Assured Environmental

SOURCE EMISSIONS MONITORING – LION CO

TOOHEYS – MARCH 2021

Project ID. 13594

R_0

DATE OF RELEASE: 6/04/2021

ABN: 87 604 851 078

Unit 7, 142 Tennyson Memorial Avenue, Tennyson, Queensland, 4105
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Table 1: Document approval

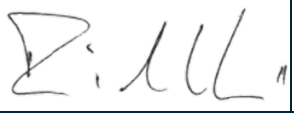
	Name	Position Title	Signature	Date
Author	Jos Mills	Technician		31/03/2021
Reviewer	David Arbuckle	General Manager		6/04/2021
Approver	David Arbuckle	General Manager		6/04/2021

Table 2: Revision register

Revision	Date	Issuer	Recipient	Comment
R_0	6/04/2021	David Arbuckle	Ian Porter	Initial release

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ACCREDITED FOR COMPLIANCE TO ISO/IEC 17025

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Accreditation ID: 19703

NATA
WORLD RECOGNISED ACCREDITATION
NATA ID: 19703

EXECUTIVE SUMMARY

The following table provides a summary of results from emissions monitoring conducted from the exhaust of the co-generator exhaust stack located on at the Lion Co, Toohey's Brewery in Lidcombe, NSW. Sampling was conducted on 19th March 2021 to meet the requirements of NSW EPL 1167. In summary;

- Oxides of nitrogen (NOx) concentration was below the EPL limit of 250 mg/Nm^3
- Total VOC concentration was above the EPL limit of 40 mg/Nm^3

Table 3: Executive summary

Parameter		Average Results	GUIDELINE LIMIT	unit of measure	Pass/Fail
Gas temperature		208	na	°C	na
Exit velocity		20.9	na	m/s	na
Oxygen		10.1	na	%v/v	na
Carbon dioxide		6.28	na	%v/v	na
Stack gas water vapour content		11.4	na	%v/v	na
Oxides of nitrogen (NOx) at 5%O_2		244	250	mg/Nm^3	Pass
Total VOCs as n-propane	<	0.646	40	mg/Nm^3	Pass

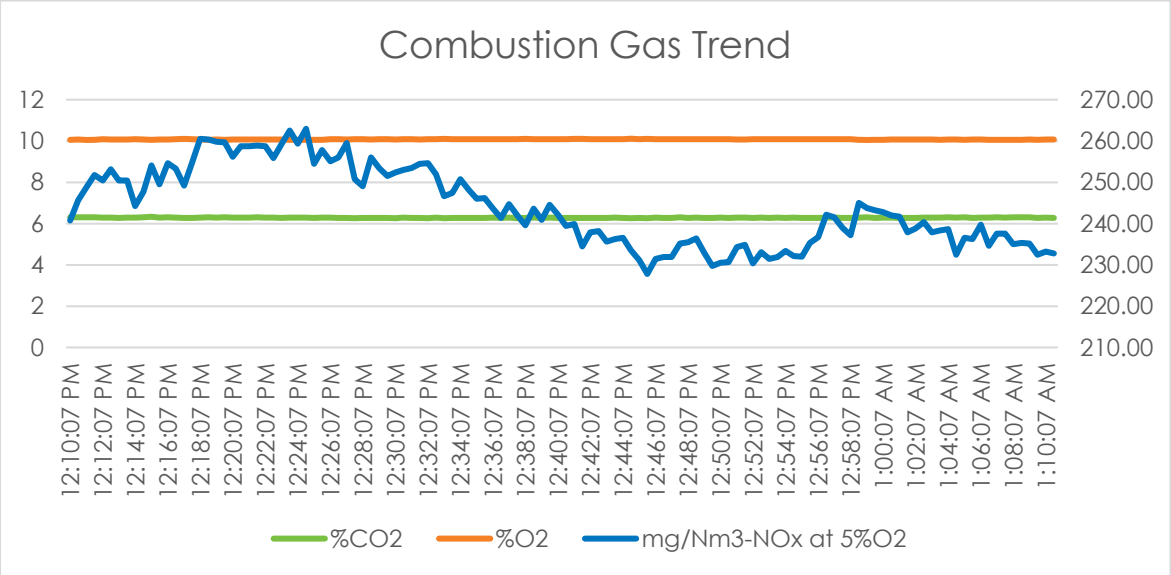

Figure 1: Combustion Gas trend – 19th March 2021

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1 INTRODUCTION

Assured Environmental (AE) was appointed by Lion Co Pty Ltd to monitor stack emissions from the 2MW natural gas co-generation engine operating at the Lion Co, Toohey's Brewery in Lidcombe as per conditions listed in NSW EPA EPL 1167. Sampling was conducted by AE on the 19th of March 2021. Refer to section 6 for the co-generators operating conditions during the test period.

AE was responsible for the collection and analysis of samples, unless otherwise indicated. The samples were recovered and stored in the appropriate manner until their return to the laboratory where the samples were prepared and analysed according to the methodologies listed below in this report.

2 METHODOLGY & EQUIPMENT

2.1 Sampling methodology

All sampling and analysis were carried in accordance with the listed requirements in Table 4. Any deviations to these methods have been documented as required.

Table 4: Test methods & EPL limits

PARAMETERS	Unit	NSW EPA TM	Reference Test Method	NATA	EPL limit
Traverse point selection	N/A	TM-1	AS4323.1	Yes	Na
Stack gas velocity	m/s	TM-2	USEPA Method 2	Yes	Na
Volumetric flow rate	m^3/s	TM-2	USEPA Method 2	Yes	Na
Moisture	%	TM-22	USEPA Method 4	Yes	Na
Stack gas temperature	°C	TM-22	USEPA Method 2	Yes	Na
Oxides of nitrogen (NO + NO_2)	mg/m^3	TM-11	USEPA Method 7E	Yes	250[a]
Volatile organic compounds[b]	mg/m^3	TM-32	USEPA Method 18	Yes	40[c]

Table 5: Analysis notes

Note	Company	Work performed	NATA ID	Report Number
1	Assured Environmental	Sampling & analysis	19703	13594
2	Test Safe Australia	VOC Analysis	3726	2021-1369-[R00]

Table 6: Deviations

Note	Comment
A	Pre & post calibration of the analyser was completed in the AE laboratory.

