

# West Gate Tunnel Project

## Ambient Air Quality Monitoring

## Validated Report

1<sup>st</sup> July 2018 – 8<sup>th</sup> August 2018

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Maintenance contract: MC1984

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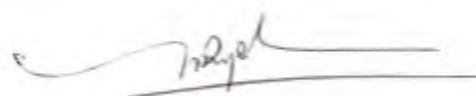
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0	DAT13550	23/08/18	Diep LAM

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## Executive Summary

Ecotech Pty Ltd is an independent company, contracted Transurban Limited (Principal) to undertake continuous ambient air quality monitoring (AAQM) at West Gate Tunnel Project network of sites in Yarraville, Victoria, Australia. Monitoring is being conducted to inform environmental compliance requirements of the planned West Gate Tunnel Project. The air quality monitoring contract between Ecotech and Transurban Limited (Principal) has ended as per schedule in March 2018. Ecotech is assisting the D&C Subcontractor in the transition program in the month of from 01/07/2018 to 08/08/2018.

The West Gate Tunnel Project monitoring network consists of five AAQM stations. Ecotech commissioned the West Gate Tunnel Project monitoring stations as following:

- Station 1 on 19<sup>th</sup> July 2016.
- Station 2 on 26<sup>th</sup> August 2016.
- Station 4 on 3<sup>rd</sup> November 2016. BTEX sampling at WD4 commenced on 21<sup>st</sup> November 2016.
- Station 5 on 17<sup>th</sup> January 2017.
- Station 3 on 25<sup>th</sup> January 2017.

This report presents the data from 01/07/2018 to 08/08/2018.

- The percentage of valid data capture for all parameters at West Gate Tunnel Project was above 85% for the reporting month, except for BTEX at Station 4.
- There were no recorded readings over the exceedance limits of the air quality goal across the station network during reporting period.

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## Introduction

Ecotech Pty Ltd was commissioned by Transurban Limited (Principal) to provide monitoring and data reporting for the West Gate tunnel Project ambient air quality monitoring stations, located as detailed in Table 1. Ecotech commenced data collection at the Station 1 on the 19<sup>th</sup> July 2016, at Station 2 on the 26<sup>th</sup> August 2016, and at Station 4 on the 3<sup>rd</sup> November 2016. BTEX sampling at Station 4 commenced on 21<sup>st</sup> of November 2016. Monitoring commenced at Station 5 and Station 3 stations on the 17<sup>th</sup> and 25<sup>th</sup> of January 2017 respectively.

The monitoring contract between Ecotech and Transurban Limited (Principal) has ended in the month of March 2018 as per contract schedule. Ecotech is assisting the D&C Subcontractor in the transition program which begins in April 2018.

This report presents the data from 01/07/2018 to the decommissioning on 07/08/2018 and 08/08/2018.

The data presented in this report:

- Describes air quality measurements;
- Compares monitoring results;
- Has been quality assured;
- Complies with NATA accreditation requirements, where applicable.



## 1.0 Monitoring and Data Collection

### 1.1. Siting Details

The West Gate Tunnel Project consists of five ambient air quality monitoring stations. The station's location and siting details are described below.

**Table 1: West Gate Tunnel Project monitoring locations**

Site Name	Street Address	Geographical Coordinates	Height Above Sea Level (m)
Station 1	Barbara Beyer Reserve, 2 Harris St, Yarraville	37°48'43.20"S 144°54'0.00"E	10m
Station 2	51-53 Francis Street, Yarraville	37°49'15.59"S 144°53'38.41"E	12m
Station 3	Railway Reserve, Woods St, Yarraville	37°48'50.40"S 144°53'27.60"E	17m
Station 4	Primula Ave, Brooklyn	37°49'27.28"S 144°50'45.72"E	23m
Station 5	Donald McLean Reserve, Spotswood	37°49'35.28"S 144°52'55.25"E	6m

Siting audits were conducted to assess for compliance with *AS/NZS 3580.1.1:2016 "Methods for sampling and analysis of ambient air – guide to siting air monitoring equipment"*.

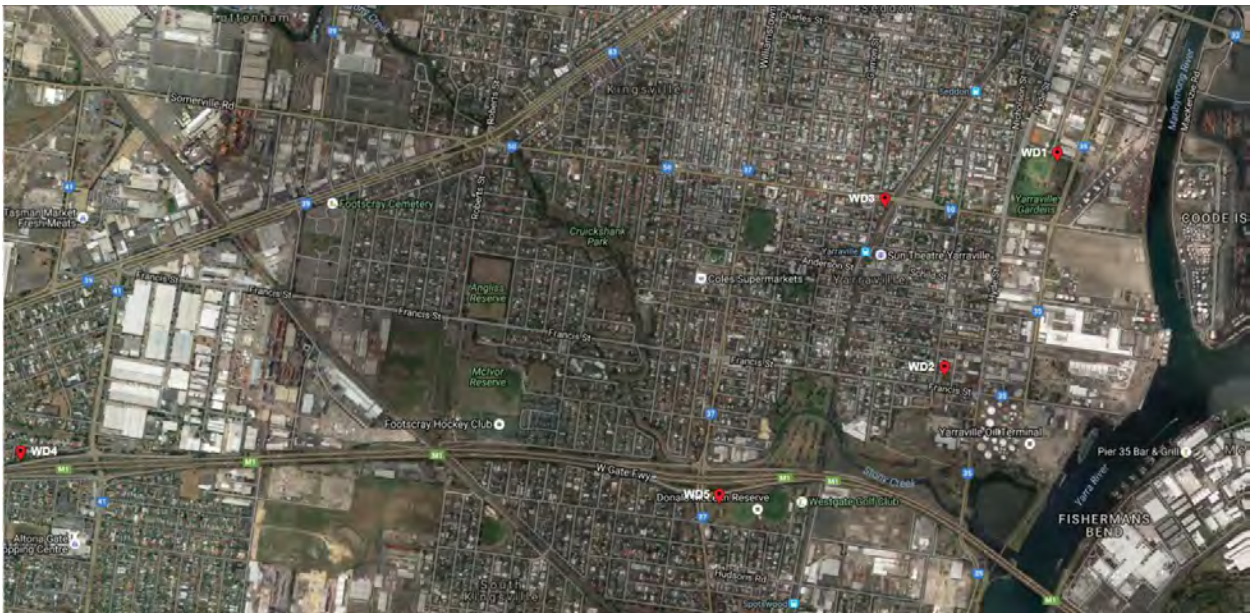
Siting audits performed at West Gate Tunnel Project monitoring network as follows:

- Station 1 on 31<sup>st</sup> July 2017.
- Station 2 on 22<sup>nd</sup> September 2017.
- Station 3 on 8<sup>th</sup> August 2018.
- Station 4 on 7<sup>th</sup> August 2018.
- Station 5 on 8<sup>th</sup> February 2018.

The siting audits of these stations showed general compliance with the guidelines in AS/NZS 3580.1.1:2016. These stations are classified as peak stations according to AS/NZS 3580.1.1:2016. Please see details of any non-compliance in Section 1.3.1.

The meteorological monitoring siting audits were completed at West Gate Tunnel Project as follows:

- Station 1 on 31<sup>st</sup> July 2017.
- Station 2 on 22<sup>nd</sup> September 2017.
- Station 3 on 8<sup>th</sup> August 2018.
- Station 4 on 7<sup>th</sup> August 2018.
- Station 5 on 2<sup>nd</sup> February 2018.



**Figure 1: West Gate Tunnel Project Monitoring Station Location**

## 1.2. Monitored Parameters

Table 2 below details the parameters monitored and the instruments used at West Gate Tunnel Project monitoring stations. Appendix 1 defines any abbreviated parameter names used throughout the report.

Sampling of all parameters is continuous, with the exception of BTEX. BTEX sampling is typically conducted by Ecotech on a one in six-day cycle at WD4 station. BTEX samples are collected from 12:30 AM to 11:30 PM on the sampling day.

For meteorological sensors, the elevation given in Table 2 is the height above ground level at the monitoring station.

**Table 2: Parameters measured at the West Gate Tunnel Project monitoring stations**

Station	Parameter Measured	Instrument and Measurement Technique
All stations	PM <sub>10</sub>	Rupprecht & Patashnick / Thermo – TEOM (Tapered Element Oscillating Microbalance)
	PM <sub>2.5</sub>	Met One BAM 1020 – Beta ray attenuation
	Wind Speed (horizontal, elevation 10m)	Vaisala WS425 – ultrasonic
	Wind Direction (elevation 10m)	Vaisala WS425 – ultrasonic
Station 4	Benzene, Toluene, Ethyl benzene, Xylene (BTEX)	Collected In Specially-Prepared Canisters And Analysed By Gas Chromatography/Mass Spectrometry (GC/MS)
	NO, NO <sub>2</sub> , NO <sub>x</sub>	Ecotech EC9841 – gas phase chemiluminescence
	CO	Ecotech EC9830 – NDIR gas filter correlation infrared photometry

### 1.3. Data Collection Methods

Table 3 below shows the methods used for data collection. Any deviations from the stated methods are detailed in sections 1.3.1. and 1.3.3.

**Table 3: Methods**

Parameter Measured	Data Collection Methods Used	Description of Method
NO, NO <sub>2</sub> , NO <sub>x</sub>	AS/NZS 3580.5.1-2011	Methods for sampling and analysis of ambient air. Method 5.1: Determination of oxides of nitrogen – chemiluminescence method
	Ecotech Laboratory Manual	In-house method 6.1 Oxides of nitrogen by chemiluminescence
CO	AS/NZS 3580.7.1-2011	Methods for sampling and analysis of ambient air. Method 7.1: Determination of carbon monoxide - direct reading instrumental method
	Ecotech Laboratory Manual	In-house method 6.3 Carbon monoxide by gas filter correlation spectrophotometry
BTEX (Sampling only)	US EPA TO-15	Method TO-15 Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air Second Edition. Compendium Method TO-15 Determination of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analysed By Gas Chromatography/Mass Spectrometry (GC/MS)
	Ecotech Laboratory Manual	In-house method 6.9 Volatile organic compounds in air collected in specially prepared canisters and analysed by gas chromatography/mass spectrometry
PM <sub>10</sub> (TEOM)	AS/NZ 3580.9.8-2008	Methods for sampling and analysis of ambient air. Method 9.8: Determination of suspended particulate matter - PM <sub>10</sub> continuous direct mass method using a tapered element oscillating microbalance analyser.
	Ecotech Laboratory Manual	In-house method 7.3- Particulates - PM <sub>2.5</sub> , PM <sub>10</sub> by TEOM

Parameter Measured	Data Collection Methods Used	Description of Method
PM <sub>2.5</sub> (BAM 1020)	AS/NZS 3580.9.12 - 2013	Methods of sampling and analysis of ambient air. Method 9.12: Determination of suspended particulate matter – PM <sub>2.5</sub> beta attenuation monitors
	Ecotech Laboratory Manual	In-house method 7.5 – Measurement of PM <sub>10</sub> , PM <sub>2.5</sub> and TSP using Beta Attenuation Monitor.
Vector Wind Speed (Horizontal)	AS/NZS 3580.14 2014	Methods for sampling and analysis of ambient air. Method 14: Meteorological monitoring for ambient air quality monitoring applications
	Ecotech Laboratory Manual	In-house method 8.1 Wind speed (Horizontal) by anemometer
Vector Wind Direction	AS/NZS 3580.14 2014	Methods for sampling and analysis of ambient air. Method 14: Meteorological monitoring for ambient air quality monitoring applications
	Ecotech Laboratory Manual	In-house method 8.3 Wind direction by anemometer

### 1.3.1. NATA Endorsement and Compliance with Standards

Unless stated below, parameters are monitored at the West Gate Tunnel Project monitoring network according to the methods detailed in Table 3 above.

- Siting of all stations may not fully comply with the guidelines in AS 3580.14-2014 “Methods for sampling and analysis of ambient air – Meteorological monitoring for ambient air quality monitoring applications guidelines”, due to possible air flow disturbances caused by nearby trees. Locating monitoring stations in urban areas often requires compromise due to a lack of clear space areas without obstructions as well as the availability of usable power supplies. Given the location, the site is fit for purpose while not fully compliant.
- AS/NZS 3580.1.1:2007 recommends a minimum distance between inlets and the roof of the supporting structure of 1.0m. However, all stations have inlets less than 1.0m above the roof. It is not thought this small difference will have any impact on measured concentrations.

- Ecotech's NATA scope of accreditation covers sampling only for BTEX parameters. Analysis and canister preparation is conducted by NATA accredited laboratories ALS as outlined in 1.3.3 below.
- Measurement of wind data at Stations 2, 3 and 5 is not covered by Ecotech's NATA scope of accreditation. Due to wind tunnel calibration is overdue.

### **1.3.2. Data Acquisition (Continuous Monitoring)**

Data acquisition is performed using a PC based WinAQMS logger (using WinAQMS® Version 2.0) situated at each of the monitoring sites. Each logger is equipped with a 3G modem for remote data collection. The recorded data is remotely collected from the AQMS loggers on a daily basis (using Airodis™ version 5.1) and stored at Ecotech's Environmental Reporting Services (ERS) department in Melbourne, Australia. Data samples are logged in 5-minute intervals.

### **1.3.3. Sampling and analysis for BTEX**

BTEX canister sampling was conducted by Ecotech field service technicians. ALS (NATA Accreditation No. 825) provided the canisters and laboratory analysis services according to method US EPA TO-15.

## **1.4. Data Validation and Reporting**

### **1.4.1. Validation**

The Ecotech ERS department performs daily data checks on continuously monitored parameters to ensure maximum data capture rates are maintained. Any equipment failures are communicated to the responsible field engineers for urgent rectification. Ecotech ERS maintains two distinct databases containing non-validated and validated data respectively.

The validated database is created by duplicating the non-validated database and then flagging data affected by instrument faults, calibrations and other maintenance activities. The data validation software requires the analyst to supply a valid reason (e.g. backed by maintenance notes, calibration sheets etc.) in the database for flagging any data as invalid.

Details of all invalid or missing data are recorded in the Valid Data Exception Tables.

Validation is performed by the analyst, and the validation is reviewed. Graphs and tables are generated based on the validated 5-minute data, while PM<sub>2.5</sub> is based on validated 1-hour data.

### 1.4.2. Reporting

The reported data for continuously monitored parameters is in a Microsoft Excel format file named *“West Gate Tunnel Project Monthly Validated Data Report 01072018\_08082018.xls”*.

The Excel file consists of 6 Excel worksheets:

1. Cover
2. 5 Minute Data
3. 1 Hour Data
4. 8 Hour Rolling
5. 1 Day Data
6. Valid Data Exception Table

The data contained in this report is based on Australian Eastern Standard Time.

Averages are based on a minimum of 75% valid readings within the averaging period. All averages are calculated from the 5-minute data, while PM<sub>2.5</sub> averages are calculated from 1-hour data.

Averaging periods of eight hours or less are reported for the end of the period, i.e. the hourly average 02:00am is for the data collected from 1:00am to 2:00am. For the purposes of calculating and reporting 4 and 8-hour averages, the first rolling average in a calendar day ends at 1.00 am and includes hours from the previous calendar day. One-hour averages are calculated based on a clock hour. One day and one-year averages are calculated based on calendar days.

### Wind Data Reporting

Wind speed and wind direction data associated with calm wind conditions are reported in accordance with the requirements of AS 3580.14-2014. Calm wind conditions are defined as wind speeds below the starting threshold of the wind speed / direction sensors. Sensor starting thresholds are given in Table 6 under “Measurement Range”.

### BTEX Reporting

Results will be provided to Ecotech by the analytical laboratory and summarised within this report. Full analytical results will be included as an Appendix 3 at the end of this report.



## 2.0 Air Quality Standards and Goals

The air quality standards for pollutants monitored at the West Gate Tunnel Project monitoring network are based on:

- State Environmental Protection Policy (Ambient Air Quality) Environmental Quality Objectives (SEPP (AAQ) EQO) for Station 1 (Yarraville Gardens) monitoring station, and
- State Environmental Protection Policy (Air Quality Management) (SEPP (AQM)) Schedule B for the remaining West Gate Tunnel Project monitoring stations.

The air quality goals are shown in Tables 4 and 5 below.

**Table 4: Air Quality Standards for Station 1**

Parameter	Time Period	Exceedance Level	Units	Maximum allowable exceedances
PM <sub>10</sub>	1 day	50	µg/m <sup>3</sup>	None (see note)
PM <sub>10</sub>	1 year	20	µg/m <sup>3</sup>	None
PM <sub>2.5</sub>	1 day	25	µg/m <sup>3</sup>	None (see note)
PM <sub>2.5</sub>	1 year	8	µg/m <sup>3</sup>	None

Note:

Exceptional events are excluded from this standard. As per the Ambient Air Quality NEPM, **Exceptional event** means a fire or dust occurrence that adversely affects air quality at a particular location and causes an exceedance of 1-day average standards in excess of normal historical fluctuations and background levels and is directly related to: bushfire; jurisdiction authorised hazard reduction burning; or continental scale windblown dust.

Ecotech will include any valid data identified as being associated with an exceptional event in all report tables and graphic representations. However, 1-day averages associated with exceptional events will not be counted as exceedances of the Air Quality standard.



**Table 5: Air Quality Standards and Air Toxic NEPM Goals for Stations 2, 3, 4 and 5**

Parameter	Time Period	Exceedance Level	Units	Maximum allowable exceedances
CO	1 hour	29.0	ppm	-
NO <sub>2</sub>	1 hour	140	ppb	-
Benzene <sup>1</sup>	1 year (based on 1-day averages)	0.003	ppm	8-year goal is to gather sufficient data nationally to facilitate development of a standard.
Toluene <sup>1</sup>	1 day	1	ppm	8-year goal is to gather sufficient data nationally to facilitate development of a standard.
	1 year (based on 1-day averages)	0.1	ppm	
Xylene <sup>1</sup>	1 day	0.25	ppm	8-year goal is to gather sufficient data nationally to facilitate development of a standard.
	1 year (based on 1-day averages)	0.2	ppm	
PM <sub>10</sub>	1 day	60	µg/m <sup>3</sup>	-
PM <sub>2.5</sub>	1 day	36	µg/m <sup>3</sup>	-

**Note:**

SEPP (AQM)) Schedule B – Intervention levels for Class 1, 2 and 3 indicators:

Intervention levels are used to assess the air quality monitoring data to determine whether the beneficial uses set out in Clause 9 of this Policy are being protected. Intervention levels are not used in the assessment of the design of individual sources. An intervention level is numerically greater than the design criteria for a given pollutant as it does not apply to an individual source but to all sources of the pollutant within a defined area.

<sup>1</sup> This value is monitoring investigation level of air pollution only, not limits according to Legislation F2011C00855 - National Environment Protection (Air Toxic) Measure 2011.

### 3.0 Calibrations and Maintenance

#### 3.1. Units and Uncertainties

The uncertainties for each parameter have been determined by the manufacturer's tolerance limits of the equipment's parameters, and by the data collection standard method.

The reported uncertainties are expanded uncertainties, calculated using coverage factors which give a level of confidence of approximately 95%.

**Table 6: Units and Uncertainties**

Parameter	Units	Resolution	Uncertainty	Measurement Range <sup>2</sup>
NO, NO <sub>x</sub> (EC9841)	ppb	1 ppb	± 13 ppb or 10% of reading K factor of 2.0	0 ppb to 500 ppb
NO <sub>2</sub> (EC9841)	ppb	1 ppb	± 17 ppb K factor of 2.0	0 ppb to 500 ppb
CO (EC9830)	ppm	0.1 ppm	± 1 ppm or 10% of reading, K factor of 2.0	0 ppm to 50 ppm
PM <sub>10</sub> (TEOM)	µg/m <sup>3</sup>	0.1 µg/m <sup>3</sup>	±5.0 µg/m <sup>3</sup> or 3.6% of reading, K factor of 2.0	0 µg/m <sup>3</sup> to 1 g/m <sup>3</sup>
PM <sub>2.5</sub> (BAM 1020)	µg/m <sup>3</sup>	1 µg/m <sup>3</sup>	±5.0 µg/m <sup>3</sup> + 5.4% of reading, K factor of 2.0	5 to 1000 µg/m <sup>3</sup>
Vector Wind Speed	m/s	0.1 m/s	±0.4 m/s or 2.0% of reading, K factor of 2.0	0 m/s to 30 m/s
Vector Wind Direction	Deg	1 deg	±4 deg K factor of 2.0	0 deg to 360 deg <i>Starting threshold:</i> 0 m/s

<sup>2</sup> Uncertainties may not be calculated based on the full measurement range. Uncertainty for CO by EC9830 is calculated based on a range of 0-10 ppm. Uncertainty for NO, NO<sub>2</sub> and NO<sub>x</sub> by EC 9841 are calculated based on a measurement range of 0-125 ppb.

### 3.2. Automatic calibration checks

Automatic span, zero and background checks occur each night for continuously monitored gaseous parameters. Data associated with these checks is invalidated and is not specifically referred to in the valid data exception reports. Table 7 displays the times for when these checks occur.

**Table 7: Automatic Span/Zero and Background Check Times**

Parameter	Span/Zero	Background
CO	01:00 to 01:25	23:35 to 23:50
NO, NO <sub>2</sub> , NO <sub>x</sub>	01:00 to 01:25	-

### 3.3. Maintenance

#### 3.3.1. Calibration & Maintenance Summary Tables

The last calibrations for the following parameters were performed on the indicated dates. Data supplied after this time is subject to further validation, to be performed at the next calibration cycle.

Note: Maintenance and calibration dates may differ, as calibrations may be less frequent than scheduled maintenance visits.

Tables 8 – 12 on the next pages indicate when the particulate, gas and meteorological equipment were last maintained/calibrated.

**Table 8: Station 1 Maintenance Table from 01/07/2018 to 08/08/2018**

Parameter	Date of Last Maintenance	Maintenance Type	Date of Last Calibration	Calibration Cycle
PM <sub>10</sub>	13/08/18	Decommissioned	08/08/18	6-Monthly
PM <sub>2.5</sub>	13/08/18	Decommissioned	08/08/18	Yearly

Parameter	Date of Last Maintenance	Maintenance Type	Date of Last Calibration	Calibration Cycle
Wind Speed	13/08/18	Decommissioned	07/05/18 <sup>3</sup>	2-Yearly
Wind Direction	13/08/18	Decommissioned	07/05/18 <sup>3</sup>	2-Yearly

**Table 9: Station 2 Maintenance Table from 01/07/2018 to 08/08/2018**

Parameter	Date of Last Maintenance	Maintenance Type	Date of Last Calibration	Calibration Cycle
PM <sub>10</sub>	10/08/18	Decommissioned	08/08/18	6-Monthly
PM <sub>2.5</sub>	10/08/18	Decommissioned	08/08/18	Yearly
Wind Speed	10/08/18	Decommissioned	24/05/16 <sup>4</sup>	2-Yearly
Wind Direction	10/08/18	Decommissioned	24/05/16 <sup>5</sup>	2-Yearly

**Table 10: Station 3 Maintenance Table from 01/07/2018 to 08/08/2018**

Parameter	Date of Last Maintenance	Maintenance Type	Date of Last Calibration	Calibration Cycle
PM <sub>10</sub>	13/08/18	Decommissioned	08/08/18	6-Monthly
PM <sub>2.5</sub>	13/08/18	Decommissioned	08/08/18	Yearly
Wind Speed	13/08/18	Decommissioned	18/01/16 <sup>5</sup>	2-Yearly
Wind Direction	13/08/18	Decommissioned	18/01/16 <sup>6</sup>	2-Yearly

<sup>3</sup> Wind tunnel calibration performed on 07/05/2018 and installed at Station 1 on 21/06/2018. <sup>4</sup>

Wind tunnel calibration performed on 24/05/2016 and installed at Station 2 on 12/09/2016. <sup>5</sup>

Wind tunnel calibration performed on 18/01/2016 and installed at Station 3 on 06/02/2017.

