corridor. Construction dust monitoring and reporting will be undertaken in accordance with the protocol outlined in Attachment I4.2 Air Quality – Dust Monitoring Protocol.

Environmental audits and site environmental inspections (SEIs) are scheduled to detect where PRs are not being met with appropriate corrective actions developed to address these issues as they arise. Schedules, responsibilities and reporting procedures for dust and other potential air emission monitoring, are set out in the Monitoring, inspection, audit and reporting schedule - Attachment L of the D&C Utilities EMP.

Monitoring will be undertaken by appropriately qualified personnel, in accordance with the appropriate standards and guidelines as specified in Attachment L of the D&C Utilities Area EMP. Monitoring equipment will be calibrated in accordance with relevant Australian Standards. Where monitoring identifies levels exceeding the targets specified in this sub plan, contingency measures will be followed (see Section 9.1 Excessive dust).

9 Contingency measures

Contingency measures have been developed and are summarised below. The control measures table (Attachment I4.1) focuses on preventative measures.

All environmental incidents will be responded to in accordance with the Utilities Environmental Incident Response Procedure (EIRP). The EIRP provides project specific details for the identification of and response to potential environmental related incidents along the utilities corridor during the D&C phase of the VDP. It provides assistance in managing potential and actual incidents, as well as follow-up and reporting requirements.

The environmental risk assessment has identified the following circumstances that could occur outside normal operating conditions:

- ~ Extreme hot dry conditions causing excessive dust emanating from the site
- ~ Fire event.

9.1 Excessive dust

An excessive dust event may be identified through:

- ~ Triggering of real time PM₁₀ aerosol dust monitoring alert level (average PM₁₀ >100µg/m³ for consecutive 15 minute periods)
- ~ Receipt of a justified complaint relating to dust impact
- ~ Visual inspection identifies localised generation of excessive dust



D&C Utilities EMP Attachment I4 – Air Quality Sub Plan

The response to complaints received in relation to dust nuisance will be in accordance with the D&C Community Involvement Plan (DC-CIP). The process for receiving, handling and documenting these enquiries is detailed in Attachment K of the D&C EMP, Enquiry and Complaints Process.

In either of these cases contingency measures will be implemented in accordance with the procedure outlined in Figure 3.