[a] mg/Nm^3 referenced to 5% oxygen.
[b] Speciated and total as n-propane – 1 sample taken over approximately 30 minutes.
[c] mg/Nm^3 as n-propane equivalent referenced to 5% oxygen.

2.2 Sampling location

The below images illustrate the Toohey's Brewery site and sample locations.

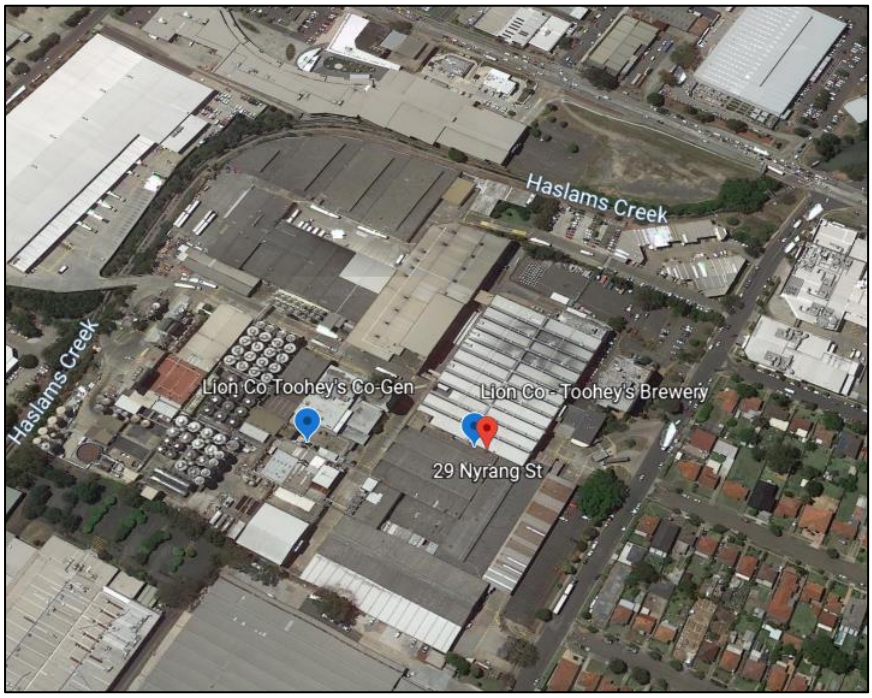


Figure 2: Site location

Figure 3: Co-Gen emission point

Figure 4: EWP used for testing

Figure 5: EWP and Co-Gen stack

2.3 Test equipment

All equipment used for the testing meets or exceeds all relevant performance standards as required by all jurisdictions. Our isokinetic and non-isokinetic equipment used for this project was from Apex Instruments[d]. Combustion gases were monitored using a Testo 350XL flue gas analyser.

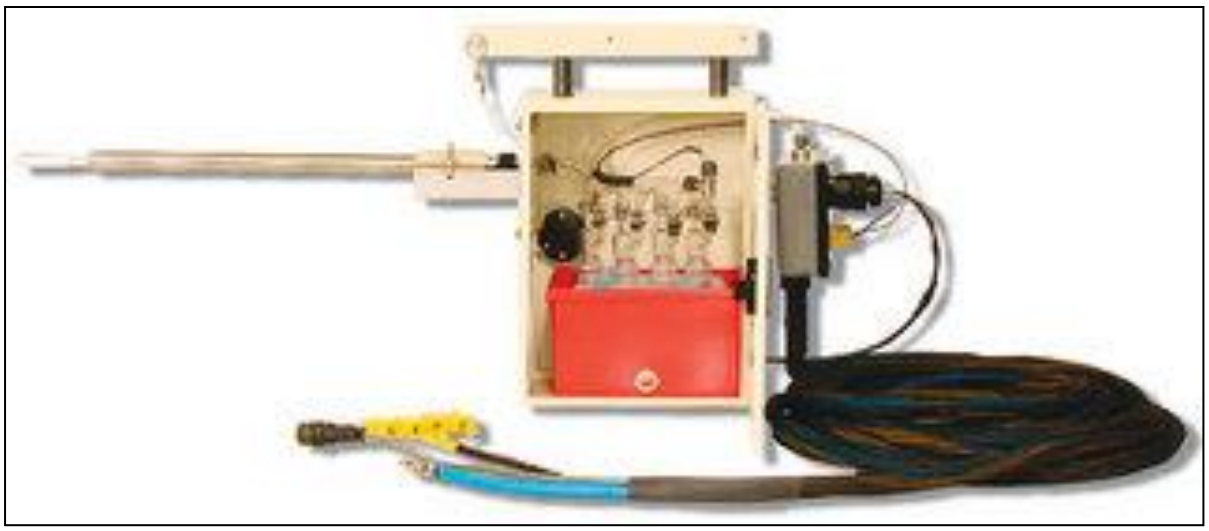


Figure 6: VOC Sampling Train (Apex Instruments[e])

Figure 7: Test Analyser

[d] http://www.apexinst.com/

[e] A sampling train like this was used. A carbon tube was placed in line after the first knock out impinger.

3 QUALITY ASSURANCE & QUALITY CONTROL (QA/QC)

AE operates within a quality system based upon the requirements of ISO17025. Our quality system defines specific procedures and methodologies to ensure any project undertaken by AE is conducted with the highest level of quality given the specific confines of each project. The overall objective of our QA/QC procedures is to representatively sample and accurately analyse components in the gas streams and therefore report valid measurements of emission concentrations.

