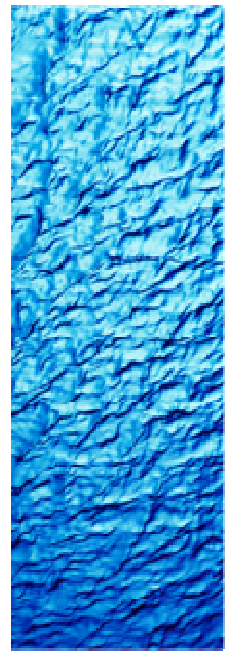
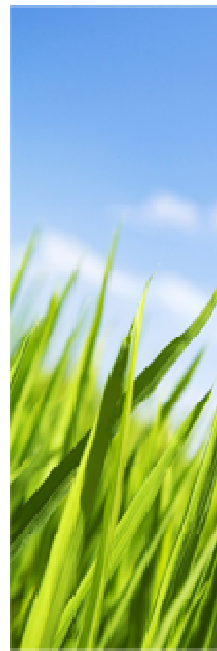
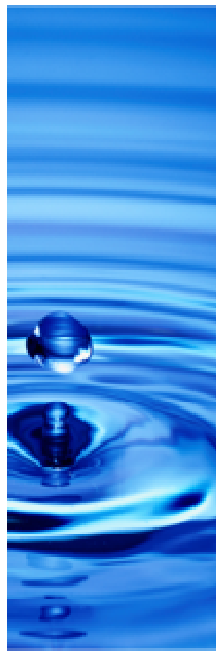
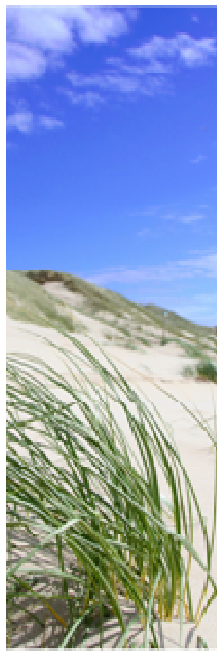


# Victorian Desalination Project



## D&C Plant and General Area Environmental Management Plan Attachment I4 – Air Quality Sub Plan

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## 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
EES	Environment Effects Statement
EIRP	Environmental Incident Response Plan
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
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
Plant site	Victorian Desalination Project Wonthaggi Plant site
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— (a) noxious or poisonous or offensive to the senses of human beings; (b) harmful or potentially harmful to the health, welfare, safety or property of human beings;



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- (c) poisonous, harmful or potentially harmful to animals, birds or wildlife;
  - (d) poisonous, harmful or potentially harmful to plants or other vegetation; or
  - (e) detrimental to any beneficial use made of the atmosphere.
- (s.41, Environment Protection Act 1970)

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)
TBM	Tunnel Boring Machine
TDJV	Thiess Degremont Joint Venture
TSP	Total Suspended Particulates
VDP	Victorian Desalination Project
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) Wonthaggi plant site. 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 Plant and General Area EMP. This sub plan forms an attachment to the D&C Plant and General Area 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 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><b>Protect air quality</b></p> <p>Limit dust emissions <b>(PR#22148) C.</b></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) <b>(PR#22150) C.</b></p>

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Issue	Objective/Performance Criteria	Target/Performance Requirement
Air quality – odour and emissions	Major Construction Sites (1996) <b>(PR#22148) C.</b>	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 <b>(PR#22151) C.</b>  - No complaints related to air and/or dust disruption (per year) <b>C.</b> - No visual dust <b>C.</b>
	Minimise dust impacts on sensitive receiver sites <b>(PR#22148) C.</b>	
	<b>Protect air quality</b> Limit odour emissions from Desalination Plant operations <b>(PR#23152) D.</b> Compliance with the State Environment Protection Policy (Air Quality Management) and State Environment Protection Policy Ambient Air Quality <b>(PR#23153) D,C.</b> Comply with the EPA Works Approval <b>(PR#23154) D,C.</b>	Develop and implement methods and management systems consistent with State Environment Protection Policy (Air Quality Management) and State Environment Protection Policy (Ambient Air Quality) to limit odour and emissions from the operation of the Desalination Plant and ensure no offensive odours beyond the boundary of the premises <b>(PR#23156) D.</b> Monitor and report the effect of Project Activities on air quality <b>(PR#23157) C.</b> - No complaints related to odour emissions (per year) <b>C.</b>
	Limit exhaust emissions	- No complaints related to exhaust emissions (per year) <b>C.</b>

D = Design phase requirement; C= Construct phase requirement

All PRs from Project Deed Schedule A of Appendix S3 are contained within the D&C Plant and General Area 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 well as respirable crystalline silica.

