

# **Air Quality Management Sub Plan**

Rev 03

Revised June 2019

# Dewhurst Gas Exploration Project Environmental Sub-Plan – Air Quality Management Sub Plan

## 1.1 Background

This Air Quality Management Plan (AQMP) is one of the Environmental Sub-Plans under the Project Environmental Management Plan (PEMP) for the Dewhurst Gas Exploration Pilot Expansion. This AQMP addresses mitigation measures and monitoring and reporting requirements associated with the management of air quality and greenhouse gas impacts of the Project.

Project-related emissions have been identified to include the following:

- Dust emissions associated with:
  - Vehicles travelling on unsealed roads;
  - Wind erosion from material stockpiles;
  - Excavation and drilling activities;
- Combustion emissions from:
  - Vehicle use;
  - Diesel use in mobile plant (e.g. excavators, graders);
  - On-site power generation.
- Greenhouse gas emissions associated with:
  - Fugitive methane from drilling operations and well development;
  - Fugitive leaks from gas production infrastructure; and
  - Flaring of produced gas;
  - Combustion of liquid and gaseous fuels.

This AQMP provides a framework for the monitoring and management of these emissions during the course of the Project.

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## 1.2 Key Statutory Requirements

### 1.2.1 General

The *Protection of the Environment Act 1997* (POEO Act) provides the statutory framework for the management of air emissions in NSW. *Part 5.4 Division 1* of the POEO Act addresses air pollution, of which the following are considered directly relevant to the management of air emissions from the Project:

- **Section 124: Operation of Plant (other than domestic plant);**

*The occupier of any premises who operates any plant in or on those premises in such a manner as to cause air pollution from those premises is guilty of an offence if the air pollution so caused, or any part of the air pollution so caused, is caused by the occupier's failure:*

*(a) to maintain the plant in an efficient condition, or*

*(b) to operate the plant in a proper and efficient manner.*

- **Section 126: Dealing with Materials**

*The occupier of any premises who deals with materials in or on those premises in such a manner as to cause air pollution from those premises is guilty of an offence if the air pollution so caused, or any part of the air pollution so caused, is caused by the occupier's failure to deal with those materials in a proper and efficient manner.*

- **Section 129: Emission of Odours from Premises Licenced for Scheduled Activities**

*(1) The occupier of any premises at which scheduled activities are carried on under the authority conferred by a licence must not cause or permit the emission of any offensive odour from the premises to which the licence applies.*

*(2) It is a defence in proceedings against a person for an offence against this section if the person establishes that:*

*(a) the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of the licence directed at minimising the odour, or*

*(b) the only persons affected by the odour were persons engaged in the management or operation of the premises.*

*(3) A person who contravenes this section is guilty of an offence.*

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### 1.2.2 *Project Specific*

- Approvals:
  - Department of Primary Industries (DPI) Project Approval for production pilots covering wells 13 to 18H – 21 July 2009 (DPI-PA)<sup>1</sup>.
  - Department of Trade and Investment (DT&I) Development Approval for pilot wells 26-29 under Minister for Resources and Energy – 16/8/2013 (MRE-DA).
  - Department of Planning and Environment (DPE) Approval – 18 July 2014 (SSD- 6038).
  - NSW Forests Occupation Permit (OP).
  - NSW Office of Water (NOW) Water Supply Works Approval (90WA832266).
  - Environment Protection Licence 20350 (EPL 20350).
- Renewal Petroleum Exploration Licence 238 (PEL 238).
- Review of Environmental Factors (REF (3/13)).
- Review of Environmental Factors - Statement of Commitments (REF – SoC (3/13)).

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<sup>1</sup> Note the operational conditions of consent and REF statement of commitments under this approval are addressed within the approved Project Environmental Management Plan (PEMP). This PEMP forms part of the SMS process for the Project

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### 1.2.3 Air Quality Criteria

Air Quality Criteria established within the approvals is listed in Tables 1, 2 and 3 for any residence on privately-owned land.