To ensure representativeness of field work, our quality procedures target:

1. Correct sampling locations
2. Sample time
3. Frequency of samples and
4. Method selection & adherence

To ensure representativeness of lab work, our quality procedures target:

1. Sample preservation
2. Chain of custody (COC)
3. Sample preparation and
4. Analytical techniques

AE maintains strict quality assurance throughout all its sampling programs, covering on-site 'field work' and the analytical phase of our projects. Our QA program covers the calibration of all sampling and analytical apparatus where applicable and the use of spikes, replicate sample and reference standards. The test methodologies used for this project are outlined in section 2 of this document. Field test data has been recorded and calculated using direct entry into Microsoft Excel spreadsheets following the procedures of the appropriate test methods. Determination of emission concentrations has been performed using the same MS Excel spreadsheets which are partially supplied as an attachment to this report. More detailed information can be supplied upon request.

QA/QC checks for this project will use validation techniques and criteria appropriate to the type of data and the purpose of the measurement to approve the test report. Records of all data will be maintained. Complete chain of custody (COC) procedures has been followed to document the entire custodial history of each sample. The COC forms also served as a laboratory sheet detailing sample ID and analysis requirements.

Table 7: Sampling data QA/QC checklist

Sampling Data QA/QC Checklist	Comment
Use of appropriate test methods	Yes
'Normal' operation of the process being tested	Yes – as instructed by client
Use of properly operating and calibrated test equipment	Yes
Use of high purity reagents	Yes
Performance of leak checks post sample (at least)	Yes

Table 8: Laboratory data QA/QC checklist

Laboratory Data QA/QC Checklist	Comment
Use of appropriate analytical methods	Yes
Use of properly operating and calibrated analytical equipment	Yes
Precision and accuracy comparable to that achieved in similar projects	Yes
Accurate reporting	Yes

4 DEFINITIONS

The following terms and abbreviations may be used in this report:

Table 9: Definitions

Symbol	Definition
<	The analytes tested for was not detected; the value stated is the reportable limit of detection
Am^3	Gas volume in cubic metres at measured conditions
AS	Australian Standard
BH	Back half of sample train (filter holder and impingers) (referred to during sample recovery)
°C	Degrees Celsius
dscm	dry standard cubic meters
FH	Front half of sample train (probe and filter holder) (referred to during sample recovery)
g	Grams
kg	Kilograms
m	Metres
m^3	actual gas volume in cubic metres as measured
mbar	Millibars
mg	Milligrams (10^{-3} grams)
min	Minute
ml	Millilitres
mmH_2O	Millimetres of water
Mole	SI unit that measures the amount of substance
N/A	Not applicable
n/a	Not applicable
Nm^3	Gas volume in dry cubic metres at standard temperature and pressure (0°C and 101.3 kPa)
NMI	National Measurement Institute
NM VOC	Non methane volatile organic compound
NR	Not required on this occasion
PM	Particulate matter
ppb	Parts per billion
ppm	Parts per million
sec	Second
Sm^3	Gas volume in dry cubic metres at standard temperature and pressure (0°C and 101.3 kPa) and corrected to a standardised value (e.g. 15% O_2)
STP	Standard temperature and pressure (0°C and 101.3 kPa)
USEPA	United States Environmental Protection Authority

5 RESULTS

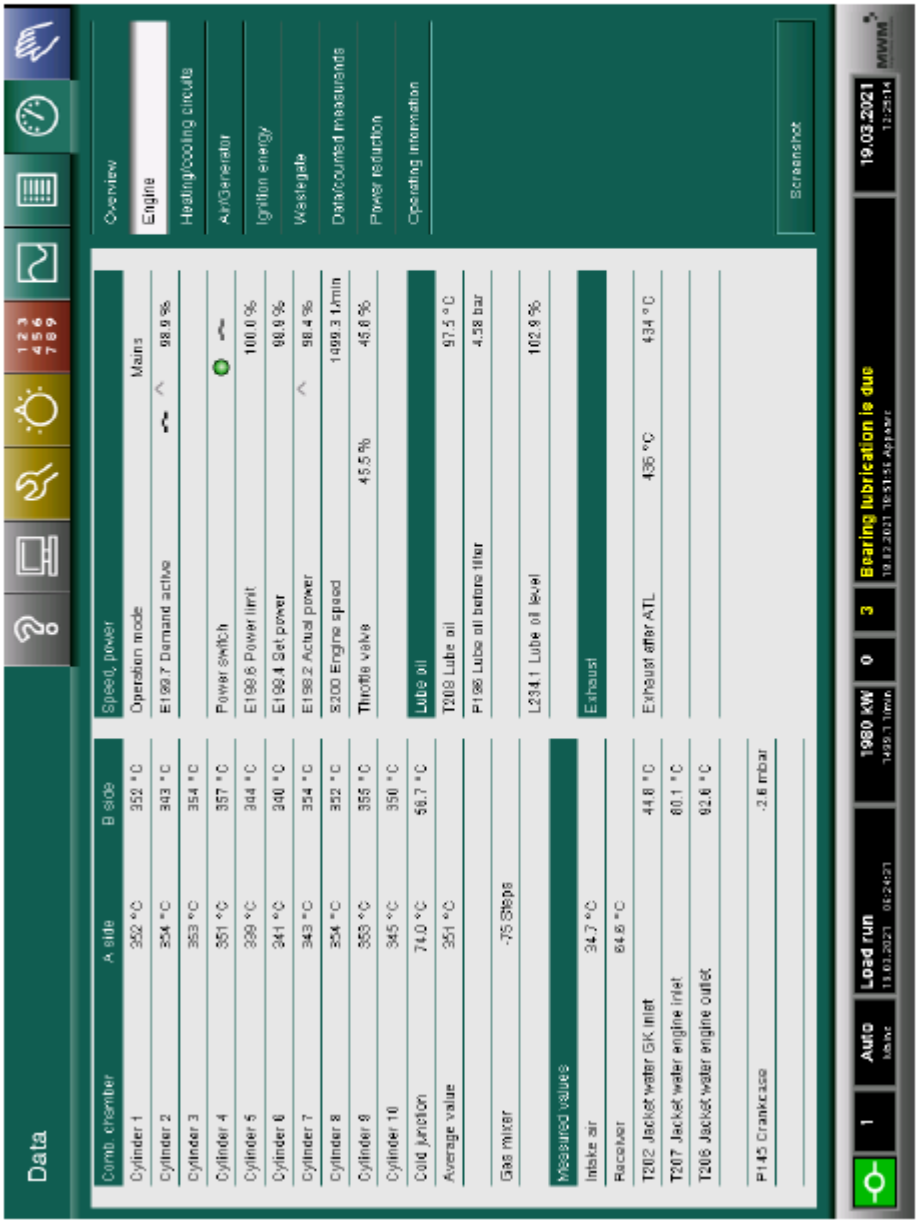
Table 10 presents a summary of the sample run.