Table 11: Station 4 Maintenance Table from 01/07/2018 to 07/08/2018

Parameter	Date of Last Maintenance	Maintenance Type	Date of Last Calibration	Calibration Cycle
PM <sub>10</sub>	13/08/18	Decommissioned	07/08/18	6-Monthly
PM <sub>2.5</sub>	13/08/18	Decommissioned	07/08/18	Yearly
CO	13/08/18	Decommissioned	07/08/18	Monthly
NO, NO <sub>2</sub> , NO <sub>x</sub>	13/08/18	Decommissioned	07/08/18	Monthly
BTEX	26/07/18	Decommissioned	Every sample	On supply of flow controller <sup>6</sup>
Wind Speed	13/08/18	Decommissioned	21/10/16 <sup>7</sup>	2-Yearly
Wind Direction	13/08/18	Decommissioned	21/10/16 <sup>8</sup>	2-Yearly

Table 12: Station 5 Maintenance Table from 01/07/2018 to 08/08/2018

Parameter	Date of Last Maintenance	Maintenance Type	Date of Last Calibration	Calibration Cycle
PM <sub>10</sub>	13/08/18	Decommissioned	08/08/18	6-Monthly
PM <sub>2.5</sub>	13/08/18	Decommissioned	08/08/18	Yearly
Wind Speed	13/08/18	Decommissioned	15/04/16 <sup>8</sup>	2-Yearly
Wind Direction	13/08/18	Decommissioned	15/04/16 <sup>9</sup>	2-Yearly

<sup>6</sup> Sampling flow orifice checks and calibrations performed by ALS for each orifice mass flow controller supplied.

Records are held by Ecotech and available on request.

<sup>7</sup> Wind tunnel calibration performed on 21/10/2016 and installed at Station 4 on 22/11/2016.

<sup>8</sup> Wind tunnel calibration performed on 15/04/2016 and installed at Station 5 on 27/01/2017.

## 4.0 Results

### 4.1. Valid Data Capture

Valid data capture refers to the amount of valid data collected during the report period. It is based on 5-minute data for all continuously monitored parameters, with the exception of PM<sub>2.5</sub>. The PM<sub>2.5</sub> data is based on 1-hour data.

The percentage of valid data captured is calculated using the following equation:

$$\text{Percentage Valid Data capture} = (\text{Reported air quality data} / \text{Total data}) \times 100\%$$

Where:

- Reported air quality data = Number of samples (instrument readings) which have been validated through a quality assured process and excludes all data errors, zero data collection due to calibration, equipment failures, planned and unplanned maintenance.
- Total data = Total number of samples (instrument readings) expected for the sampling period. Total data is calculated based on the same averaging period as “reported air quality data” and the duration of the corresponding report period. e.g. for 5-minute data collected over a month of 31 days, the total data would be equal to 12 (5-minute samples in an hour) x 24 (hours in a day) x 31 (days in a month) = 8928 samples.

Table 13 below displays data capture statistics for 1<sup>st</sup> of July to the decommission in August 2018. **Bold** values in the table indicates the of percentage valid data capture below 85%.

**Table 13: West Gate Tunnel Project Monthly Data Capture from 01/07/2018 to the decommission**

Parameter	Station 1 (%)	Station 2 (%)	Station 3 (%)	Station 4 (%)	Station 5 (%)
PM <sub>10</sub>	99.7	99.9	99.7	99.8	99.9
PM <sub>2.5</sub>	99.9	99.8	99.8	99.9	99.9
WS, WD	100.0	100.0	100.0	100.0	99.9
CO	-	-	-	96.9	-
NO, NO <sub>2</sub> , NO <sub>x</sub>	-	-	-	97.4	-
BTEX	-	-	-	80.0	-

#### 4.2. Air Quality Monthly Summary

Tables 14 - 19 below include a summary of any air quality exceedances recorded at West Gate Tunnel Project during the report period.

**Table 14: Station 1 Exceedances recorded from 01/07/2018 to 08/08/2018**

Parameter	Time Period	Exceedance Level	Number of exceedances	Value of Exceedance	End Date/Time of Exceedance
PM <sub>10</sub>	1 day	50 µg/m <sup>3</sup>	None recorded	-	-
PM <sub>2.5</sub>	1 day	25 µg/m <sup>3</sup>	None recorded	-	-
PM <sub>10</sub>	1 year	20 µg/m <sup>3</sup>	None recorded	-	-
PM <sub>2.5</sub>	1 year	8 µg/m <sup>3</sup>	None recorded	-	-

**Table 15: Station 2 Exceedances recorded from 01/07/2018 to 08/08/2018**

Parameter	Time Period	Exceedance Level	Number of exceedances	Value of Exceedance	End Date/Time of Exceedance
PM <sub>10</sub>	1 day	60 µg/m <sup>3</sup>	None recorded	-	-
PM <sub>2.5</sub>	1 day	36 µg/m <sup>3</sup>	None recorded	-	-

**Table 16: Station 3 Exceedances recorded from 01/07/2018 to 08/08/2018**

Parameter	Time Period	Exceedance Level	Number of exceedances	Value of Exceedance	End Date/Time of Exceedance
PM <sub>10</sub>	1 day	60 µg/m <sup>3</sup>	None recorded	-	-
PM <sub>2.5</sub>	1 day	36 µg/m <sup>3</sup>	None recorded	-	-

**Table 17: Station 4 Exceedances recorded from 01/07/2018 to 07/08/2018**

Parameter	Time Period	Exceedance Level	Number of exceedances	Value of Exceedance	End Date/Time of Exceedance
PM <sub>10</sub>	1 day	60 µg/m <sup>3</sup>	None recorded	-	-
PM <sub>2.5</sub>	1 day	36 µg/m <sup>3</sup>	None recorded	-	-
CO	1 hour	29 ppm	None recorded	-	-
NO <sub>2</sub>	1 hour	140 ppb	None recorded	-	-

**Table 18: Station 4 readings above Monitoring Investigation Level recorded from 01/07/2018 to 07/08/2018**

Parameter	Time Period	Exceedance Level	Number of exceedances	Value of Exceedance	End Date/Time of Exceedance
Toluene	1 day	1 ppm	None recorded	-	-
Xylenes	1 day	0.25 ppm	None recorded	-	-

**Table 19: Station 5 Exceedances recorded from 01/07/2018 to 08/08/2018**

Parameter	Time Period	Exceedance Level	Number of exceedances	Value of Exceedance	End Date/Time of Exceedance
PM <sub>10</sub>	1 day	60 µg/m <sup>3</sup>	None recorded	-	-
PM <sub>2.5</sub>	1 day	36 µg/m <sup>3</sup>	None recorded	-	-



### 4.3. BTEX Analytical Results Summary

Table 20 below displays a summary of the analytical results for BTEX during the reporting period. Full analysis reports from ALS are included in Appendix 3. Results displayed as “<x ppb” indicated a reading below the lower detectable limit.

**Table 20: Station 4 BTEX Analytical Results from 01/07/2018 to 08/08/2018**

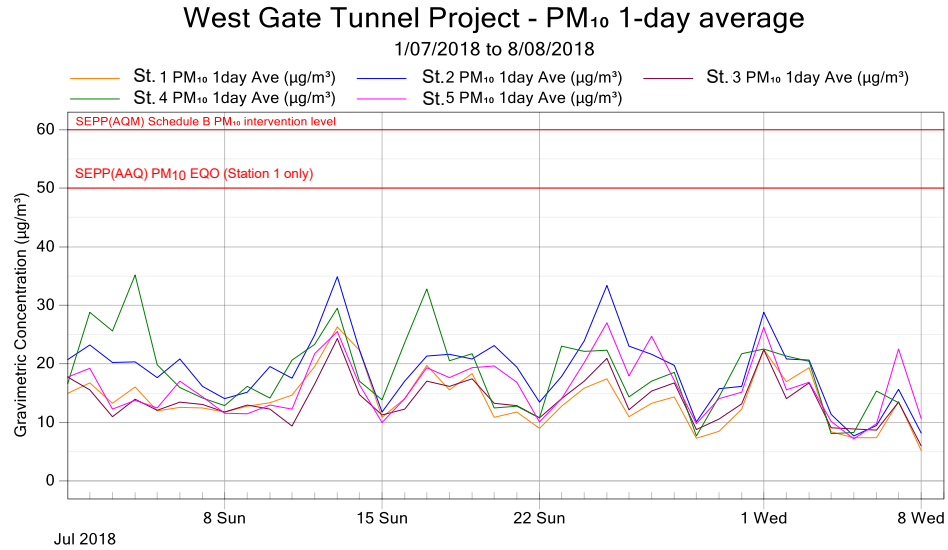
Parameter	NEMP MIL	Units	Samples				
Canister Number			C4973	C12625†	C12645	C4763	C4989
Sample Date			02/07/18	08/07/18	14/07/18	20/07/18	26/07/18
Final Vacuum		inHg	0	-2†	-4	-4	-5
Benzene	3 (1 year)	ppb	*	<0.5	<0.5	<0.5	<0.5
Toluene	1000 (1 day) 100 (1 Year)	ppb	*	8.6	5.2	1.1	2.8
Ethyl benzene	-	ppb	*	<0.5	<0.5	<0.5	<0.5
m,p-xylenes	250 (1 day)	ppb	*	<1.0	<1.0	<1.0	<1.0
o-xylene	200 (1 Year)	ppb	*	<0.5	<0.5	<0.5	<0.5

†Sample flow may have decreased towards the end of the 24 hours sampling period. Therefore, the reported result may not be fully representative of the 24-hour average concentration.

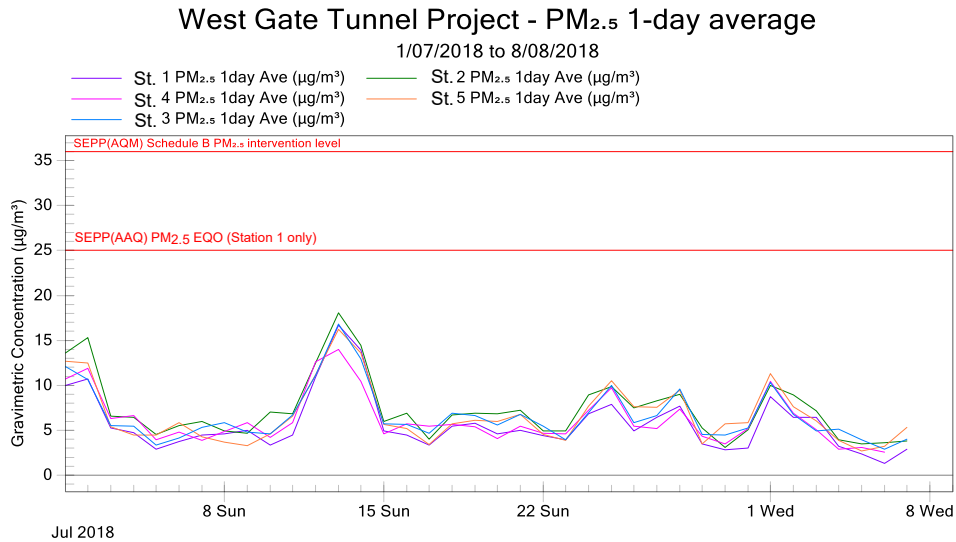
\*Invalid dataset.

#### 4.4. Graphic Representations

Validated 5-minute data for NO, NO<sub>2</sub>, NO<sub>x</sub>, CO and PM<sub>10</sub>, and validated 1-hour data for PM<sub>2.5</sub> were used to construct the following monthly graphic representations.



**Figure 2: West Gate Tunnel Project - PM<sub>10</sub> 1-day Averages from 01/07/2018 to 08/08/2018**

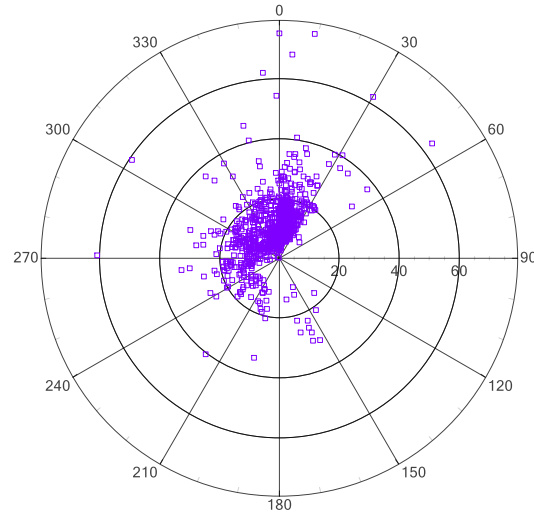


**Figure 3: West Gate Tunnel Project - PM<sub>2.5</sub> 1-day Averages from 01/07/2018 to 08/08/2018**

Polar Scatter

1/07/2018 midnight to 8/08/2018 11:10

□ PM<sub>10</sub> 1hr Avg (µg/m<sup>3</sup>)



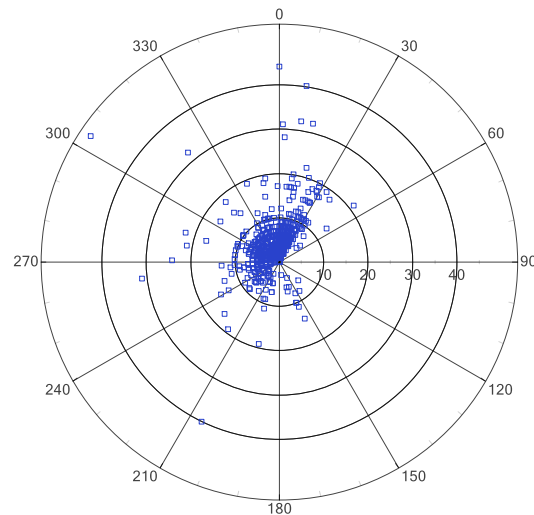
99.7% valid data present

**Figure 4: Station 1 - PM<sub>10</sub> 1-hour Averages scatter plot from 01/07/2018 to 08/08/2018**

Polar Scatter

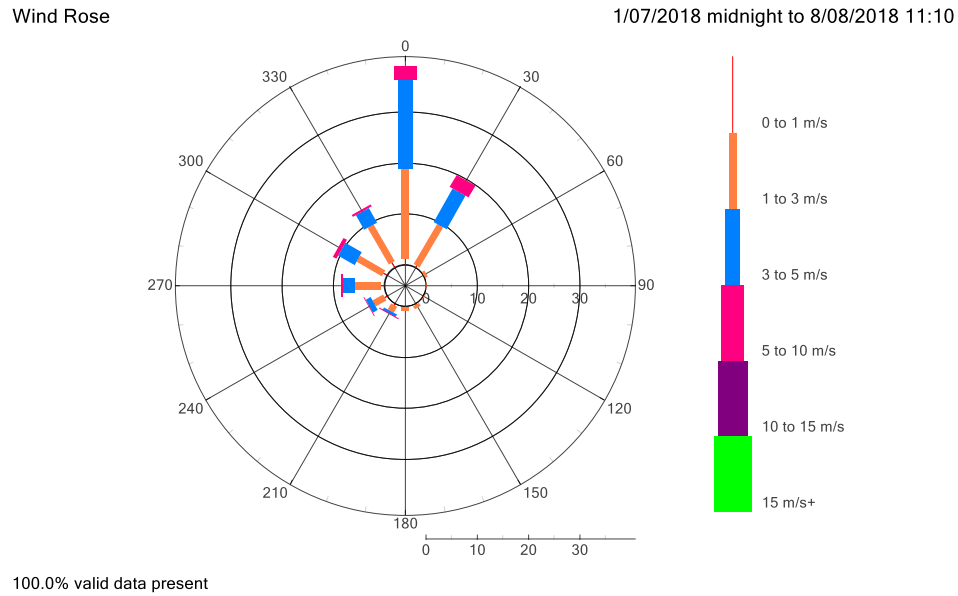
1/07/2018 midnight to 8/08/2018 09:00

□ PM<sub>2.5</sub> 1hr Avg (µg/m<sup>3</sup>)

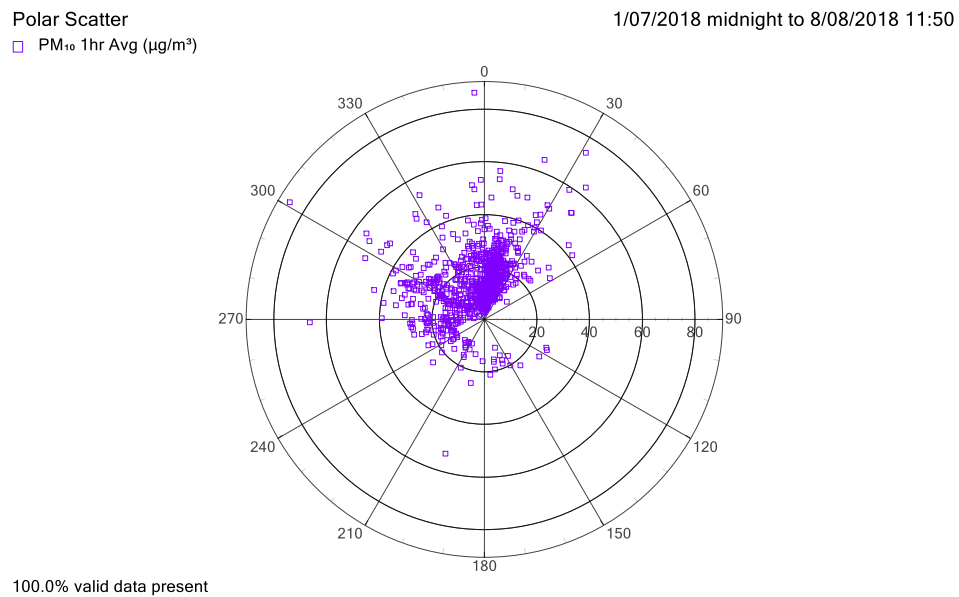


99.9% valid data present

**Figure 5: Station 1 - PM<sub>2.5</sub> 1-hour Averages scatter plot from 01/07/2018 to 08/08/2018**



**Figure 6: Station 1 - Monthly Wind Rose from 01/07/2018 to 08/08/2018**

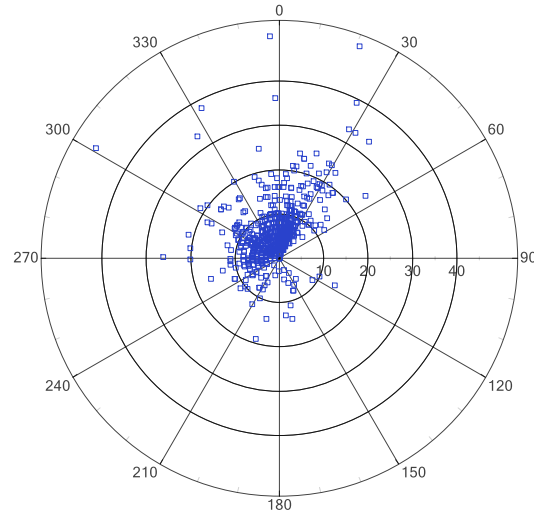


**Figure 7: Station 2 - PM<sub>10</sub> 1-hour Averages scatter plot from 01/07/2018 to 08/08/2018**

Polar Scatter

1/07/2018 midnight to 8/08/2018 10:00

□ PM<sub>2.5</sub> 1hr Avg (µg/m<sup>3</sup>)

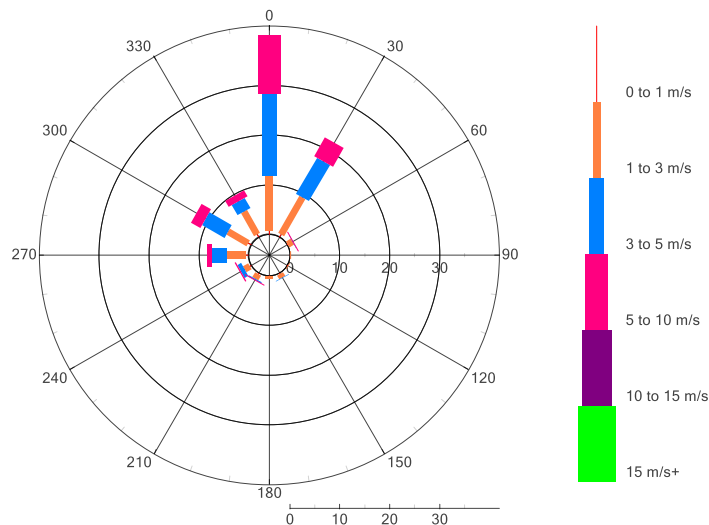


99.8% valid data present

**Figure 8: Station 2 - PM<sub>2.5</sub> 1-hour Averages scatter plot from 01/07/2018 to 08/08/2018**

Wind Rose

1/07/2018 midnight to 8/08/2018 11:50



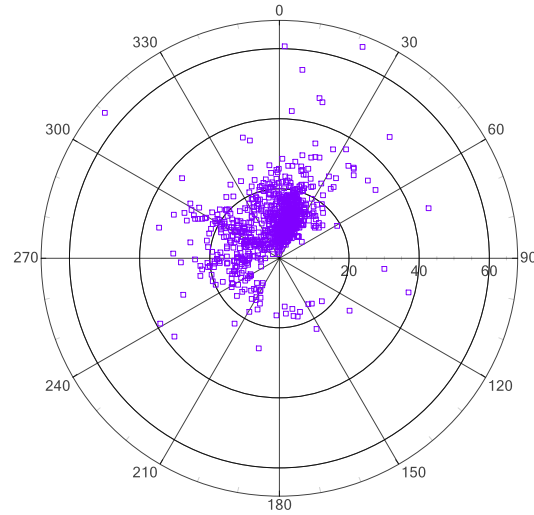
100.0% valid data present

**Figure 9: Station 2 - Monthly Wind Rose from 01/07/2018 to 08/08/2018**

Polar Scatter

1/07/2018 midnight to 8/08/2018 11:10

□ PM<sub>10</sub> 1hr Avg (µg/m<sup>3</sup>)



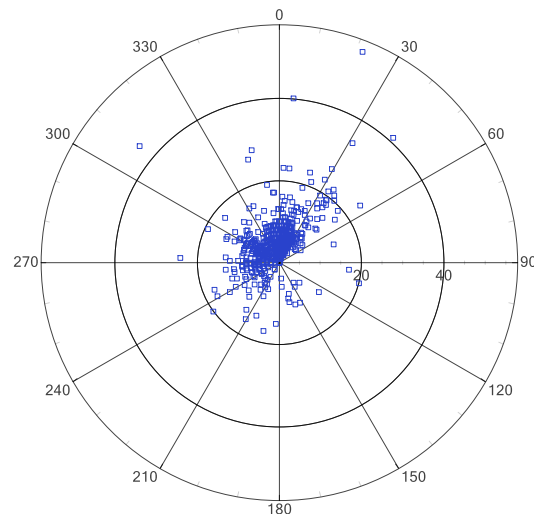
99.6% valid data present

**Figure 10: Station 3 - PM<sub>10</sub> 1-hour Averages scatter plot from 01/07/2018 to 08/08/2018**

Polar Scatter

1/07/2018 midnight to 8/08/2018 11:00

□ PM<sub>2.5</sub> 1hr Avg (µg/m<sup>3</sup>)