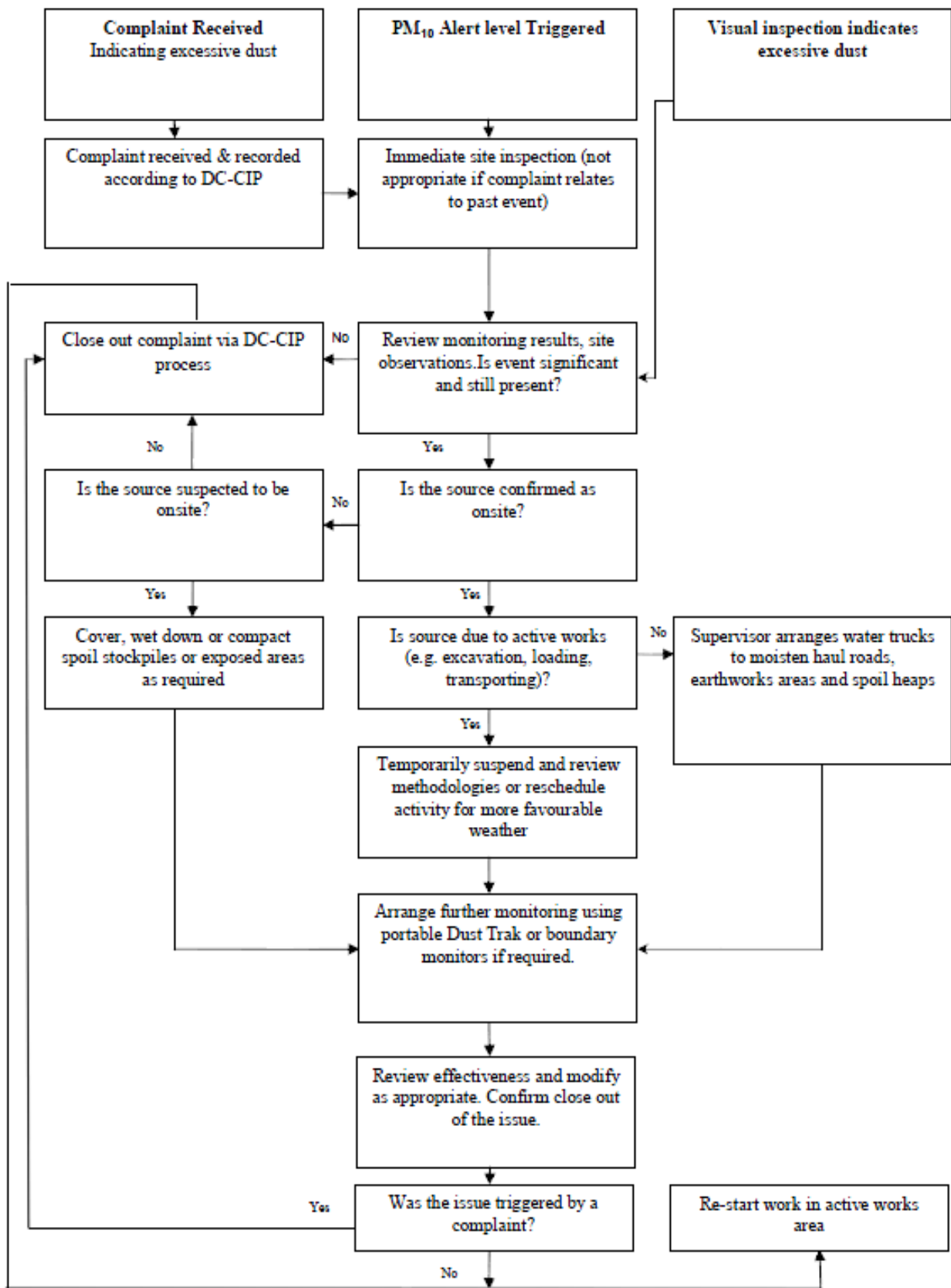


Figure 3: Excessive dust – contingency procedure

9.2 Odour or other non-dust complaints

Any complaints received regarding potential air quality impacts that do not relate to dust, such as odour or vehicle emissions, will be dealt with according to the contingency procedure for dust outlined in Figure 3 above, noting that control measures to address the issue, if caused by project works, will be different to those for mitigating dust.

In addition to the procedure outlined in Figure 3, if an odour problem is identified through excavating acid sulfate soils, odorous waterway muds or decomposing organic material, the following general measures will be implemented:

- ~ Identify the source of the odour
- ~ Separate and cover (cap) the offending material
- ~ Assess the extent of residual odour by monitoring at the boundary of the site
- ~ Engage an odour expert to determine appropriate longer-term mitigation action
- ~ (if associated with acid sulfate soils refer to the Acid Sulfate Soils Sub Plan)

9.3 Fire event

Potential pathways that may lead to a fire event within the plant site are:

- ~ Unexpected ignition of flammable and combustible liquids during normal construction operations
- ~ Welding works (particularly along the transfer pipeline construction during high temperatures) may lead to an unexpected spark and subsequent fire
- ~ Small plant operations (e.g. grinders, chainsaws) causing a spark and subsequent fire
- ~ Large plant operations (excavator digging near underground pipe) causing a spark and subsequent fire
- ~ Large plant operations hitting overhead power lines, causing them to fall, spark and cause a fire
- ~ Inappropriate disposal of cigarette butts, leading to fire
- ~ Natural causes (lightning strike).

Should a fire event occur the following protocols will be in place and actions undertaken:

- ~ The site supervisor will call a halt to all work on site and evacuate personnel to the emergency assembly area (to be determined on a site by site basis)
- ~ Report to the relevant emergency authority (CFA; MFB branch). These contact numbers will be provided in each site shed or with the site supervisor
- ~ Should the fire event be too large to be dealt with by personnel on site, then all personnel will remain in the emergency assembly area if safe. Should this area be deemed unsafe, the site supervisor will direct personnel to an alternative location, inform local property owners of a potential threat, and await fire fighting authorities to extinguish the fire.

Fire event procedures are dealt with further in the overarching project Incident Management Plan.