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 <sub>10</sub> <sup>(1)</sup>	60µg/m <sup>3</sup>	24 hours
PM <sub>2.5</sub> <sup>(1)</sup>	36µg/m <sup>3</sup>	24 hours
Respirable Crystalline Silica (as PM <sub>2.5</sub> ) – RCS <sup>(2)</sup>	60µg/m <sup>3</sup>	24 hours
Deposition Rate <sup>(3)</sup>	4 g/m <sup>2</sup> /mth	monthly

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

(2) Mining PEM, Table 2, Assessment Criteria

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

These criteria are to be met at the nearest sensitive locations to the plant site and not necessarily the site 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)*
  - o SEPP AQM
  - o 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 Plant and General Area are summarised in:

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

The applicable PRs from Project Deed Schedule A of Appendix S3 are provided in Table1.

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

The local air quality is strongly influenced by the air quality over Bass Strait. In particular, fine particulate (PM<sub>10</sub>) levels would be elevated from the contribution of sea salt particles. Air borne pollutants may originate locally, or may be wind blown from Bass Strait, greater Melbourne or the Latrobe Valley (EES, Technical Appendix 47).

Ambient air quality levels at the plant site have been estimated using guidelines set out in the SEPP (AQM) and EPA monitoring data. Table 3 provides a conservative measure of the ambient dust levels at air quality monitoring stations around Victoria and are used to estimate ambient background levels at the plant site.

**Table 3: Daily PM10 concentrations in Victoria – 75th percentiles during 2006**

Performance monitoring location	Region	75th percentile (ug/m <sup>3</sup> )	Data availability
Brighton	Port Phillip	19.8	89.9
Geelong South		26.9	91.0
Moe	Latrobe Valley	21.6	87.9
Traralgon		22.1	99.7
Ballarat	Regional	20.1	60.5
Warrnambool		24.0	21.9

Source: EES Volume 3, Chapter 9 (2008)

The generally windier conditions that occur in coastal areas would cause lower levels of ambient dust at the plant site compared to most of the locations listed in Table 3.

The nearest air quality monitoring sites to the Bass Coast are metropolitan Melbourne (Port Phillip) and the Latrobe Valley but the ambient levels in the region of the plant site are more comparable to the regional sites listed in Table 3.

With consideration to the exposed nature of the Bass Coast, low population density and distance from major air sheds, a conservative estimate of 20µg/m<sup>3</sup> for ambient respirable dust (PM<sub>10</sub>) will be used for the plant site area.

The typical odour in the vicinity of the plant site will be either marine or rural in character. There are no current data available to quantify this background odour. The low lying Powlett River is an area which may generate hydrogen sulfide odour emissions if the *insitu* muds are disturbed.

### 4.2 Meteorology

The Bureau of Meteorology (BOM) operates an automatic weather station at Rhyll and provides a close representation of the wind climate at the plant site. The Rhyll wind data shows that north to north-west winds are the most common (winter time) but the summer time sea breezes come from the south through to the west. The sea breeze influence is similar to that found at Wonthaggi, south through west. North-east to north-west winds experienced in Wonthaggi are more likely to prevail from the east closer to the plant site. Further meteorological data is available in the EES Volume 3, Chapter 9.

