



REPORT NUMBER R011325

**Emission testing Report
CPE Central Park Pty Ltd, Chippendale**

Document Information

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Report Authorisation



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NATA Accredited Laboratory
No. 14601

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1 EXECUTIVE SUMMARY

1.1 Background

Ektimo was engaged by CPE Central Park Pty Ltd to perform emission testing at their Chippendale plant. Testing was carried out in accordance with NSW EPA Environment Protection Licence 20768.

1.2 Project Objective

The objectives of the project were to conduct a monitoring programme to quantify emissions from two discharge points to determine compliance with CPE Central Park Pty Ltd.'s Environment Protection Licence.

Monitoring was performed as follows:

Location	Test Date	Test Parameters*
EPA ID No. 1 - Engine 1	29 November 2021	Nitrogen Oxides (as NO ₂)
EPA ID No. 2 - Engine 2		Ammonia

* 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 the report.

1.3 Results Summary

The following licence comparison table shows that all analytes highlighted in green are within the licence limit set by the NSW EPA as per licence 20768 (last amended on 18 April 2016).

EPA No.	Location Description	Pollutant	Units	Licence Limit	Detected Values
1	Engine 1	Nitrogen Oxides	mg/m ³	57	15
		Ammonia	mg/m ³	4	0.065
2	Engine 2	Nitrogen Oxides	mg/m ³	57	50
		Ammonia	mg/m ³	4	1.2

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

Refer to the Test Methods table for the measurement uncertainties.

2 RESULTS

2.1 EPA ID No. 1 – Engine 1

Date	29/11/2021	Client	CPE Central Park Pty Ltd
Report	R011325	Stack ID	EPA ID No. 1 - Engine 1
Licence No.	20768	Location	Chippendale
Ektimo Staff	Graham Edwards	State	NSW
Process Conditions	Engine Load: 1MW (83%), SCR Temp: 404°C		

211115

Sampling Plane Details

Sampling plane dimensions	430 mm
Sampling plane area	0.145 m ²
Sampling port size, number & depth	1" BSP (x2), 55 mm
Access & height of ports	Ground level 1.5 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Bend 7 D
Upstream disturbance	Bend 6 D
No. traverses & points sampled	2 8
Sample plane compliance to AS4323.1 (1995)	Ideal

Stack Parameters

Moisture content, %v/v	9.9	
Gas molecular weight, g/g mole	28.4 (wet)	29.5 (dry)
Gas density at STP, kg/m ³	1.27 (wet)	1.32 (dry)
Gas density at discharge conditions, kg/m ³	0.89	

Gas Flow Parameters

Flow measurement time(s) (hhmm)	1415 & 1525
Temperature, °C	121
Temperature, K	394
Velocity at sampling plane, m/s	13
Volumetric flow rate, actual, m ³ /s	1.9
Volumetric flow rate (wet STP), m ³ /s	1.3
Volumetric flow rate (dry STP), m ³ /s	1.2
Mass flow rate (wet basis), kg/hour	6100
Velocity difference, %	2

Gas Analyser Results	Sampling time	Average		Minimum		Maximum	
		1419 - 1519		1419 - 1519		1419 - 1519	
Combustion Gases		Concentration	Mass Rate	Concentration	Mass Rate	Concentration	Mass Rate
		mg/m ³	g/min	mg/m ³	g/min	mg/m ³	g/min
Nitrogen oxides (as NO ₂)		15	1.1	8.2	0.59	26	1.9
		Concentration		Concentration		Concentration	
		% v/v		% v/v		% v/v	
Carbon dioxide		6.4		6.3		6.5	
Oxygen		9.9		9.9		10	

Ammonia	Sampling time	Results	
		1420-1520	
		Concentration	Mass Rate
		mg/m ³	g/min
Ammonia		0.065	0.0047

2.2 EPA ID No. 2 – Engine 2

Date	29/11/2021	Client	CPE Central Park Pty Ltd
Report	R011325	Stack ID	EPA ID No. 2 - Engine 2
Licence No.	20768	Location	Chippendale
Ektimo Staff	Graham Edwards	State	NSW
Process Conditions	Engine Load: 1MW (83%), SCR Temp: 418°C		

211115

Sampling Plane Details

Sampling plane dimensions	430 mm
Sampling plane area	0.145 m ²
Sampling port size, number & depth	1" BSP (x2), 55 mm
Access & height of ports	Ground level 1.5 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Bend 7 D
Upstream disturbance	Bend 6 D
No. traverses & points sampled	2 8
Sample plane compliance to AS4323.1 (1995)	Ideal

Stack Parameters

Moisture content, %v/v	10	
Gas molecular weight, g/g mole	28.3 (wet)	29.5 (dry)
Gas density at STP, kg/m ³	1.26 (wet)	1.32 (dry)
Gas density at discharge conditions, kg/m ³	0.88	

Gas Flow Parameters

Flow measurement time(s) (hhmm)	1100 & 1303
Temperature, °C	121
Temperature, K	394
Velocity at sampling plane, m/s	13
Volumetric flow rate, actual, m ³ /s	1.8
Volumetric flow rate (wet STP), m ³ /s	1.3
Volumetric flow rate (dry STP), m ³ /s	1.1
Mass flow rate (wet basis), kg/hour	5800
Velocity difference, %	4

