



Experts in air quality, odour and emission monitoring.

# Emission Testing Report

Report: R018602

Supagas, Ingleburn



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## Document Information

Client Name: Supagas  
Report Number: R018602  
Date of Issue: 11 March 2025  
Attention: Ben Woodbridge  
Address: 5 Benson Road  
Ingleburn NSW 2565  
Testing Laboratory: Ektimo Pty Ltd, ABN 86 600 381 413

## Report Authorisation



**Sam Estell**  
**Air Monitoring Consultant**



NATA Accredited Laboratory  
No. 14601



**Adnan Latif**  
**Ektimo Signatory**

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Please note that only numerical results pertaining to measurements conducted directly by Ektimo are covered by Ektimo terms of NATA accreditation as described in the Test Methods table. This does not include calculations that use data supplied by third-parties, comments, conclusions, or recommendations based upon the results. Refer to Test Methods section for full details of testing covered by NATA accreditation.

## Table of Contents

1	Executive Summary .....	3
1.1	Background .....	3
1.2	Project Objective & Overview .....	3
1.3	Licence Comparison .....	3
2	Results.....	4
2.1	EPA 1 – CO <sub>2</sub> Production Plant Absorber Tower Stack.....	4
3	Sample Plane Compliance .....	5
3.1	EPA 1 – CO <sub>2</sub> Production Plant Absorber Tower Stack.....	5
4	Plant Operating Conditions.....	5
5	Test Methods.....	5
6	Quality Assurance/Quality Control Information.....	6
7	Definitions .....	6

## 1 Executive Summary

### 1.1 Background

Ektimo was engaged by Supagas to perform annual emission testing at their Ingleburn plant. Testing was carried out in accordance with Environment Licence 20022.

### 1.2 Project Objective & Overview

The objective of the project was to quantify emissions from one (1) discharge point to determine compliance with Supagas' Environmental Licence.

Monitoring was performed as follows:

Location	Test Date	Test Parameters*
EPA 1 CO <sub>2</sub> Production Plant Absorber Tower Stack	4 March 2025	Nitrogen oxides, carbon monoxide, carbon dioxide, oxygen

\* Flow rate, velocity, temperature, and moisture were also determined.

All results are reported on a dry basis at STP.

Plant operating conditions have been noted in this report.

### 1.3 Licence Comparison

The following licence comparison table shows that the analyte below is within the licence limit set by the NSW EPA as per licence 20022 (last amended on 10 July 2014).

EPA ID	Location Description	Pollutant	Units	Licence limit	Detected values	Detected values (corrected to 3% O <sub>2</sub> )
1	CO <sub>2</sub> Production Plant Absorber Tower Stack	Nitrogen Oxides	mg/m <sup>3</sup> at STP dry	230	130	<b>130</b>

*Please note that the measurement uncertainty associated with the test results was not considered when determining whether the results were compliant or non-compliant.*

## 2 Results

### 2.1 EPA 1 – CO<sub>2</sub> Production Plant Absorber Tower Stack

<b>Date</b>	4/03/2025	<b>Client</b>	Supagas
<b>Report</b>	R018602	<b>Stack ID</b>	CO2 Production Plant Adsorber Tower Stack
<b>Licence No.</b>	20022	<b>Location</b>	Ingleburn
<b>Ektimo Staff</b>	Sam Estell	<b>State</b>	NSW
<b>Process Conditions</b>	Please refer to client records.		