## D&C PGA EMP Attachment I4 – Air Quality Sub Plan

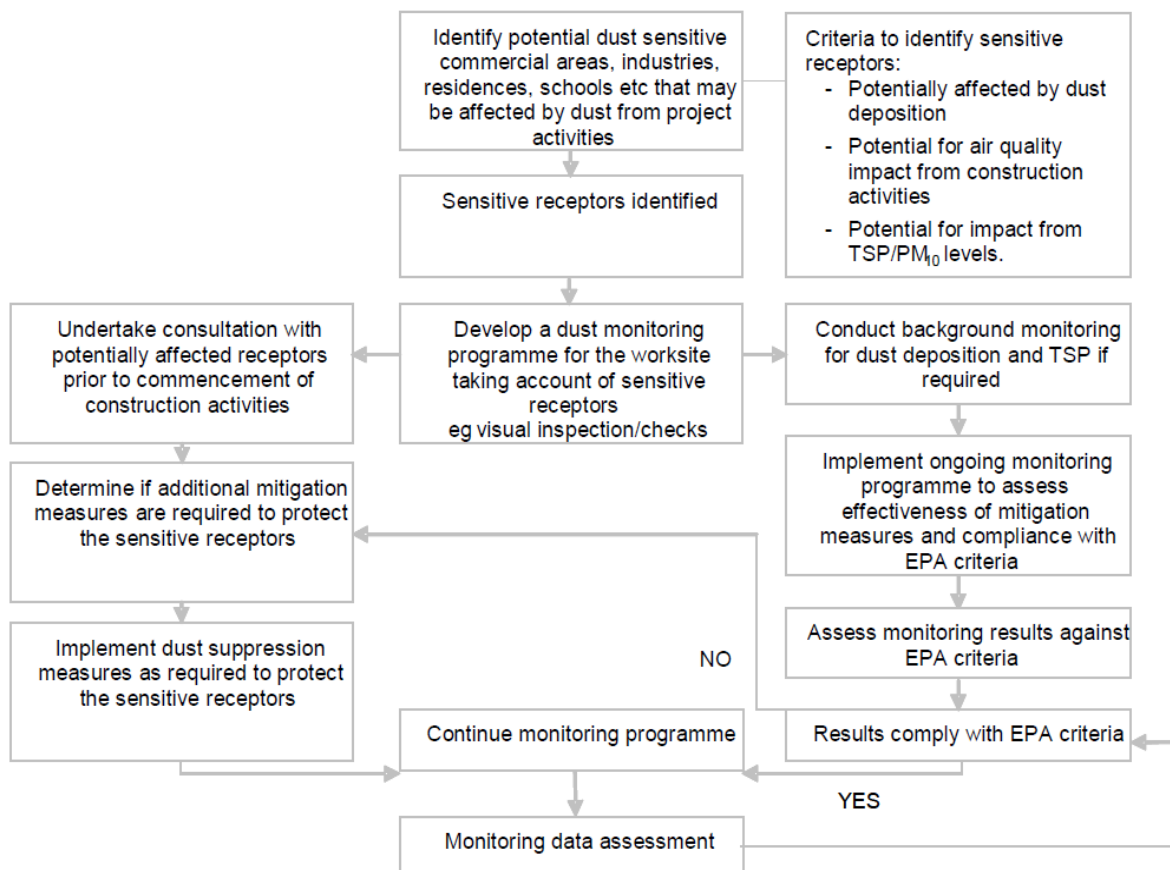
Rainfall at Wonthaggi shows no distinct dry season. Wonthaggi has a mean annual rainfall of 940mm and a mean of 148 rain days per year.

It is anticipated that the Rhyll weather station will be utilised throughout the project works to obtain climatic weather data for the region.

In addition, the project has installed a fixed weather station at the plant site that will provide local weather information to inform implementation of environmental controls based on weather conditions.

### 4.3 Sensitive receptors

The plant site is in the vicinity of the rural township of Wonthaggi. A number of receptors such as residential premises are located in the vicinity of the plant site. These receptors are considered to be sensitive locations in regards to health and amenity impacts due to odour, dust and vehicle emissions. Utilising this approach, the potential receptors in the vicinity of the plant site have been 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 Plant and General Area EMP, Attachment C). The protocol that is used is outlined in Figure 1.



**Figure 1: Dust Sensitive Receptor Identification and Monitoring Protocol**

TSP = Total Suspended Particulates;

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

Utilising the above approach, the monitoring locations identified in Figure 2 have been determined.