Table 10: Results summary

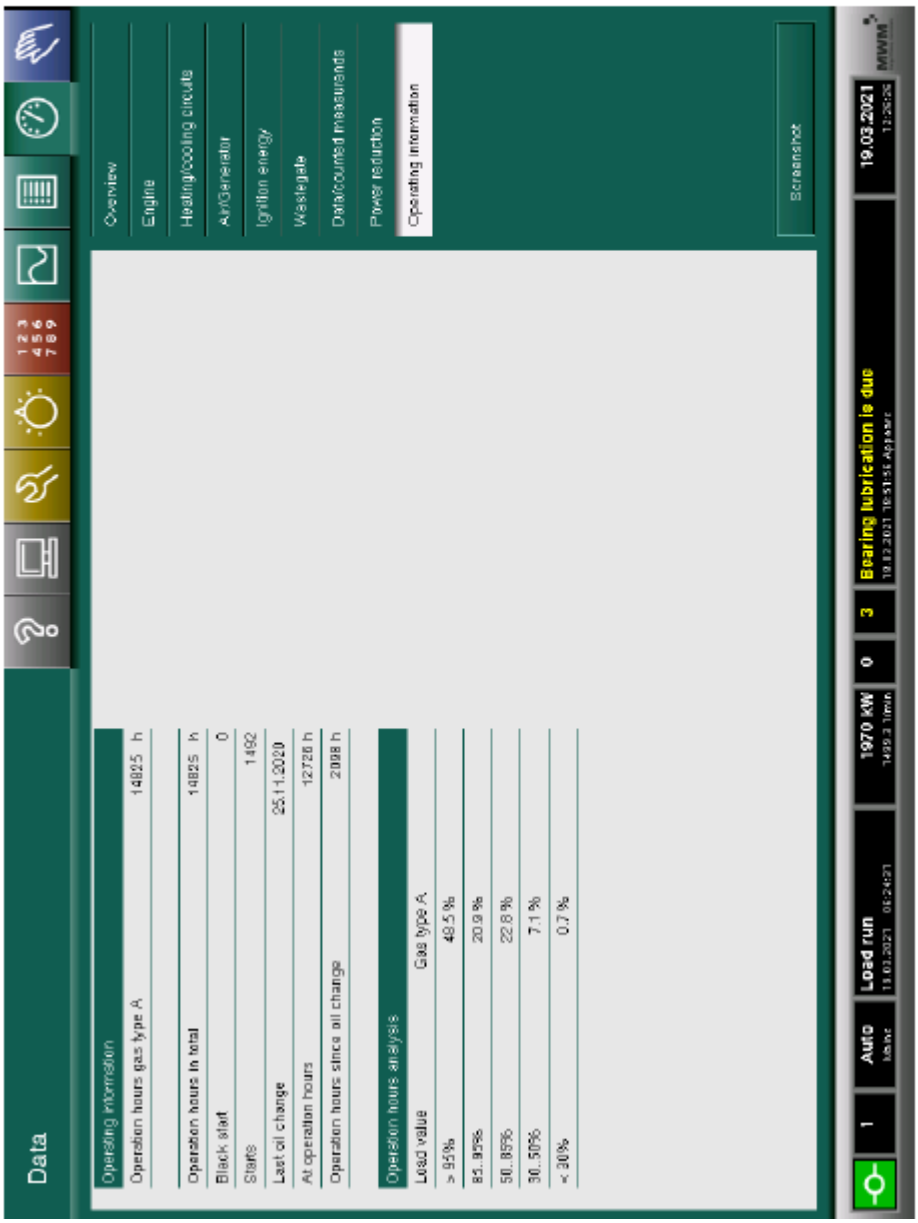
Source Data		Stack SDS version - 3.28	
Client		Lion CO	
Site		Tooheys	
Sample Point		Co-GEN	
Reference Method		M18 - CONSTANT FLOW	
Test Parameters		VOCs & Gases	
Process conditions		Normal	
Historical Data & Hardware Information - Manual Sample			
Run Start Date		19/03/2021	dd-mm-yyyy
Project ID		13594	
Run ID		-1	
Run Start Time	Ti	12:10	hh:mm
Run Stop Time	Tf	12:55	hh:mm
Positioning compliance check with AS4323.1		Non-ideal	
Flow & temperature compliance check with AS4323.1		YES	
Traverse pt factors; up, down, total & trav pts		1.15 , 1 , 1.15 , 12	
Console Serial Number		gm4	
Meter Calibration Factor	(Y)	1.000	
Orifice Coefficient		N/A	($DH_{@}$)
Pitot Tube Coefficient	(C_p)	0.81	
Actual Nozzle Diameter	(D_{na})	N/A	mm
Stack Test Data			
Initial Meter Volume	(V_m)$_i$	8.0120	m^3
Final Meter Volume	(V_m)$_f$	8.0550	m^3
Actual Sampling Time	(Q)	60.0	minutes
Average Meter Temperature	(t_m)$_{avg}$	26.00	°C
Average Stack Temperature	(t_s)$_{avg}$	208.33	°C
Barometric Pressure	(P_b)	1022	mb
Stack Static Pressure	(P_{static})	10.00	mm H_2O
Absolute Stack Pressure	(P_s)	1023	mb
Sample Volumes			
Actual Meter Volume	(V_m)	0.0430	m^3
Standard Meter Volume	(V_m)$_{std}$	0.0396	Nm^3
Moisture Content Data			
Water vapour concentration	($B_{ws(calc)}$)	11.40	%
Stack Gas Density Analysis Data			
Carbon Dioxide Percentage	(%CO_2)	6.28	%
Oxygen Percentage	(%O_2)	10.08	%
Carbon Monoxide Percentage	(%CO)	0.051	%
Nitrogen Percentage	(%N_2)	83.64	%
Dry Gas Molecular Weight	(M_d)	1.313	kg/Nm^3
Dry Gas Molecular Weight	(M_d)	29.4	g/g-mole
Wet Stack Gas Molecular Weight	(M_s)	28.1	g/g-mole
Volumetric Flow Rate Data (at Sample Plane)			
Average Stack Gas Velocity	(v_s)	20.93	m/sec
Stack Diameter	Ds	0.480	m
Stack Cross-Sectional Area	(A_s)	0.181	m^2
Upstream distance (from disturbance)	B	1.40	m
Downstream distance (from disturbance)	A	1.90	m
Actual Stack Flow Rate	(Q_{aw})	227.2	m^3/min
Wet Standard Stack Flow Rate	(Q_{sw})	130.2	Nm^3/min-wet
Dry Standard Stack Flow Rate	(Q_{sd})	115.4	Nm^3/min-dry
Percent of Isokinetic Rate	(I)	N/A	%
Particulate Uncertainty Calculation			
Uncertainty expressed at 95%CI	(U)	Non ideal.	%
Uncertainty expressed at 95%CI	(U)	Cannot quote	mg/Nm^3
Instrumental Analyser - Historical Data & Hardware Information			
Analyser serial number, make & model		Testo 350XL	value
Analyser Run Start Time	Ti	12:10	hh:mm
Analyser Run Stop Time	Tf	12:59	hh:mm
Analyser Total Sampling Time	(Q)	0:49	hh:min
Instrumental Analyser Raw Data Averages			
Oxides of Nitrogen	(NOx)	80.83	ppm
Average Oxides of Nitrogen (USEPA Method 7E - instrumental analyser)			
Nitrogen Oxides (NOx as NO_2)	(Conc)	166.0	mg/Nm^3
Nitrogen Oxides at 5 % O2	(Conc)	243.9	mg/Nm^3
Nitrogen Oxides (NOx as NO_2)	(E)	19.15	g/min
OTHER ANALYTES (PLEASE SPECIFIY)			
TVOC as n-propane	(Conc)	< 0.646	mg/Nm^3
TVOC as n-propane emission rate	(E)	< 0.0745	g/min