*Table 1: Long term criteria for particulate matter*

Pollutant	Averaging Period	<sup>d</sup> Criterion
Total Suspended Particulate (TSP)	Annual	<sup>a</sup> 90 µg/m <sup>3</sup>
Particulate matter < 10 µm (PM10)	Annual	<sup>a</sup> 30 µg/m <sup>3</sup>

*Table 2: Short term criterion for particulate matter*

Pollutant	Averaging Period	<sup>d</sup> Criterion
Particulate matter < 10 µm (PM10)	24 hour	<sup>a</sup> 50 µg/m <sup>3</sup>

*Table 3: Long term criteria for deposited dust*

Pollutant	Averaging Period	Maximum increase in deposited dust level	Maximum total deposited dust level
<sup>c</sup> Deposited dust	Annual	<sup>b</sup> 2 g/m <sup>2</sup> /month	<sup>a</sup> 4g/m <sup>2</sup> /month

Notes for Tables 1-3: <sup>a</sup>Total impact (ie incremental increase in concentrations due to the development plus background concentrations due to other sources); <sup>b</sup>Incremental impact (ie incremental increase in concentrations due to the development on its own); <sup>c</sup>Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003:Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method; and <sup>d</sup>Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed to by the Secretary in consultation with EPA.

### 1.2.4 Santos Management System (SMS)

This AQMP has been developed in accordance with relevant legislative and regulatory requirements and conditions in the **Santos Management System (SMS)**:

- SMS-MS1\_Risk\_ST13 Environmental Hazard Controls Procedure
- EHSMS09 Managing EHS Risks
- EHSMS 19 Climate Change
- EHSMS 14 Monitoring, Evaluation and Reporting

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### **1.3 Objectives**

Objectives relating to the Air Quality and Greenhouse Gas Management Plan are described below:

- Minimise the potential impact of air pollutant and greenhouse gas emissions on the receiving environment;
- Address community expectations concerning air quality and greenhouse gas-related issues;
- Achieve compliance with Environmental Protection Licence 20350;
- Address the Review of Environmental Factors (REF) Mitigation Strategy (Chapter 2.8 of the REF, March, 2013);
- Achieve compliance with the Minister's Conditions of Approval and relevant regulatory requirements; and
- Prevent adverse air quality impacts on the amenity of local communities and environment.

### **1.4 Performance Indicators**

Performance indicators relating to this Air Quality Management Plan are outlined below:

- Zero complaints received from landowners or government agencies concerning dust and odour issues; and
- Zero reportable leak/venting incidents from construction and operational activities.

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**1.5 Mitigation Measures**

Plan Ref.	Actions	Timing	Reference
<b>General</b>			
AQMP-1	<ul style="list-style-type: none"> <li>Vehicles, plant and equipment will be regularly maintained to ensure they are in good operating condition.</li> <li>The use of energy efficient equipment and processes will be undertaken, where possible.</li> <li>Vehicles, plant and machinery will be turned off when not in use rather than left idling unless used to mitigate other identified hazards (such as heat stress).</li> <li>Vehicles will maintain site speed limits to minimise dust generation.</li> </ul>	At all times	REF SoC 44, 45, 50, 51 & 56, 81 SSD-6038 SoC 54
AQMP-2	Dust will be suppressed by a combination of methods: Speed reduction and other Traffic Management Plan controls, surface stabilisation methods, and where necessary spraying water along the access tracks and lease areas.	As required	REF SoC 54 and 55
AQMP-3	Loose, dust generating materials will be covered when transported to and from site.	At all times	SSD-6038 SoC 49
AQMP-4	Rehabilitation works, including landform establishment, will occur within six months of abandonment.	Post Operation	SSD-6038 SoC 52
<b>Mitigation of Greenhouse Gas Emissions</b>			
AQMP-5	All wells to be drilled using water based mud that will minimise venting and flaring requirements	During Drilling	REF SoC 51
AQMP-6	<ul style="list-style-type: none"> <li>A portion of the produced CSG will be diverted for on-site power generation, reducing the need to use diesel on the site, and reducing gas to flare.</li> <li>Any gas surplus to the requirements for onsite electricity generation will be flared onsite through a skid mounted or equivalent flare system, which will ignite automatically to ensure that all gas is burnt rather than vented to the atmosphere.</li> </ul>	During Operation	REF. 2.7.5.3 & 2.7.5.8 REF SoC 53
AQMP-7	Well or drill hole to be abandoned to be sealed and filled such that there is no leak of gas and/or water	Post Operation	WIC. 83
AQMP-8	In performing the Activity, Santos will endeavour to minimise: a) the use of power-consuming equipment; b) water and energy consumption; and c) the generation of waste.	At all times	OP.15
AQMP-9	Timber and woody debris cleared during site preparation will be retained (excluding merchantable timber identified by Forestry NSW) for use in rehabilitation to assist re-establishing the carbon sink.	During Construction and Operation	SSD-6038 SoC 53