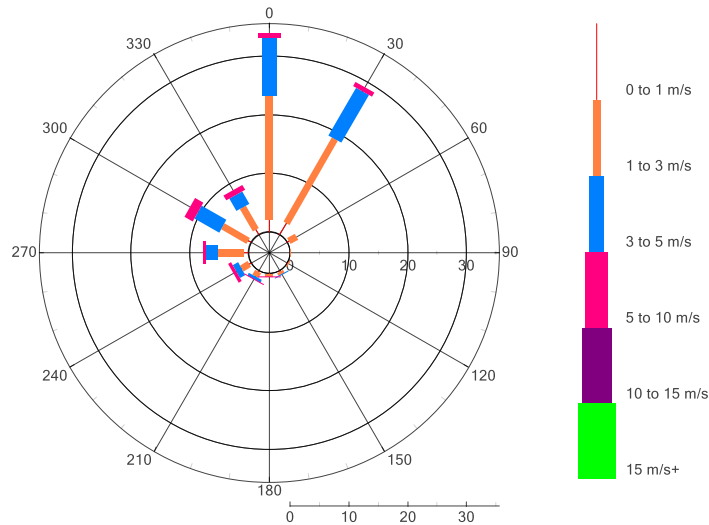


99.7% valid data present

**Figure 11: Station 3 - PM<sub>2.5</sub> 1-hour Averages scatter plot from 01/07/2018 to 08/08/2018**

Wind Rose

1/07/2018 midnight to 8/08/2018 11:10



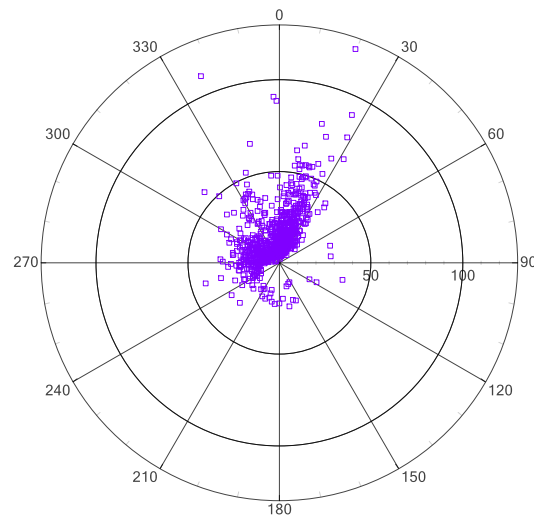
100.0% valid data present

**Figure 12: Station 3 - Monthly Wind Rose from 01/07/2018 to 08/08/2018**

Polar Scatter

1/07/2018 midnight to 7/08/2018 12:25

□ PM<sub>10</sub> 1hr Avg (µg/m<sup>3</sup>)



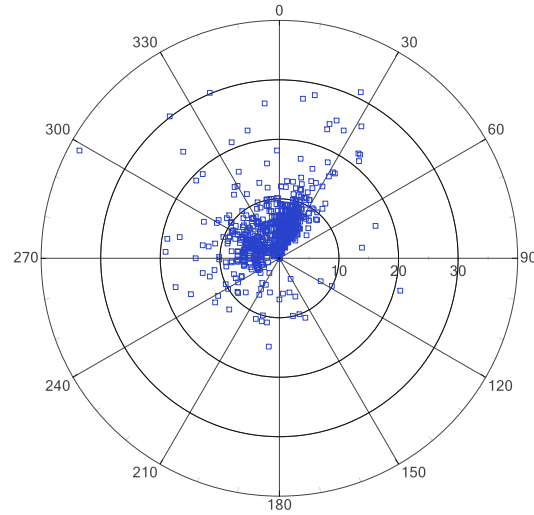
99.7% valid data present

**Figure 13: Station 4 - PM<sub>10</sub> 1-hour Averages scatter plot from 01/07/2018 to 07/08/2018**

Polar Scatter

□ PM<sub>2.5</sub> 1hr Avg (µg/m<sup>3</sup>)

1/07/2018 midnight to 7/08/2018 12:00



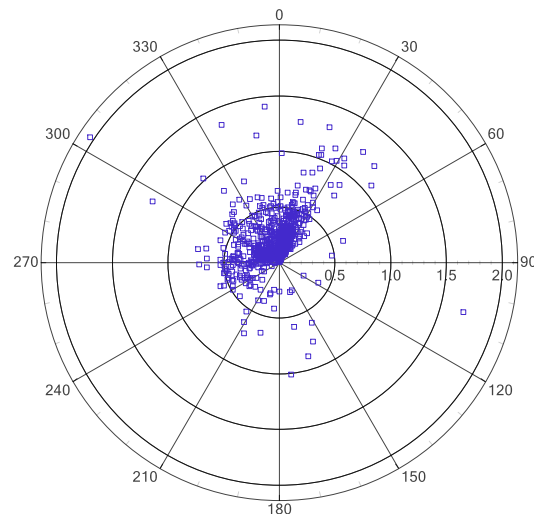
99.9% valid data present

**Figure 14: Station 4 - PM<sub>2.5</sub> 1-hour Averages scatter plot from 01/07/2018 to 07/08/2018**

Polar Scatter

□ CO 1hr Avg (ppm)

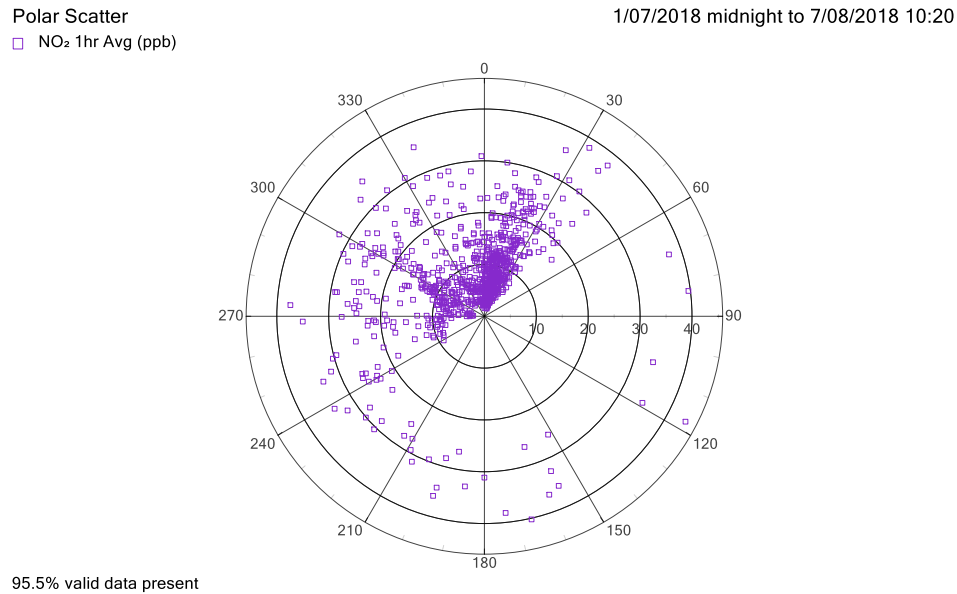
1/07/2018 midnight to 7/08/2018 10:20



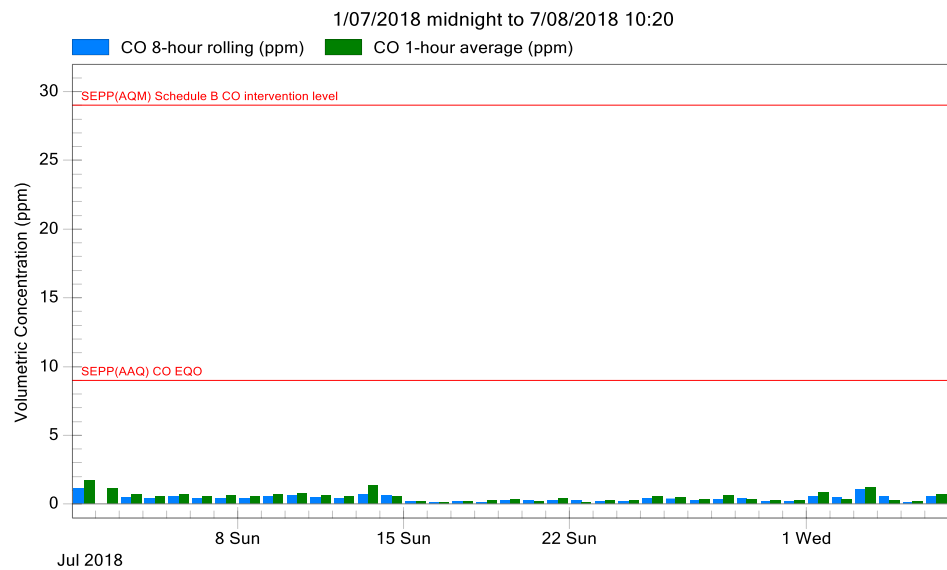
95.2% valid data present

**Figure 15: Station 4 - CO 1-hour Averages scatter plot from 01/07/2018 to 07/08/2018**

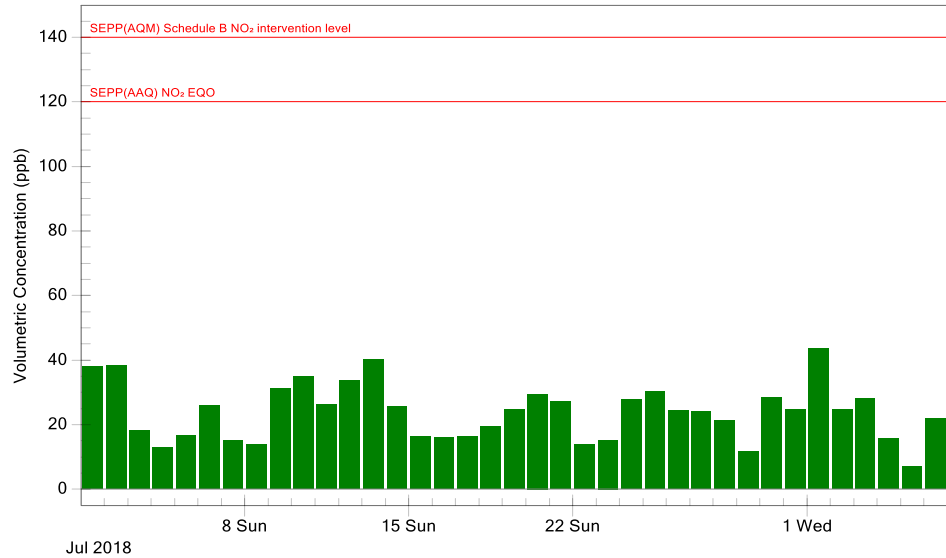




**Figure 16: Station 4 - NO<sub>2</sub> 1-hour Averages scatter plot from 01/07/2018 to 07/08/2018**



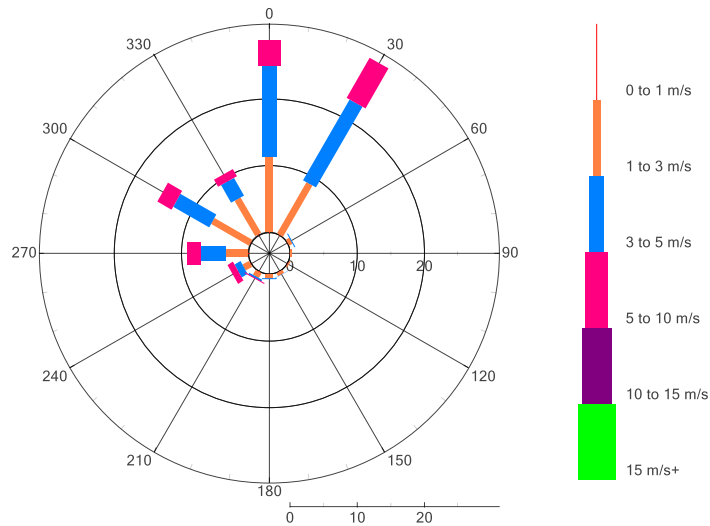
**Figure 17: Station 4 – CO daily maximum based on 1-hour and 8-hour rolling Averages from 01/07/2018 to 07/08/2018**



**Figure 18: Station 4 - NO<sub>2</sub> daily maximum based on 1-hour Averages from 01/07/2018 to 07/08/2018**

Wind Rose

1/07/2018 midnight to 7/08/2018 14:50



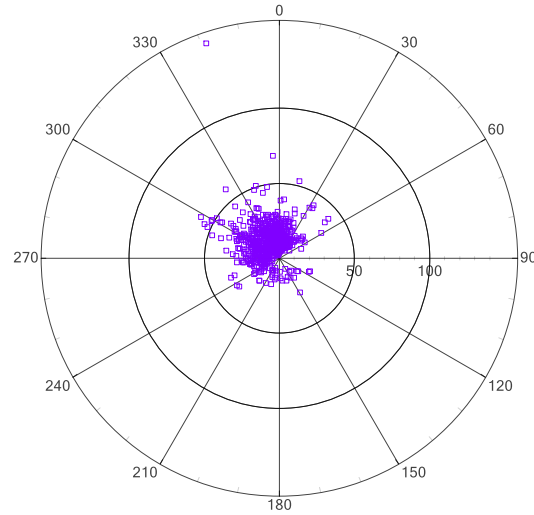
100.0% valid data present

**Figure 19: Station 4 - Monthly Wind Rose from 01/07/2018 to 07/08/2018**

Polar Scatter

1/07/2018 midnight to 8/08/2018 13:30

□ PM<sub>10</sub> 1hr Avg (µg/m<sup>3</sup>)



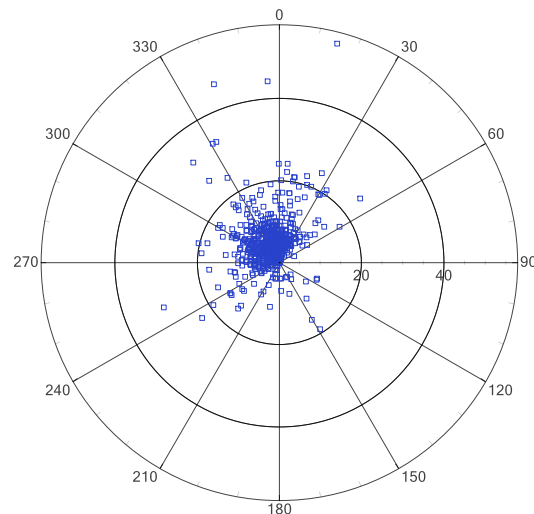
99.8% valid data present

**Figure 20: Station 5 - PM<sub>10</sub> 1-hour Averages scatter plot from 01/07/2018 to 08/08/2018**

Polar Scatter

1/07/2018 midnight to 8/08/2018 12:00

□ PM<sub>2.5</sub> 1hr Avg (µg/m<sup>3</sup>)

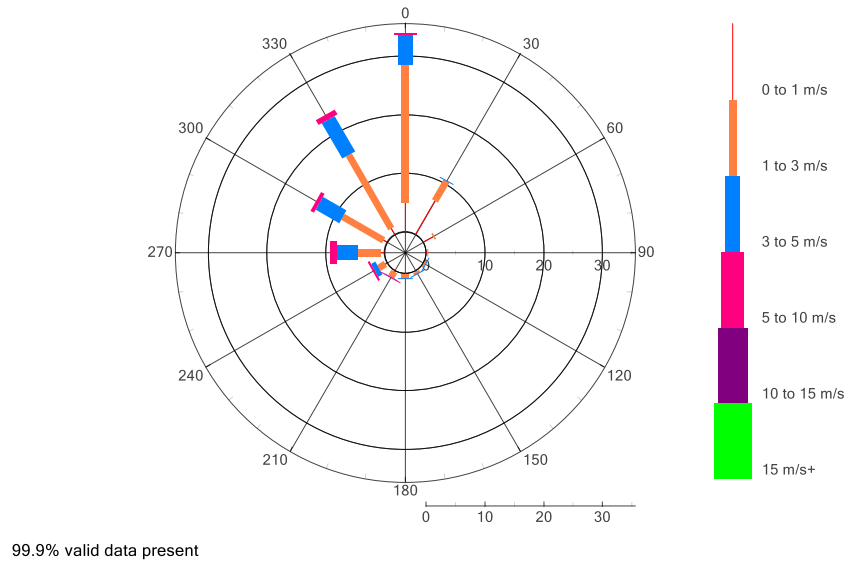


99.8% valid data present

**Figure 21: Station 5 - PM<sub>2.5</sub> 1-hour Averages scatter plot from 01/07/2018 to 08/08/2018**

Wind Rose

1/07/2018 midnight to 8/08/2018 13:30



**Figure 22: Station 5 - Monthly Wind Rose from 01/07/2018 to 08/08/2018**

## 5.0 Valid Data Exception Table

Tables 21 - 25 below detail all changes made to the raw data set during the validation process. An explanation of reasons given in the table can be found in Appendix 2.

**Table 21: Station 1 Valid Data Exception Table**

Start Date	End Date	Reason	Change Details	User Name	Change Date
02/07/18 13:50	02/07/18 16:45	Scheduled monthly maintenance	PM <sub>2.5</sub> , PM <sub>10</sub>	DL	20/08/18
08/08/18 09:00	08/08/18 09:00	Unrealistic data - WS spikes and not tracking with other sites	WS & WD	DL	20/08/18
08/08/18 10:00	13/08/18 10:25	Non-scheduled maintenance - Station decommissioned	All parameters	DL	20/08/18

**Table 22: Station 2 Valid Data Exception Table**

Start Date	End Date	Reason	Change Details	User Name	Change Date
03/07/18 12:00	03/07/18 13:55	Scheduled monthly maintenance	PM <sub>2.5</sub> , PM <sub>10</sub>	DL	20/08/18
08/08/18 11:00	10/08/18 13:35	Non-scheduled maintenance - Station decommissioned	All parameters	DL	20/08/18

**Table 23: Station 3 Valid Data Exception Table**

Start Date	End Date	Reason	Change Details	User Name	Change Date
11/07/18 10:00	11/07/18 14:25	Scheduled 6 monthly maintenance	PM <sub>2.5</sub> , PM <sub>10</sub>	DL	20/08/18
26/07/18 17:30	26/07/18 17:30	Data transmission error	WS, WD & PM <sub>10</sub>	DL	20/08/18
27/07/18 00:00	27/07/18 00:00	Instrument fault - Beta count error	PM <sub>2.5</sub>	DL	20/08/18
08/08/18 11:15	13/08/18 09:15	Non-scheduled maintenance - Station decommissioned	All parameters	DL	20/08/18

**Table 24: Station 4 Valid Data Exception Table**

Start Date	End Date	Reason	Change Details	User Name	Change Date
01/07/18 00:00	02/07/18 10:15	Static offset of +0.2ppm applied to correct baseline	CO	DL	20/08/18
02/07/18 00:30	02/07/18 23:30	Sample C4973 invalid due to canister final vacuum check too low indicating a leak. The analytical results have been included in the appendix for reference	BTX TO-15	DL	20/08/18
02/07/18 10:20	02/07/18 13:05	Scheduled 3 monthly maintenance	PM <sub>10</sub> , PM <sub>2.5</sub> , CO, NO, NO <sub>2</sub> , NO <sub>x</sub>	DL	20/08/18
02/07/18 13:10	06/07/18 23:30	Static offset of +0.3ppm applied to correct baseline	CO	DL	20/08/18
03/07/18 01:30	05/08/18 01:30	Additional instrument stabilisation following the automatic span checks	CO, NO, NO <sub>2</sub> , NO <sub>x</sub>	DL	20/08/18
04/07/18 12:00	04/07/18 13:00	Scheduled weekly maintenance - BTX TO-15 Canister changed over	No data affected	DL	20/08/18
08/07/18 00:30	08/07/18 23:30	Sample 12625 flow final vacuum was low. Sample flow may have decreased towards the end of the 24 hours sampling period. Therefore, the reported result may not be fully representative of the 24 hours average concentration	BTX TO-15	DL	20/08/18
10/07/18 12:00	10/07/18 12:00	Scheduled weekly maintenance - BTX TO-15 Canister changed over	No data affected	DL	20/08/18
10/07/18 23:40	11/07/18 23:30	Linear offset of A = +0.3ppm and B = 0ppm to correct baseline	CO	DL	20/08/18
11/07/18 15:50	06/08/18 15:10	Intermittent unrealistic data - WS spikes and not tracking with other sites	WS & WD	DL	20/08/18
12/07/18 23:40	15/07/18 00:55	Static offset of -0.2ppm applied to correct baseline	CO	DL	20/08/18
17/07/18 13:00	17/07/18 13:00	Scheduled weekly maintenance - BTX TO-15 Canister changed over	No data affected	DL	20/08/18
24/07/18 16:15	24/07/18 16:30	Scheduled weekly maintenance - BTX TO-15 Canister changed over	No data affected	DL	20/08/18
28/07/18 23:35	29/07/18 23:25	Static offset of +0.2ppm applied to correct baseline	CO	DL	20/08/18

Start Date	End Date	Reason	Change Details	User Name	Change Date
30/07/18 01:30	30/07/18 23:25	Static offset of -0.1ppm applied to correct baseline	CO	DL	20/08/18
02/08/18 22:50	02/08/18 23:25	Unrealistic data - Large negative readings	CO	DL	20/08/18
02/08/18 23:40	03/08/18 00:55	Static offset of -1.0ppm to correct baseline	CO	DL	20/08/18
03/08/18 23:35	04/08/18 23:25	Linear offset of A = 0ppm and B = +0.4ppm to correct baseline	CO	DL	20/08/18
06/08/18 01:30	06/08/18 23:25	Linear offset of A = 0ppm and B = -0.3ppm to correct baseline	CO	DL	20/08/18
07/08/18 01:30	07/08/18 10:20	Static offset of +1.0ppm applied to correct baseline	CO	DL	20/08/18
07/08/18 10:25	13/08/18 07:35	Non-scheduled maintenance - Station decommissioned	All parameters	DL	20/08/18

**Table 25: Station 5 Valid Data Exception Table**

Start Date	End Date	Reason	Change Details	User Name	Change Date
11/07/18 14:00	11/07/18 16:15	Scheduled 6 monthly maintenance	PM <sub>2.5</sub> , PM <sub>10</sub>	DL	20/08/18
16/07/18 09:05	05/08/18 09:50	Intermittent unrealistic data - WS spikes and not tracking with other sites	WS & WD	DL	20/08/18
08/08/18 13:00	13/08/18 08:20	Non-scheduled maintenance - Station decommissioned	All parameters	DL	20/08/18

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## 6.0 Report Summary

- The percentage of valid data capture for most parameters at West Gate Tunnel Project monitoring network was above 85% for the reporting month, except for BTEX at Station 4.
- Percentage availability for BTEX at Station 4 was below 95% due to canister final vacuum check on 2<sup>nd</sup> July 2018 was too low indicating a leak. The analytical results have been included in the appendix for reference.
- The final vacuum of canister sampled on the 8<sup>th</sup> of from 01/07/2018 to 08/08/2018 was low. The sample flow may have decreased towards the end of the 24 hours sampling period. Therefore, the reported results may not be fully representative of the 24-hour average concentration. Refer to Table 20 for more details.
- There were no recorded readings over the exceedance limits of the air quality goal across the station network during the reporting period. Refer to Table 14 for more details.

-----END OF REPORT-----



## Appendix 1 - Definitions & Abbreviations

$\mu\text{g}/\text{m}^3$	Micrograms per cubic metre at standard temperature and pressure (0°C and 101.3 kPa)
BTEX	Benzene, Toluene, Ethyl Benzene and Xylene <i>ortho</i> -, <i>meta</i> - and <i>para</i> -isomers
calm	Wind conditions where the wind speed is below the operating range of the wind sensor
CO	Carbon monoxide
deg	Degrees (True North)
m/s	Metres per second
NO	Nitric oxide
NO <sub>2</sub>	Nitrogen dioxide
NO <sub>x</sub>	Oxides of nitrogen
PM <sub>10</sub>	Particulate less than 10 microns in equivalent aerodynamic diameter
PM <sub>2.5</sub>	Particulate less than 2.5 microns in equivalent aerodynamic diameter
ppb	Parts per billion
ppm	Parts per million
SEPP (AAQ) EQO	State Environmental Protection Policy (Ambient Air Quality) Environmental Quality Objectives
SEPP (AQM)	State Environmental Protection Policy (Air Quality Management)
Sigma	Sigma Theta is the standard deviation of the horizontal wind direction fluctuations over the averaging period.
WD	Vector Wind Direction
WS	Vector Wind Speed

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## Appendix 2 - Explanation of Exception Table

**Automatic background check** refers to when analyser samples zero air and measures the level of the concentration voltage. This voltage is taken as the zero signal level and this value is subtracted from any subsequent readings as an active zero compensation. This is the analyser's fine zero measurement.

