

Ektimo

Bituminous Products Pty Ltd, Revesby

Emission Testing Report

Report R015412

ektimo.com.au



Accredited for compliance with ISO/IEC 17025 - Testing.
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, calibration, and inspection reports.

Document Information

Client Name: Bituminous Products Pty Ltd
Report Number: R015412
Date of Issue: 16 August 2024
Attention: Joshua Bell
Address: 33 Violet St
Revesby NSW 2212
Testing Laboratory: Ektimo Pty Ltd, ABN 86 600 381 413

Report Authorisation



Steven Cooper
Senior Air Monitoring Consultant



NATA Accredited Laboratory
No. 14601

This document is confidential and is prepared for the exclusive use of Bituminous Products Pty Ltd and those granted permission by Bituminous Products Pty Ltd. The report shall not be reproduced except in full.

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 4

 1.1 Background 4

 1.2 Project Objective & Overview 4

 1.3 Licence Comparison 4

2 Results 5

 2.1 EPA 1 - Thermal Oxidiser 5

 2.2 EPA 2 - Vapour Scrubber Stack 6

3 Sample Plane Compliance 8

 3.1 EPA 1 - Thermal Oxidiser 8

 3.2 EPA 2 - Vapour Scrubber Stack 8

4 Plant Operating Conditions 8

5 Test Methods 9

6 Quality Assurance/Quality Control Information 9

7 Definitions 10

8 Appendices 11

Appendix A: Site Images

Appendix B: Chain(s) of Custody

Appendix C: Laboratory Results

1 Executive Summary

1.1 Background

Ektimo was engaged by Bituminous Products Pty Ltd to perform emission testing at their Revesby plant. Testing was carried out in accordance with Environment Protection Licence 5267.

1.2 Project Objective & Overview

The objective of the project was to conduct a monitoring programme to quantify emissions from two (2) discharge points to determine compliance with Bituminous Products Pty Ltd's Environmental Licence.

Monitoring was performed as follows:

Location	Test Date	Test Parameters*
EPA 1 - Thermal Oxidiser	28 August 2023	Nitrogen oxides (as NO ₂), oxygen, carbon dioxide Total solid particles Sulfuric acid mist & sulfur trioxide (as SO ₃) Total organic compounds (TOC)
EPA 2 - Vapour Scrubber Stack	28 August 2023	Total solid particles Odour (x2)
	15 September 2023	Total organic compounds (TOC)

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

All results are reported on a dry basis at STP (except odour wet – STP).

Plant operating conditions have been noted in this report.

1.3 Licence Comparison

The following licence comparison table shows that all analytes are within the licence limit set by the NSW EPA as per licence 5267 (last amended on 26 September 2022).

EPA No.	Location Description	Pollutant	Units	Licence Limit	Detected Values
1	Thermal Oxidiser	Solid particles	mg/m ³ at 3% O ₂ STP dry	50	2.9
		Volatile organic compounds (VOCs)	mg/m ³ at 3% O ₂ STP dry	40	5.8
		Sulfuric acid mist and sulfur trioxide (as SO ₃)	mg/m ³ at 3% O ₂ STP dry	100	1
		Nitrogen oxides (as NO ₂)	mg/m ³ at 3% O ₂ STP dry	350	190
2	Vapour Scrubber Stack	Solid particles	mg/m ³ at STP dry	50	<3
		Volatile organic compounds (VOCs)	mg/m ³ at STP dry	40	30

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 - Thermal Oxidiser

Date	28/08/2023	Client	Bituminous Products
Report	R015412	Stack ID	EPA 1 - Thermal Oxidiser
Licence No.	5267	Location	Revesby
Ektimo Staff	Steven Cooper & Ahmad Ramiz	State	NSW
Process Conditions	Please refer to Plant Operating Conditions.		

230825

Stack Parameters		
Moisture content, %v/v	5	
Gas molecular weight, g/g mole	29.3 (wet)	29.9 (dry)
Gas density at STP, kg/m³	1.31 (wet)	1.33 (dry)
Gas density at discharge conditions, kg/m³	0.40	
% Oxygen correction & Factor	3 %	1.49
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1045 & 1210	
Temperature, °C	641	
Temperature, K	914	
Velocity at sampling plane, m/s	9.1	
Volumetric flow rate, actual, m³/s	0.64	
Volumetric flow rate (wet STP), m³/s	0.19	
Volumetric flow rate (dry STP), m³/s	0.18	
Mass flow rate (wet basis), kg/h	910	