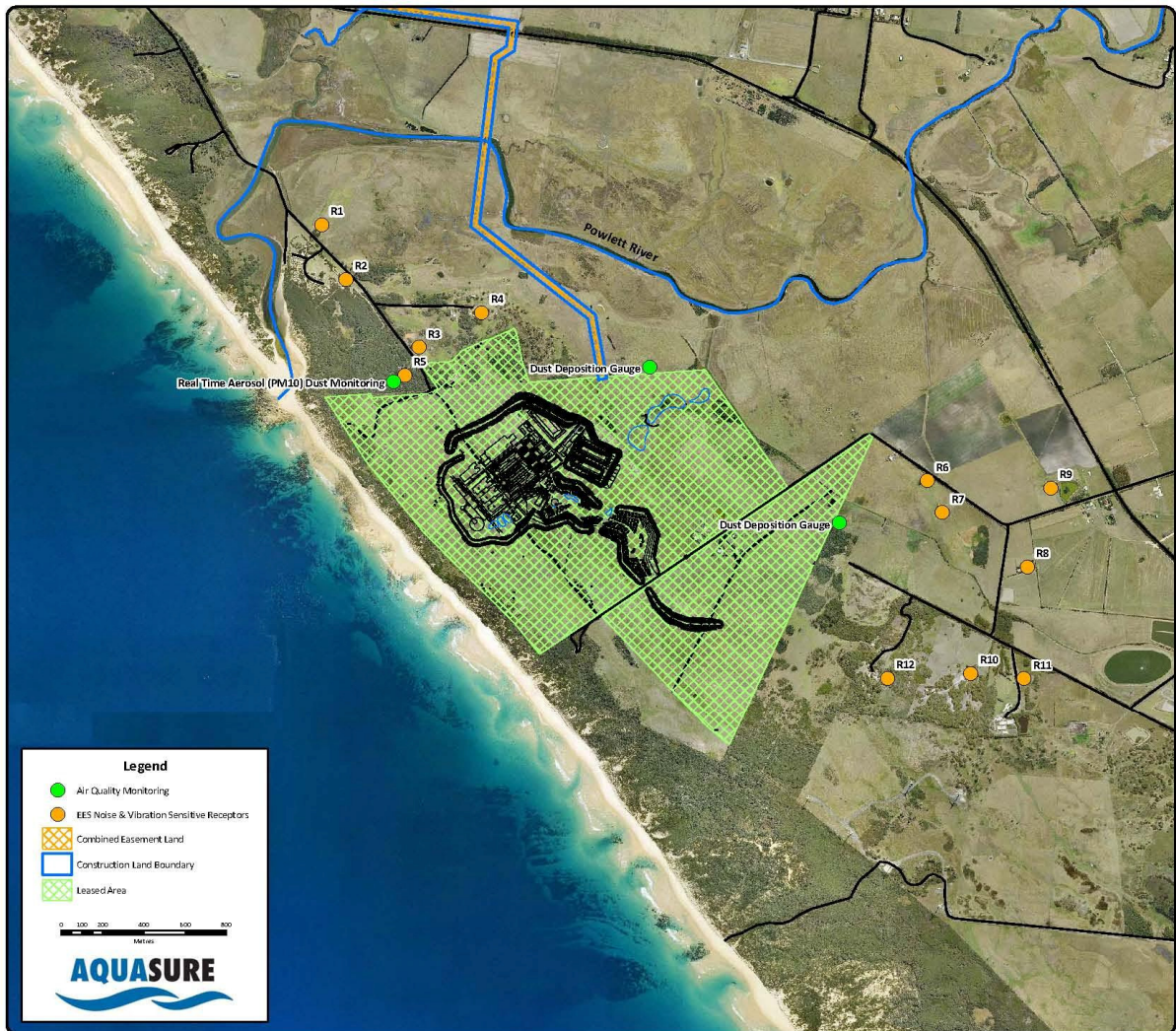


Figure 2: Dust Monitoring Sites

## 5 Environmental risk

An environmental risk assessment has been carried out for the D&C Plant and General Area works. This assessment is contained in the Environmental Risk Register, Attachment C of the D&C Plant and General 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 plant and general area risk assessment for Air Quality**

Activity posing hazard	Risk/ Potential Impact	Inherent Risk (before controls)	Control Measure Reference (Att I04.1)
Movement of soils, stockpiles and equipment on site	Potential for Dust disturbance and impacts on sensitive receptors	High	#21-30, 32-46
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	#47-49
Fire event resulting from construction activities or natural events leading to a fire event	Potential for air quality impacts on sensitive receptors	Low	#53-59

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

The major emissions from D & C activities will be related to surface works including site clearance, earthworks, excavation, spoil stockpiling and management and vehicle movements.

#### 5.1.1 Dust

The major potential dust sources are anticipated 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 fines on sealed areas
- ~ Spoil handling – including stockpiling, placement, compaction and spoil loading/unloading activities



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- ~ Wind erosion of exposed areas of worksite and temporary spoil stockpiles
- ~ Vehicular movements on the worksite over unsealed or dirty areas
- ~ Tracking of dirt onto roads resulting in offsite dust generation

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
- ~ 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 appropriate person (i.e. Site Manager) 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.