**Beta count failure** refers to a fault in the functioning of the beta attenuation monitor.

**Calibration check outside tolerance** refers to when the calibration values are outside the tolerance limits set for the precision check.

**Calibration correction factor applied to data** refers to an offset or multiplier applied to the data. This operation may be performed for a number of reasons including: (a) when a clear trend / drift outside the tolerance limit can be demonstrated by repeated operation precision checks, (b) when a correction is required on previously logged data due to a calibration check being outside the allowable tolerance.

**Commissioning** refers to the initial setup and calibration of the instrument when it is first installed. For some instruments there may be a stabilisation period before normal operation commences.

**Data affected by environmental conditions – wind speed spike** refers to when a one-off high reading occurs due to a natural occurrence such as a bird sitting on the wind sensor, or some other event causing the readings to spike.

**Data transmission error** refers to a period of time when the instrument could not transmit data. This may be due to interference, or a problem with the phone line or modem.

**Equipment malfunction/instrument fault** refers to a period of time when the instrument was not in the normal operating mode and did not measure a representative value of the existing conditions.

**Gap in data/data not available** refers to a period of time when either data has been lost or could not be collected.

**Instrument Alarm** refers to an alarm produced by the instrument. A range of alarms can be produced depending on how operation of the instrument is being affected.

**Instrument out of service** refers to a lack of data due to an instrument being shut down for repair, maintenance, or factory calibration.

**Linear offset or multiplier** refers to when an offset or multiplier has been applied between two points where the values of the offset or multiplier are different and the correction is interpolated between the two points.

**Logger error** refers to when an error occurs and instrument readings are not correctly recorded by the logger.

**Maintenance** refers to a period of time when the logger / instrument was switched off due to maintenance.

**Overnight span/zero out of tolerance** refers to when the span/zero reading measured by the analyser during an automatic precision check falls outside of the expected concentration limits.

**Overnight zero out of tolerance** refers to when the automatic zero reading measured by the analyser falls outside the expected limits.

**Power Interruption** refers to no power to the station therefore no data was collected at this time.

**Remote Calibration** refers to when a technician remotely connects to the station and manually performs a span check.

**Static offset or multiplier** refers to when a single offset or multiplier has been applied to the data between two points either to increase or decrease the measured value.

**Tape break** refers to the breaking of the beta attenuation monitor sample tape during operation.

**Warm up after power interruption** refers to the start up period of an instrument after power has been restored.

## **Appendix 3 – BTEX Analytical Results**

## CERTIFICATE OF ANALYSIS

**Work Order** : **EN1804332**  
**Client** : **ECOTECH PTY LTD**  
**Contact** : **LARA NICHOLAS**  
**Address** : **1492 FERNTREE GULLY ROAD**  
**KNOXFIELD VICTORIA, AUSTRALIA 3180**  
**Telephone** : **+61 03 9730 7800**  
**Project** : **WD4 PRIMULA AVE**  
**Order number** : **235939**  
**C-O-C number** : **----**  
**Sampler** : **DANIEL RAYMOND**  
**Site** : **----**  
**Quote number** : **NE/070/17**  
**No. of samples received** : **2**  
**No. of samples analysed** : **2**

**Page** : 1 of 4  
**Laboratory** : Environmental Division Newcastle  
**Contact** : Hayley Withers  
**Address** : 5/585 Maitland Road Mayfield West NSW Australia 2304  
**Telephone** : +612 4014 2500  
**Date Samples Received** : 12-Jul-2018 10:00  
**Date Analysis Commenced** : 13-Jul-2018  
**Issue Date** : 18-Jul-2018 11:46



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

**Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.**

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dale Semple	Analyst	Newcastle - Organics, Mayfield West, NSW
Dale Semple	Analyst	Newcastle, Mayfield West, NSW
Daniel Juneke	Senior Air Analyst	Newcastle - Organics, Mayfield West, NSW



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EP101: Results reported in  $\mu\text{g}/\text{m}^3$  are calculated from PPBV results based on a temperature of 25°C and atmospheric pressure of 101.3 kPa.
- CAN-001: Results for Pressure - As Received are measured under controlled conditions using calibrated laboratory gauges. These results are expressed as an Absolute Pressure. Equivalent gauge pressures may be calculated by subtracting the Pressure - Laboratory Atmosphere taken at the time of measurement.
- CAN-001: Results for Pressure - Gauge as Received are obtained from uncalibrated field gauges and are indicative only. These results may not precisely match calibrated gauge readings and may vary from field measurements due to changes in temperature and pressure



## Analytical Results

Sub-Matrix: AIR (Matrix: AIR)			Client sample ID		260618 C4759_S2831	020718 C4973_S1617	----	----	----
Client sampling date / time				26-Jun-2018 00:00	02-Jul-2018 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	EN1804332-001	EN1804332-002	-----	-----	-----	
				Result	Result	----	----	----	
EP101: VOCs by USEPA Method TO15 (Calculated Concentration)									
Benzene	71-43-2	1.6	µg/m³	<1.6	<1.6	----	----	----	
Toluene	108-88-3	1.9	µg/m³	53.5	10.5	----	----	----	
Ethylbenzene	100-41-4	2.2	µg/m³	<2.2	<2.2	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	4.3	µg/m³	5.2	<4.3	----	----	----	
ortho-Xylene	95-47-6	2.2	µg/m³	<2.2	<2.2	----	----	----	
Naphthalene	91-20-3	2.6	µg/m³	<2.6	<2.6	----	----	----	
Total Xylenes	----	6.6	µg/m³	<6.6	<6.6	----	----	----	
EP101: VOCs by USEPA Method TO15r									
Benzene	71-43-2	0.5	ppbv	0.5	<0.5	----	----	----	
Toluene	108-88-3	0.5	ppbv	14.2	2.8	----	----	----	
Ethylbenzene	100-41-4	0.5	ppbv	<0.5	<0.5	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	1.0	ppbv	1.2	<1.0	----	----	----	
ortho-Xylene	95-47-6	0.5	ppbv	<0.5	<0.5	----	----	----	
Naphthalene	91-20-3	0.5	ppbv	<0.5	<0.5	----	----	----	
Total Xylenes	----	1.5	ppbv	<1.5	<1.5	----	----	----	
Sampling Quality Assurance									
Pressure - As received	PRESSURE	0.1	kPaa	92.6	103	----	----	----	
Pressure - Gauge as Received	----	1	Inches Hg	-2	0	----	----	----	
Pressure - Laboratory Atmosphere	----	0.1	kPaa	102	102	----	----	----	
Temperature as Received	----	0.1	°C	20.0	20.0	----	----	----	
USEPA Air Toxics Method TO15r Surrogates									
4-Bromofluorobenzene	460-00-4	0.5	%	93.1	92.3	----	----	----	



Surrogate Control Limits

Sub-Matrix: AIR		Recovery Limits (%)	
Compound	CAS Number	Low	High
USEPA Air Toxics Method TO15r Surrogates			
4-Bromofluorobenzene	460-00-4	60	140



## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: EN1804332</b>	<b>Page</b>	<b>: 1 of 3</b>
<b>Client</b>	<b>: ECOTECH PTY LTD</b>	<b>Laboratory</b>	<b>: Environmental Division Newcastle</b>
<b>Contact</b>	<b>: LARA NICHOLAS</b>	<b>Contact</b>	<b>: Hayley Withers</b>
<b>Address</b>	<b>: 1492 FERNTREE GULLY ROAD KNOXFIELD VICTORIA, AUSTRALIA 3180</b>	<b>Address</b>	<b>: 5/585 Maitland Road Mayfield West NSW Australia 2304</b>
<b>Telephone</b>	<b>: +61 03 9730 7800</b>	<b>Telephone</b>	<b>: +612 4014 2500</b>
<b>Project</b>	<b>: WD4 PRIMULA AVE</b>	<b>Date Samples Received</b>	<b>: 12-Jul-2018</b>
<b>Order number</b>	<b>: 235939</b>	<b>Date Analysis Commenced</b>	<b>: 13-Jul-2018</b>
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	<b>: 18-Jul-2018</b>
<b>Sampler</b>	<b>: DANIEL RAYMOND</b>		
<b>Site</b>	<b>: ----</b>		
<b>Quote number</b>	<b>: NE/070/17</b>		
<b>No. of samples received</b>	<b>: 2</b>		
<b>No. of samples analysed</b>	<b>: 2</b>		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report; Recovery and Acceptance Limits

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dale Semple	Analyst	Newcastle - Organics, Mayfield West, NSW
Dale Semple	Analyst	Newcastle, Mayfield West, NSW
Daniel Juneke	Senior Air Analyst	Newcastle - Organics, Mayfield West, NSW



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :  
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
 LOR = Limit of reporting  
 RPD = Relative Percentage Difference  
 # = Indicates failed QC

## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **AIR**

Sub-Matrix: AIR				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP101: VOCs by USEPA Method TO15r (QC Lot: 1802938)									
EN1804266-001	Anonymous	EP101-H: Benzene	71-43-2	0.5	ppbv	<0.5	<0.5	0.00	No Limit
		EP101-H: Toluene	108-88-3	0.5	ppbv	0.7	0.7	0.00	No Limit
		EP101-H: Ethylbenzene	100-41-4	0.5	ppbv	<0.5	<0.5	0.00	No Limit
		EP101-H: ortho-Xylene	95-47-6	0.5	ppbv	0.9	0.9	0.00	No Limit
		EP101-H: meta- & para-Xylene	108-38-3 106-42-3	1	ppbv	2.2	2.2	0.00	No Limit



### Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control terms Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (DCS) refers to certified reference materials, or known interference free matrices spiked with target analytes. The purpose of these QC parameters are to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS and DCS.

Sub-Matrix: AIR		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
						LCS	DCS	Low	High	Value	Control Limit
Method: Compound	CAS Number										
<b>EP101: VOCs by USEPA Method TO15r (QCLot: 1802938)</b>											
EP101-H: Benzene	71-43-2	0.5	ppbv	<0.5	100 ppbv	94.4	94.2	77	114	25	25
EP101-H: Toluene	108-88-3	0.5	ppbv	<0.5	100 ppbv	97.4	96.8	78	115	25	25
EP101-H: Ethylbenzene	100-41-4	0.5	ppbv	<0.5	100 ppbv	92.4	92.0	82	121	25	25
EP101-H: meta- & para-Xylene	108-38-3	1	ppbv	<1.0	200 ppbv	90.4	89.6	82	122	25	25
	106-42-3										
EP101-H: ortho-Xylene	95-47-6	0.5	ppbv	<0.5	100 ppbv	91.9	91.3	83	122	25	25

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

## QA/QC Compliance Assessment to assist with Quality Review

Work Order : **EN1804332**

Page : 1 of 4

Client : **ECOTECH PTY LTD**  
Contact : **LARA NICHOLAS**  
Project : **WD4 PRIMULA AVE**  
Site : **----**  
Sampler : **DANIEL RAYMOND**  
Order number : **235939**

Laboratory : **Environmental Division Newcastle**  
Telephone : **+612 4014 2500**  
Date Samples Received : **12-Jul-2018**  
Issue Date : **18-Jul-2018**  
No. of samples received : **2**  
No. of samples analysed : **2**

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

### Summary of Outliers

#### Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

#### Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

#### Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**



## Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **AIR**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP101: VOCs by USEPA Method TO15r							
Summa style Canister - ALS Supplied Silonite (EP101-H) 020718 - C4973_S1617	02-Jul-2018	----	----	----	16-Jul-2018	01-Aug-2018	✓
Summa style Canister - ALS Supplied Silonite (EP101-H) 260618 - C4759_S2831	26-Jun-2018	----	----	----	16-Jul-2018	26-Jul-2018	✓
Sampling Quality Assurance							
Summa style Canister - ALS Supplied Silonite (CAN-001) 020718 - C4973_S1617	02-Jul-2018	----	----	----	13-Jul-2018	02-Jul-2019	✓
Summa style Canister - ALS Supplied Silonite (CAN-001) 260618 - C4759_S2831	26-Jun-2018	----	----	----	13-Jul-2018	26-Jun-2019	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **AIR**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Duplicate Control Samples (DCS)							
Hydrocarbons in Air by USEPA TO15	EP101-H	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Duplicates (DUP)							
Hydrocarbons in Air by USEPA TO15	EP101-H	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Hydrocarbons in Air by USEPA TO15	EP101-H	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Hydrocarbons in Air by USEPA TO15	EP101-H	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Canister Sampling - Field Data	CAN-001	AIR	In house: Referenced to USEPA TO14 / TO15
Hydrocarbons in Air by USEPA TO15	EP101-H	AIR	In house: Referenced to USEPA TO15r Volatile Organic Compounds in Air by USEPA TO15. Aliphatic and Aromatic Hydrocarbons
Hydrocarbons in Air by USEPA TO15 (mass/volume)	EP101-H-MV	AIR	In house: Referenced to USEPA TO15r Hydrocarbons in Air by USEPA TO15 (Calculated Concentration)



If sourced from an ALS Laboratory: please tick →

Client Supplied Canister(s)? Y / N

[illegible]

2016年5月15日 星期二 14:58:15  
IP: 192.168.1.100 浏览器: Microsoft Edge

[illegible][illegible]

Q: 如何理解“三个代表”重要思想？

A: “三个代表”重要思想是中国共产党在新的历史条件下，根据马克思列宁主义、毛泽东思想、邓小平理论，结合中国实际提出的。它集中体现了党的性质和宗旨，反映了我国最广大人民的根本利益，是对马克思主义、毛泽东思想和邓小平理论的继承和发展。

Q447333: 1966 Sydney ABC Election Night Party  
Q447334: 1966 ABC Election Night Party

ONLINE: 8-888-Verdant Road Whyte from 200-204-  
 99. 01-01-2004 E-mail: [news@atlantic.ca](mailto:news@atlantic.ca)

THESE 411: Gary Anne Roth, M.A. 1984  
Ph.D. 1987. 200 p. \$16.00 (hardcover)

SECRET

225-245- 277-285- 400-500- Head Southfield Nov 21-24  
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E: 214.494.9181; web: davidlingdale.com

Toll: APYG 008168

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### AIR SAMPLING EQUIPMENT

### DISPATCH RECORD

Inquiries: Client Services - Newcastle Phone: +61 (02) 4014 2500

E-mail: samples.newcastle@alsenviro.com

Dispatch to:		ALS Use ONLY	
Client / Office:	ECOTECH	Request Received By:	DB 14/06/18
Contact:	Lara Nicholas/Daniel Raymond	Deliver By:	19/06/18
Telephone:	03 9730 7800	Dispatched By:	15/06/18
ALS Quotation:	NE/070/17	Workorder:	
Delivery Address:	1492 Ferntree Gully Rd Knoxfield VIC 3180	Agreed Rent Free Period:	14 days

SPECIAL INSTRUCTIONS: PLEASE EMAIL CLEAN CERTIFICATES TO lara.nicholas@ecotech.com ON DISPATCH ....

## Air Sampling Equipment Request

### CANISTERS

No	Canister Type	Size	Gauge	Valve	Cap	Rental
3	Entech Silonite Canister (Summa™)	6L	Yes	S	Yes	\$200 ea

No Returned

Analyst Initials & Date
Leak Checked: <i>Y</i> Certified OK: <i>Y</i> 15/6/18

### CONNECTORS AND FLOW CONTROL DEVICES

No	Equipment Type	Duration (hrs)	Flow (ml/min)	T Piece	Gauge	Certified	Sealed / Vacuum	Connection Quick Connect Swagelok	No. Returned	Rental
3	Passive Sampler -TWA	24hr		No	Yes	Yes	Yes / No	S		Incl Above
6	Flow Sampler Caps			No	No	No	Yes / No			\$20 ea. Replacement
3	ECOTECH Autosampler			No	No	No	Yes / No			N/A
6	1/4" Swagelok connectors and ferrules (spares)									\$5 ea. Replacement

Other (specify) *1 T piece*

<sup>1</sup> Refer to Acceptance of Terms



ALS use only	
Sampling Guide Included (Y / N)	Packed by: <i>Y</i>
Number of Boxes: <i>2</i>	Dispatch Time / Date: <i>KS 15/6/18</i>
Courier / Dispatcher: <i>TNT</i>	Consignment Note Number: <i>980243824386</i>
	Consignment Dispatched by: <i>KJONE</i>



### AIR SAMPLING EQUIPMENT

### DISPATCH RECORD

## ALS SUPPLIED EQUIPMENT

Item	Quantity	Item Description	Serial Nos
	3	6L Silonite Summa™ canister	4759 ✓ 4973 ✓ 12/07 K4 126 46✓2916
	3	Passive Sampler - TWA - 24hr	1617 ✓ 2820 12/07 K4 #4 3.5ml/min 2831 ✓



**Canister No: 4973**

<b>Specified Purpose:</b>	USEPA TO15 (Extended Suite) Ambient Air	<b>Verification Date:</b> <b>Valid To (At least):</b> <b>Verification File:</b>	08-Jun-2018 06-Jul-2019 180605_07.D
<b>Canister Type:</b> <b>Canister Size:</b> <b>Valve Type:</b> <b>Dispatch Pressure:</b>	Entech Silonite - Summa Style 6L TOV <0.01 psia	<b>Last Stability Check:</b> <b>Next Check Scheduled:</b> <b>Analyst:</b> <b>Approved for Dispatch by:</b>	04-Aug-2017 04-Aug-2019 K. Gelderman <i>K. Gelderman 15/6/18</i>

Applicants are notified in the summer for the requested and approved applications. Approved applicants are notified of the exact procedure to the program and of the exact number of the

Each verification involves a check for contamination, wear and damage to valves. Integrity checks are performed at intervals or for damage to the container in suspicious cases every two years, within the designated holding time for emergency response. In the event of failure, the material must be withdrawn from service immediately.

16. **NAME**—NAME CODE—FNU  
 17. **DATE**—MM/YY—FNU  
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Target Compound	Alt. Name	Qualifiers	Verification	
			Goal (<)	Result
			ppbv	ppbv
1,1,1-Trichloroethane	1,1,1-TCA / Methyl chloroform		0.2	<0.2
1,1,1,2,2-Tetrachloroethane	R-130 / Acetylene tetrachloride		0.2	<0.2
1,1,2-Trichloroethane	Vinyl trichloride		0.2	<0.2
1,1-Dichloroethane	Ethylidene chloride		0.2	<0.2
1,1-Dichloroethene	1,1-DCE / Vinylidene chloride		0.2	<0.2
1,2-Dichloroethane	Ethylene chloride		0.2	<0.2
1,2,4-Trimethylbenzene	Pseudocumene		0.2	<0.2
1,2-Dibromoethane	EDB / Ethylene dibromide		0.2	<0.2
1,2-Dichlorobenzene	o-Dichlorobenzene		0.2	<0.2
1,2-Dichloropropane	Propylene dichloride		0.2	<0.2
1,3,5-Trimethylbenzene	Mesitylene		0.2	<0.2
1,3-Dichlorobenzene	m-Dichlorobenzene		0.2	<0.2
1,4-Dichlorobenzene	p-Dichlorobenzene		0.2	<0.2
Benzene	Cyclohexatriene		0.2	<0.2
Bromomethane	Methyl bromide		0.2	<0.2
Tetrachloromethane	Carbon tetrachloride		0.2	<0.2
Chlorobenzene	Phenyl chloride		0.2	<0.2
Chloroethane	Ethyl chloride		0.2	<0.2
Chloroform	Trichloromethane		0.2	<0.2
Chloromethane	Methyl chloride		0.2	<0.2
cis-1,2-Dichloroethene	cis-1,2-Dichloroethylene		0.2	<0.2
cis-1,3-Dichloropropene	cis-1,3-Dichloropropylene		0.2	<0.2
Ethylbenzene	Phenyl ethane		0.2	<0.2
Freon 12	Dichlorodifluoromethane		0.2	<0.2
Freon 11	Trichlorofluoromethane		0.2	<0.2
Freon 113	1,1,2-Trichloro-1,2,2-trifluoroethane		0.2	<0.2
Freon 114	1,2-Dichlorotetrafluoroethane		0.2	<0.2
Hexachlorobutadiene	Hexachloro-1,3-Butadiene		0.2	<0.2

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Target Compound	Alt. Name	Qualifiers	Verification	Result
			Goal (<) ppbv	
Dichloromethane	Methylene chloride		0.2	<0.2
m- & p-Xylene	1,3 & 1,4 -Dimethylbenzene		0.4	<0.4
o-Xylene	1,2-Dimethylbenzene		0.2	<0.2
Styrene	Vinyl benzene		0.2	<0.2
Tetrachloroethene	PCE / Perchloroethylene		0.2	<0.2
Toluene	Methyl Benzene		0.2	<0.2
trans-1,3-Dichloropropene	trans-1,3-Dichloropropylene		0.2	<0.2
Trichloroethene	TCE / Trichloroethylene		0.2	<0.2
Vinyl chloride	Chloroethene		0.2	<0.2
1,2,4-Trichlorobenzene			0.2	<0.2
1,3-Butadiene	Biethylene		0.2	<0.2
1,4-Dioxane	p-Dioxane		0.2	<0.2
2,2,4-Trimethylpentane	Isooctane		0.2	<0.2
4-Ethyltoluene	p-Ethyltoluene		0.2	<0.2
Acetone	2-Propanone		0.2	<0.2
Allyl chloride	3-Chloropropene		0.2	<0.2
Bromodichloromethane	Dichlorobromomethane		0.2	<0.2
Bromoform	Tribromomethane		0.2	<0.2
Carbon disulfide	CS2		0.2	<0.2
Cyclohexane			0.2	<0.2
Dibromochloromethane	Chlorodibromoethane		0.2	<0.2
Ethyl acetate	Acetic ester		0.2	<0.2
Isopropyl alcohol	Isopropanol / 2-Propanol		0.2	<0.2
Methyl butyl ketone	MBK / 2-Hexanone		0.2	<0.2
Methyl ethyl ketone	MEK / 2-Butanone		0.2	<0.2
Methyl isobutyl ketone	MIBK / 4-Methyl-2-pentanone		0.2	<0.2
Methyl tert-butyl ether	MTBE		0.2	<0.2
n-Heptane			0.2	<0.2
n-Hexane			0.2	<0.2
Propene	Propylene		0.2	<0.2
Tetrahydrofuran	THF		0.2	<0.2
trans-1,2-Dichloroethene	trans-1,2-Dichloroethylene		0.2	<0.2
Vinyl acetate	Acetic acid vinyl ester		0.2	<0.2
Bromoethene	Vinyl bromide		0.2	<0.2
Benzyl chloride	α-Chlorotoluene		0.2	<0.2
Ethanol	Ethyl alcohol		0.2	<0.2
Acetonitrile	Methyl cyanide		0.2	<0.2
Acrolein	2-Propenal		0.2	<0.2
Acrylonitrile	2-Propenenitrile		0.2	<0.2
tert-Butyl alcohol	TBA		0.2	<0.2
2-Chloroprene	2-Chloro-1,3-butadiene		0.2	<0.2
Diisopropyl Ether	DIPE		0.2	<0.2
Ethyl tert-butyl ether	ETBE		0.2	<0.2
tert-Amyl methyl ether	TAME		0.2	<0.2
Methyl methacrylate	MMA		0.2	<0.2
1,1,1,2-Tetrachloroethane	R-130a / Acetylene trichloride		0.2	<0.2
Isopropylbenzene	Cumene		0.2	<0.2
2-Chlorotoluene	o-Chlorotoluene		0.2	<0.2
n-Propylbenzene	Phenyl propane		0.2	<0.2
tert-Butylbenzene	1,1-Dimethylethylbenzene		0.2	<0.2
sec-Butylbenzene	1-Methylpropylbenzene		0.2	<0.2
2-Isopropyltoluene	o-Cymene		0.2	<0.2
n-Butylbenzene	Phenyl butane		0.2	<0.2
Naphthalene			0.2	<0.2

Qualifiers - F: Fails Stability Check, V: Fails Verification

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## Sampler Verification Report

**Sampler No:** 1617

**Specified Purpose:** USEPA TO15 (Extended Suite)  
**LORs Required:** Ambient Air  
**Sampler Type:** Passive Sampler

**Verification Date:** 08-Jun-2018  
**Valid To (At least):** 06-Jul-2018  
**Verification File:** 180605\_10.D

**Flow Rate Calibrated at:** 3.5 ml/min

**Analyst:** K. Gelderman

**Calibrated by:** PF 12/6/18

**Approved for Dispatch by:** 18 15/6/18

### Sampler Verification Protocol

Samplers are generally verified 'fit for purpose' for the requested analyses and applications. For most applications, samplers are verified clean according to the requirements of USEPA method TO-15.