Gas Analyser Results		Average			Minimum			Maximum		
Sampling time		1058 - 1158			1058 - 1158			1058 - 1158		
		Corrected			Corrected			Corrected		
		Concentration	to 3% O2	Mass Rate	Concentration	to 3% O2	Mass Rate	Concentration	to 3% O2	Mass Rate
Combustion Gases		mg/m³	mg/m³	g/min	mg/m³	mg/m³	g/min	mg/m³	mg/m³	g/min
Nitrogen oxides (as NO₂)		130	190	1.4	130	190	1.4	130	200	1.5
		Concentration			Concentration			Concentration		
		% v/v			% v/v			% v/v		
Carbon dioxide		8.9			8.7			9.4		
Oxygen		8.9			8.5			8.9		

Total Organic Compounds (TOC)	Sampling time	Average			Minimum			Maximum		
		1058 - 1158			1058 - 1158			1058 - 1158		
		Corrected			Corrected			Corrected		
		Concentration	to 3% O ₂	Mass Rate	Concentration	to 3% O ₂	Mass Rate	Concentration	to 3% O ₂	Mass Rate
		mg/m ³	mg/m ³	g/min	mg/m ³	mg/m ³	g/min	mg/m ³	mg/m ³	g/min
TOC (as Propane)		3.9	5.8	0.043	<2	<3	<0.02	7.9	12	0.087

Isokinetic Results	Sampling time	Results		
		1058-1159		
		Corrected		
		Concentration	to 3% O ₂	Mass Rate
		mg/m ³	mg/m ³	g/min
Solid Particles		1.9	2.9	0.021
Sulfur trioxide and/or Sulfuric acid (as SO ₃)		0.7	1	0.0077
Isokinetic Sampling Parameters				
Sampling time, min		60		
Isokinetic rate, %		99		
Gravimetric analysis date (total particulate)		04-09-2023		

2.2 EPA 2 - Vapour Scrubber Stack

Date	28/08/2023	Client	Bituminous Products
Report	R015412	Stack ID	EPA 2 - Vapour Scrubber Stack
Licence No.	5267	Location	Revesby
Ektimo Staff	Steven Cooper & Ahmad Ramiz	State	NSW
Process Conditions	Please refer to Plant Operating Conditions.		230825

Stack Parameters		
Moisture content, %v/v	0.74	
Gas molecular weight, g/g mole	28.9 (wet)	29.0 (dry)
Gas density at STP, kg/m ³	1.29 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m ³	1.19	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1316 & 1431	
Temperature, °C	27	
Temperature, K	300	
Velocity at sampling plane, m/s	1.5	
Volumetric flow rate, actual, m ³ /s	0.14	
Volumetric flow rate (wet STP), m ³ /s	0.13	
Volumetric flow rate (dry STP), m ³ /s	0.13	
Mass flow rate (wet basis), kg/h	620	

Odour	Sampling time	Average		Test 1 1323 - 1335		Test 2 1336 - 1349	
		Concentration ou	Odourant Flow Rate ou.m ³ /min	Concentration ou	Odourant Flow Rate ou.m ³ /min	Concentration ou	Odourant Flow Rate ou.m ³ /min
Results		1700	14000	1700	14000	1700	14000
Lower uncertainty limit		1400		1300		1300	
Upper uncertainty limit		2200		2400		2400	
Hedonic tone				Mildly unpleasant		Mildly unpleasant	
Odour character				Metallic, chemicals, bitumen, asphalt, sulfur		Metallic, chemicals, bitumen, asphalt, sulfur, sweet	
Analysis date & time				29/08/23, 1000 - 1030		29/08/23, 1000 - 1030	
Holding time				21 hours		21 hours	
Dilution factor				1		1	
Bag material				Nalophan		Nalophan	
Butanol threshold (ppb)		45					
Laboratory temp (°C)		21					
Last calibration date		October 2022					

Isokinetic Results	Sampling time	Results 1320-1425	
		Concentration mg/m ³	Mass Rate g/min
Solid Particles		<3	<0.02
Isokinetic Sampling Parameters			
Sampling time, min		64	
Isokinetic rate, %		100	
Gravimetric analysis date (total particulate)		04-09-2023	

Date	15/09/2023	Client	Bituminous Products
Report	R015412	Stack ID	EPA 2 - Vapour Scrubber Stack
Licence No.	5267	Location	Revesby
Ektimo Staff	Steven Cooper	State	NSW
Process Conditions	Please refer to Plant Operating Conditions.		230913