6 OPERATING CONDITIONS

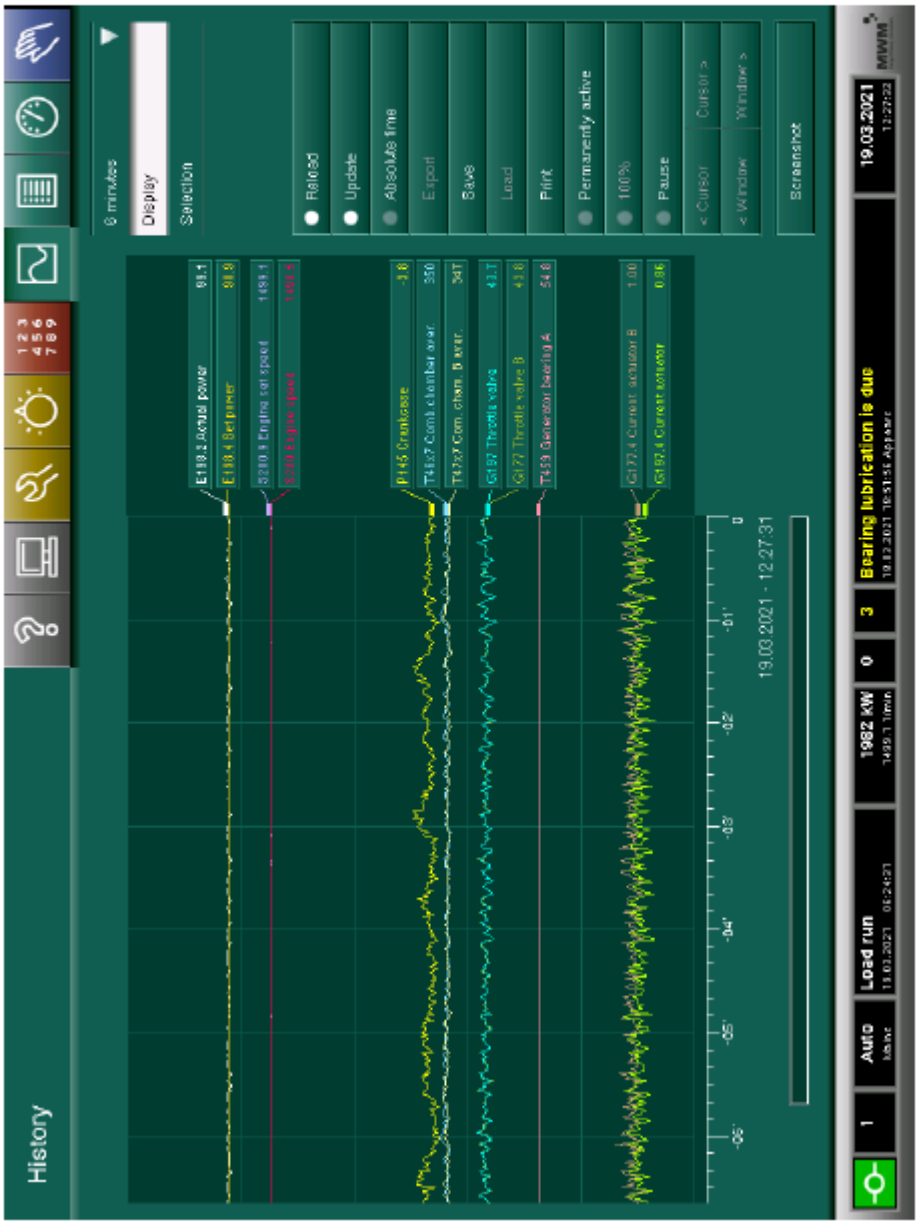
Name:	PLC date: 19.03.2021	Number of faults: 0 Number of alarms: 3
Comment: Toohey's	PLC release: 2.50.21-m03	State: Load run Operation mode: Mains
Number: 9296876	PLC operating system: 2.53.03	Actual power: 1980 kW Actual speed: 1499.1 1/min
Engine type: TCG2020V20	Visualisation: 3.4.2	Operation hours: 14825 Starts: 1492
Serial number CPU-P: 233500100-01891	Serial number BRT: 26030040114483	Serial number DZR: 832800092