Each verification involves a check for contamination, leaks and damage to fittings.

### USEPA METHOD TO-15

REFERENCE: EPA-821-R-02-010, USEPA Method TO-15, Revision 2, 2002. This method describes the procedures for the verification of samplers used for the collection and analysis of ambient air samples for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). The method includes procedures for the verification of samplers used for the collection and analysis of ambient air samples for VOCs and SVOCs.

Target Compound	Alt. Name	Verified to ppbv	Result ppbv
1,1,1-Trichloroethane	1,1,1-TCA / Methyl chloroform	0.2	<0.2
1,1,1,2-Tetrachloroethane	R-130 / Acetylene tetrachloride	0.2	<0.2
1,1,2-Trichloroethane	Vinyl trichloride	0.2	<0.2
1,1-Dichloroethane	Ethylidene chloride	0.2	<0.2
1,1-Dichloroethene	1,1-DCE / Vinylidene chloride	0.2	<0.2
1,2-Dichloroethane	Ethylene chloride	0.2	<0.2
1,2,4-Trimethylbenzene	Pseudocumene	0.2	<0.2
1,2-Dibromoethane	EDB / Ethylene dibromide	0.2	<0.2
1,2-Dichlorobenzene	o-Dichlorobenzene	0.2	<0.2
1,2-Dichloropropane	Propylene dichloride	0.2	<0.2
1,3,5-Trimethylbenzene	Mesitylene	0.2	<0.2
1,3-Dichlorobenzene	m-Dichlorobenzene	0.2	<0.2
1,4-Dichlorobenzene	p-Dichlorobenzene	0.2	<0.2
Benzene	Cyclohexatriene	0.2	<0.2
Bromomethane	Methyl bromide	0.2	<0.2
Tetrachloromethane	Carbon tetrachloride	0.2	<0.2
Chlorobenzene	Phenyl chloride	0.2	<0.2
Chloroethane	Ethyl chloride	0.2	<0.2
Chloroform	Trichloromethane	0.2	<0.2
Chloromethane	Methyl chloride	0.2	<0.2
cis-1,2-Dichloroethene	cis-1,2-Dichloroethylene	0.2	<0.2
cis-1,3-Dichloropropene	cis-1,3-Dichloropropylene	0.2	<0.2
Phenylbenzene	Phenyl ethane	0.2	<0.2
Freon 12	Dichlorodifluoromethane	0.2	<0.2
Freon 11	Trichlorofluoromethane	0.2	<0.2
Freon 113	1,1,2-Trichloro-1,1,2-trifluoroethane	0.2	<0.2
Freon 114	1,2-Dichlorotetrafluoroethane	0.2	<0.2
Hexachlorobutadiene	Hexachloro-1,3-Butadiene	0.2	<0.2

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Target Compound	Alt. Name	Verified to ppbv	Result ppbv
Dichloromethane	Methylene chloride	0.2	<0.2
m -& p-Xylene	1,3 & 1,4 -Dimethylbenzene	0.4	<0.4
o-Xylene	1,2-Dimethylbenzene	0.2	<0.2
Styrene	Vinyl benzene	0.2	<0.2
Tetrachloroethene	PCE / Perchloroethylene	0.2	<0.2
Toluene	Methyl Benzene	0.2	<0.2
trans-1,3-Dichloropropene	trans-1,3-Dichloropropylene	0.2	<0.2
Trichloroethene	TCE / Trichloroethylene	0.2	<0.2
Vinyl chloride	Chloroethene	0.2	<0.2
1,2,4-Trichlorobenzene		0.2	<0.2
1,3-Butadiene	Biethylene	0.2	<0.2
1,4-Dioxane	p-Dioxane	0.2	<0.2
2,2,4-Trimethylpentane	Isooctane	0.2	<0.2
4-Ethyltoluene	p-Ethyltoluene	0.2	<0.2
Acetone	2-Propanone	0.2	<0.2
Allyl chloride	3-Chloropropene	0.2	<0.2
Bromodichloromethane	Dichlorobromomethane	0.2	<0.2
Bromoform	Tribromomethane	0.2	<0.2
Carbon disulfide	CS2	0.2	<0.2
Cyclohexane		0.2	<0.2
Dibromochloromethane	Chlorodibromoethane	0.2	<0.2
Ethyl acetate	Acetic ester	0.2	<0.2
Isopropyl alcohol	Isopropanol / 2-Propanol	0.2	<0.2
Methyl butyl ketone	MBK / 2-Hexanone	0.2	<0.2
Methyl ethyl ketone	MEK / 2-Butanone	0.2	<0.2
Methyl isobutyl ketone	MIBK / 4-Methyl-2-pentanone	0.2	<0.2
Methyl tert-butyl ether	MTBE	0.2	<0.2
n-Heptane		0.2	<0.2
n-Hexane		0.2	<0.2
Propene	Propylene	0.2	<0.2
Tetrahydrofuran	THF	0.2	<0.2
trans-1,2-Dichloroethene	trans-1,2-Dichloroethylene	0.2	<0.2
Vinyl acetate	Acetic acid vinyl ester	0.2	<0.2
Bromoethene	Vinyl bromide	0.2	<0.2
Benzyl chloride	α-Chlorotoluene	0.2	<0.2
Ethanol	Ethyl alcohol	0.2	<0.2
Acetonitrile	Methyl cyanide	0.2	<0.2
Acrolein	2-Propenal	0.2	<0.2
Acrylonitrile	2-Propenenitrile	0.2	<0.2
tert-Butyl alcohol	TBA	0.2	<0.2
2-Chloroprene	2-Chloro-1,3-butadiene	0.2	<0.2
Diisopropyl Ether	DIPE	0.2	<0.2
Ethyl tert-butyl ether	ETBE	0.2	<0.2
tert-Amyl methyl ether	TAME	0.2	<0.2
Methyl methacrylate	MMA	0.2	<0.2
1,1,1,2-Tetrachloroethane	R-130a / Acetylene trichloride	0.2	<0.2
Isopropylbenzene	Cumene	0.2	<0.2
2-Chlorotoluene	o-Chlorotoluene	0.2	<0.2
n-Propylbenzene	Phenyl propane	0.2	<0.2
tert-Butylbenzene	1,1-Dimethylethylbenzene	0.2	<0.2
sec-Butylbenzene	1-Methylpropylbenzene	0.2	<0.2
2-Isopropyltoluene	o-Cymene	0.2	<0.2
n-Butylbenzene	Phenyl butane	0.2	<0.2
Naphthalene		0.2	<0.2

## CERTIFICATE OF ANALYSIS

**Work Order** : **EN1804558**  
**Client** : **ECOTECH PTY LTD**  
**Contact** : **LARA NICHOLAS**  
**Address** : **1492 FERNTREE GULLY ROAD**  
**KNOXFIELD VICTORIA, AUSTRALIA 3180**  
**Telephone** : **+61 03 9730 7800**  
**Project** : **WD4 PRIMULA AVE**  
**Order number** : **235939**  
**C-O-C number** : **----**  
**Sampler** : **DANIEL RAYMOND**  
**Site** : **----**  
**Quote number** : **NE/070/17**  
**No. of samples received** : **2**  
**No. of samples analysed** : **2**

**Page** : 1 of 4  
**Laboratory** : Environmental Division Newcastle  
**Contact** : Hayley Withers  
**Address** : 5/585 Maitland Road Mayfield West NSW Australia 2304  
**Telephone** : +612 4014 2500  
**Date Samples Received** : 23-Jul-2018 09:00  
**Date Analysis Commenced** : 25-Jul-2018  
**Issue Date** : 26-Jul-2018 18:52



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

**Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.**

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Dale Semple	Analyst	Newcastle - Organics, Mayfield West, NSW
Daniel Junek	Senior Air Analyst	Newcastle - Organics, Mayfield West, NSW
Daniel Junek	Senior Air Analyst	Newcastle, Mayfield West, NSW



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EP101: Results reported in  $\mu\text{g}/\text{m}^3$  are calculated from PPBV results based on a temperature of 25°C and atmospheric pressure of 101.3 kPa.
- CAN-001: Results for Pressure - As Received are measured under controlled conditions using calibrated laboratory gauges. These results are expressed as an Absolute Pressure. Equivalent gauge pressures may be calculated by subtracting the Pressure - Laboratory Atmosphere taken at the time of measurement.
- CAN-001: Results for Pressure - Gauge as Received are obtained from uncalibrated field gauges and are indicative only. These results may not precisely match calibrated gauge readings and may vary from field measurements due to changes in temperature and pressure



## Analytical Results

Sub-Matrix: AIR (Matrix: AIR)				Client sample ID		080718 C12625_S2820	140718 C12645_S2824	----	----	----
Client sampling date / time						08-Jul-2018 00:00	14-Jul-2018 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EN1804558-001		EN1804558-002		-----	-----	-----
				Result		Result		----	----	----
EP101: VOCs by USEPA Method TO15 (Calculated Concentration)										
Benzene	71-43-2	1.6	µg/m³	<1.6		<1.6		----	----	----
Toluene	108-88-3	1.9	µg/m³	32.4		19.6		----	----	----
Ethylbenzene	100-41-4	2.2	µg/m³	<2.2		<2.2		----	----	----
meta- & para-Xylene	108-38-3 106-42-3	4.3	µg/m³	<4.3		<4.3		----	----	----
ortho-Xylene	95-47-6	2.2	µg/m³	<2.2		<2.2		----	----	----
Naphthalene	91-20-3	2.6	µg/m³	<2.6		<2.6		----	----	----
Total Xylenes	----	6.6	µg/m³	<6.6		<6.6		----	----	----
EP101: VOCs by USEPA Method TO15r										
Benzene	71-43-2	0.5	ppbv	<0.5		<0.5		----	----	----
Toluene	108-88-3	0.5	ppbv	8.6		5.2		----	----	----
Ethylbenzene	100-41-4	0.5	ppbv	<0.5		<0.5		----	----	----
meta- & para-Xylene	108-38-3 106-42-3	1.0	ppbv	<1.0		<1.0		----	----	----
ortho-Xylene	95-47-6	0.5	ppbv	<0.5		<0.5		----	----	----
Naphthalene	91-20-3	0.5	ppbv	<0.5		<0.5		----	----	----
Total Xylenes	----	1.5	ppbv	<1.5		<1.5		----	----	----
Sampling Quality Assurance										
Pressure - As received	PRESSURE	0.1	kPaa	96.8		92.7		----	----	----
Pressure - Gauge as Received	----	1	Inches Hg	-2		-4		----	----	----
Pressure - Laboratory Atmosphere	----	0.1	kPaa	102		102		----	----	----
Temperature as Received	----	0.1	°C	21.0		21.0		----	----	----
USEPA Air Toxics Method TO15r Surrogates										
4-Bromofluorobenzene	460-00-4	0.5	%	95.3		96.5		----	----	----





Surrogate Control Limits

Sub-Matrix: AIR		Recovery Limits (%)	
Compound	CAS Number	Low	High
USEPA Air Toxics Method TO15r Surrogates			
4-Bromofluorobenzene	460-00-4	60	140

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: EN1804558</b>	<b>Page</b>	<b>: 1 of 3</b>
<b>Client</b>	<b>: ECOTECH PTY LTD</b>	<b>Laboratory</b>	<b>: Environmental Division Newcastle</b>
<b>Contact</b>	<b>: LARA NICHOLAS</b>	<b>Contact</b>	<b>: Hayley Withers</b>
<b>Address</b>	<b>: 1492 FERNTREE GULLY ROAD KNOXFIELD VICTORIA, AUSTRALIA 3180</b>	<b>Address</b>	<b>: 5/585 Maitland Road Mayfield West NSW Australia 2304</b>
<b>Telephone</b>	<b>: +61 03 9730 7800</b>	<b>Telephone</b>	<b>: +612 4014 2500</b>
<b>Project</b>	<b>: WD4 PRIMULA AVE</b>	<b>Date Samples Received</b>	<b>: 23-Jul-2018</b>
<b>Order number</b>	<b>: 235939</b>	<b>Date Analysis Commenced</b>	<b>: 25-Jul-2018</b>
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	<b>: 26-Jul-2018</b>
<b>Sampler</b>	<b>: DANIEL RAYMOND</b>		
<b>Site</b>	<b>: ----</b>		
<b>Quote number</b>	<b>: NE/070/17</b>		
<b>No. of samples received</b>	<b>: 2</b>		
<b>No. of samples analysed</b>	<b>: 2</b>		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report; Recovery and Acceptance Limits

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dale Semple	Analyst	Newcastle - Organics, Mayfield West, NSW
Daniel Juneke	Senior Air Analyst	Newcastle - Organics, Mayfield West, NSW
Daniel Juneke	Senior Air Analyst	Newcastle, Mayfield West, NSW



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :  
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
 LOR = Limit of reporting  
 RPD = Relative Percentage Difference  
 # = Indicates failed QC

## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: AIR				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP101: VOCs by USEPA Method TO15r (QC Lot: 1829973)									
EN1804558-001	080718 C12625_S2820	EP101-H: Benzene	71-43-2	0.5	ppbv	<0.5	<0.5	0.00	No Limit
		EP101-H: Toluene	108-88-3	0.5	ppbv	8.6	8.5	0.00	0% - 50%
		EP101-H: Ethylbenzene	100-41-4	0.5	ppbv	<0.5	<0.5	0.00	No Limit
		EP101-H: ortho-Xylene	95-47-6	0.5	ppbv	<0.5	<0.5	0.00	No Limit
		EP101-H: meta- & para-Xylene	108-38-3 106-42-3	1	ppbv	<1.0	<1.0	0.00	No Limit



## Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control terms Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (DCS) refers to certified reference materials, or known interference free matrices spiked with target analytes. The purpose of these QC parameters are to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS and DCS.

Sub-Matrix: <b>AIR</b>		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	DCS	Low	High	Value	Control Limit
EP101: VOCs by USEPA Method TO15r (QCLot: 1829973)											
EP101-H: Benzene	71-43-2	0.5	ppbv	<0.5	100 ppbv	96.4	89.0	77	114	25	25
EP101-H: Toluene	108-88-3	0.5	ppbv	<0.5	100 ppbv	103	103	78	115	25	25
EP101-H: Ethylbenzene	100-41-4	0.5	ppbv	<0.5	100 ppbv	104	104	82	121	25	25
EP101-H: meta- & para-Xylene	108-38-3	1	ppbv	<1.0	200 ppbv	105	103	82	122	25	25
	106-42-3										
EP101-H: ortho-Xylene	95-47-6	0.5	ppbv	<0.5	100 ppbv	102	102	83	122	25	25

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

## QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EN1804558	Page	: 1 of 4
Client	: ECOTECH PTY LTD	Laboratory	: Environmental Division Newcastle
Contact	: LARA NICHOLAS	Telephone	: +612 4014 2500
Project	: WD4 PRIMULA AVE	Date Samples Received	: 23-Jul-2018
Site	: ----	Issue Date	: 26-Jul-2018
Sampler	: DANIEL RAYMOND	No. of samples received	: 2
Order number	: 235939	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

### Summary of Outliers

#### Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

#### Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

#### Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



## Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **AIR**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP101: VOCs by USEPA Method TO15r							
Summa style Canister - ALS Supplied Silonite (EP101-H) 080718 - C12625_S2820	08-Jul-2018	----	----	----	26-Jul-2018	07-Aug-2018	✓
Summa style Canister - ALS Supplied Silonite (EP101-H) 140718 - C12645_S2824	14-Jul-2018	----	----	----	26-Jul-2018	13-Aug-2018	✓
Sampling Quality Assurance							
Summa style Canister - ALS Supplied Silonite (CAN-001) 080718 - C12625_S2820	08-Jul-2018	----	----	----	25-Jul-2018	08-Jul-2019	✓
Summa style Canister - ALS Supplied Silonite (CAN-001) 140718 - C12645_S2824	14-Jul-2018	----	----	----	25-Jul-2018	14-Jul-2019	✓



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **AIR**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Duplicate Control Samples (DCS)							
Hydrocarbons in Air by USEPA TO15	EP101-H	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Duplicates (DUP)							
Hydrocarbons in Air by USEPA TO15	EP101-H	1	2	50.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Hydrocarbons in Air by USEPA TO15	EP101-H	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Hydrocarbons in Air by USEPA TO15	EP101-H	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Canister Sampling - Field Data	CAN-001	AIR	In house: Referenced to USEPA TO14 / TO15
Hydrocarbons in Air by USEPA TO15	EP101-H	AIR	In house: Referenced to USEPA TO15r Volatile Organic Compounds in Air by USEPA TO15. Aliphatic and Aromatic Hydrocarbons
Hydrocarbons in Air by USEPA TO15 (mass/volume)	EP101-H-MV	AIR	In house: Referenced to USEPA TO15r Hydrocarbons in Air by USEPA TO15 (Calculated Concentration)





Client Supplied Canister(s)? Y / N

2004-2005 2005-2006 2006-2007 2007-2008 2008-2009 2009-2010 2010-2011 2011-2012 2012-2013 2013-2014 2014-2015 2015-2016 2016-2017 2017-2018 2018-2019 2019-2020 2020-2021 2021-2022 2022-2023 2023-2024 2024-2025 2025-2026 2026-2027 2027-2028 2028-2029 2029-2030 2030-2031 2031-2032 2032-2033 2033-2034 2034-2035 2035-2036 2036-2037 2037-2038 2038-2039 2039-2040 2040-2041 2041-2042 2042-2043 2043-2044 2044-2045 2045-2046 2046-2047 2047-2048 2048-2049 2049-2050 2050-2051 2051-2052 2052-2053 2053-2054 2054-2055 2055-2056 2056-2057 2057-2058 2058-2059 2059-2060 2060-2061 2061-2062 2062-2063 2063-2064 2064-2065 2065-2066 2066-2067 2067-2068 2068-2069 2069-2070 2070-2071 2071-2072 2072-2073 2073-2074 2074-2075 2075-2076 2076-2077 2077-2078 2078-2079 2079-2080 2080-2081 2081-2082 2082-2083 2083-2084 2084-2085 2085-2086 2086-2087 2087-2088 2088-2089 2089-2090 2090-2091 2091-2092 2092-2093 2093-2094 2094-2095 2095-2096 2096-2097 2097-2098 2098-2099 2099-2100 2100-2101 2101-2102 2102-2103 2103-2104 2104-2105 2105-2106 2106-2107 2107-2108 2108-2109 2109-2110 2110-2111 2111-2112 2112-2113 2113-2114 2114-2115 2115-2116 2116-2117 2117-2118 2118-2119 2119-2120 2120-2121 2121-2122 2122-2123 2123-2124 2124-2125 2125-2126 2126-2127 2127-2128 2128-2129 2129-2130 2130-2131 2131-2132 2132-2133 2133-2134 2134-2135 2135-2136 2136-2137 2137-2138 2138-2139 2139-2140 2140-2141 2141-2142 2142-2143 2143-2144 2144-2145 2145-2146 2146-2147 2147-2148 2148-2149 2149-2150 2150-2151 2151-2152 2152-2153 2153-2154 2154-2155 2155-2156 2156-2157 2157-2158 2158-2159 2159-2160 2160-2161 2161-2162 2162-2163 2163-2164 2164-2165 2165-2166 2166-2167 2167-2168 2168-2169 2169-2170 2170-2171 2171-2172 2172-2173 2173-2174 2174-2175 2175-2176 2176-2177 2177-2178 2178-2179 2179-2180 2180-2181 2181-2182 2182-2183 2183-2184 2184-2185 2185-2186 2186-2187 2187-2188 2188-2189 2189-2190 2190-2191 2191-2192 2192-2193 2193-2194 2194-2195 2195-2196 2196-2197 2197-2198 2198-2199 2199-2200 2200-2201 2201-2202 2202-2203 2203-2204 2204-2205 2205-2206 2206-2207 2207-2208 2208-2209 2209-2210 2210-2211 2211-2212 2212-2213 2213-2214 2214-2215 2215-2216 2216-2217 2217-2218 2218-2219 2219-2220 2220-2221 2221-2222 2222-2223 2223-2224 2224-2225 2225-2226 2226-2227 2227-2228 2228-2229 2229-2230 2230-2231 2231-2232 2232-2233 2233-2234 2234-2235 2235-2236 2236-2237 2237-2238 2238-2239 2239-2240 2240-2241 2241-2242 2242-2243 2243-2244 2244-2245 2245-2246 2246-2247 2247-2248 2248-2249 2249-2250 2250-2251 2251-2252 2252-2253 2253-2254 2254-2255 2255-2256 2256-2257 2257-2258 2258-2259 2259-2260 2260-2261 2261-2262 2262-2263 2263-2264 2264-2265 2265-2266 2266-2267 2267-2268 2268-2269 2269-2270 2270-2271 2271-2272 2272-2273 2273-2274 2274-2275 2275-2276 2276-2277 2277-2278 2278-2279 2279-2280 2280-2281 2281-2282 2282-2283 2283-2284 2284-2285 2285-2286 2286-2287 2287-2288 2288-2289 2289-2290 2290-2291 2291-2292 2292-2293 2293-2294 2294-2295 2295-2296 2296-2297 2297-2298 2298-2299 2299-2300 2300-2301 2301-2302 2302-2303 2303-2304 2304-2305 2305-2306 2306-2307 2307-2308 2308-2309 2309-2310 2310-2311 2311-2312 2312-2313 2313-2314 2314-2315 2315-2316 2316-2317 2317-2318 2318-2319 2319-2320 2320-2321 2321-2322 2322-2323 2323-2324 2324-2325 2325-2326 2326-2327 2327-2328 2328-2329 2329-2330 2330-2331 2331-2332 2332-2333 2333-2334 2334-2335 2335-2336 2336-2337 2337-2338 2338-2339 2339-2340 2340-2341 2341-2342 2342-2343 2343-2344 2344-2345 2345-2346 2346-2347 2347-2348 2348-2349 2349-2350 2350-2351 2351-2352 2352-2353 2353-2354 2354-2355 2355-2356 2356-2357 2357-2358 2358-2359 2359-2360 2360-2361 2361-2362 2362-2363 2363-2364 2364-2365 2365-2366 2366-2367 2367-2368 2368-2369 2369-2370 2370-2371 2371-2372 2372-2373 2373-2374 2374-2375 2375-2376 2376-2377 2377-2378 2378-2379 2379-2380 2380-2381 2381-2382 2382-2383 2383-2384 2384-2385 2385-2386 2386-2387 2387-2388 2388-2389 2389-2390 2390-2391 2391-2392 2392-2393 2393-2394 2394-2395 2395-2396 2396-2397 2397-2398 2398-2399 2399-2400 2400-2401 2401-2402 2402-2403 2403-2404 2404-2405 2405-2406 2406-2407 2407-2408 2408-2409 2409-2410 2410-2411 2411-2412 2412-2413 2413

CHOCOFF 112 Rybný/Road Mungah RD & 1250  
Pl. 02 8330 2123. E-mail: [chocoff@chocoff.com.au](mailto:chocoff@chocoff.com.au)

CHRYSLER CREDIT CORPORATION  
300 N. LAKE STREET, CHRYSLER BLDG., NEW YORK, N.Y. 10020  
ATTN: CREDIT DEPARTMENT

TO: JAMES H. HARRIS, JR., 1000 10th St., N.W., Washington, D.C. 20004  
TOLL: APV900821

CLIENT: ECOTECH		TURNAROUND REQUIREMENTS : <small>(Standard TAT may be extended for multiple sequential analysis suites)</small>		<input checked="" type="checkbox"/> Standard TAT (List due date): <input type="checkbox"/> Non Standard or urgent TAT (List due date):		LABORATORY USE ONLY (Circle) <small>Receptor to initial and determine</small>	
OFFICE: 1492 Ferntree Gully Rd, KNOXFIELD VIC		ALS QUOTE NO.: NE/070/17		COC SEQUENCE NUMBER (Circle)		GC study Seal intact? Rec Lab Y / N NE Y / N <input checked="" type="checkbox"/> N/A Valves closed on Receipt? Rec Lab Y / N NE Y / N <input checked="" type="checkbox"/> N/A Canister/Sampler Complete and Not Damaged <input checked="" type="checkbox"/> Yes No	
PROJECT: WD4 PRIMULA AVE		COUNTRY OF ORIGIN:		COC: <input checked="" type="checkbox"/> 1 2 3 4 5 6 7		Other comment: Temperature C	
PURCHASE ORDER NC 235939		CONTACT PH: 03 9370 7845 0417351053		OF: <input checked="" type="checkbox"/> 1 2 3 4 5 6 7			
PROJECT MANAGER: Lara Nicholas		SAMPLER MOBILE: 0419424932		RELINQUISHED BY:		RELINQUISHED BY:	
SAMPLER: Daniel Raymond		EDD FORMAT (or default):		RECEIVED BY:		RECEIVED BY:	
COC Emailed to ALS? ( YES / NO)				RECEIVED BY:		RECEIVED BY:	
Email Reports to (will default to PM if no other addresses are listed): lara.nicholas@ecotech.com, daniel.raymond@ecotech.com				RECEIVED BY:		RECEIVED BY:	
Email Invoice to (will default to PM if no other addresses are listed): naomi.dans@ecotech.com				RECEIVED BY:		RECEIVED BY:	
COMMENTS/SPECIAL HANDLING/REPLACEMENT OR RETURN INSTRUCTIONS:							

[illegible]

*Job Specific Instructions: Ecotech Timers Sent with samples to be cleaned with nitrogen and returned with new canisters*

ENFM (204A/2)



## AIR SAMPLING EQUIPMENT

## DISPATCH RECORD

Inquiries: Client Services - Newcastle Phone: +61 (02) 4014 2500

E-mail: samples.newcastle@alsenviro.com

Dispatch to:		ALS Use ONLY	
Client / Office:	ECOTECH	Request Received By:	HW
Contact:	Lara Nicholas	Deliver By:	asap
Telephone:	03 9730 7800	Dispatched By:	asap
ALS Quotation:	NE/070/17	Workorder:	
Delivery Address:	1492 Ferntree Gully Rd Knoxfield VIC 3180	Agreed Rent Free Period:	14 days

SPECIAL INSTRUCTIONS: PLEASE EMAIL CLEAN CERTIFICATES TO lara.nicholas@ecotech.com ON DISPATCH .....