Stack Parameters

Moisture content, %v/v	1.7	
Gas molecular weight, g/g mole	28.8 (wet)	29.0 (dry)
Gas density at STP, kg/m ³	1.28 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m ³	1.21	

Gas Flow Parameters

Flow measurement time(s) (hhmm)	0915 & 1033
Temperature, °C	21
Temperature, K	294
Velocity at sampling plane, m/s	1.5
Volumetric flow rate, actual, m ³ /s	0.14
Volumetric flow rate (wet STP), m ³ /s	0.13
Volumetric flow rate (dry STP), m ³ /s	0.13
Mass flow rate (wet basis), kg/h	620

Total Organic Compounds (TOC) Sampling time	Average 0924-1024		Minimum 0924-1024		Maximum 0924-1024	
	Concentration mg/m ³	Mass Rate g/min	Concentration mg/m ³	Mass Rate g/min	Concentration mg/m ³	Mass Rate g/min
TOC (as Propane)	30	0.24	<2	<0.02	37	0.3

3 Sample Plane Compliance

3.1 EPA 1 - Thermal Oxidiser

Sampling Plane Details	
Source tested	Mixing
Pollution control equipment	Thermal oxidiser
Sampling plane dimensions	300 mm
Sampling plane area	0.0707 m ²
Sampling port size, number & depth	4" Flange (x2), 90 mm
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit >6 D
Upstream disturbance	Change in diameter 6 D
No. traverses & points sampled	2 4
Sample plane conformance to AS 4323.1	Ideal sampling plane

3.2 EPA 2 - Vapour Scrubber Stack

Sampling Plane Details	
Source tested	Mixing
Pollution control equipment	Wet scrubber & carbon bed
Sampling plane dimensions	345 mm
Sampling plane area	0.0935 m ²
Sampling port size, number	3" Flange (x2)
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit >6 D
Upstream disturbance	Junction 3 D
No. traverses & points sampled	2 8
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 sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

4 Plant Operating Conditions

The below plant operating conditions have been supplied by Bituminous Products Pty Ltd personnel.

Locations	Operating Conditions
EPA 1 - Thermal Oxidiser	Combustion Temperature > 760 °C
EPA 2 - Vapour Scrubber Stack (28/8/23)	Fed from Mixer 1 C170, Mixer 3 S20E and Mixer 4 Polymer A10E (emptied earlier in the day), Tank 24 C170, Tank 5 C170, Tank 22 A10E Polymer with Wax and Tank 23 Polymer S45R
EPA 2 - Vapour Scrubber Stack (15/9/23)	Fed from Mixer 2 Polymer A10E (emptied earlier in the day), Mixer 3 Polymer A10E and Mixer 4 Polymer A15E (emptied during the test), Tank 24 C170, Tank 5 C170, Tank 22 A10E Polymer with Wax, Tank 23 Polymer S45R and displaced vapour from tanker being loaded with Polymer A15E

5 Test Methods

All sampling and analysis was 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 content	NSW EPA TM-22 (USEPA Alt-Method 008)	NSW EPA TM-22 (USEPA Alt-Method 008)	19%	✓	✓
Moisture content	NSW EPA TM-22 (USEPA Method 4)	NSW EPA TM-22 (USEPA Method 4)	8%	✓	✓
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%	✓	✓
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%	✓	✓
Volatile organic compounds	NSW EPA TM-34 (USEPA Method 25B)	NSW EPA TM-34 (USEPA Method 25B)	not specified	✓	✓
Solid particles (total)	NSW EPA TM-15 (AS 4323.2)	NSW EPA TM-15 (AS 4323.2)	3%	✓	✓ ^{††}
Sulfuric acid mist and/or sulfur trioxide	NSW EPA TM-3 (USEPA Method 8)	Ektimo 235	16%	✓	✓ ^{†m}
Odour	NSW EPA OM-7 (AS 4323.3)	NSW EPA OM-7 (AS 4323.3)	refer to results	✓	✓ [‡]
Odour characterisation	NA	direct observation	NA	NA	✗

080923

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

[‡] Odour analysis conducted at the Ektimo NSW EPA laboratory by forced choice olfactometry. Results were reported to Ektimo on 29 August 2023 in report ON-00214.

[†] Analysis performed by Ektimo. Results were reported to Ektimo on 8 September 2023 in report LV-004840.

^{††} Gravimetric analysis conducted at the Ektimo NSW laboratory.

^m Includes analysis of SO₃/H₂SO₄ by Ektimo 235 which uses the same principle as USEPA SW-846 Method 9056A which is an approved alternative to the analytical procedure of USEPA Method 8.