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**1.6 Monitoring Requirements**

Issue	Monitoring Description	Frequency																																																
Air Quality	<p>Ambient Air Quality Monitoring: Ambient air quality monitoring will be undertaken in accordance with the detail provided in Tables A, B and As per table B C below.</p> <p><i>Table A: Air quality monitoring location</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Monitoring Point</th> <th style="text-align: left;">Easting (MGA94, Z55)</th> <th style="text-align: left;">Northing (MGA94, Z55)</th> <th style="text-align: left;">Parameters Monitored</th> </tr> </thead> <tbody> <tr> <td>DWH16AQ1<sup>2</sup></td> <td>TBA</td> <td>TBA</td> <td>PM10, TSP, deposited dust</td> </tr> <tr> <td>DWH26AQ2</td> <td>754984</td> <td>6600699</td> <td>PM10, TSP, deposited dust</td> </tr> </tbody> </table> <p><i>Table B: Air Quality Monitoring Frequency</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Monitoring Type</th> <th style="text-align: left;">Construction Phase</th> <th style="text-align: left;">Operational Phase</th> </tr> </thead> <tbody> <tr> <td>Deposited Dust</td> <td>Monthly</td> <td>Monthly</td> </tr> <tr> <td>PM10</td> <td>1 every six days (as per AS 3580)</td> <td>1 every six days (as per AS 3580)</td> </tr> <tr> <td>TSP</td> <td>1 every six days (as per AS 3580)</td> <td>1 every six days (as per AS 3580)</td> </tr> </tbody> </table> <p><i>Table C: Air Quality Monitoring Methods</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Sample Parameter</th> <th style="text-align: left;">PM10</th> <th style="text-align: left;">TSP</th> <th style="text-align: left;">Deposited Dust</th> </tr> </thead> <tbody> <tr> <td>Monitoring Apparatus</td> <td>HVAS</td> <td>HVAS</td> <td>DDG</td> </tr> <tr> <td>Monitoring Parameters</td> <td>PM10</td> <td>TSP</td> <td>Deposited dust and ash content</td> </tr> <tr> <td>Reporting Units</td> <td>µg/m<sup>3</sup></td> <td>µg/m<sup>3</sup></td> <td>g/m<sup>2</sup>/month, %</td> </tr> <tr> <td>Averaging Period</td> <td>24 hours</td> <td>24 hours</td> <td>Monthly</td> </tr> <tr> <td>Relevant Standards</td> <td>AS3580.9.6:2005 AS3580.1.1:2007</td> <td>AS3580.9.3:2003 AS3580.1.1:2007</td> <td>AS3580.10.1:2003 AS3580.1.1:2007</td> </tr> </tbody> </table>	Monitoring Point	Easting (MGA94, Z55)	Northing (MGA94, Z55)	Parameters Monitored	DWH16AQ1 <sup>2</sup>	TBA	TBA	PM10, TSP, deposited dust	DWH26AQ2	754984	6600699	PM10, TSP, deposited dust	Monitoring Type	Construction Phase	Operational Phase	Deposited Dust	Monthly	Monthly	PM10	1 every six days (as per AS 3580)	1 every six days (as per AS 3580)	TSP	1 every six days (as per AS 3580)	1 every six days (as per AS 3580)	Sample Parameter	PM10	TSP	Deposited Dust	Monitoring Apparatus	HVAS	HVAS	DDG	Monitoring Parameters	PM10	TSP	Deposited dust and ash content	Reporting Units	µg/m <sup>3</sup>	µg/m <sup>3</sup>	g/m <sup>2</sup> /month, %	Averaging Period	24 hours	24 hours	Monthly	Relevant Standards	AS3580.9.6:2005 AS3580.1.1:2007	AS3580.9.3:2003 AS3580.1.1:2007	AS3580.10.1:2003 AS3580.1.1:2007	
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Air Quality Equipment Maintenance	Plant and equipment will be inspected regularly to ensure these are properly maintained. This will include piping to assist in identification of any leaks of fugitive emissions. Maintenance Programs will be undertaken using Santos' Maintenance Management System	In accordance with preventative maintenance program.																																																
Air Quality Equipment Operation	The licensee must operate a Leak Detection And Repair Program for all relevant components of plant and equipment in order to detect gas leaks.	Six monthly																																																