10 References

10.1 VDP Documents

- ~ Environmental Effects Statement, Volume 3, Chapter 9
- ~ Minister of Planning VDP Assessment under the Environment Effects Act 1978, (Jan 2009)
- ~ Environmental Effects Statement, Technical Appendix 76, GHD 2008

10.2 Technical / legislative documents

- ~ State Environment Protection Policy (Air Quality Management) No. S240, Gazette 21/12/200, Victorian EPA
- ~ State Environmental Protection Policy (Ambient Air Quality) No. S19, Gazette 9/2/1999, Victorian EPA
- ~ EPA Best Practice Environmental Management – Environmental Guidelines for Major Construction Sites (1996)
- ~ AS 2922-1987 Guide for the Siting of Sampling Units
- ~ AS 3580.10.1 1991 Particulates – Deposited Matter – Gravimetric Method
- ~ AS 3580.9.6-1990 Particulate Matter – PM10 – High-volume Sampler with Size-selective Inlet
- ~ EPA Vic 2007 Protocol for Environmental Management – Mining and Extractive Industries Pubn 1191, December 2007.



D&C Utilities EMP Attachment I4 – Air Quality Sub Plan

ATTACHMENT I4.1 AIR QUALITY – CONTROL MEASURES TABLE

ATTACHMENT I4.1 AIR QUALITY – CONTROL MEASURES TABLE

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
	Air Quality						
1	Burn off awareness	22151	To ensure site managers are informed of planned burns offs in the area of any construction works the project will register interest with Parks Victoria fire operation plans (see Community Involvement Plan).	Stakeholder and Community Relations Manager	Construct	Evidence of communication	
2	Vehicle Exhaust Emissions	23153	Vehicles and machinery to be fitted with appropriate emission control equipment	Area Environment Manager and Site Manager	Design, Construct	Purchase records	
3	Vehicle Maintenance	23153	Trucks and construction equipment entering the site will be well maintained in accordance with the manufacturer's specification to comply with all relevant regulations	Site Manager	Construct	Maintenance records	
4	Vehicle Maintenance	23153	Vehicles with smoky exhausts (more than ten (10) seconds) shall be stood down for maintenance	Site Manager	Construct	Inspection records	
5	Idling emissions	23153	Unnecessary idling for trucks and plant should be avoided with engines turned off during periods of inactivity.	Site Manager	Construct	Inspection records	
6	Congestion management	23153	Delivery of materials should be planned and co-ordinated to avoid congestion and excessive truck queuing and/or idling where possible	Site Manager	Construct	See Traffic Management Plan	
7	Open burning	23153	There will be no open burning or incineration at any construction areas without relevant permits and approvals	Site Manager	Construct	Inspection records	
8	Odour control	23153	All waste material will be stored in sealed containment within waste designated bins	Site Manager and Environmental Officer	Construct	Inspection records	

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
9	Odour control	23157	Regular checking for odour at the boundary of the work site during excavation of odorous materials (including acid sulfate soils).	Site Manager and Environmental Officer	Construct	Daily logs	
10	Legislative Compliance	23153	Comply with air quality criteria and management as laid out in State Environment Protection Policy (Air Quality Management) and State Environment Protection Policy (Ambient Air Quality).	Design Package Manager and Area Environment Manager	Design, Construct	PM ₁₀ monitoring records – evidence of no exceedances	
	Dust						
11	Water controls	22148, 22150	Minimise dust emissions from the site using water suppression spraying.	Site Manager	Construct	Inspection records, daily logs	
12	Offsite dust	22148, 23157	Carry out visual inspection to ensure that emissions of visible dust are not leaving the site	Site Manager	Construct	Inspection records	
13	Inspection of dust controls	22148, 23157	Carry out visual inspection of the worksite as part of the Site Environmental Inspection to monitor likelihood of dust generation and effectiveness of the dust mitigation measures	Site Manager	Construct	Inspection records	
14	Weather forecasts	22148, 22150	Daily weather forecasts communicated to Site Manager to help plan works i.e. manage wind-blown dust, use rain to suppress dust. Consider changing practices ahead of forecasts of sharp increases in wind speed.	Site Manager and Environmental Officer	Construct	Inspection records	
15	Monitor weather	22148	Record weather conditions (real time, data logging) utilising an on site weather station	Environmental Officer	Construct	Weather station records	
16	Monitoring	22148, 22150, 23157	Implement a dust monitoring programme in accordance with the Dust Monitoring Protocol (Attachment I4.2) and the D&C Plant and General Area EMP Attachment L, Monitoring, inspection, audit and reporting schedule.	Environmental Officer	Construct	Monitoring records	
17	Internal roads	22148, 22150	Where possible, form haul road of compacted non-descript excavated material on the worksite prior to substantial construction works to reduce potential for dust generation resulting from vehicle movements	Construction Manager	Construct	Inspection records	