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.

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.

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
APHA	American Public Health Association, Standard Methods for the Examination of Water and Waste Water
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 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
I-TEQ	International toxic equivalents
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	Particulate matter having an equivalent aerodynamic diameter less than or equal to 10 microns (µm).
PM _{2.5}	Particulate matter having an equivalent aerodynamic diameter less than or equal to 2.5 microns (µm).
PSA	Particle size analysis. PSA provides a distribution of geometric diameters, for a given sample, determined using laser diffraction.
RATA	Relative accuracy test audit
Semi-quantified VOCs	Unknown VOCs (those for which an analytical standard is not available), 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.
TM	Test method
TOC	Total organic carbon. This is 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.
WHO05-TEQ	World Health Organisation toxic equivalents
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.

8 Appendices

Appendix A: Site Images



Image 1 – EPA 1 Thermal Oxidiser



Image 2 – EPA 2 Vapour Scrubber Stack

Prepared for: Bituminous Products Pty Ltd
Report No.: R015412
Date: 16/08/2024

Ektimo

Appendix B: Chain(s) of Custody

Ektimo

Checked at Ektimo Division by: Paul W 11/9/25 Sign/Date

Samples received in good order: _____

Sample ID	Job No.	Analysis Required	Units Required	Analytical Lab	Purchase Order No.	Ektimo Contact	Notes	TAT Required (days)
N18076	R015412	SCC	ug/litre	Ektimo		Steven Cooper	Blank solution	
N18076	R015412	SCC	ug/litre	Ektimo		Steven Cooper	Imp A	

logged also 5/5/2

Appendix C: Laboratory Results

CERTIFICATE OF ANALYSIS

Testing Laboratory: Ektimo
26 Redland Drive
Mitcham, VIC 3132
Report Number: LV-004840
Job Number: R015412
Date of Issue: 8/09/2023
Attention: Bituminous Products
Address: 33 Violet St
Revesby NSW 2212

Date samples received: 5/09/2023
Number of samples received: 2
Date samples analysed: 6/09/2023
No of samples analysed: 2

Test method(s) used: Ektimo 235

Comments

QC Acceptance Criteria:	Parameter	Criteria	Pass/Fail
	Standard Curve	$R^2 > 0.99$	Pass
	Range	All samples <110% of highest standard	Pass
	Repeat samples	Between 80% - 120%	Pass
	Method Blanks	All method blanks < PQL	Pass
	QC sample	2 standard deviations of theoretical	Pass
	Chemical Expiry	All chemicals within expiry date	Pass

This report supersedes any previous report(s) with this reference. Sample(s) have been analysed as received.

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 Laboratory Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through the mutual recognition arrangements with both of these organisations, NATA accreditation is recognised world-wide.

A formal Quality Control program is in place at Ektimo to monitor analyses performed in the laboratory and sampling conducted in the field. The program is designed to check where appropriate; the sampling reproducibility, analytical method, accuracy, precision and the performance of the analyst. The Laboratory Manager is responsible for the administration and maintenance of this program.

REPORT AUTHORISATION

Version 230707



Cappi Tuffery
Laboratory Chemist



Daniel Balaam
Senior Laboratory Chemist



NATA Accredited Laboratory 14601

Accredited for compliance with ISO/IEC 17025. NATA is a signatory to the ILAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports

Ektimo PTY LTD • ABN 86 600 381 413

Melbourne, VIC (Head Office)
26 Redland Drive,
Mitcham, VIC 3132

Perth, WA (Postal Address)
52 Cooper Road,
Cockburn Central, WA 6164

Sydney, NSW
6/78 Reserve Road,
Artarmon, NSW 2064

Wollongong, NSW
1/251 Princes Highway,
Unanderra, NSW 2526

Brisbane, QLD
3/109 Riverside Place,
Morningside, QLD 4170

Report No. LV-004840

Job No. R015412

Client Name: Bituminous Products

Parameter	Analyte	Units	N 18075 Bituminous Products EPA 1 Tox Blank solution (SO3)	N 18076 Bituminous Products EPA 1 Tox Imp A + B
Sample Volume		mL	168	168
Sulfur trioxide (SO ₃)	SO ₄ ²⁻	mg/L	<0.2	5.41
PQL	<	mg/L	0.2	0.2