## Air Sampling Equipment Request

## CANISTERS

No.	Canister Type	Size	Gauge	Valve	Cap	Rental
4	Entech Silonite Canister (Summa™)	6L	Yes	S	Yes	\$200 ea

No. Returned	Leak Checked	Certified OK
	15	24/5/18

## CONNECTORS AND FLOW CONTROL DEVICES

No.	Equipment Type	Duration (hrs)	Flow (L/min)	T Piece	Gauge	Certified	Sealed / Vacuum	Connection (Quick Connect / 5/16 Swagelok)	No. Returned	Rental
4	Passive Sampler - TWA	24hr		No	Yes	Yes	Yes / No	S		Incl Above
4	Flow Sampler Caps			No	No	No	Yes / No			\$20 ea. Replacement
2	ECOTECH Autosampler			No	No	No	Yes / No			N/A
7	1/8" Swagelok connectors and ferrules (spares)									\$5 ea. Replacement

☒ Other (specify) T piece

1 Refer to Acceptance of Terms



ALS use only	
Sampling Guide Included (Y/N):	Packed by: 15
Number of Boxes:	Dispatch Time / Date: 15 24/5/18
Courier / Dispatcher:	Consignment Note Number: ECN009911844
	Consignment Dispatched by: K Jones 24/5/18



## AIR SAMPLING EQUIPMENT

## DISPATCH RECORD

## ALS SUPPLIED EQUIPMENT

Item	Quantity	Item Description	Serial Nos
		6L Silonite Summa™ canister	4757 ✓ Rec. 14/6 4989 ✓ 29/16 12621 ✓ 15/6 12645 ✓ # 23/06
		Passive Sampler - TWA - 24hr #4 3.5 mL/min	1621 / 15/6 2825 ✓ 29/16 2826 2856 / 15/6



## AIR SAMPLING EQUIPMENT

## DISPATCH RECORD

### Acceptance of Terms

Acceptance and use of the accompanying ALS Air Sampling Equipment constitutes acceptance of the following terms:

1. This equipment remains the property of ALS Laboratory Group.
2. Subject to the conditions below and unless stated otherwise in the relevant quotation, the supply and use of this equipment is included in the price of analysis.
3. No responsibility is accepted by ALS for equipment requirements that have been incorrectly or incompletely specified by the client. Interfacing of ALS equipment with other sampling equipment or structures is solely the client's responsibility.
4. Sampling equipment is configured and supplied based on client specified requirements. ALS will take all reasonable care to meet these specifications, but will not accept responsibility for changes in equipment calibration or failures during transit. Replacement equipment will be provided at no charge if required.
5. Equipment calibration and verification records are available for review on request. Verification reports are provided with equipment and electronic copies are available on request.
6. This air sampling equipment is provided solely for the use of the nominated client. Responsibility for ensuring the equipment is not damaged and for returning this equipment to ALS remains with the nominated client until all equipment is returned to the ALS Group.
7. Unless otherwise agreed in writing, if equipment is not returned within the agreed rent free period after dispatch, the quoted rental fees above will apply per week per unit thereafter. If equipment is returned unused, the cleaning fees quoted will apply (1 weeks rental charge). If sampling equipment return is delayed, please contact the laboratory prior to expiry of the rent free period to negotiate an extension.
8. Irreparably damaged equipment and any equipment not returned within 40 days will be charged to the client at a replacement cost (up to) equal to 15 weeks rent, less rental costs already paid.
9. Cleaning costs will apply for equipment marked or defaced by the client. Please attach labels for

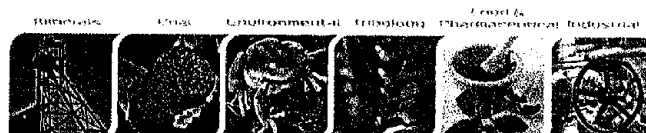
**If these conditions are not acceptable please return all equipment to ALS Newcastle immediately.**

### EQUIPMENT SUPPLY AND LOGISTICS

Additional air sampling equipment can be ordered through any ALS Environmental Laboratory and supplied direct to your site or office by courier. For the fastest turnaround, equipment should be returned direct to Newcastle Laboratory.

ALS Environmental, Newcastle  
5/585 Maitland Road  
Mayfield West, NSW 2304

Note that Dangerous Goods Transport Regulations may apply after sampling if the air cylinders are pressurised or contain hazardous materials.



## AIR SAMPLING EQUIPMENT

## DISPATCH RECORD

Inquiries: Client Services - Newcastle Phone: +61 (02) 4014 2500 E-mail: samples.newcastle@alsenviro.com

Dispatch to:		ALS Use ONLY	
Client / Office:	ECOTECH	Request Received By:	HW
Contact:	Lara Nicholas	Deliver By:	asap
Telephone:	03 9730 7800	Dispatched By:	asap 2/7/18
ALS Quotation:	NE/070/17	Workorder:	
Delivery Address:	1492 Ferntree Gully Rd Knoxfield VIC 3180	Agreed Rent Free Period:	14 days

SPECIAL INSTRUCTIONS: PLEASE EMAIL CLEAN CERTIFICATES TO lara.nicholas@ecotech.com ON DISPATCH .....

## Air Sampling Equipment Request

## CANISTERS

No.	Canister Type	Size	Gauge	Valve	Cap	Rental	No. Returned	Leak Checked	Certified OK
2	Entech Silonite Canister (Summa™)	6L	Yes	S	Yes	\$200 ea		✓	2/7/18

## CONNECTORS AND FLOW CONTROL DEVICES

No.	Equipment Type	Duration (hrs)	Flow (ml/min)	T. Piece	Gauge	Certified	Sealed / Vacuum	Connection (Quick Connect / Swagelok)	No. Returned	Rental
2	Passive Sampler - TWA	24hr		No	Yes	Yes	Yes / No	S		incl Above
4	Flow Sampler Caps			No	No	No	Yes / No			\$20 ea. Replacement
2	ECOTECH Autosampler			No	No	No	Yes / No			N/A
5	1/4" Swagelok connectors and ferrules (spares)									\$5 ea. Replacement

✓ Other (specify) T piece

<sup>1</sup> Refer to Acceptance of Terms

ALS use only	
Sampling Guide Included (Y/N)	Packed by: <i>LS</i>
Number of Boxes: 3	Dispatch Time / Date: 18/7/18
Courier / Dispatcher: TNT	Consignment Note Number: ECN009992863
	Consignment Dispatched by: KP 2-7-18

ENFMCDR1.1 11-05-11

RIGHT SOLUTIONS

Enfance - Adelaide - Brisbane - Canberra - Christchurch - Gladstone - Melbourne (Secresty) - Melbourne (Springvale) - Mudgee - Newcastle - Perth - Port Phillip - Sydney - Townsville - Tzaneen - Warragamba

www.alsglobal.com



## AIR SAMPLING EQUIPMENT

## DISPATCH RECORD

## ALS SUPPLIED EQUIPMENT

Item	Quantity	Item Description	Serial Nos
		6L Silonite Summa™ canister	4763 12625 ✓ 23/107
		Passive Sampler - TWA - 24hr	2824 ✓ record 2832 23/107 #4 3.5ml/min

ENFMCDR1.1 11-05-11

RIGHT SOLUTIONS

Enfance - Adelaide - Brisbane - Canberra - Christchurch - Gladstone - Melbourne (Secresty) - Melbourne (Springvale) - Mudgee - Newcastle - Perth - Port Phillip - Sydney - Townsville - Tzaneen - Warragamba

www.alsglobal.com



## AIR SAMPLING EQUIPMENT

## DISPATCH RECORD

### Acceptance of Terms

Acceptance and use of the accompanying ALS Air Sampling Equipment constitutes acceptance of the following terms:

1. This equipment remains the property of ALS Laboratory Group.
2. Subject to the conditions below and unless stated otherwise in the relevant quotation, the supply and use of this equipment is included in the price of analysis.
3. No responsibility is accepted by ALS for equipment requirements that have been incorrectly or incompletely specified by the client. Interfacing of ALS equipment with other sampling equipment or structures is solely the client's responsibility.
4. Sampling equipment is configured and supplied based on client specified requirements. ALS will take all reasonable care to meet these specifications, but will not accept responsibility for changes in equipment calibration or failure during transit. Replacement equipment will be provided at no charge if required.
5. Equipment calibration and verification records are available for review on request. Verification reports are provided with equipment and electronic copies are available on request.
6. This air sampling equipment is provided solely for the use of the nominated client. Responsibility for ensuring the equipment is not damaged and for returning this equipment to ALS remains with the nominated client until all equipment is returned to the ALS Group.
7. Unless otherwise agreed in writing, if equipment is not returned within the agreed rent free period after dispatch, the quoted rental fees above will apply per week per unit thereafter. If equipment is returned unused, the cleaning fees quoted will apply (1 weeks rental charge). If sampling equipment return is delayed, please contact the laboratory prior to expiry of the rent free period to negotiate and extension.
8. Irreparably damaged equipment and any equipment not returned within 40 days will be charged to the client at replacement cost per unit equal to 6 weeks rent less rental costs already paid.
9. Cleaning costs will apply for equipment marked or defaced by the client. Please attach labels for

If these conditions are not acceptable please return all equipment to ALS Newcastle immediately.

### EQUIPMENT SUPPLY AND LOGISTICS

Additional air sampling equipment can be ordered through any ALS Environmental Laboratory and supplied direct to your site or office by courier. For the fastest turnaround, equipment should be returned direct to Newcastle Laboratory.

ALS Environmental, Newcastle  
5/585 Maitland Road  
Mayfield West, NSW 2304

Note that Dangerous Goods Transport Regulations may apply after sampling if the air cylinders are pressurised or contain hazardous materials.



**Canister No: 12625**

**Specified Purpose:** USEPA TO15 (Extended Suite)  
Ambient Air

Verification Date: 28-Jun-2018  
Valid To (At least): 26-Jul-2018  
Verification File: 180628\_15.D

**Canister Type:** Entech Silonite - Summa Style  
**Canister Size:** 6L  
**Valve Type:** TOV  
**Dispatch Pressure:** <0.01 psia

Last Stability Check: 14-Mar-2018  
Next Check Scheduled: 13-Mar-2020  
Analyst: Daniel Juneke  
Approved for Dispatch by: *DS* 2/7/18

年份	地区	人口 (万人)	出生率 (‰)	死亡率 (‰)	自然增长率 (‰)	性别比	平均预期寿命 (岁)	婴儿死亡率 (‰)	孕产妇死亡率 (1/10万)	住院分娩率 (%)	避孕率 (%)	计划生育率 (%)	独生子女率 (%)	流动人口 (万人)	流动人口出生率 (‰)	流动人口死亡率 (‰)	流动人口自然增长率 (‰)	流动人口性别比	流动人口平均预期寿命 (岁)	流动人口婴儿死亡率 (‰)	流动人口孕产妇死亡率 (1/10万)	流动人口住院分娩率 (%)	流动人口避孕率 (%)	流动人口计划生育率 (%)	流动人口独生子女率 (%)
2000	全国	12.66	14.64	6.46	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83	0.00	14.64	6.46	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83
2001	全国	12.76	14.54	6.36	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83	0.00	14.54	6.36	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83
2002	全国	12.86	14.44	6.26	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83	0.00	14.44	6.26	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83
2003	全国	12.96	14.34	6.16	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83	0.00	14.34	6.16	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83
2004	全国	13.06	14.24	6.06	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83	0.00	14.24	6.06	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83
2005	全国	13.16	14.14	5.96	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83	0.00	14.14	5.96	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83
2006	全国	13.26	14.04	5.86	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83	0.00	14.04	5.86	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83
2007	全国	13.36	13.94	5.76	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83	0.00	13.94	5.76	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83
2008	全国	13.46	13.84	5.66	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83	0.00	13.84	5.66	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83
2009	全国	13.56	13.74	5.56	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83	0.00	13.74	5.56	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83
2010	全国	13.66	13.64	5.46	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83	0.00	13.64	5.46	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83
2011	全国	13.76	13.54	5.36	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83	0.00	13.54	5.36	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83
2012	全国	13.86	13.44	5.26	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83	0.00	13.44	5.26	8.18	106.74	71.40	30.92	51.15	98.90	55.83	55.83	55.83
2013	全国	13.96	13.34	5.16	8.18	106.74	71.40	30.92	51.15																

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Each of the four bodies is made by compressing a steel and copper alloy. Steel by itself is not malleable, but a thin layer of copper is applied to the steel, which, when the two are rolled together, produces a malleable material. Making the body stronger is done by rolling it between

[illegible]

Source: *MS-1980*, Department of National Defense, Bureau of Public Administration, with permission of the Department of National Defense, Manila. Digitized by the Department of National Defense, Manila. 1980-2000.

[illegible]

Target Compound	Alt. Name	Qualifiers	Verification	Result
			Goal (<) ppbv	
1,1,1-Trichloroethane	1,1,1-TCA / Methyl chloroform		0.2	<0.2
1,1,2,2-Tetrachloroethane	R-130 / Acetylene tetrachloride		0.2	<0.2
1,1,2-Trichloroethane	Vinyl trichloride		0.2	<0.2
1,1-Dichloroethane	Ethylidene chloride		0.2	<0.2
1,1-Dichloroethene	1,1-DCE / Vinylidene chloride		0.2	<0.2
1,2-Dichloroethane	Ethylene chloride		0.2	<0.2
1,2,4-Trimethylbenzene	Pseudocumene		0.2	<0.2
1,2-Dibromoethane	EDB / Ethylene dibromide		0.2	<0.2
1,2-Dichlorobenzene	o-Dichlorobenzene		0.2	<0.2
1,2-Dichloropropane	Propylene dichloride		0.2	<0.2
1,3,5-Trimethylbenzene	Mesitylene		0.2	<0.2
1,3-Dichlorobenzene	m-Dichlorobenzene		0.2	<0.2
1,4-Dichlorobenzene	p-Dichlorobenzene		0.2	<0.2
Benzene	Cyclohexatriene		0.2	<0.2
Bromomethane	Methyl bromide		0.2	<0.2
Tetrachloromethane	Carbon tetrachloride		0.2	<0.2
Chlorobenzene	Phenyl chloride		0.2	<0.2
Chloroethane	Ethyl chloride		0.2	<0.2
Chloroform	Trichloromethane		0.2	<0.2
Chloromethane	Methyl chloride		0.2	<0.2
cis-1,2-Dichloroethene	cis-1,2-Dichloroethylene		0.2	<0.2
cis-1,3-Dichloropropene	cis-1,3-Dichloropropylene		0.2	<0.2
Ethylbenzene	Phenyl ethane		0.2	<0.2
Freon 12	Dichlorodifluoromethane		0.2	<0.2
Freon 11	Trichlorofluoromethane		0.2	<0.2
Freon 113	1,1,2-Trichloro-1,2,2-trifluoroethane		0.2	<0.2
Freon 114	1,2-Dichlorotetrafluoroethane		0.2	<0.2
Hexachlorobutadiene	Hexachloro-1,3-Butadiene		0.2	<0.2

**Qualifiers - F: Fails Stability Check, V: Fails Verification**

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Target Compound	Alt. Name	Qualifiers	Verification	Result
			Goal (<) ppbv	
Dichloromethane	Methylene chloride		0.2	<0.2
m- & p-Xylene	1,3 & 1,4 -Dimethylbenzene		0.4	<0.4
o-Xylene	1,2-Dimethylbenzene		0.2	<0.2
Styrene	Vinyl benzene		0.2	<0.2
Tetrachloroethene	PCE / Perchloroethylene		0.2	<0.2
Toluene	Methyl Benzene		0.2	<0.2
trans-1,3-Dichloropropene	trans-1,3-Dichloropropylene		0.2	<0.2
Trichloroethene	TCE / Trichloroethylene		0.2	<0.2
Vinyl chloride	Chloroethene		0.2	<0.2
1,2,4-Trichlorobenzene			0.2	<0.2
1,3-Butadiene	Biethylene		0.2	<0.2
1,4-Dioxane	p-Dioxane		0.2	<0.2
2,2,4-Trimethylpentane	Isooctane		0.2	<0.2
4-Ethyltoluene	p-Ethyltoluene		0.2	<0.2
Acetone	2-Propanone		0.2	<0.2
Allyl chloride	3-Chloropropene		0.2	<0.2
Bromodichloromethane	Dichlorobromomethane		0.2	<0.2
Bromoform	Tribromomethane		0.2	<0.2
Carbon disulfide	CS2		0.2	<0.2
Cyclohexane			0.2	<0.2
Dibromochloromethane	Chlorodibromoethane		0.2	<0.2
Ethyl acetate	Acetic ester		0.2	<0.2
Isopropyl alcohol	Isopropanol / 2-Propanol		0.2	<0.2
Methyl butyl ketone	MBK / 2-Hexanone		0.2	<0.2
Methyl ethyl ketone	MEK / 2-Butanone		0.2	<0.2
Methyl isobutyl ketone	MIBK / 4-Methyl-2-pentanone		0.2	<0.2
Methyl tert-butyl ether	MTBE		0.2	<0.2
n-Heptane			0.2	<0.2
n-Hexane			0.2	<0.2
Propene	Propylene		0.2	<0.2
Tetrahydrofuran	THF		0.2	<0.2
trans-1,2-Dichloroethene	trans-1,2-Dichloroethylene		0.2	<0.2
Vinyl acetate	Acetic acid vinyl ester		0.2	<0.2
Bromoethene	Vinyl bromide		0.2	<0.2
Benzyl chloride	o-Chlorotoluene		0.2	<0.2
Ethanol	Ethyl alcohol		0.2	<0.2
Acetonitrile	Methyl cyanide		0.2	<0.2
Acrolein	2-Propenal		0.2	<0.2
Acrylonitrile	2-Propenenitrile		0.2	<0.2
tert-Butyl alcohol	TBA		0.2	<0.2
2-Chloroprene	2-Chloro-1,3-butadiene		0.2	<0.2
Diisopropyl Ether	DIPE		0.2	<0.2
Ethyl tert-butyl ether	ETBE		0.2	<0.2
tert-Amyl methyl ether	TAME		0.2	<0.2
Methyl methacrylate	MMA		0.2	<0.2
1,1,1,2-Tetrachloroethane	R-130a / Acetylene trichloride		0.2	<0.2
Isopropylbenzene	Cumene		0.2	<0.2
2-Chlorotoluene	o-Chlorotoluene		0.2	<0.2
n-Propylbenzene	Phenyl propane		0.2	<0.2
tert-Butylbenzene	1,1-Dimethylethylbenzene		0.2	<0.2
sec-Butylbenzene	1-Methylpropylbenzene		0.2	<0.2
2-Isopropyltoluene	o-Cymene		0.2	<0.2
n-Butylbenzene	Phenyl butane		0.2	<0.2
Naphthalene			0.2	<0.2

Qualifiers - F: Fails Stability Check, V: Fails Verification

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## Sampler Verification Report

**Sampler No:** 2820

**Specified Purpose:** USEPA TO15 (Extended Suite)  
**LORs Required:** Ambient Air  
**Sampler Type:** Passive Sampler

**Verification Date:** 14-Jun-2018  
**Valid To (At least):** 12-Jul-2018  
**Verification File:** 180614\_05.D

**Flow Rate Calibrated at:** 3.5 ml/min

**Analyst:** K. Gelderman

**Calibrated by:** PF 15/6/18

**Approved for Dispatch by:** KG 15/6/18

### Sampler Verification Protocol

Samplers are generally verified for use for the requested analysis and applications. For most applications, samplers are verified clean according to the requirements of USEPA Method TO-15.

Each verification involves a check for performance, leaks and damage to fittings.

