DATE OF REPORT: 24TH MAY 2019

Attn: **Viral Raval**
Environment Officer
Riverina Oils & BioEnergy (ROBE)
177 Trahairs Road
Bomen NSW 2650

TEST REPORT NO. MAR19054.1

QUARTERLY EPL AIR EMISSIONS TESTING CONDUCTED AT THE RIVERINA OILS BIOENERGY PLANT IN BOMEN

DATE OF TESTING: 1ST APRIL 2019

ACCREDITATION:

This laboratory is accredited by the National Association of Testing Authorities (NATA).
NATA Accredited Laboratory No. 15463.
Accredited for compliance with ISO/IEC 17025:2005.
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EXECUTIVE SUMMARY

AirLabs Environmental Pty Ltd carried out stack emissions monitoring at Riverina Oils and BioEnergy (ROBE) in Bomen, NSW.

The results are shown below and compared to the plant's license emission limits.

Table 1: Results Summary

Stack	Parameter	Concentration (mg/Nm³)	Licence Limit (mg/Nm³)
EP2 – Combined Vent (Point 2)	Hydrogen Sulphide	<0.2	**5.0**
EP3 – Solvent Extraction Plant Scrubber Vent (Point 3)	Hydrogen Sulphide	4.0	**5.0**
	TVOCs as n-propane	<0.04	**40**
EP14 – Filter Blowing Vapour Scrubber (Point 14)	TVOCs as n-propane	18	**40**
	Hydrogen Sulphide	2.7	**5.0**
	TRS as H_2S	2.7	**N/A**

INTRODUCTION

Airlabs Environmental Pty Ltd was commissioned by Riverina Oils and BioEnergy (ROBE) to undertake quarterly air emissions monitoring 2018 program at their facility in Bomen.

1. ***Testing of Point 2 – Combined Vent for:***

    - temperature, gas velocity and volume flow rate
    - concentration of water vapour (moisture content)
    - concentration and emission rate of:
    - hydrogen sulphide

2. ***Testing of Point 3 – Solvent Extraction Plant Scrubber Vent for:***

    - temperature, gas velocity and volume flow rate
    - concentration of water vapour (moisture content)
    - concentration and emission rate of:
    - hydrogen sulphide
    - TVOCs as n-propane

3. ***Testing of Point 14 – Filter Blowing Vapour Scrubber for:***

    - temperature, gas velocity and volume flow rate
    - concentration of water vapour (moisture content)
    - concentration and emission rate of:
    - TRS compounds as H_2S
    - hydrogen sulphide
    - TVOCs as n-propane

All sampling was conducted on the 1st April 2019.

TEST METHODS

All sampling was undertaken by Airlabs Environmental. Airlabs Environmental is NATA accredited for all sampling undertaken for this project (NATA Accredited Laboratory No. 15463). Analysis was undertaken by Airlabs Environmental and the National Measurement Institute (NMI, NATA Accreditation No. 198) in accordance with our terms of accreditation. Specific details of the test methods used are available upon request.

Table 2: Summary of Test Methods

Test Parameter	Test Method	Method Detection Limit	Estimated Measurement Uncertainty	NATA Accredited	
				Sampling	Analysis
Sample plane criteria	NSWEPA TM1	NA	NA	✓	NA
Gas velocity& Volumetric Flow-Rate	NSWEPA TM2	3 m/s	± 10%	✓	NA
Temperature	NSWEPA TM2	273K (0°C)	± 1%	✓	NA
Moisture content	NSWEPA TM22	0.2%	± 5%	✓	✓
Oxygen & carbon dioxide	NSWEPA TM23	0.1%	± 2%	✓	✓
Dry molecular weight & gas density	NSWEPA TM23	NA	± 5%	✓	✓
Volatile Organic Compounds	NSWEPA TM34	0.1 mg/m³	± 20%	✓	✓[a]
Total Reduced Sulphur Compounds	NSWEPA TM33	0.2 mg/m³	± 10%	✓	✓

QUALITY STATEMENT

AirLabs Environmental is committed to providing the highest quality data to all our clients, as reflected in our ISO 17025 (NATA) accreditation. This requires strict adherence to and continuous improvement of all our processes and test work. Our goal is to exceed the QA/QC requirements as set by our clients and appropriate governmental entities and to ensure that all data generated is scientifically valid and defensible.