### 5.1.3 Odour

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

- ~ Excavation or exposure of muds in the vicinity of the Powlett River

## 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**

A single Site Environmental Plan (SEP) has been developed for the whole plant site that details environmental management measures such as permanent controls, No Go zones, property boundaries and significant flora and fauna species. These measures are implemented to minimise potential impacts of construction activity on the environment and community.

The information contained in the SEP 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.

The air quality management controls set out in the SEP are drawn from this sub plan. Additional practical management measures are picked up and covered by the Weekly Environmental Checklist.

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 at the plant site. 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 Lof the D&C Plant and General Area 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 Plant and General 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 plant site Environmental Incident Response Plan (EIRP). The EIRP provides project specific details for the identification of and response to potential environmental related incidents at the plant site 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 during a weekend or overnight break in construction causing excessive dust emanating from the site



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~ Fire event.

### 9.1 Excessive dust

An excessive dust event may be identified through:

- ~ Triggering of real time PM<sub>10</sub> aerosol dust monitoring alert level
- ~ Receipt of a justified complaint relating to dust impact
- ~ Visual inspection identifies localised generation of excessive dust

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.

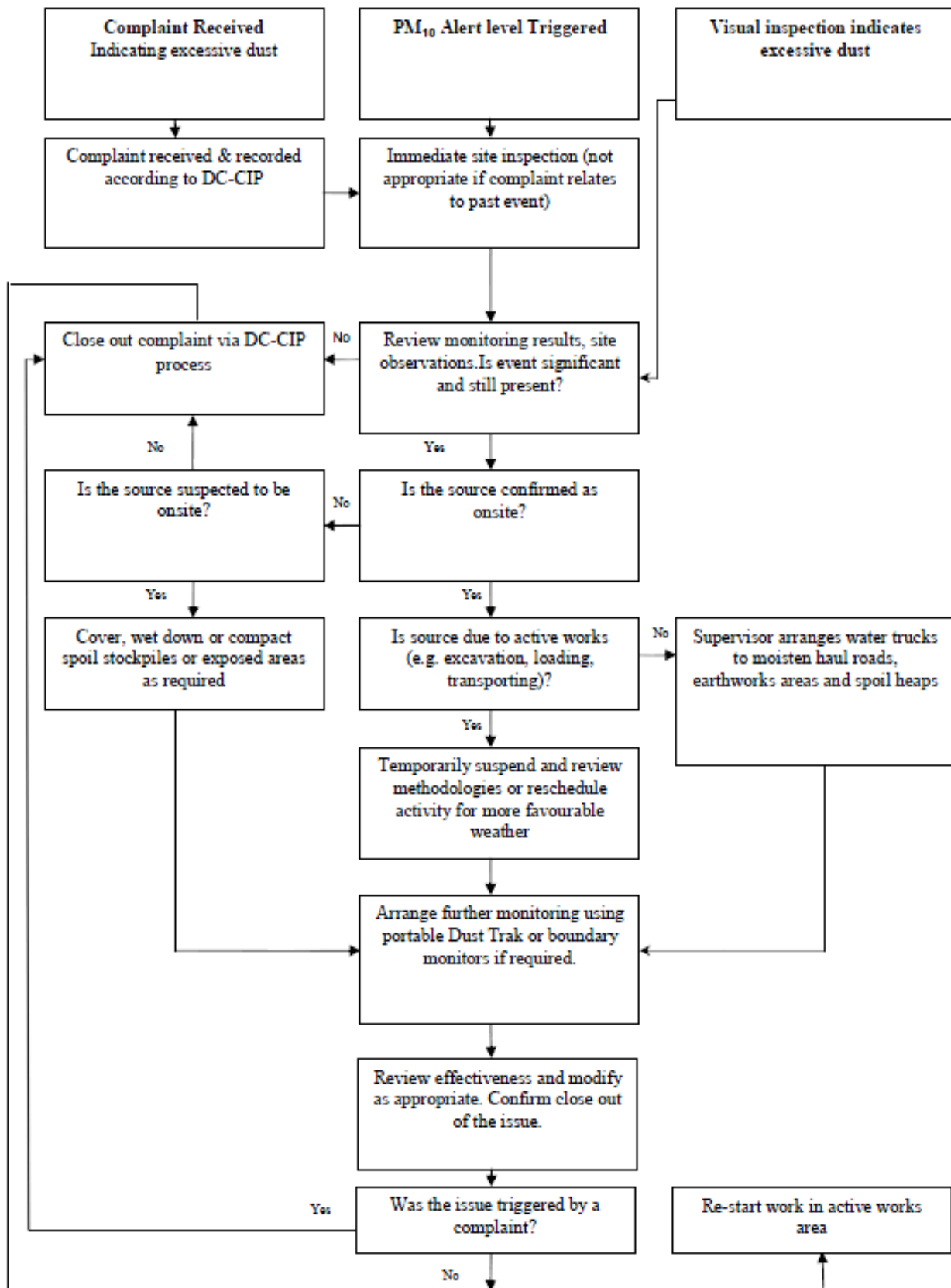


Figure 3: Excessive dust – contingency procedure



## 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.

## 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

## 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)



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- ~ 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.