CERTIFICATE OF ANALYSIS

Testing Laboratory: Ektimo ABN 86 600 381 413
Laboratory Location: 1/251 Princes Hwy, Unanderra NSW, 2526
Report Number: ON-00214
Job Number: R015412
Date of Issue: 29 August 2023

Attention: Stephan Suzor
Company Name: Bituminous Products
Address: 33 Violet St
Revesby NSW 2212

Date Samples Received: 28 August 2023
Number of samples received: 2
No of samples analysed: 2

Test Method(s) Used: Odour Analysis: AS4323.3 (NATA accredited)
Hedonic Tone and Odour Character: Direct observation (Not NATA accredited)

Olfactometer Calibration Date: October 2022

Comments
Nil

QUALITY CONTROL / QUALITY ASSURANCE INFORMATION

QC Acceptance Criteria:	Parameter	Criteria	Result	Pass/Fail
	Panel Butanol Threshold	20-80 ppb	44.8	PASS
	r	≤ 0.477	0.199	PASS
	10 ^r	≤ 3.00	1.581	PASS
	A	< 0.217	0.118	PASS
	Max Room Temperature	$< 25^{\circ}\text{C}$	21	PASS
	Temperature Variation	$< 3^{\circ}\text{C}$	0	PASS

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 by NATA. For full details, search for Ektimo at NATA's website www.nata.com.au.

Ektimo is accredited by NATA to ISO/IEC 17025 - Testing. ISO/IEC 17025 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 the mutual recognition arrangements with both of these organisations, NATA accreditation is recognised world-wide.

A formal Quality Control program is in place at Ektimo to monitor analyses performed in the laboratory and sampling conducted in the field. The program is designed to check where appropriate; the sampling reproducibility, analytical method, accuracy, precision and the performance of the analyst. The Laboratory Manager is responsible for the administration and maintenance of this program.

REPORT AUTHORISATION



Zoe Parker
Olfactometer Operator



Tom Manton
Ektimo Signatory



NATA Accredited Laboratory 14601

RESULTS

Report no. ON-00214

Date and time of analysis: 29 August 2023, 1000 - 1030
Date of last calibration: October 2022

Sample ID	Sample Location	Dilution ratio			Odour concentration (ou)	Confidence Interval (ou)	Hedonic Tone	Odour Character
		Pre	Post	Total				
96	EPA 2 - Vapour Scrubber Stack T1	-	-	-	1,700	1,300 - 2,400	mildly unpleasant	Metallic, chemicals, bitumen, asphalt, Sulfur,
27	EPA 2 - Vapour Scrubber Stack T2	-	-	-	1,700	1,300 - 2,400	mildly unpleasant	Metallic, chemicals, bitumen, asphalt, Sulfur, sweet

Uncertainty values cited in this table are calculated at the 95% confidence level (coverage factor = 2).

A dash '-' in the dilution columns represents no dilution (dilution ratio = 1).

The pre dilution ratio has been supplied by the client and taken into account when calculating odour concentration results. **No pre dilution has been assumed if the pre dilution was not stated.**

If post dilution ratio has been reported, this was done by Ektimo to bring samples within the working range of the olfactometer and taken into account when calculating odour concentration results.