### Reference Methods

USEPA Method TO-15: Ambient Air Sampling for Organic Compounds by Passive Sampling. EPA-821-R-02-001. <http://www.epa.gov/epaosweb/documents/default.asp?docid=60001>

Target Compound	Alt. Name	Verified to ppbv	Result ppbv
1,1,1-Trichloroethane	1,1,1-TCA / Methyl chloroform	0.2	<0.2
1,1,2,2-Tetrachloroethane	R-130 / Acetylene tetrachloride	0.2	<0.2
1,1,2-Trichloroethane	Vinyl trichloride	0.2	<0.2
1,1-Dichloroethane	Ethylidene chloride	0.2	<0.2
1,1-Dichloroethene	1,1-DCE / Vinylidene chloride	0.2	<0.2
1,2-Dichloroethane	Ethylene chloride	0.2	<0.2
1,2,4-Trimethylbenzene	Pseudocumene	0.2	<0.2
1,2-Dibromoethane	EDB / Ethylene dibromide	0.2	<0.2
1,2-Dichlorobenzene	o-Dichlorobenzene	0.2	<0.2
1,2-Dichloropropane	Propylene dichloride	0.2	<0.2
1,3,5-Trimethylbenzene	Mesitylene	0.2	<0.2
1,3-Dichlorobenzene	m-Dichlorobenzene	0.2	<0.2
1,4-Dichlorobenzene	p-Dichlorobenzene	0.2	<0.2
Benzene	Cyclohexatriene	0.2	<0.2
Bromomethane	Methyl bromide	0.2	<0.2
Tetrachloromethane	Carbon tetrachloride	0.2	<0.2
Chlorobenzene	Phenyl chloride	0.2	<0.2
Chloroethane	Ethyl chloride	0.2	<0.2
Chloroform	Trichloromethane	0.2	<0.2
Chloromethane	Methyl chloride	0.2	<0.2
cis-1,2-Dichloroethene	cis-1,2-Dichloroethylene	0.2	<0.2
cis-1,3-Dichloropropene	cis-1,3-Dichloropropylene	0.2	<0.2
Phenylbenzene	Phenyl ethane	0.2	<0.2
Freon 12	Dichlorodifluoromethane	0.2	<0.2
Freon 11	Trichlorofluoromethane	0.2	<0.2
Freon 113	1,1,2-Trichloro-1,1,2-trifluoroethane	0.2	<0.2
Freon 114	1,2-Dichlorotetrafluoroethane	0.2	<0.2
Hexachlorobutadiene	Hexachloro-1,3-Butadiene	0.2	<0.2

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Target Compound	Alt. Name	Verified to ppbv	Result ppbv
Dichloromethane	Methylene chloride	0.2	<0.2
m- & p-Xylene	1,3 & 1,4 -Dimethylbenzene	0.4	<0.4
o-Xylene	1,2-Dimethylbenzene	0.2	<0.2
Styrene	Vinyl benzene	0.2	<0.2
Tetrachloroethene	PCE / Perchloroethylene	0.2	<0.2
Toluene	Methyl Benzene	0.2	<0.2
trans-1,3-Dichloropropene	trans-1,3-Dichloropropylene	0.2	<0.2
Trichloroethene	TCE / Trichloroethylene	0.2	<0.2
Vinyl chloride	Chloroethene	0.2	<0.2
1,2,4-Trichlorobenzene		0.2	<0.2
1,3-Butadiene	Biethylene	0.2	<0.2
1,4-Dioxane	p-Dioxane	0.2	<0.2
2,2,4-Trimethylpentane	Isooctane	0.2	<0.2
4-Ethyltoluene	p-Ethyltoluene	0.2	<0.2
Acetone	2-Propanone	0.2	<0.2
Allyl chloride	3-Chloropropene	0.2	<0.2
Bromodichloromethane	Dichlorobromomethane	0.2	<0.2
Bromoform	Tribromomethane	0.2	<0.2
Carbon disulfide	CS2	0.2	<0.2
Cyclohexane		0.2	<0.2
Dibromochloromethane	Chlorodibromoethane	0.2	<0.2
Ethyl acetate	Acetic ester	0.2	<0.2
Isopropyl alcohol	Isopropanol / 2-Propanol	0.2	<0.2
Methyl butyl ketone	MBK / 2-Hexanone	0.2	<0.2
Methyl ethyl ketone	MEK / 2-Butanone	0.2	<0.2
Methyl isobutyl ketone	MIBK / 4-Methyl-2-pentanone	0.2	<0.2
Methyl tert-butyl ether	MTBE	0.2	<0.2
n-Heptane		0.2	<0.2
n-Hexane		0.2	<0.2
Propene	Propylene	0.2	<0.2
Tetrahydrofuran	THF	0.2	<0.2
trans-1,2-Dichloroethene	trans-1,2-Dichloroethylene	0.2	<0.2
Vinyl acetate	Acetic acid vinyl ester	0.2	<0.2
Bromoethene	Vinyl bromide	0.2	<0.2
Benzyl chloride	α-Chlorotoluene	0.2	<0.2
Ethanol	Ethyl alcohol	0.2	<0.2
Acetonitrile	Methyl cyanide	0.2	<0.2
Acrolein	2-Propenal	0.2	<0.2
Acrylonitrile	2-Propenenitrile	0.2	<0.2
tert-Butyl alcohol	TBA	0.2	<0.2
2-Chloroprene	2-Chloro-1,3-butadiene	0.2	<0.2
Diisopropyl Ether	DIPE	0.2	<0.2
Ethyl tert-butyl ether	ETBE	0.2	<0.2
tert-Amyl methyl ether	TAME	0.2	<0.2
Methyl methacrylate	MMA	0.2	<0.2
1,1,1,2-Tetrachloroethane	R-130a / Acetylene trichloride	0.2	<0.2
Isopropylbenzene	Cumene	0.2	<0.2
2-Chlorotoluene	o-Chlorotoluene	0.2	<0.2
n-Propylbenzene	Phenyl propane	0.2	<0.2
tert-Butylbenzene	1,1-Dimethylethylbenzene	0.2	<0.2
sec-Butylbenzene	1-Methylpropylbenzene	0.2	<0.2
2-Isopropyltoluene	o-Cymene	0.2	<0.2
n-Butylbenzene	Phenyl butane	0.2	<0.2
Naphthalene		0.2	<0.2



## Canister Verification Report

**Canister No:** 12645

<b>Specified Purpose:</b>	USEPA TO15 (Extended Suite) Ambient Air	<b>Verification Date:</b>	23-May-2018
		<b>Valid To (At least):</b>	20-Jun-2018
		<b>Verification File:</b>	180523_02.D
<b>Canister Type:</b>	Entech Silonite - Summa Style	<b>Last Stability Check:</b>	01-May-2018
<b>Canister Size:</b>	6L	<b>Next Check Scheduled:</b>	30-Apr-2020
<b>Valve Type:</b>	TOV	<b>Analyst:</b>	K. Gelderman
<b>Dispatch Pressure:</b>	<0.01 psia	<b>Approved for Dispatch by:</b>	<i>KS 24/5/18</i>

### Canister Verification Protocol

Canisters are verified for leakage for the requested analytes and applications of service. For most applications, canisters are verified clean according to the requirements of USEPA method TO-15.

Each verification involves a check for contamination, leaks and damage to valves. Stability checks are performed after 5 years or if damage to the canister is suspected, then every two years, within the designated holding time to ensure each canister is capable of holding the target chemicals without significant degradation.

See www.alsglobal.com for more information.

ALS Global is a leading provider of environmental testing services, including canister verification, for a wide range of industries. Our services are performed in accordance with the latest standards and regulations, ensuring the highest quality and accuracy. For more information, please contact us at [www.alsglobal.com](http://www.alsglobal.com).

Target Compound	Alt. Name	Qualifiers	Verification	
			Goal (<)	Result
			ppbv	ppbv
1,1,1-Trichloroethane	1,1,1-TCA / Methyl chloroform		0.2	<0.2
1,1,2,2-Tetrachloroethane	R-130 / Acetylene tetrachloride		0.2	<0.2
1,1,2-Trichloroethane	Vinyl trichloride		0.2	<0.2
1,1-Dichloroethane	Ethylidene chloride		0.2	<0.2
1,1-Dichloroethene	1,1-DCE / Vinylidene chloride		0.2	<0.2
1,2-Dichloroethane	Ethylene chloride		0.2	<0.2
1,2,4-Trimethylbenzene	Pseudocumene		0.2	<0.2
1,2-Dibromoethane	EDB / Ethylene dibromide		0.2	<0.2
1,2-Dichlorobenzene	o-Dichlorobenzene		0.2	<0.2
1,2-Dichloropropane	Propylene dichloride		0.2	<0.2
1,3,5-Trimethylbenzene	Mesitylene		0.2	<0.2
1,3-Dichlorobenzene	m-Dichlorobenzene		0.2	<0.2
1,4-Dichlorobenzene	p-Dichlorobenzene		0.2	<0.2
Benzene	Cyclohexatriene		0.2	<0.2
Bromomethane	Methyl bromide		0.2	<0.2
Tetrachloromethane	Carbon tetrachloride		0.2	<0.2
Chlorobenzene	Phenyl chloride		0.2	<0.2
Chloroethane	Ethyl chloride		0.2	<0.2
Chloroform	Trichloromethane		0.2	<0.2
Chloromethane	Methyl chloride		0.2	<0.2
cis-1,2-Dichloroethene	cis-1,2-Dichloroethylene		0.2	<0.2
cis-1,3-Dichloropropene	cis-1,3-Dichloropropylene		0.2	<0.2
Ethylbenzene	Phenyl ethane		0.2	<0.2
Freon 12	Dichlorodifluoromethane		0.2	<0.2
Freon 11	Trichlorofluoromethane		0.2	<0.2
Freon 113	1,1,2-Trichloro-1,2,2-trifluoroethane		0.2	<0.2
Freon 114	1,2-Dichlorotetrafluoroethane		0.2	<0.2
Hexachlorobutadiene	Hexachloro-1,3-Butadiene		0.2	<0.2

Qualifiers - F: Fails Stability Check, V: Fails Verification

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Target Compound	Alt. Name	Qualifiers	Verification	Result
			Goal (<) ppbv	
Dichloromethane	Methylene chloride		0.2	<0.2
m- & p-Xylene	1,3 & 1,4 -Dimethylbenzene		0.4	<0.4
o-Xylene	1,2-Dimethylbenzene		0.2	<0.2
Styrene	Vinyl benzene		0.2	<0.2
Tetrachloroethene	PCE / Perchloroethylene		0.2	<0.2
Toluene	Methyl Benzene		0.2	<0.2
trans-1,3-Dichloropropene	trans-1,3-Dichloropropylene		0.2	<0.2
Trichloroethene	TCE / Trichloroethylene		0.2	<0.2
Vinyl chloride	Chloroethene		0.2	<0.2
1,2,4-Trichlorobenzene			0.2	<0.2
1,3-Butadiene	Biethylene		0.2	<0.2
1,4-Dioxane	p-Dioxane		0.2	<0.2
2,2,4-Trimethylpentane	Isooctane		0.2	<0.2
4-Ethyltoluene	p-Ethyltoluene		0.2	<0.2
Acetone	2-Propanone		0.2	<0.2
Allyl chloride	3-Chloropropene		0.2	<0.2
Bromodichloromethane	Dichlorobromomethane		0.2	<0.2
Bromoform	Tribromomethane		0.2	<0.2
Carbon disulfide	CS2		0.2	<0.2
Cyclohexane			0.2	<0.2
Dibromochloromethane	Chlorodibromoethane		0.2	<0.2
Ethyl acetate	Acetic ester		0.2	<0.2
Isopropyl alcohol	Isopropanol / 2-Propanol		0.2	<0.2
Methyl butyl ketone	MBK / 2-Hexanone		0.2	<0.2
Methyl ethyl ketone	MEK / 2-Butanone		0.2	<0.2
Methyl isobutyl ketone	MIBK / 4-Methyl-2-pentanone		0.2	<0.2
Methyl tert-butyl ether	MTBE		0.2	<0.2
n-Heptane			0.2	<0.2
n-Hexane			0.2	<0.2
Propene	Propylene		0.2	<0.2
Tetrahydrofuran	THF		0.2	<0.2
trans-1,2-Dichloroethene	trans-1,2-Dichloroethylene		0.2	<0.2
Vinyl acetate	Acetic acid vinyl ester		0.2	<0.2
Bromoethene	Vinyl bromide		0.2	<0.2
Benzyl chloride	o-Chlorotoluene		0.2	<0.2
Ethanol	Ethyl alcohol		0.2	<0.2
Acetonitrile	Methyl cyanide		0.2	<0.2
Acrolein	2-Propenal		0.2	<0.2
Acrylonitrile	2-Propenenitrile		0.2	<0.2
tert-Butyl alcohol	TBA		0.2	<0.2
2-Chloroprene	2-Chloro-1,3-butadiene		0.2	<0.2
Diisopropyl Ether	DIPE		0.2	<0.2
Ethyl tert-butyl ether	ETBE		0.2	<0.2
tert-Amyl methyl ether	TAME		0.2	<0.2
Methyl methacrylate	MMA		0.2	<0.2
1,1,1,2-Tetrachloroethane	R-130a / Acetylene trichloride		0.2	<0.2
Isopropylbenzene	Cumene		0.2	<0.2
2-Chlorotoluene	o-Chlorotoluene		0.2	<0.2
n-Propylbenzene	Phenyl propane		0.2	<0.2
tert-Butylbenzene	1,1-Dimethylethylbenzene		0.2	<0.2
sec-Butylbenzene	1-Methylpropylbenzene		0.2	<0.2
2-Isopropyltoluene	o-Cymene		0.2	<0.2
n-Butylbenzene	Phenyl butane		0.2	<0.2
Naphthalene			0.2	<0.2

Qualifiers - F: Fails Stability Check, V: Fails Verification

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**Sampler No: 2824**

Verification Date: 19-Jun-2018  
Valid To (At least): 17-Jul-2018  
Verification File: 180619 10.D

Analyst: Dale Semple

Approved for Dispatch by:

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Target Compound	Alt. Name	Verified to ppbv	Result ppbv
1,1,1-Trichloroethane	1,1,1-TCA / Methyl chloroform	0.2	<0.2
1,1,2,2-Tetrachloroethane	R-130 / Acetylene tetrachloride	0.2	<0.2
1,1,2-Trichloroethane	Vinyl trichloride	0.2	<0.2
1,1-Dichloroethane	Ethylidene chloride	0.2	<0.2
1,1-Dichloroethene	1,1-DCE / Vinylidene chloride	0.2	<0.2
1,2-Dichloroethane	Ethylene chloride	0.2	<0.2
1,2,4-Trimethylbenzene	Pseudocumene	0.2	<0.2
1,2-Dibromoethane	EDB / Ethylene dibromide	0.2	<0.2
1,2-Dichlorobenzene	o-Dichlorobenzene	0.2	<0.2
1,2-Dichloropropane	Propylene dichloride	0.2	<0.2
1,3,5-Trimethylbenzene	Mesitylene	0.2	<0.2
1,3-Dichlorobenzene	m-Dichlorobenzene	0.2	<0.2
1,4-Dichlorobenzene	p-Dichlorobenzene	0.2	<0.2
Benzene	Cyclohexatriene	0.2	<0.2
Bromomethane	Methyl bromide	0.2	<0.2
Tetrachloromethane	Carbon tetrachloride	0.2	<0.2
Chlorobenzene	Phenyl chloride	0.2	<0.2
Chloroethane	Ethyl chloride	0.2	<0.2
Chloroform	Trichloromethane	0.2	<0.2
Chloromethane	Methyl chloride	0.2	<0.2
cis-1,2-Dichloroethene	cis-1,2-Dichloroethylene	0.2	<0.2
cis-1,3-Dichloropropene	cis-1,3-Dichloropropylene	0.2	<0.2
Ethylbenzene	Phenyl ethane	0.2	<0.2
Freon 12	Dichlorodifluoromethane	0.2	<0.2
Freon 11	Trichlorofluoromethane	0.2	<0.2
Freon 113	1,1,2-Trichloro-1,1,2-trifluoroethane	0.2	<0.2
Freon 114	1,2-Dichlorotetrafluoroethane	0.2	<0.2
Hexachlorobutadiene	Hexachloro-1,3-Butadiene	0.2	<0.2

## RESULTS

Enchance Adelaide Bendigo Canberra Cessford Gladstone Melbourne (Scoresby) Melbourne (Springvale) Mudgee Newcastle Nswra Perth Wollongong Sydney - Townsville Tarengo Wangaratta

[illegible]



Target Compound	Alt. Name	Verified to ppbv	Result ppbv
Dichloromethane	Methylene chloride	0.2	<0.2
m- & p-Xylene	1,3 & 1,4 -Dimethylbenzene	0.4	<0.4
o-Xylene	1,2-Dimethylbenzene	0.2	<0.2
Styrene	Vinyl benzene	0.2	<0.2
Tetrachloroethene	PCE / Perchloroethylene	0.2	<0.2
Toluene	Methyl Benzene	0.2	<0.2
trans-1,3-Dichloropropene	trans-1,3-Dichloropropylene	0.2	<0.2
Trichloroethene	TCE / Trichloroethylene	0.2	<0.2
Vinyl chloride	Chloroethene	0.2	<0.2
1,2,4-Trichlorobenzene		0.2	<0.2
1,3-Butadiene	Biethylene	0.2	<0.2
1,4-Dioxane	p-Dioxane	0.2	<0.2
2,2,4-Trimethylpentane	Isooctane	0.2	<0.2
4-Ethyltoluene	p-Ethyltoluene	0.2	<0.2
Acetone	2-Propanone	0.2	<0.2
Allyl chloride	3-Chloropropene	0.2	<0.2
Bromodichloromethane	Dichlorobromomethane	0.2	<0.2
Bromoform	Tribromomethane	0.2	<0.2
Carbon disulfide	CS2	0.2	<0.2
Cyclohexane		0.2	<0.2
Dibromochloromethane	Chlorodibromoethane	0.2	<0.2
Ethyl acetate	Acetic ester	0.2	<0.2
Isopropyl alcohol	Isopropanol / 2-Propanol	0.2	<0.2
Methyl butyl ketone	MBK / 2-Hexanone	0.2	<0.2
Methyl ethyl ketone	MEK / 2-Butanone	0.2	<0.2
Methyl isobutyl ketone	MIBK / 4-Methyl-2-pentanone	0.2	<0.2
Methyl tert-butyl ether	MTBE	0.2	<0.2
n-Heptane		0.2	<0.2
n-Hexane		0.2	<0.2
Propene	Propylene	0.2	<0.2
Tetrahydrofuran	THF	0.2	<0.2
trans-1,2-Dichloroethene	trans-1,2-Dichloroethylene	0.2	<0.2
Vinyl acetate	Acetic acid vinyl ester	0.2	<0.2
Bromoethene	Vinyl bromide	0.2	<0.2
Benzyl chloride	α-Chlorotoluene	0.2	<0.2
Ethanol	Ethyl alcohol	0.2	<0.2
Acetonitrile	Methyl cyanide	0.2	<0.2
Acrolein	2-Propenal	0.2	<0.2
Acrylonitrile	2-Propenenitrile	0.2	<0.2
tert-Butyl alcohol	TBA	0.2	<0.2
2-Chloroprene	2-Chloro-1,3-butadiene	0.2	<0.2
Diisopropyl Ether	DIPE	0.2	<0.2
Ethyl tert-butyl ether	ETBE	0.2	<0.2
tert-Amyl methyl ether	TAME	0.2	<0.2
Methyl methacrylate	MMA	0.2	<0.2
1,1,1,2-Tetrachloroethane	R-130a / Acetylene trichloride	0.2	<0.2
Isopropylbenzene	Cumene	0.2	<0.2
2-Chlorotoluene	o-Chlorotoluene	0.2	<0.2
n-Propylbenzene	Phenyl propane	0.2	<0.2
tert-Butylbenzene	1,1-Dimethylethylbenzene	0.2	<0.2
sec-Butylbenzene	1-Methylpropylbenzene	0.2	<0.2
2-Isopropyltoluene	o-Cymene	0.2	<0.2
n-Butylbenzene	Phenyl butane	0.2	<0.2
Naphthalene		0.2	<0.2

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**Canister No: 12625**

**Specified Purpose:** USEPA TO15 (Extended Suite)  
Ambient Air

Verification Date: 28-Jun-2018  
Valid To (At least): 26-Jul-2018  
Verification File: 180628\_15.D

Canister Type: Entech Silonite - Summa Style  
Canister Size: 6L  
Valve Type: TOV  
Dispatch Pressure: <0.01 psia

Last Stability Check: 14-Mar-2018  
Next Check Scheduled: 13-Mar-2020  
Analyst: Daniel Juneke  
Approved for Dispatch by: *DS* 2/7/18

年份	地区	人口	人口密度	人口增长率	人口密度增长率	人口增长率与人口密度增长率之比
1980	全国	9.87	122.5	1.1%	0.1%	11
1985	全国	10.58	145.5	1.4%	0.2%	7
1990	全国	11.34	167.5	1.7%	0.3%	6
1995	全国	12.11	189.5	2.0%	0.4%	5
2000	全国	12.88	211.5	2.3%	0.5%	4.6
2005	全国	13.65	233.5	2.6%	0.6%	4.3
2010	全国	14.42	255.5	2.9%	0.7%	4.1
2015	全国	15.19	277.5	3.2%	0.8%	4.0
2020	全国	15.96	299.5	3.5%	0.9%	3.9
2025	全国	16.73	321.5	3.8%	1.0%	3.8
2030	全国	17.50	343.5	4.1%	1.1%	3.7
2035	全国	18.27	365.5	4.4%	1.2%	3.7
2040	全国	19.04	387.5	4.7%	1.3%	3.6
2045	全国	19.81	409.5	5.0%	1.4%	3.6
2050	全国	20.58	431.5	5.3%	1.5%	3.5
2055	全国	21.35	453.5	5.6%	1.6%	3.5
2060	全国	22.12	475.5	5.9%	1.7%	3.5
2065	全国	22.89	497.5	6.2%	1.8%	3.4
2070	全国	23.66	519.5	6.5%	1.9%	3.4
2075	全国	24.43	541.5	6.8%	2.0%	3.4
2080	全国	25.20	563.5	7.1%	2.1%	3.4
2085	全国	25.97	585.5	7.4%	2.2%	3.3
2090	全国	26.74	607.5	7.7%	2.3%	3.3
2095	全国	27.51	629.5	8.0%	2.4%	3.3
2100	全国	28.28	651.5	8.3%	2.5%	3.3
2105	全国	29.05	673.5	8.6%	2.6%	3.3
2110	全国	29.82	695.5	8.9%	2.7%	3.3
2115	全国	30.59	717.5	9.2%	2.8%	3.3
2120	全国	31.36	739.5	9.5%	2.9%	3.3
2125	全国	32.13	761.5	9.8%	3.0%	3.3
2130	全国	32.90	783.5	10.1%	3.1%	3.3
2135	全国	33.67	805.5	10.4%	3.2%	3.3
2140	全国	34.44	827.5	10.7%	3.3%	3.3
2145	全国	35.21	849.5	11.0%	3.4%	3.3
2150	全国	35.98	871.5	11.3%	3.5%	3.3
2155	全国	36.75	893.5	11.6%	3.6%	3.3
2160	全国	37.52	915.5	11.9%	3.7%	3.3
2165	全国	38.29	937.5	12.2%	3.8%	3.3
2170	全国	39.06	959.5	12.5%	3.9%	3.3
2175	全国	39.83	981.5	12.8%	4.0%	3.3
2180	全国	40.60	1003.5	13.1%	4.1%	3.3
2185	全国	41.37	1025.5	13.4%	4.2%	3.3
2190	全国	42.14	1047.5	13.7%	4.3%	3.3
2195	全国	42.91	1069.5	14.0%	4.4%	3.3
2200	全国	43.68	1091.5	14.3%	4.5%	3.3
2205	全国	44.45	1113.5	14.6%	4.6%	3.3
2210	全国	45.22	1135.5	14.9%	4.7%	3.3
2215	全国	45.99	1157.5	15.2%	4.8%	3.3
2220	全国	46.76	1179.5	15.5%	4.9%	3.3
2225	全国	47.53	1201.5	15.8%	5.0%	3.3
2230	全国	48.30	1223.5	16.1%	5.1%	3.3
2235	全国	49.07	1245.5	16.4%	5.2%	3.3
2240	全国	49.84	1267.5	16.7%	5.3%	3.3
2245	全国	50.61	1289.5	17.0%	5.4%	3.3
2250	全国	51.38	1311.5			

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Each of the above bodies is made up of representatives from the relevant sectors. Such bodies are established after the relevant strategy is approved. The bodies work with the designated bodies and committees outside of the state, leading the work through a strategy plan approved by the state.