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## **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
	<b>Air Quality</b>						
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	Ensure that all vehicles and machinery are 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. Truck idle times should be set at three minutes maximum	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	Site Manager	Construct	See Traffic Management Plan	
7	Open burning	23153	There will be no open burning or incineration at the construction worksite area	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	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
9	Odour control	23157	Regular checking for odour at the boundary of the site during excavation of odorous materials (including acid sulfate soils).	Site Manager and Environmental Officer	Construct	Daily logs	
10	Desalination Plant Operations – odour and emissions**	23152	DESIGN PACKAGE # DP 2-0001 – Plant Process Design Concept ensures each drum screen is fitted with a cover to prevent the occurrence of odours	Design Package Manager	Design	Validated design	
11	Desalination Plant Operations – odour and emissions**	23152	DESIGN PACKAGE # DP 2-0001 – Plant Process Design Concept ensures an automatic screen backwash system regularly washes away the screenings using seawater to prevent the occurrence of odours	Design Package Manager	Design	Validated design	
12	Desalination Plant Operations – odour and emissions**	23152	DESIGN PACKAGE # DP 2-0001 – Plant Process Design Concept ensures screenings are channelled through shredding devices and collected into an enclosed pit before being pumped to the plant effluent treatment facility to prevent the occurrence of odours	Design Package Manager	Design	Validated design	
13	Desalination Plant Operations – odour and emissions**	23152	DESIGN PACKAGE # DP 2-0001 – Plant Process Design Concept ensures screenings will end up in the sludge produced by the plant and will be removed from the site to prevent the occurrence of odours. The system is designed to deal with up to 100 kg/day of screenings.	Design Package Manager	Design	Validated design	
14	Desalination Plant Operations – odour and emissions**	23152	DESIGN PACKAGE # DP 2-0001 – Plant Process Design Concept ensures screenings can also be diverted into a dedicated skip and removed from site to prevent the occurrence of odours	Design Package Manager	Design	Validated design	

Att I4 D&C Plant and General Area - Air Quality Sub Plan

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
15	Desalination Plant Operations – odour and emissions**	23152	DESIGN PACKAGE # DP 2-0001 – Plant Process Design Concept ensures the effluent treatment facility includes Densadeg® clarifiers and centrifuge dewatering machines to prevent the occurrence of odours.	Design Package Manager	Design	Validated design	
16	Desalination Plant Operations – odour and emissions***	23152	DESIGN PACKAGE # DP 2-0001 – Plant Process Design Concept ensures dewatered sludge is collected into skips and removed from site to prevent the occurrence of odours.	Design Package Manager	Design	Validated design	
17	Desalination Plant Operations – odour and emissions**	23152	DESIGN PACKAGE # DP 2-0001 – Plant Process Design Concept ensures the clarifiers are fitted with a removable cover to prevent the occurrence of odours.	Design Package Manager	Design	Validated design	
18	Desalination Plant Operations – odour and emissions**	23152	DESIGN PACKAGE # DP 2-0001 – Plant Process Design Concept ensures the centrifuge machines and the sludge skips are located indoors to prevent the occurrence of odours.	Design Package Manager	Design	Validated design	
19	Desalination Plant Operations – odour and emissions**	23152	DESIGN PACKAGE # DP 2-0001 – Plant Process Design Concept ensures the sludge building is ventilated to prevent the occurrence of odours.	Design Package Manager	Design	Validated design	
20	Desalination Plant Operations – odour and emissions**	23152	DESIGN PACKAGE # DP 2-0001 – Plant Process Design Concept ensures sludge will not be stockpiled outdoors and will be removed regularly to prevent the occurrence of odours.	Design Package Manager	Design	Validated design	