Name:	PLC date: 19.03.2021	Number of faults: 0 Number of alarms: 3
Comment: Toohey's	PLC release: 2.50.21-m03	State: Load run Operation mode: Mains
Number: 9296876	PLC operating system: 2.53.03	Actual power: 1970 kW Actual speed: 1499.3 1/min
Engine type: TCG2020V20	Visualisation: 3.4.2	Operation hours: 14825 Starts: 1492
Serial number CPU-P: 233500100-01891	Serial number BRT: 26030040114483	Serial number DZR: 832800092



Name:	PLC date: 19.03.2021	Number of faults: 0 Number of alarms: 3
Comment: Toohey's	PLC release: 2.50.21-m03	State: Load run Operation mode: Mains
Number: 9296876	PLC operating system: 2.53.03	Actual power: 1982 kW Actual speed: 1499.1 1/min
Engine type: TCG2020V20	Visualisation: 3.4.2	Operation hours: 14825 Starts: 1492
Serial number CPU-P: 233500100-01891	Serial number BRT: 26030040114483	Serial number DZR: 832800092



7 RELEVANT NSW EPA EPL 1167 EXTRACTS

Section 55 Protection of the Environment Operations Act 1997

Environment Protection Licence

Licence - 1167

POINT 7

Pollutant	Units of measure	100 percentile concentration limit	Reference conditions	Oxygen correction	Averaging period
Nitrogen Oxides	milligrams per cubic metre	250	Dry, 273k, 101.3kPa,	5%	As per test method
volatile organic compounds as n-propane equivalent	milligrams per cubic metre	40	Dry, 273k, 101.3kPa,	5%	As per test method

Figure 8: EPL 1167 Limits

POINT 7

Pollutant	Units of measure	Frequency	Sampling Method
Dry gas density	kilograms per cubic metre	Yearly	TM-23
Moisture	percent	Yearly	TM-22
Molecular weight of stack gases	grams per gram mole	Yearly	TM-23
Nitrogen Oxides	milligrams per cubic metre	Yearly	TM-11
Temperature	degrees Celsius	Yearly	TM-2
Velocity	metres per second	Yearly	TM-2
volatile organic compounds as n-propane equivalent	milligrams per normalised cubic metre	Yearly	TM-34

Environment Protection Authority - NSW
Licence version date: 25-Feb-2019

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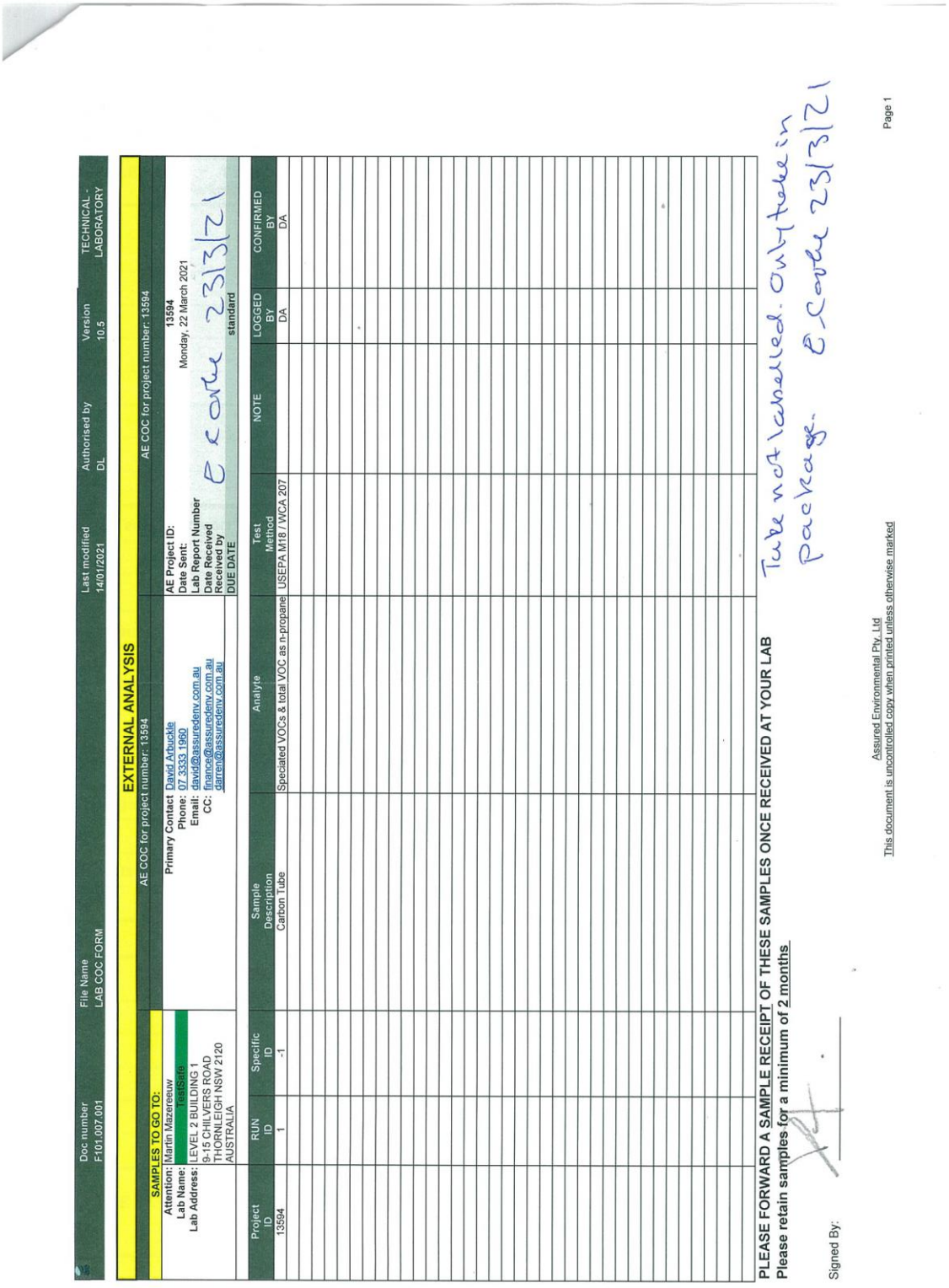
Figure 9: EPL 1167 Frequency & Test Methods