Gas Analyser Results	Sampling time	Average		Minimum		Maximum	
		1157 - 1257		1157 - 1257		1157 - 1257	
Combustion Gases		Concentration	Mass Rate	Concentration	Mass Rate	Concentration	Mass Rate
		mg/m ³	g/min	mg/m ³	g/min	mg/m ³	g/min
Nitrogen oxides (as NO ₂)		50	3.4	40	2.7	63	4.3
		Concentration		Concentration		Concentration	
		% v/v		% v/v		% v/v	
Carbon dioxide		6.5		6.4		6.7	
Oxygen		9.4		9.3		9.5	

Ammonia	Sampling time	Results	
		1055-1255	
Ammonia		Concentration	Mass Rate
		mg/m ³	g/min
Ammonia		1.2	0.08

3 PLANT OPERATING CONDITIONS

Engine load have been noted in the results section of the report.

4 TEST METHODS

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

Parameter	Sampling Method	Analysis Method	Method Detection Limit	Uncertainty*	NATA Accredited	
					Sampling	Analysis
Sampling points - Selection	NSW EPA TM-1	NA	NA	NA	✓	NA
Flow rate, temperature and velocity	NSW EPA TM-2	NSW EPA TM-2	location specific	8%, 2%, 7%	NA	✓
Moisture content	NSW EPA TM-22	NSW EPA TM-22	1.0%	19%	✓	✓
Molecular weight	NA	NSW EPA TM-23	NA	not specified	NA	✓
Dry gas density	NA	NSW EPA TM-23	NA	not specified	NA	✓
Carbon dioxide	NSW EPA TM-24	NSW EPA TM-24	0.1%	13%	✓	✓
Nitrogen oxides	NSW EPA TM-11	NSW EPA TM-11	0.004 g/m ³	12%	✓	✓
Oxygen	NSW EPA TM-25	NSW EPA TM-25	0.1%	13%	✓	✓
Ammonia	Ektimo 260	Envirolab in-house methods Inorg-093 & Inorg-057	0.4 mg/m ³	18%	✓	✓ [‡]

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

‡ Analysis performed by Envirolab, NATA accreditation number 2901. Results were reported to Ektimo on 15 December 2021 in report 284905.

5 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.

Ektimo is accredited by NATA (National Association of Testing Authorities) 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.

6 DEFINITIONS

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

% v/v	Volume to volume ratio, dry or wet basis
~	Approximately
<	Less than
>	Greater than
≥	Greater than or equal to
APHA	American Public Health Association, Standard Methods for the Examination of Water and Waste Water
AS	Australian Standard
BSP	British standard pipe
CARB	Californian Air Resources Board
CEM/CEMS	Continuous Emission Monitoring/Continuous Emission Monitoring System
CTM	Conditional test method
D	Duct diameter or equivalent duct diameter for rectangular ducts
D ₅₀	'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 ₅₀ 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 ₅₀ of that cyclone and less than the D ₅₀ 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.
DWER	Department of Water and Environmental Regulation (WA)
DEHP	Department of Environment and Heritage Protection (QLD)
EPA	Environment Protection Authority
FTIR	Fourier Transform Infra-red
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
NIOSH	National Institute of Occupational Safety and Health
NT	Not tested or results not required
OM	Other approved method
OU	Odour unit. One OU is that concentration of odorant(s) at standard conditions that elicits a physiological response from a panel equivalent to that elicited by one Reference Odour Mass (ROM), evaporated in one cubic metre of neutral gas at standard conditions.
PM ₁₀	Atmospheric suspended particulate matter having an equivalent aerodynamic diameter of less than approximately 10 microns (µm).
PM _{2.5}	Atmospheric suspended particulate matter having an equivalent aerodynamic diameter of less than approximately 2.5 microns (µm).
PSA	Particle size analysis
RATA	Relative accuracy test audit
Semi-quantified VOCs	Unknown VOCs (those not matching a standard compound), are identified by matching the mass spectrum of the chromatographic peak to the NIST Standard Reference Database (version 14.0), with a match quality exceeding 70%. An estimated concentration is determined by matching the area of the peak with the nearest suitable compound in the analytical calibration standard mixture.
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, unless otherwise specified.
TM	Test method
TOC	The sum of all compounds of carbon which contain at least one carbon-to-carbon bond, plus methane and its derivatives.
USEPA	United States Environmental Protection Agency
VDI	Verein Deutscher Ingenieure (Association of German Engineers)
Velocity difference	The percentage difference between the average of initial flows and after flows.
Vic EPA	Victorian Environment Protection Authority
VOC	Volatile organic compound. A carbon-based chemical compound with a vapour pressure of at least 0.010 kPa at 25°C or having a corresponding volatility under the given conditions of use. VOCs may contain oxygen, nitrogen and other elements. VOCs do not include carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonate salts.
XRD	X-ray diffractometry
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.

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