### Att 14 D&C Plant and General Area - Air Quality Sub Plan

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
21	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 <sub>10</sub> monitoring records – evidence of no exceedances	
22	Legislative Compliance	23154	Comply with EPA Works Approval – Air Quality Management (as per measure above)	Area Environment Manager	Design, Construct	PM <sub>10</sub> monitoring records – evidence of no exceedances	
	<b>Dust</b>						
23	Water controls	22148, 22150	Minimise dust emissions from the site using water suppression spraying.	Site Manager	Construct	Inspection records, daily logs	
24	Offsite dust	22148, 23157	Carry out daily visual inspection to ensure that emissions of visible dust are not leaving the site	Site Manager	Construct	Inspection records	
25	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	
26	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	
27	Monitor weather	22148	Record weather conditions (real time, data logging) utilising an on site weather station	Environmental Officer	Construct	Weather station records	
28	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 F, Monitoring, inspection, audit and reporting schedule.	Environmental Officer	Construct	Monitoring records	
29	Internal roads	22148, 22150	Where possible, seal internal roads on the worksite prior to substantial construction works to reduce potential for dust generation resulting from vehicle movements	Construction Manager	Construct	Inspection records	

### Att I4 D&C Plant and General Area - Air Quality Sub Plan

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
30	Dust control	22148, 22150	If dust is visible use appropriate measures (eg water sprays, water bowsers etc.) to dampen exposed surfaces on the worksite to control dust generation, including: exposed stockpiles, unsealed roadways, and dry/fine materials within blasting/drilling areas	Construction Manager	Construct	Daily logs	
31	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 bodes or groundwater system at the site	Construction Manager	Construct	Inspection records	
32	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	
33	Surface run-off	22148, 22150	Limit the application of water for dust suppression so that runoff is prevented	Construction Manager	Construct	Inspection records	
34	Post construction dust control	22148, 22150	Seal or revegetate disturbed areas of the worksite as soon as practicable after completion of construction works to reduce potential dust generation	Site Manager	Construct	Inspection records	
35	Transfer system dust control	22148, 22150	Use water sprays on all conveyor transfer systems and other material transfer systems to control visible dust	Construction Manager / Site Manager	Construct	Daily logs	
36	Dust containment	22148, 22150	Erect dust screens and/or wind fences where possible.	Construction Manager / Site Manager	Construct	Site environmental plans	
37	Transport Management	22148, 22150	Position frequently trafficked haulage routes as far away from sensitive receptors as practicable	Site Manager	Construct	Site environmental plans	
38	Vehicle speeds in trafficked areas	22148, 22150	Ensure vehicle speeds within the worksite areas are minimised at all times by placing restrictions eg 25km/h	Site Manager	Construct	Inspection records	

Att I4 D&C Plant and General Area - Air Quality Sub Plan

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
39	Vehicle management	22148, 22150	Minimise the number of vehicles operating on site at any given time, where applicable.. in line with other drivers such as safety (minimising vehicle/ worker interactions)	Site Manager	Construct	Inspection records	
40	Vehicle wash on leaving site	22148, 22150	Clean wheels and under-rig of trucks (either through a wheel wash or using a high pressure water spray) prior to vehicles exiting the worksite to ensure that dirt is not tracked onto public roadways	Site Manager	Construct	Maintenance records	
41	Load management	22148, 22150	Check all trucks carrying spoil are covered and tailgates are secured, prior to leaving the worksite	Site Manager	Construct	Inspection records	
42	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	
43	Haul routes	22148, 22150	Clearly define haul routes.	Site Manager	Construct	Site Environmental Plans	
44	Stockpiles	22148, 22150	Locate stockpiles as far away from sensitive receptors as practicable	Construction Manager	Construct	Inspection records	
45	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	
46	Stockpiles	22148, 22150	Dust from stockpiles may also be controlled by utilising plastic sheeting to cover the mounds when not in use, or by 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	
47	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), stop all activities causing dust until the control of dust emissions is achieved, particularly if strong winds are blowing towards sensitive receptors	Construction Manager and Site Manager	Construct	Daily logs	