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
18	Dust control	22148, 22150	If dust is visible use appropriate measures (eg water sprays) to dampen exposed surfaces on the worksite to control dust generation, including: exposed stockpiles, unsealed roadways, and dry/fine materials.	Construction Manager	Construct	Daily logs	
19	Dust control	22148, 22150	Do not use contaminated water to suppress dust. Ensure water used for dust suppression is of a quality that will not adversely affect nearby surface water bodies or groundwater system at the site	Construction Manager	Construct	Inspection records	
20	Vehicle generated dust	22148, 22150	Regularly inspect sealed surfaces for deposited spoil. If present, use appropriate measures to reduce the potential for dust generation from vehicle movements	Construction Manager	Construct	Inspection records	
21	Surface run-off	22148, 22150	Limit the application of water for dust suppression so that runoff is prevented	Construction Manager	Construct	Inspection records	
22	Dust containment	22148, 22150	Erect dust screens and/or wind fences around sensitive receptors where required.	Construction Manager / Site Manager	Construct	Site environmental plans	
23	Vehicle speeds in trafficked areas	22148, 22150	Ensure vehicle speeds within the worksite areas are minimised at all times by placing restrictions eg 20km/h	Site Manager	Construct	Inspection records	
24	Load management	22148, 22150	Check all trucks carrying spoil on public roads are covered and tailgates are secured, prior to leaving the worksite	Site Manager	Construct	Inspection records	
25	Load management	22148, 22150	Limit truck loads to a vertical height no greater than 0.5 metres above the side walls of the vehicle body	Site Manager	Construct	Inspection records	
26	Haul routes	22148, 22150	Clearly define haul routes in traffic management plan	Site Manager	Construct	Site Environmental Plans	

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
27	Stockpiles	22148, 22150	Control dust from temporary stockpiles of spoil using appropriate measures such as by spraying water regularly, compacting the material or coating to reduce potential for dust generation during stockpiling	Construction Manager	Construct	Daily logs	
28	Stockpiles	22148, 22150	Dust from stockpiles may also be controlled by allow vegetation to establish or spraying with a polymer based crusting agent that seals the surface of the stockpile to aid dust suppression.	Construction Manager / Site Manager	Construct	Daily logs	
29	Extreme Weather Conditions	22148, 22150	If excessive dust is observed on the worksite or generated by construction activities (eg from high winds, surface dirt accumulation etc), focus control of dust emissions around sensitive receptors and note areas that require additional controls such as application of polymer based crusting agent or broadcast of sterile grass seed	Construction Manager and Site Manager	Construct	Daily logs	
30	Extreme Weather Conditions	22148, 22150	Under strong wind conditions, review the frequency of watering and spraying of surfaces and, if conditions are dry, increase across the site to control dust generation	Site Manager	Construct	Daily logs	
31	Extreme Weather Conditions	22148, 22150	Commence dust suppression before work starts each day to wet site prior to work start. See also water management measures.	Construction Manager	Construct	Daily logs	
32	Water Management	22148, 22150	Minimise the use of potable water in line with the Resource Efficiency Sub Plan. This will include use of <ul style="list-style-type: none"> - recycled water from on-site sedimentation basins or dewatering of the trench (combination of groundwater and surface water). - utilising groundwater extracted for temporary dewatering of the trench - identifying other non- potable water sources (such as water from quarries) 	Construction Manager	Construct	Inspection records	
33	Fire Induction	22150, 22151	Staff will be appropriately inducted with safety measures to address an on site fire as necessary	Site Manager	Construct	Induction records	