8 LAB ANALYTICAL TEST DATA

8.1 Chain of Custody



Doc number F101.007.001 | File Name LAB COC FORM | Last modified 14/01/2021 | Authorised by DL | Version 10.5 | TECHNICAL - LABORATORY

EXTERNAL ANALYSIS

AE COC for project number: 13594 | AE COC for project number: 13594

SAMPLES TO GO TO:

Attention: Martin Mazereeuw
Lab Name: testSafe
Lab Address: LEVEL 2 BUILDING 1, 9-15 CHILVERS ROAD, THORNLEIGH NSW 2120 AUSTRALIA

Primary Contact David Arbuckle
Phone: 07 3333 1960
Email: david@assuredenv.com.au
CC: finance@assuredenv.com.au, darren@assuredenv.com.au

AE Project ID: 13594
Date Sent: Monday, 22 March 2021
Lab Report Number
Date Received
Received by
DUE DATE standard

E carter 23/3/21

Project ID	RUN ID	Specific ID	Sample Description	Analyte	Test Method	NOTE	LOGGED BY	CONFIRMED BY
13594	1	-1	Carbon Tube	Speciated VOCs & total VOC as n-propane	USEPA M18 / WCA 207		DA	DA

Tube not labelled. Only taken in Package. E Carter 23/3/21

PLEASE FORWARD A SAMPLE RECEIPT OF THESE SAMPLES ONCE RECEIVED AT YOUR LAB
Please retain samples for a minimum of 2 months

Signed By: _____

Assured Environmental Pty. Ltd
This document is uncontrolled copy when printed unless otherwise marked

Page 1

8.2 Test Safe Australia Analytical Report

NSW GOVERNMENT SafeWork NSW

Test Safe AUSTRALIA

David Arbuckle
Assured Environmental Pty Ltd
Unit 7
142 Tennyson Memorial Avenue
TENNYSON QLD 4105

Lab. Reference: 2021-1369

Samples analysed as received

SAMPLE ORIGIN: AE Project ID: 13594

DATE OF INVESTIGATION: Not Stated **DATE RECEIVED:** 23/03/21

ANALYSIS REQUIRED: Volatile Organic Compounds

REPORT OF ANALYSIS

See attached sheet(s) for sample description and test results.

The results of this report have been approved by the signatory whose signature appears below.

For all administrative or account details please contact the Laboratory.

Increment and total pagination can be seen on the following pages.

Martin Mazereeuw
Manager

Date: 26/03/21

TestSafe Australia – Chemical Analysis Branch
Level 2, Building 1, 9-15 Chilvers Road, Thornleigh, NSW 2120, Australia
T: +61 2 9473 4000 E: lab@safework.nsw.gov.au W: testsafe.com.au
ABN 81 913 830 179