Att I4 D&C Plant and General Area - Air Quality Sub Plan

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
48	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	
49	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	
50	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"> <li>- Recycled water from on-site sedimentation basins</li> <li>- Collected stormwater runoff</li> </ul>	Construction Manager	Construct	Inspection records	
51	Water Management	22148, 22150	Apply water during periods of least evaporation (early morning and late evening) where practical. This should not preclude use at other times if dust issues are identified	Construction Manager	Construct	Daily logs	
52	Water Management	22148, 22150	Reduce the number of active work areas through a “start to finish” approach minimising areas requiring water to suppress dust.	Construction Manager	Construct	Site environmental plans	
53	Fire Induction	22150, 22151	Staff will be appropriately inducted with safety measures (i.e. video displaying appropriate actions and usage of equipment) to address an on site fire as necessary	Site Manager	Construct	Induction records	
54	Suitable fire equipment	22150, 22151	All site offices shall store suitable fire extinguishing equipment, inclusive of but not limited to; water extinguishers; foam extinguishers; CO <sub>2</sub> extinguishers; and, fire blankets as deemed necessary dependent upon identified risks in the JHA for each site	Site Manager	Construct	Inspection records	

### Att I4 D&C Plant and General Area - Air Quality Sub Plan

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
55	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	
56	Heat-out rules	22150, 22151	Heat-out rules in place for extreme weather, to ensure no welding works are undertaken in very hot conditions	Site Manager	Construct	Daily logs	
57	Spark safety	22150, 22151	Use of all hand-held plant that may cause a spark are used according to site safety protocols, and usage restricted or forbidden on total fire ban days	Site Manager	Construct	Inspection records	
58	Smoking signage	22150, 22151	Appropriate signage restricting smoking on site, along with designated 'smoking' areas with approved disposal bins	Site Manager	Construct	Inspection records - signage present	
59	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	
60	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.

\*\* see O&M EMP



D&C PGA 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>Further monitoring may be required in response to a request by Vic EPA, complaints, exceedances, or for the purpose of refining construction methods/techniques (aimed at minimising dust emissions). This additional monitoring will be devised in discussion with the parties involved.</p> <p>Incremental air quality impacts will be determined by monitoring deposition and concentration impacts at the nearest potentially affected sensitive receptor[s].</p> <p>Typical baseline conditions for the area (PM<sub>10</sub> concentration profiles only) will be referenced from existing regional conditions available from the Ballarat, Mildura and Warrnambool meteorological sites.</p>
Dust monitoring programme	<p><b>Dust Trak hand held monitoring</b></p> <p>One portable aerosol dust monitor (Dust Trak) is available and utilised to conduct spot checks or continuous monitoring as required. This may be in response to a dust event or complaints.</p>
Dust monitoring programme	<p><b>Dust deposition gauges</b></p> <p>In accordance with the dust monitoring programme established in the EES process, the site utilises two dust deposition gauges on the northern and eastern boundaries of the site (as shown in shown in Figure 2).</p> <p>Dust deposition gauges are collected and analysed on a monthly basis</p>

Requirement	Measure
Dust monitoring programme	<p><b>Real time aerosol dust monitoring station</b></p> <p>In accordance with the dust monitoring programme established in the EES process, the desalination plant site uses one real time aerosol dust monitor with PM<sub>10</sub> size selective inlet to assess the potential dust impacts at the nearest potentially affected receptor (see Figure 2).</p> <p>The aerosol is fitted with:</p> <ul style="list-style-type: none"> <li>- A 10µm size selective inlet matched to the inlet flow rate</li> <li>- A heating coil around the inlet air tube so as to reduce the humidity in the inlet air stream.</li> </ul> <p>The results can be used to</p> <ul style="list-style-type: none"> <li>- Provide a demonstration of compliance to the EPA criteria and</li> <li>- To compare against the nominated alert level and used to provide an evidence-based approach to manage and control construction operations on site.</li> </ul> <p>Typical indicative background monitoring not influenced by emissions from construction works will be used for comparative purposes (regional conditions available from Rhyll, Ballarat, Mildura and Warrnambool meteorological sites).</p>
Alert Levels	<p>The real time aerosol dust monitoring station is configured to record 10-minute averages of PM<sub>10</sub>.</p> <p>An alert level of 100 µg/ m<sup>3</sup> over a 10 minute average has been implemented in consultation with EPA.</p> <p>This level will be reviewed if deemed required in consultation with the EPA.</p> <p>The monitoring station is linked to a computer in the site office. The Environmental Officer is required to check the dust levels 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><b>Weather station</b></p> <p>An on site weather station is installed and utilised on site to record weather conditions such as wind speed and direction. It is 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>

Requirement	Measure
Siting Requirements	<p><b>Standards for siting, installation and operation</b></p> <p>The aerosol monitoring station 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 station 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 – integrating nephelometer method</i> 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	All laboratory analysis will be carried out by a NATA accredited facility.