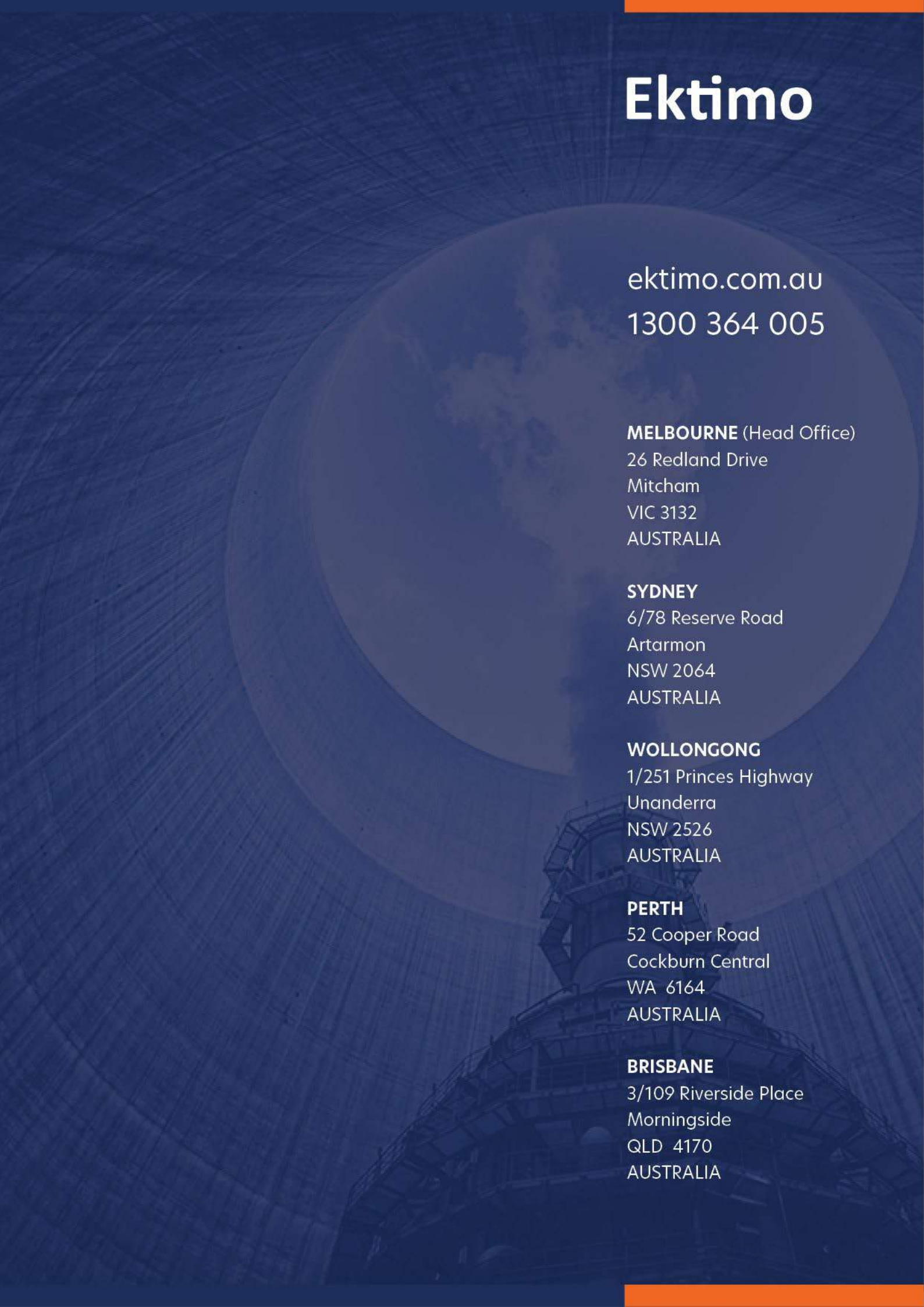
DEFINITIONS

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

~	Approximately
<	Less than
>	Greater than
≤	Less than or equal to
≥	Greater than or equal to
ND	Not determined
Odour Emission Rate	The product of the odour level of the waste discharged and the volume rate of the discharge (in wet cubic metres per minute referred to a temperature of 0°C and a pressure of 101.325 kilopascals). Emission rate is expressed as Odour Unit Volumes per Minute, ouv/min.
Odour Threshold	The concentration of a substance, or of a mixture of substances, which is distinguished from odourless air at 50% panel response. By definition, the odour threshold corresponds to an odour concentration of 1 odour unit per m ³ .
OU	The number of odour units per unit of volume. The numerical value of the odour concentration is equal to the number of dilutions to arrive at the odour threshold (50% panel response).
Dilution ratio	Dilution ratio = (Volume sample gas + Volume dilution gas) / Volume sample gas. Pre-dilution values received from the client are assumed to be calculated in this manner for the purposes of calculating reported the sample odour concentrations.
r	Precision, expressed as repeatability; implies that the factor that expresses the difference between two single measurements, performed on the same testing material in one laboratory under repeatability conditions, will not be larger than a factor of 3 in 95% of cases.
A	Accuracy of the odour concentration measurement. The accuracy is a reflection of trueness (expressed as bias) and the precision (r).
ITE	Individual Threshold Estimate: The detection threshold applying to an individual estimated on the basis of one dilution series.



NATA Accredited Laboratory 14601



Ektimo

ektimo.com.au

1300 364 005

MELBOURNE (Head Office)

26 Redland Drive
Mitcham
VIC 3132
AUSTRALIA

SYDNEY

6/78 Reserve Road
Artarmon
NSW 2064
AUSTRALIA

WOLLONGONG

1/251 Princes Highway
Unanderra
NSW 2526
AUSTRALIA

PERTH

52 Cooper Road
Cockburn Central
WA 6164
AUSTRALIA

BRISBANE

3/109 Riverside Place
Morningside
QLD 4170
AUSTRALIA