ilac-MRA NATA

Accreditation No. 3726

Accredited for compliance with ISO/IEC 17025 - Testing

Page 1

NSW GOVERNMENT | SafeWork NSW

Test Safe AUSTRALIA

Analysis of Volatile Organic Compounds in Workplace Air by GC/MS

Date Sampled NA

Client: Assured Environmental **Date Analysed** 24/03/2021

Sample ID: 13594 **Reference Number** 2021-1369-1

No	Compounds	CAS No	Front µg/section	Back µg/section	No	Compounds	CAS No	Front µg/section	Back µg/section
	Aliphatic hydrocarbons (LOQ = 5µg/compound/section)					**Aromatic hydrocarbons** (LOQ = 1µg/compound/section)			
1	2-Methylbutane	78-78-4	<LOQ	<LOQ	39	Benzene	71-43-2	<LOQ	<LOQ
2	n-Pentane	109-66-0	<LOQ	<LOQ	40	Ethylbenzene	100-41-4	<LOQ	<LOQ
3	2-Methylpentane	107-83-5	<LOQ	<LOQ	41	Isopropylbenzene	98-82-8	<LOQ	<LOQ
4	3-Methylpentane	96-14-0	<LOQ	<LOQ	42	1,2,3-Trimethylbenzene	526-73-8	<LOQ	<LOQ
5	Cyclopentane	287-92-3	<LOQ	<LOQ	43	1,2,4-Trimethylbenzene	95-63-6	<LOQ	<LOQ
6	Methylcyclopentane	96-37-7	<LOQ	<LOQ	44	1,3,5-Trimethylbenzene	108-67-8	<LOQ	<LOQ
7	2,3-Dimethylpentane	565-59-3	<LOQ	<LOQ	45	Styrene	100-42-5	<LOQ	<LOQ
8	n-Hexane	110-54-3	<LOQ	<LOQ	46	Toluene	108-88-3	<LOQ	<LOQ
9	3-Methylhexane	589-34-4	<LOQ	<LOQ	47	p-Xylene &/or m-Xylene	106-42-3 & 108-38-3	<LOQ	<LOQ
10	Cyclohexane	110-82-7	<LOQ	<LOQ	48	o-Xylene	95-47-6	<LOQ	<LOQ
11	Methylcyclohexane	108-87-2	<LOQ	<LOQ		**Ketones** (LOQ #49, #54 & #55 =5µg/c/s; #50, #51, #52 & #53 =25µg/c/s)			
12	2,2,4-Trimethylpentane	540-84-1	<LOQ	<LOQ	49	Acetone	67-64-1	<LOQ	<LOQ
13	n-Heptane	142-82-5	<LOQ	<LOQ	50	Acetoin	513-86-0	<LOQ	<LOQ
14	n-Octane	111-65-9	<LOQ	<LOQ	51	Diacetone alcohol	123-42-2	<LOQ	<LOQ
15	n-Nonane	111-84-2	<LOQ	<LOQ	52	Cyclohexanone	108-94-1	<LOQ	<LOQ
16	n-Decane	124-18-5	<LOQ	<LOQ	53	Isophorone	78-59-1	<LOQ	<LOQ
17	n-Undecane	1120-21-4	<LOQ	<LOQ	54	Methyl ethyl ketone (MEK)	78-93-3	<LOQ	<LOQ
18	n-Dodecane	112-40-3	<LOQ	<LOQ	55	Methyl isobutyl ketone (MIBK)	108-10-1	<LOQ	<LOQ
19	n-Tridecane	629-50-5	<LOQ	<LOQ		**Alcohols** (LOQ = 25µg/compound/section)			
20	n-Tetradecane	629-59-4	<LOQ	<LOQ	56	Ethyl alcohol	64-17-5	<LOQ	<LOQ
21	α-Pinene	80-56-8	<LOQ	<LOQ	57	n-Butyl alcohol	71-36-3	<LOQ	<LOQ
22	β-Pinene	127-91-3	<LOQ	<LOQ	58	Isobutyl alcohol	78-83-1	<LOQ	<LOQ
23	D-Limonene	138-86-3	<LOQ	<LOQ	59	Isopropyl alcohol	67-63-0	<LOQ	<LOQ
	Chlorinated hydrocarbons (LOQ = 5µg/compound/section)				60	2-Ethyl hexanol	104-76-7	<LOQ	<LOQ
24	Dichloromethane	75-09-2	<LOQ	<LOQ	61	Cyclohexanol	108-93-0	<LOQ	<LOQ
25	1,1-Dichloroethane	75-34-3	<LOQ	<LOQ		**Acetates** (LOQ = 25µg/compound/section)			
26	1,2-Dichloroethane	107-06-2	<LOQ	<LOQ	62	Ethyl acetate	141-78-6	<LOQ	<LOQ
27	Chloroform	67-66-3	<LOQ	<LOQ	63	n-Propyl acetate	109-60-4	<LOQ	<LOQ
28	1,1,1-Trichloroethane	71-55-6	<LOQ	<LOQ	64	n-Butyl acetate	123-86-4	<LOQ	<LOQ
29	1,1,2-Trichloroethane	79-00-5	<LOQ	<LOQ	65	Isobutyl acetate	110-19-0	<LOQ	<LOQ
30	Trichloroethylene	79-01-6	<LOQ	<LOQ		**Ethers** (LOQ = 25µg/compound/section)			
31	Carbon tetrachloride	56-23-5	<LOQ	<LOQ	66	Ethyl ether	60-29-7	<LOQ	<LOQ
32	Perchloroethylene	127-18-4	<LOQ	<LOQ	67	*tert*-Butyl methyl ether (MTBE)	1634-04-4	<LOQ	<LOQ
33	1,1,2,2-Tetrachloroethane	79-34-5	<LOQ	<LOQ	68	Tetrahydrofuran (THF)	109-99-9	<LOQ	<LOQ
34	Chlorobenzene	108-90-7	<LOQ	<LOQ		**Glycols** (LOQ = 25µg/compound/section)			
35	1,2-Dichlorobenzene	95-50-1	<LOQ	<LOQ	69	PGME	107-98-2	<LOQ	<LOQ
36	1,4-Dichlorobenzene	106-46-7	<LOQ	<LOQ	70	Ethylene glycol diethyl ether	629-14-1	<LOQ	<LOQ
	Miscellaneous (LOQ #37= 5µg & #38=25µg/compound/section)				71	PGMEA	108-65-6	<LOQ	<LOQ
37	Acetonitrile	75-05-8	<LOQ	<LOQ	72	Cellosolve acetate	111-15-9	<LOQ	<LOQ
38	n-Vinyl-2-pyrrolidinone	88-12-0	<LOQ	<LOQ	73	DGMEA	112-15-2	<LOQ	<LOQ
	Extra compound (LOQ = 25µg/compound/section)					**Extra compound** (LOQ = 25µg/compound/section)			
74	Bromopropane *	106-94-5	<LOQ	<LOQ	75	Naphthalene *	91-20-3	<LOQ	<LOQ
	Total VOCs (LOQ =50µg/compound/section)		<LOQ	<LOQ		Worksheet check			2021-1369

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Accreditation No. 3726

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Analysis of Volatile Organic Compounds in Workplace Air by GC/MS

All compounds (numbered 1-73) that are reported in the analysis are covered within the scope of NATA accreditation. Any additional compounds attonated with * are not covered by NATA accreditation.

Method : WCA.207 Analysis of Volatile Organic Compounds in Workplace Air by Gas Chromatography/Mass Spectrometry

Limit of Quantitation (LOQ) : 5µg/section; 25µg/section for oxygenated hydrocarbons except acetone, MEK and MIBK at 5µg/section and aromatic hydrocarbons at 1µg/section.

Method Description : Volatile organic compounds were trapped from the workplace air onto charcoal tubes by the use of a personal air monitoring pump. The volatile organic compounds were desorbed from the charcoal in the laboratory with CS_2. An aliquot of the desorbant was analysed by gas chromatography with mass spectrometry detection.

PGME: Propylene Glycol Monomethyl Ether
PGMEA: Propylene Glycol Monomethyl Ether Acetate
DGMEA: Diethylene Glycol Monoethyl Ether Acetate

Measurement Uncertainty : The measurement uncertainty is an estimate that characterises the range of values within which the true value is asserted to lie. The uncertainty estimate is an expanded uncertainty using a coverage factor of 2, which gives a level of confidence of approximately 95%. The estimate is compliant with the "ISO Guide to the Expression of Uncertainty in Measurement" and is a full estimate based on in-house method validation and quality control data. The measurement uncertainty relates to the analysis of the analyte on the sampling device and does not take into consideration the sampling parameters such as pump flowrate, time, temperature and pressure. The measurement of uncertainty estimates are available upon request.

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