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Stack Parameters			
Moisture content, %v/v	9.8		
Gas molecular weight, g/g mole	27.6 (wet)	28.6 (dry)	
Gas density at STP, kg/m <sup>3</sup>	1.23 (wet)	1.28 (dry)	
Gas density at discharge conditions, kg/m <sup>3</sup>	1.04		
% Oxygen correction & Factor	3 %	1.00	
Gas Flow Parameters			
Flow measurement time(s) (hhmm)	1011		
Temperature, °C	51		
Temperature, K	324		
Ambient pressure, kPa	102		
Stack pressure, kPa	102		
Velocity at sampling plane, m/s	2.3		
Volumetric flow rate, actual, m <sup>3</sup> /s	2.4		
Volumetric flow rate (wet STP), m <sup>3</sup> /s	2		
Volumetric flow rate (dry STP), m <sup>3</sup> /s	1.8		
Mass flow rate (wet basis), kg/h	8800		

Gas Analyser Results	Sampling time	Average			Minimum			Maximum		
		1025 - 1125			1025 - 1125			1025 - 1125		
		Corrected to			Corrected to			Corrected to		
Concentration	3% O2	Mass Rate	Concentration	3% O2	Mass Rate	Concentration	3% O2	Mass Rate		
mg/m <sup>3</sup>	mg/m <sup>3</sup>	g/min	mg/m <sup>3</sup>	mg/m <sup>3</sup>	g/min	mg/m <sup>3</sup>	mg/m <sup>3</sup>	g/min		
<b>Combustion Gases</b>										
Nitrogen oxides (as NO <sub>2</sub> )	130	130	14	110	110	12	130	130	14	
Carbon monoxide	1600	1600	170	1300	1300	140	2400	2400	260	
	Concentration			Concentration			Concentration			
	% v/v			% v/v			% v/v			
Carbon dioxide	2.2			2.1			2.7			
Oxygen	3			2.5			3.2			

### 3 Sample Plane Compliance

#### 3.1 EPA 1 – CO<sub>2</sub> Production Plant Absorber Tower Stack

Sampling Plane Details	
Source tested	Boiler
Pollution control equipment	Wet scrubber
Sampling plane dimensions	1140 mm
Sampling plane area	1.02 m <sup>2</sup>
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 0 D
Upstream disturbance	Exit 0 D
No. traverses & points sampled	2 20
Sample plane conformance to AS 4323.1	Non-conforming

**The sampling plane is deemed to be non-conforming due to the following reasons:**

- The differential pressure at one or more sampling points is less than 5 Pa
- The downstream disturbance is <1D from the sampling plane
- The upstream disturbance is <2D from the sampling plane
- The stack or duct does not have the required number of access holes (ports)

### 4 Plant Operating Conditions

See Supagas records for complete process conditions.

Based on information received from Supagas personnel, it is our understanding that samples were collected during typical plant operations.

### 5 Test Methods

All sampling and analysis were performed by Ektimo unless otherwise specified. Specific details of the methods are available upon request.

Parameter	Sampling method	Analysis method	Uncertainty*	NATA accredited	
				Sampling	Analysis
Sampling points - Selection	NSW EPA TM-1 (AS 4323.1)	NA	NA	✓	NA
Flow rate, temperature & velocity	NSW EPA TM-2 (USEPA Method 2)	NSW EPA TM-2 (USEPA Method 2)	8%, 2%, 7%	NA	✓
Moisture (stacks <60°C)	Ektimo 050	Ektimo 050	not specified	✓	✓ <sup>j</sup>
Molecular weight	NA	NSW EPA TM-23 (USEPA Method 3)	not specified	NA	✓
Dry gas density	NA	NSW EPA TM-23 (USEPA Method 3)	not specified	NA	✓
Carbon dioxide	NSW EPA TM-24 (USEPA Method 3A)	NSW EPA TM-24 (USEPA Method 3A)	13%	✓	✓
Carbon monoxide	NSW EPA TM-32 (USEPA Method 10)	NSW EPA TM-32 (USEPA Method 10)	12%	✓	✓
Nitrogen oxides	NSW EPA TM-11 (USEPA Method 7E)	NSW EPA TM-11 (USEPA Method 7E)	12%	✓	✓
Oxygen	NSW EPA TM-25 (USEPA Method 3A)	NSW EPA TM-25 (USEPA Method 3A)	13%	✓	✓

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\* Uncertainties cited in this table are estimated using typical values and are calculated at the 95% confidence level (coverage factor = 2).