Airlabs Environmental is NATA accredited for all sampling undertaken for this project. Analysis was undertaken by the National Measurement Institute (NATA Accreditation No. 198) and Airlabs Environmental in accordance with our terms of accreditation.

[a] VOC analyses were performed by NMI, with results included in their Report No. RN1229190.

DEFINITIONS

'NSWEPA'	New South Wales Environment Protection Authority.
'USEPA'	United States Environmental Protection Agency.
'VOCs'	Volatile Organic Compounds.
'N/A'	Not applicable.
'STP'	Standard temperature and pressure (0°C and 101.3 kPa).
'Am^3'	Actual gas volume at stack conditions.
'Nm^3'	Normalised gas volume in dry cubic metres at STP.
'<'	Less than. The value stated is the limit of detection.
'g'	Grams.
'mg'	Milligrams (10^{-3} grams).
'min'	Minute.
'sec'	Second.

SUITABILITY OF SAMPLING PLANE

The criteria for sampling planes as specified in AS4323.1-1995 'Stationary Source Emissions, Method 1: Selection of Sampling Provisions' states that, in the absence of cyclonic flow activity, ideal sampling plane conditions are found to exist at the positions given in Table 3 below:

Table 3: Criteria for the Selection of Sampling Planes

Type of flow disturbance	**Minimum distance upstream from disturbance, diameters (*D*)**	**Minimum distance downstream from disturbance, diameters (*D*)**
Bend, connection, junction, direction change	>2D	>6D
Louvre, butterfly damper (partially closed or closed)	>3D	>6D
Axial fan	>3D	>8D (see Note)
Centrifugal fan	>3D	>6D

NOTE: The plane should be selected as far as practicable from a fan. Flow straighteners may be required to ensure the position chosen meets the check criteria listed in Items (a) to (f).

The Sampling Plane Details for all stacks are given below:

Table 4: Sampling Plane Details for the Combined Vent (Point 2)

Parameter	
Stack Shape	Circular
Actual Stack Internal Diameter (m)	1.05
Direction of Discharge to Air	Vertical
Type of Disturbance, Upstream	Junction
Distance from Upstream Disturbance	> 2D
Type of Disturbance, Downstream	Junction
Distance to Downstream Disturbance	< 2D
Compliance with AS4323.1, Ideal Conditions	No
Standard No. of Sampling Points per Traverse	6
Number of Traverses	2
Downstream Correction Factor	1.2
Corrected No. of Sampling Points per Traverse	8
Total No. of Sampling Points	16
Stratified	No
Flow Assessment items (a)-(f) of AS4323.1	Yes
Compliance with AS4323.1, Non-Ideal Conditions	Yes

SUITABILITY OF SAMPLING PLANE Continued

Table 5: Sampling Plane Details for the Solvent Extraction Plant Scrubber Vent (Point 3)

Parameter	
Stack Shape	Circular
Actual Stack Internal Diameter (m)	1.05
Direction of Discharge to Air	Vertical
Type of Disturbance, Upstream	Stack Exit
Distance from Upstream Disturbance	>2D
Type of Disturbance, Downstream	Junction
Distance to Downstream Disturbance	<2D
Compliance with AS4323.1, Ideal Conditions	No
Standard No. of Sampling Points per Traverse	6
Number of Traverses	2
Downstream Correction Factor	1.2
Corrected No. of Sampling Points per Traverse	8
Total No. of Sampling Points	16
Stratified	No
Flow Assessment items (a)-(f) of AS4323.1	Yes
Compliance with AS4323.1, Non-Ideal Conditions	Yes

Table 6: Sampling Plane Details for the Filter Blowing Vapour Scrubber Vent (Point 14)