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
34	Suitable fire equipment	22150, 22151	All site offices and work fronts shall store suitable fire extinguishing equipment, inclusive of but not limited to; water extinguishers; foam extinguishers; CO ₂ extinguishers; and, fire blankets as deemed necessary dependent upon identified risks in the JHA for each site	Site Manager	Construct	Inspection records	
35	Fire response kits in vehicles	22150, 22151	If the site contains no site office, the site supervisor will carry a fire response kit in their work vehicle to be on site whenever work is being undertaken within that site	Site Manager	Construct	Inspection records	
36	Heat-out rules	22150, 22151	Permits will be obtained from the relevant authorities for welding and other hot works during total fire ban days	Site Manager	Construct	Daily logs	
37	Weather forecasts	22150, 22151	Regular updates on forecast storm conditions, to inform site supervisors of potential fire hazards, should a lightning storm ensue.	Site Manager	Construct	Inspection records	
38	Monitoring	22150, 23157	Monitoring during construction to be in accordance with section 8 of this sub plan	Environmental Officer	Construct	Monitoring records	

* The Responsibilities column refers in many cases to senior positions within the project organisation, due to the changing nature of project teams. In practice some responsibilities may be delegated by the person nominated.



D&C Utilities EMP Attachment I4 – Air Quality Sub Plan

ATTACHMENT I4.2 AIR QUALITY – DUST MONITORING PROTOCOL

ATTACHMENT I4.2 AIR QUALITY – DUST MONITORING PROTOCOL

Requirement	Measure
General Approach	<p>This dust monitoring protocol will be implemented on site.</p> <p>Incremental air quality impacts will be determined by monitoring deposition and concentration impacts relative to potentially affected sensitive receptor[s].</p> <p>Typical baseline conditions for the area (PM₁₀ concentration profiles only) will be referenced from existing regional conditions available from the Ballarat, Mildura and Warrnambool meteorological sites.</p>
Dust monitoring programme	<p>Dust Trak “fixed” monitoring units</p> <p>Six real time aerosol dust monitors (Dust Trak), with selective size inlets, are available for use on each work front / spread to allow continuous monitoring of dust levels. Dust Trak monitors are mounted on tripods for the duration of work activity in a spread and linked with SMS capabilities to allow real time access to data, which is available at http://www.dataloggers.net.au/.</p> <p>The location of the sites to be monitored is based on an even distribution throughout in each work area or construction spread. Monitors will be placed between construction operations and the identified sensitive receiver.</p>
Dust monitoring programme	<p>Dust Trak hand held monitoring</p> <p>Two further portable aerosol dust monitors (Dust Trak) will be available and utilised to conduct spot checks of aerosol dust levels as required. This may be in response to a dust event or complaints.</p>
Dust monitoring programme	<p>Dust deposition gauges</p> <p>In accordance with the dust monitoring programme established in the EES process, the site utilises seven dust deposition gauges in the vicinity of the work corridor which are rolled over progressively each month as construction spreads along the corridor.</p> <p>Dust deposition gauges are collected and analysed on a monthly basis.</p>

Requirement	Measure
Alert Levels	<p>The real time aerosol dust monitoring station is configured to record 10-minute averages of PM₁₀.</p> <p>The 24 hours intervention level is 60µg/m³. The threshold particulate concentration for alarm / warning activation will be 100 µg/m³ over a 10 minute average.</p> <p>This level will be reviewed if deemed required in consultation with the EPA.</p> <p>The monitoring station is configured to provide a warning via an audible or visible signal of short term elevations in concentrations of respirable dust.</p> <p>The Environmental Officer is required to check the monitors on at least a daily basis</p>
Alert Level Response	<p>Where the alert level is triggered the response will be in accordance with Contingency Measures detailed in Section 9.0.</p>
Weather	<p>Weather station</p> <p>Two fixed weather stations are installed to record weather conditions that influence air quality including temperature, wind speed and direction. These weather stations are used to provide a real-time indication to the site office on the mean and gust wind speed and direction to assist in works planning</p>
Siting Requirements	<p>Standards for siting, installation and operation</p> <p>The aerosol monitoring stations and dust deposition gauges will conform to the Australian Standards: <i>AS 2922-1987 Guide for the Siting of Sampling Units</i>.</p> <p>The aerosol monitoring stations will conform to the relevant components of <i>AS/NZ 3580.12.1 2001 Methods for sampling and analysis of ambient air Method 12.1: Determination of light scattering</i> – integrating nephelometer method and <i>AS2923:1987 Ambient Air – Guide for the measurement of horizontal wind for air quality applications</i></p> <p>The dust deposition gauges will conform to <i>AS 3580.10.1 1991 Particulates – Deposited Matter – Gravimetric Method</i>.</p>
Analysis and reporting	<p>All laboratory analysis will be carried out by a NATA accredited facility.</p>