<sup>j</sup> Includes analysis of moisture content by Ektimo 050 which uses the same principle as ASTM E337.

## 6 Quality Assurance/Quality Control Information

Ektimo is accredited by the National Association of Testing Authorities (NATA) for the sampling and analysis of air pollutants from industrial sources. Unless otherwise stated test methods used are accredited with the National Association of Testing Authorities. For full details, search for Ektimo at NATA's website [www.nata.com.au](http://www.nata.com.au).

Ektimo is accredited by NATA to ISO/IEC 17025 - Testing. ISO/IEC 17025 - Testing requires that a laboratory have adequate equipment to perform the testing, as well as laboratory personnel with the competence to perform the testing. This quality assurance system is administered and maintained by the Quality Director.

NATA is a member of APAC (Asia Pacific Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through mutual recognition arrangements with these organisations, NATA accreditation is recognised worldwide.

Unless specifically noted, all samples were collected and handled in accordance with Ektimo's QA/QC standards.

## 7 Definitions

The following symbols and abbreviations may be used in this test report:

% v/v	Volume to volume ratio, dry basis
~	Approximately
<	Less than
>	Greater than
≥	Greater than or equal to
AS	Australian Standard
BaP-TEQ	Benzo(a)pyrene toxic equivalents
BSP	British standard pipe
CEM/CEMS	Continuous emission monitoring/Continuous emission monitoring system
CTM	Conditional test method
D	Duct diameter or equivalent duct diameter for rectangular ducts
D <sub>50</sub>	'Cut size' of a cyclone is defined as the particle diameter at which the cyclone achieves a 50% collection efficiency i.e. half of the particles are retained by the cyclone and half pass through it. The D <sub>50</sub> method simplifies the capture efficiency distribution by assuming that a given cyclone stage captures all of the particles with a diameter equal to or greater than the D <sub>50</sub> of that cyclone and less than the D <sub>50</sub> of the preceding cyclone.
DECC	Department of Environment & Climate Change (NSW)
Disturbance	A flow obstruction or instability in the direction of the flow which may impede accurate flow determination. This includes centrifugal fans, axial fans, partially closed or closed dampers, louvres, bends, connections, junctions, direction changes or changes in pipe diameter.
EPA	Environment Protection Authority
ISC	Intersociety Committee, Methods of Air Sampling and Analysis
ISO	International Organisation for Standardisation
ITE	Individual threshold estimate
Lower bound	When an analyte is not present above the detection limit, the result is assumed to be equal to zero.
Medium bound	When an analyte is not present above the detection limit, the result is assumed to be equal to half of the detection limit.
NA	Not applicable
NATA	National Association of Testing Authorities
NT	Not tested or results not required
OM	Other approved method
STP	Standard temperature and pressure. Gas volumes and concentrations are expressed on a dry basis at 0 °C, at discharge oxygen concentration and an absolute pressure of 101.325 kPa.
TM	Test method
USEPA	United States Environmental Protection Agency
Velocity difference	The percentage difference between the average of initial flows and after flows.
Upper bound	When an analyte is not present above the detection limit, the result is assumed to be equal to the detection limit.
95% confidence interval	Range of values that contains the true result with 95% certainty. This means there is a 5% risk that the true result is outside this range



Experts in air quality, odour and emission monitoring.

### **Melbourne**

(Head Office)  
26 Redland Dr  
Mitcham, VIC 3132

### **Wollongong**

1/10 Doyle Ave  
Unanderra  
NSW 2526

### **Brisbane**

3/109 Riverside Pl  
Morningside  
QLD 4170

### **Perth**

52 Cooper Rd  
Cockburn Central  
WA 6164

**1300 364 005**

**[ektimo.com.au](http://ektimo.com.au)**