Parameter	
Stack Shape	Circular
Actual Stack Internal Diameter (m)	0.31
Direction of Discharge to Air	Vertical
Type of Disturbance, Upstream	Stack Exit
Distance from Upstream Disturbance	>2D
Type of Disturbance, Downstream	Centrifugal Fan
Distance to Downstream Disturbance	>6D
Compliance with AS4323.1, Ideal Conditions	Yes
Standard No. of Sampling Points per Traverse	4
Number of Traverses	2
Downstream Correction Factor	N/A
Corrected No. of Sampling Points per Traverse	N/A
Total No. of Sampling Points	8
Stratified	No
Flow Assessment items (a)-(f) of AS4323.1	Yes
Compliance with AS4323.1, Non-Ideal Conditions	N/A

RESULTS – Combined Vent (Point 2)

Company	Riverina Oils & BioEnergy Pty Ltd
Site	177 Trahairs Road, Bomen
Date of Test	1st April 2019
Source Tested	Release Point 2 – Combined Vent
Sampling Period	09:25 – 10:30
Testing Officers	A. Aitharaju
Sampling Position	Two 4" BSP sockets in a circular stack

Table 7: Test Conditions for the Combined Vent (Point 2)

Test Conditions	
Stack dimensions at sampling plane (m)	1.05
Average stack gas temperature (K)	314 (41°C)
Average velocity at sampling plane (m/s)	6.67
Actual gas flow rate (Am^3/sec)	5.77
Average moisture content (%v/v)	1.50
Gas flow rate at STP, dry (Nm^3/sec)	4.84

Table 8: General Test Results for the Combined Vent (Point 2)

Parameter	**Measured Concentration (mg/Nm^3)**	**NSWEPA Limit (mg/Nm^3)**	**Mass Emission Rate (g/sec)**
Hydrogen Sulphide	<0.2	5.0	<0.001

RESULTS – Solvent Extraction Plant Scrubber Vent (Point 3)

Company	Riverina Oils & BioEnergy Pty Ltd
Site	177 Trahairs Road, Bomen
Date of Test	1st April 2019
Source Tested	Release Point 3 – Solvent Extraction Plant Scrubber Vent
Sampling Period	11:40 – 12:45
Testing Officers	A. Aitharaju
Sampling Position	Two 2" BSP sampling ports in a circular stack

Table 9: Test Conditions for the Solvent Extraction Plant Scrubber Vent (Point 3)

Test Conditions	
Stack dimensions at sampling plane (m)	1.05
Average stack gas temperature (K)	319 (46°C)
Average velocity at sampling plane (m/s)	4.70
Actual gas flow rate (Am^3/sec)	4.07
Average moisture content (%v/v)	14.1
Gas flow rate at STP, dry (Nm^3/sec)	3.00

Table 10: General Test Results for the Solvent Extraction Plant Scrubber Vent (Point 3)

Parameter	**Measured Concentration (mg/Nm^3)**	**NSWEPA Limit (mg/Nm^3)**	**Mass Emission Rate (g/sec)**
Hydrogen Sulphide	4.0	5.0	0.012
Total VOCs *as n-propane*	<0.04	40	<0.0001

RESULTS – Filter Blowing Vapour Scrubber (Point 14)

Company	Riverina Oils & BioEnergy Pty Ltd
Site	177 Trahairs Road, Bomen
Date of Test	1st April 2019
Source Tested	Release Point 14 – Filter Blower Vapour Scrubber Vent
Sampling Period	08:07 – 09:10
Testing Officers	A. Aitharaju
Sampling Position	Two 2" BSP sampling ports in a circular stack

Table 11: Test Conditions for the Filter Blowing Vapour Scrubber Vent (Point 14)

Test Conditions	
Stack dimensions at sampling plane (m)	0.31
Average stack gas temperature (K)	298 (25°C)
Average velocity at sampling plane (m/s)	4.91
Actual gas flow rate (Am^3/sec)	0.37
Average moisture content (%v/v)	8.41
Gas flow rate at STP, dry (Nm^3/sec)	0.31

Table 12: General Test Results for the Filter Blowing Vapour Scrubber Vent (Point 14)

Parameter	**Measured Concentration (mg/Nm^3)**	**NSWEPA Limit (mg/Nm^3)**	**Mass Emission Rate (g/sec)**
Total VOCs *as n-propane*	18	40	0.0056
Hydrogen Sulphide	2.7	5.0	0.00085
TRS as H_2S	2.7	N/A	0.00085