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Issue	Monitoring Description	Frequency
Air Quality Equipment Operation	Santos a Leak Detection and Repair Program in accordance with EPL 20350 A fugitive emissions monitoring program has been implemented in the Energy NSW CSG Exploration and Appraisal Program (E&A Program) area, incorporating a leak detection and repair program using the Picarro Cavity Ring Down Spectrometer.	Six monthly
Air Quality Equipment Operation	A flow meter will monitor the gas flow rate from the gathering system prior to safe ignition. Note: A REF amendment to the Dewhurst Southern flowline was approved on 14 September 2018 whereby gas is piped to the Wilga Park Power Station. The flare at Dewhurst 28 remains in place but is only used in emergency situations)	Continuous
Air Quality Equipment Operation	Activities at the premises must be carried out in a manner what will minimise the emissions of air pollutants from the premises (condition E3.1 EPL 20350 inserted 9 January 2019)	Ongoing
Air Quality Statutory	Appropriate monitoring of emissions and consumables will be undertaken for legislative reporting requirements (such asAs required to inform National Greenhouse and Energy Reporting Scheme (NGERS) calculations).	
General Inspections	Field Superintendent to assess potential air/dust, noise, soil and water and waste issues during construction and drilling	Daily during construction and drilling
General Inspections	Environmental Advisor inspection of activities to determine if all reasonable and feasible air/dust emission, noise, soil and water, waste mitigation measures are in place	6 monthly during operation
General Inspections	Well Operator to undertake 'Well Runs' during operation to assess any potential air/dust, noise, soil and water and waste issues	In accordance with planned activities

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**1.7 Reporting Requirements**

Description	Timing	Reference
<p>Gas Leaks must be reported to the department (Environmental Sustainability Unit and the Mines Safety Operations) A <b>Wellhead Reportable Leak</b> is defined as ‘an emission due to an unplanned release from a well site facility that, at a measurement distance of 150mm immediately above (and downwind) and surrounding the leak source in an open air environment above ground position gives a sustained LFL reading greater than 10% of LFL for a 15 second duration. Refer to the definition of 4 circumstances which also fall under the definition.</p>	As required	WIC 3.3
<p>Pollution Incidents that cause or threaten material harm to the environment must be immediately notified to each of the following authorities:</p> <ol style="list-style-type: none"> <li>1. The department (Environmental Sustainability Unit and Mine Safety Operations)</li> <li>2. The Environment Protection Authority( 131555)</li> <li>3. The Ministry of Health</li> <li>4. The local Council (Narrabri Shire Council)</li> <li>5. Fire and Rescue NSW.</li> </ol> <p>R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.</p>	As required but immediately	WIC 2.2.5.3 & EPL 20350 condition R2
<p>The licensee must submit a brief summary report on the Leak Detection and Repair (LDAR) program with the annual return. The summary report must include:</p> <ol style="list-style-type: none"> <li>a) The total number and type of components not repaired within the required timeframes in condition O 6.8.3 of EPL 20350 – 15 days;</li> <li>b) Reviewing current leak detection practices and technology implemented at the premises to ensure it is fit for purpose;</li> <li>c) The licensee must carry out a full review of the Leak Detection and Repair Program every 5 years In undertaking the review, the licensee must benchmark the effectiveness of current leak detection practices in the existing LDAR program with best available leak detection practices and technology.</li> </ol>	As required	EPL 20350 (Condition R4.3)
<p>All reporting requirements for air quality reporting will be managed through Santos’ compliance tracking system</p>	As required	

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