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Target Compound	Alt. Name	Qualifiers	Verification	Result
			Goal (<) ppbv	
1,1,1-Trichloroethane	1,1,1-TCA / Methyl chloroform		0.2	<0.2
1,1,2,2-Tetrachloroethane	R-130 / Acetylene tetrachloride		0.2	<0.2
1,1,2-Trichloroethane	Vinyl trichloride		0.2	<0.2
1,1-Dichloroethane	Ethylidene chloride		0.2	<0.2
1,1-Dichloroethene	1,1-DCE / Vinylidene chloride		0.2	<0.2
1,2-Dichloroethane	Ethylene chloride		0.2	<0.2
1,2,4-Trimethylbenzene	Pseudocumene		0.2	<0.2
1,2-Dibromoethane	EDB / Ethylene dibromide		0.2	<0.2
1,2-Dichlorobenzene	o-Dichlorobenzene		0.2	<0.2
1,2-Dichloropropane	Propylene dichloride		0.2	<0.2
1,3,5-Trimethylbenzene	Mesitylene		0.2	<0.2
1,3-Dichlorobenzene	m-Dichlorobenzene		0.2	<0.2
1,4-Dichlorobenzene	p-Dichlorobenzene		0.2	<0.2
Benzene	Cyclohexatriene		0.2	<0.2
Bromomethane	Methyl bromide		0.2	<0.2
Tetrachloromethane	Carbon tetrachloride		0.2	<0.2
Chlorobenzene	Phenyl chloride		0.2	<0.2
Chloroethane	Ethyl chloride		0.2	<0.2
Chloroform	Trichloromethane		0.2	<0.2
Chloromethane	Methyl chloride		0.2	<0.2
cis-1,2-Dichloroethene	cis-1,2-Dichloroethylene		0.2	<0.2
cis-1,3-Dichloropropene	cis-1,3-Dichloropropylene		0.2	<0.2
Ethylbenzene	Phenyl ethane		0.2	<0.2
Freon 12	Dichlorodifluoromethane		0.2	<0.2
Freon 11	Trichlorofluoromethane		0.2	<0.2
Freon 113	1,1,2-Trichloro-1,2,2-trifluoroethane		0.2	<0.2
Freon 114	1,2-Dichlorotetrafluoroethane		0.2	<0.2
Hexachlorobutadiene	Hexachloro-1,3-Butadiene		0.2	<0.2

**Qualifiers - F: Fails Stability Check, V: Fails Verification**

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Target Compound	Alt. Name	Qualifiers	Verification	Result
			Goal (<) ppbv	
Dichloromethane	Methylene chloride		0.2	<0.2
m- & p-Xylene	1,3 & 1,4 -Dimethylbenzene		0.4	<0.4
o-Xylene	1,2-Dimethylbenzene		0.2	<0.2
Styrene	Vinyl benzene		0.2	<0.2
Tetrachloroethene	PCE / Perchloroethylene		0.2	<0.2
Toluene	Methyl Benzene		0.2	<0.2
trans-1,3-Dichloropropene	trans-1,3-Dichloropropylene		0.2	<0.2
Trichloroethene	TCE / Trichloroethylene		0.2	<0.2
Vinyl chloride	Chloroethene		0.2	<0.2
1,2,4-Trichlorobenzene			0.2	<0.2
1,3-Butadiene	Biethylene		0.2	<0.2
1,4-Dioxane	p-Dioxane		0.2	<0.2
2,2,4-Trimethylpentane	Isooctane		0.2	<0.2
4-Ethyltoluene	p-Ethyltoluene		0.2	<0.2
Acetone	2-Propanone		0.2	<0.2
Allyl chloride	3-Chloropropene		0.2	<0.2
Bromodichloromethane	Dichlorobromomethane		0.2	<0.2
Bromoform	Tribromomethane		0.2	<0.2
Carbon disulfide	CS2		0.2	<0.2
Cyclohexane			0.2	<0.2
Dibromochloromethane	Chlorodibromoethane		0.2	<0.2
Ethyl acetate	Acetic ester		0.2	<0.2
Isopropyl alcohol	Isopropanol / 2-Propanol		0.2	<0.2
Methyl butyl ketone	MBK / 2-Hexanone		0.2	<0.2
Methyl ethyl ketone	MEK / 2-Butanone		0.2	<0.2
Methyl isobutyl ketone	MIBK / 4-Methyl-2-pentanone		0.2	<0.2
Methyl tert-butyl ether	MTBE		0.2	<0.2
n-Heptane			0.2	<0.2
n-Hexane			0.2	<0.2
Propene	Propylene		0.2	<0.2
Tetrahydrofuran	THF		0.2	<0.2
trans-1,2-Dichloroethene	trans-1,2-Dichloroethylene		0.2	<0.2
Vinyl acetate	Acetic acid vinyl ester		0.2	<0.2
Bromoethene	Vinyl bromide		0.2	<0.2
Benzyl chloride	o-Chlorotoluene		0.2	<0.2
Ethanol	Ethyl alcohol		0.2	<0.2
Acetonitrile	Methyl cyanide		0.2	<0.2
Acrolein	2-Propenal		0.2	<0.2
Acrylonitrile	2-Propenenitrile		0.2	<0.2
tert-Butyl alcohol	TBA		0.2	<0.2
2-Chloroprene	2-Chloro-1,3-butadiene		0.2	<0.2
Diisopropyl Ether	DIPE		0.2	<0.2
Ethyl tert-butyl ether	ETBE		0.2	<0.2
tert-Amyl methyl ether	TAME		0.2	<0.2
Methyl methacrylate	MMA		0.2	<0.2
1,1,1,2-Tetrachloroethane	R-130a / Acetylene trichloride		0.2	<0.2
Isopropylbenzene	Cumene		0.2	<0.2
2-Chlorotoluene	o-Chlorotoluene		0.2	<0.2
n-Propylbenzene	Phenyl propane		0.2	<0.2
tert-Butylbenzene	1,1-Dimethylethylbenzene		0.2	<0.2
sec-Butylbenzene	1-Methylpropylbenzene		0.2	<0.2
2-Isopropyltoluene	o-Cymene		0.2	<0.2
n-Butylbenzene	Phenyl butane		0.2	<0.2
Naphthalene			0.2	<0.2

Qualifiers - F: Fails Stability Check, V: Fails Verification

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## Sampler Verification Report

**Sampler No:** 2820

**Specified Purpose:** USEPA TO15 (Extended Suite)  
**LORs Required:** Ambient Air  
**Sampler Type:** Passive Sampler

**Verification Date:** 14-Jun-2018  
**Valid To (At least):** 12-Jul-2018  
**Verification File:** 180614\_05.D

**Flow Rate Calibrated at:** 3.5 ml/min

**Analyst:** K. Gelderman

**Calibrated by:** PF 15/6/18

**Approved for Dispatch by:** *KG 15/6/18*

### Sampler Verification Protocol

Samplers are generally verified for use for the requested analysis and applications. For most applications, samplers are verified clean according to the requirements of USEPA Method TO-15.

Each verification involves a check for performance, leaks and damage to fittings.

### Reference Methods

USEPA Method TO-15: Ambient Air Sampling and Analysis for Organic Compounds in Air by Passive Sampling. EPA-821-R-02-010. <http://www.epa.gov/epaosweb/documents/default.asp?docid=60001>

Target Compound	Alt. Name	Verified to ppbv	Result ppbv
1,1,1-Trichloroethane	1,1,1-TCA / Methyl chloroform	0.2	<0.2
1,1,2,2-Tetrachloroethane	R-130 / Acetylene tetrachloride	0.2	<0.2
1,1,2-Trichloroethane	Vinyl trichloride	0.2	<0.2
1,1-Dichloroethane	Ethylidene chloride	0.2	<0.2
1,1-Dichloroethene	1,1-DCE / Vinylidene chloride	0.2	<0.2
1,2-Dichloroethane	Ethylene chloride	0.2	<0.2
1,2,4-Trimethylbenzene	Pseudocumene	0.2	<0.2
1,2-Dibromoethane	EDB / Ethylene dibromide	0.2	<0.2
1,2-Dichlorobenzene	o-Dichlorobenzene	0.2	<0.2
1,2-Dichloropropane	Propylene dichloride	0.2	<0.2
1,3,5-Trimethylbenzene	Mesitylene	0.2	<0.2
1,3-Dichlorobenzene	m-Dichlorobenzene	0.2	<0.2
1,4-Dichlorobenzene	p-Dichlorobenzene	0.2	<0.2
Benzene	Cyclohexatriene	0.2	<0.2
Bromomethane	Methyl bromide	0.2	<0.2
Tetrachloromethane	Carbon tetrachloride	0.2	<0.2
Chlorobenzene	Phenyl chloride	0.2	<0.2
Chloroethane	Ethyl chloride	0.2	<0.2
Chloroform	Trichloromethane	0.2	<0.2
Chloromethane	Methyl chloride	0.2	<0.2
cis-1,2-Dichloroethene	cis-1,2-Dichloroethylene	0.2	<0.2
cis-1,3-Dichloropropene	cis-1,3-Dichloropropylene	0.2	<0.2
Phenylbenzene	Phenyl ethane	0.2	<0.2
Freon 12	Dichlorodifluoromethane	0.2	<0.2
Freon 11	Trichlorofluoromethane	0.2	<0.2
Freon 113	1,1,2-Trichloro-1,1,2-trifluoroethane	0.2	<0.2
Freon 114	1,2-Dichlorotetrafluoroethane	0.2	<0.2
Hexachlorobutadiene	Hexachloro-1,3-Butadiene	0.2	<0.2

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Target Compound	Alt. Name	Verified to ppbv	Result ppbv
Dichloromethane	Methylene chloride	0.2	<0.2
m- & p-Xylene	1,3 & 1,4 -Dimethylbenzene	0.4	<0.4
o-Xylene	1,2-Dimethylbenzene	0.2	<0.2
Styrene	Vinyl benzene	0.2	<0.2
Tetrachloroethene	PCE / Perchloroethylene	0.2	<0.2
Toluene	Methyl Benzene	0.2	<0.2
trans-1,3-Dichloropropene	trans-1,3-Dichloropropylene	0.2	<0.2
Trichloroethene	TCE / Trichloroethylene	0.2	<0.2
Vinyl chloride	Chloroethene	0.2	<0.2
1,2,4-Trichlorobenzene		0.2	<0.2
1,3-Butadiene	Biethylene	0.2	<0.2
1,4-Dioxane	p-Dioxane	0.2	<0.2
2,2,4-Trimethylpentane	Isooctane	0.2	<0.2
4-Ethyltoluene	p-Ethyltoluene	0.2	<0.2
Acetone	2-Propanone	0.2	<0.2
Allyl chloride	3-Chloropropene	0.2	<0.2
Bromodichloromethane	Dichlorobromomethane	0.2	<0.2
Bromoform	Tribromomethane	0.2	<0.2
Carbon disulfide	CS2	0.2	<0.2
Cyclohexane		0.2	<0.2
Dibromochloromethane	Chlorodibromoethane	0.2	<0.2
Ethyl acetate	Acetic ester	0.2	<0.2
Isopropyl alcohol	Isopropanol / 2-Propanol	0.2	<0.2
Methyl butyl ketone	MBK / 2-Hexanone	0.2	<0.2
Methyl ethyl ketone	MEK / 2-Butanone	0.2	<0.2
Methyl isobutyl ketone	MIBK / 4-Methyl-2-pentanone	0.2	<0.2
Methyl tert-butyl ether	MTBE	0.2	<0.2
n-Heptane		0.2	<0.2
n-Hexane		0.2	<0.2
Propene	Propylene	0.2	<0.2
Tetrahydrofuran	THF	0.2	<0.2
trans-1,2-Dichloroethene	trans-1,2-Dichloroethylene	0.2	<0.2
Vinyl acetate	Acetic acid vinyl ester	0.2	<0.2
Bromoethene	Vinyl bromide	0.2	<0.2
Benzyl chloride	α-Chlorotoluene	0.2	<0.2
Ethanol	Ethyl alcohol	0.2	<0.2
Acetonitrile	Methyl cyanide	0.2	<0.2
Acrolein	2-Propenal	0.2	<0.2
Acrylonitrile	2-Propenenitrile	0.2	<0.2
tert-Butyl alcohol	TBA	0.2	<0.2
2-Chloroprene	2-Chloro-1,3-butadiene	0.2	<0.2
Diisopropyl Ether	DIPE	0.2	<0.2
Ethyl tert-butyl ether	ETBE	0.2	<0.2
tert-Amyl methyl ether	TAME	0.2	<0.2
Methyl methacrylate	MMA	0.2	<0.2
1,1,1,2-Tetrachloroethane	R-130a / Acetylene trichloride	0.2	<0.2
Isopropylbenzene	Cumene	0.2	<0.2
2-Chlorotoluene	o-Chlorotoluene	0.2	<0.2
n-Propylbenzene	Phenyl propane	0.2	<0.2
tert-Butylbenzene	1,1-Dimethylethylbenzene	0.2	<0.2
sec-Butylbenzene	1-Methylpropylbenzene	0.2	<0.2
2-Isopropyltoluene	o-Cymene	0.2	<0.2
n-Butylbenzene	Phenyl butane	0.2	<0.2
Naphthalene		0.2	<0.2

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## Canister Verification Report

**Canister No:** 12645

<b>Specified Purpose:</b>	USEPA TO15 (Extended Suite) Ambient Air	<b>Verification Date:</b>	23-May-2018
		<b>Valid To (At least):</b>	20-Jun-2018
		<b>Verification File:</b>	180523_02.D
<b>Canister Type:</b>	Entech Silonite - Summa Style	<b>Last Stability Check:</b>	01-May-2018
<b>Canister Size:</b>	6L	<b>Next Check Scheduled:</b>	30-Apr-2020
<b>Valve Type:</b>	TOV	<b>Analyst:</b>	K. Gelderman
<b>Dispatch Pressure:</b>	<0.01 psia	<b>Approved for Dispatch by:</b>	<i>KS 24/5/18</i>

### Canister Verification Protocol

Canisters are verified for leakage for the requested analytes and applications of service. For most applications, canisters are verified clean according to the requirements of USEPA method TO-15.

Each verification involves a check for contamination, leaks and damage to valves. Stability checks are performed after 5 years or if damage to the canister is suspected, then every two years, within the designated holding time to ensure each canister is capable of holding the target chemicals without significant degradation.

See www.alsglobal.com for more information.

ALS Global is a leading provider of environmental testing services. We offer a wide range of services including canister verification, leak testing, and more. For more information, please contact us at [www.alsglobal.com](http://www.alsglobal.com).

Target Compound	Alt. Name	Qualifiers	Verification	
			Goal (<)	Result
			ppbv	ppbv
1,1,1-Trichloroethane	1,1,1-TCA / Methyl chloroform		0.2	<0.2
1,1,2,2-Tetrachloroethane	R-130 / Acetylene tetrachloride		0.2	<0.2
1,1,2-Trichloroethane	Vinyl trichloride		0.2	<0.2
1,1-Dichloroethane	Ethylidene chloride		0.2	<0.2
1,1-Dichloroethene	1,1-DCE / Vinylidene chloride		0.2	<0.2
1,2-Dichloroethane	Ethylene chloride		0.2	<0.2
1,2,4-Trimethylbenzene	Pseudocumene		0.2	<0.2
1,2-Dibromoethane	EDB / Ethylene dibromide		0.2	<0.2
1,2-Dichlorobenzene	o-Dichlorobenzene		0.2	<0.2
1,2-Dichloropropane	Propylene dichloride		0.2	<0.2
1,3,5-Trimethylbenzene	Mesitylene		0.2	<0.2
1,3-Dichlorobenzene	m-Dichlorobenzene		0.2	<0.2
1,4-Dichlorobenzene	p-Dichlorobenzene		0.2	<0.2
Benzene	Cyclohexatriene		0.2	<0.2
Bromomethane	Methyl bromide		0.2	<0.2
Tetrachloromethane	Carbon tetrachloride		0.2	<0.2
Chlorobenzene	Phenyl chloride		0.2	<0.2
Chloroethane	Ethyl chloride		0.2	<0.2
Chloroform	Trichloromethane		0.2	<0.2
Chloromethane	Methyl chloride		0.2	<0.2
cis-1,2-Dichloroethene	cis-1,2-Dichloroethylene		0.2	<0.2
cis-1,3-Dichloropropene	cis-1,3-Dichloropropylene		0.2	<0.2
Ethylbenzene	Phenyl ethane		0.2	<0.2
Freon 12	Dichlorodifluoromethane		0.2	<0.2
Freon 11	Trichlorofluoromethane		0.2	<0.2
Freon 113	1,1,2-Trichloro-1,2,2-trifluoroethane		0.2	<0.2
Freon 114	1,2-Dichlorotetrafluoroethane		0.2	<0.2
Hexachlorobutadiene	Hexachloro-1,3-Butadiene		0.2	<0.2

Qualifiers - F: Fails Stability Check, V: Fails Verification

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Target Compound	Alt. Name	Qualifiers	Verification	Result
			Goal (<) ppbv	
Dichloromethane	Methylene chloride		0.2	<0.2
m- & p-Xylene	1,3 & 1,4 -Dimethylbenzene		0.4	<0.4
o-Xylene	1,2-Dimethylbenzene		0.2	<0.2
Styrene	Vinyl benzene		0.2	<0.2
Tetrachloroethene	PCE / Perchloroethylene		0.2	<0.2
Toluene	Methyl Benzene		0.2	<0.2
trans-1,3-Dichloropropene	trans-1,3-Dichloropropylene		0.2	<0.2
Trichloroethene	TCE / Trichloroethylene		0.2	<0.2
Vinyl chloride	Chloroethene		0.2	<0.2
1,2,4-Trichlorobenzene			0.2	<0.2
1,3-Butadiene	Biethylene		0.2	<0.2
1,4-Dioxane	p-Dioxane		0.2	<0.2
2,2,4-Trimethylpentane	Isooctane		0.2	<0.2
4-Ethyltoluene	p-Ethyltoluene		0.2	<0.2
Acetone	2-Propanone		0.2	<0.2
Allyl chloride	3-Chloropropene		0.2	<0.2
Bromodichloromethane	Dichlorobromomethane		0.2	<0.2
Bromoform	Tribromomethane		0.2	<0.2
Carbon disulfide	CS2		0.2	<0.2
Cyclohexane			0.2	<0.2
Dibromochloromethane	Chlorodibromoethane		0.2	<0.2
Ethyl acetate	Acetic ester		0.2	<0.2
Isopropyl alcohol	Isopropanol / 2-Propanol		0.2	<0.2
Methyl butyl ketone	MBK / 2-Hexanone		0.2	<0.2
Methyl ethyl ketone	MEK / 2-Butanone		0.2	<0.2
Methyl isobutyl ketone	MIBK / 4-Methyl-2-pentanone		0.2	<0.2
Methyl tert-butyl ether	MTBE		0.2	<0.2
n-Heptane			0.2	<0.2
n-Hexane			0.2	<0.2
Propene	Propylene		0.2	<0.2
Tetrahydrofuran	THF		0.2	<0.2
trans-1,2-Dichloroethene	trans-1,2-Dichloroethylene		0.2	<0.2
Vinyl acetate	Acetic acid vinyl ester		0.2	<0.2
Bromoethene	Vinyl bromide		0.2	<0.2
Benzyl chloride	o-Chlorotoluene		0.2	<0.2
Ethanol	Ethyl alcohol		0.2	<0.2
Acetonitrile	Methyl cyanide		0.2	<0.2
Acrolein	2-Propenal		0.2	<0.2
Acrylonitrile	2-Propenenitrile		0.2	<0.2
tert-Butyl alcohol	TBA		0.2	<0.2
2-Chloroprene	2-Chloro-1,3-butadiene		0.2	<0.2
Diisopropyl Ether	DIPE		0.2	<0.2
Ethyl tert-butyl ether	ETBE		0.2	<0.2
tert-Amyl methyl ether	TAME		0.2	<0.2
Methyl methacrylate	MMA		0.2	<0.2
1,1,1,2-Tetrachloroethane	R-130a / Acetylene trichloride		0.2	<0.2
Isopropylbenzene	Cumene		0.2	<0.2
2-Chlorotoluene	o-Chlorotoluene		0.2	<0.2
n-Propylbenzene	Phenyl propane		0.2	<0.2
tert-Butylbenzene	1,1-Dimethylethylbenzene		0.2	<0.2
sec-Butylbenzene	1-Methylpropylbenzene		0.2	<0.2
2-Isopropyltoluene	o-Cymene		0.2	<0.2
n-Butylbenzene	Phenyl butane		0.2	<0.2
Naphthalene			0.2	<0.2

Qualifiers - F: Fails Stability Check, V: Fails Verification

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**Sampler No: 2824**

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Verification File: 180619 10.D

Analyst: Dale Semple

Approved for Dispatch by:

various applications of the model to the design of the system, the model is used to generate a set of design requirements. These requirements are then used to generate a set of design alternatives. The model is then used to evaluate the design alternatives and select the best one. The model is then used to generate a set of design requirements for the next iteration of the design process.

for the first time in the history of the world, the world is becoming a village.

1. 凡在本公司工作之员工，均须遵守本规定。
 2. 本规定所称之“员工”，指与公司签订劳动合同之全职、兼职、临时、季节工、实习生、劳务派遣人员等。
 3. 本规定所称之“工作时间”，指员工在正常工作时间内应从事本职工作之时间。
 4. 本规定所称之“休息休假”，指员工在正常工作时间内应享有之休息、休假、探亲假、婚假、丧假、产假、病假、事假等。
 5. 本规定所称之“加班”，指员工在正常工作时间内从事本职工作之外之工作。
 6. 本规定所称之“加班费”，指员工在正常工作时间内从事本职工作之外之工作，公司应支付之加班工资。
 7. 本规定所称之“法定节假日”，指国家规定的法定节假日。
 8. 本规定所称之“带薪年假”，指员工在公司工作满一定年限后，依法享有的带薪假期。
 9. 本规定所称之“病假”，指员工因患病或非因工负伤，需要停止工作医疗的时间。
 10. 本规定所称之“事假”，指员工因个人事务需要停止工作医疗的时间。
 11. 本规定所称之“婚假”，指员工结婚时依法享有的带薪假期。
 12. 本规定所称之“丧假”，指员工直系亲属死亡时依法享有的带薪假期。
 13. 本规定所称之“产假”，指女职工生育时依法享有的带薪假期。
 14. 本规定所称之“探亲假”，指员工与配偶、父母分居两地，依法享有的带薪假期。
 15. 本规定所称之“工伤”，指员工在工作时间、工作场所内，因工作原因受到事故伤害或患职业病。
 16. 本规定所称之“工伤认定”，指劳动保障行政部门依法对工伤事故进行调查、认定。
 17. 本规定所称之“劳动能力鉴定”，指劳动能力鉴定委员会依法对工伤职工的劳动能力进行鉴定。
 18. 本规定所称之“工伤保险”，指公司为员工缴纳之工伤保险费。
 19. 本规定所称之“工伤保险待遇”，指员工发生工伤后依法享有的各项待遇。
 20. 本规定所称之“劳动争议”，指员工与公司之间因劳动关系发生之争议。
 21. 本规定所称之“劳动争议仲裁”，指劳动争议仲裁委员会依法对劳动争议进行仲裁。
 22. 本规定所称之“劳动争议诉讼”，指员工或公司向人民法院提起劳动争议诉讼。
 23. 本规定所称之“劳动争议调解”，指劳动争议调解委员会依法对劳动争议进行调解。
 24. 本规定所称之“劳动争议和解”，指员工与公司就劳动争议达成和解协议。
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 97. 本规定所称之“劳动争议仲裁裁决书”，指劳动争议仲裁委员会依法制作的仲裁裁决书。
 98. 本规定所称之“劳动争议诉讼判决书”，指人民法院依法制作的判决书。
 99. 本规定所称之“劳动争议和解协议”，指员工与公司就劳动争议达成的和解协议。
 100. 本规定所称之“劳动争议调解协议”，指员工与公司就劳动争议达成的调解协议。

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Target Compound	Alt. Name	Verified to ppbv	Result ppbv
1,1,1-Trichloroethane	1,1,1-TCA / Methyl chloroform	0.2	<0.2
1,1,2,2-Tetrachloroethane	R-130 / Acetylene tetrachloride	0.2	<0.2
1,1,2-Trichloroethane	Vinyl trichloride	0.2	<0.2
1,1-Dichloroethane	Ethylidene chloride	0.2	<0.2
1,1-Dichloroethene	1,1-DCE / Vinylidene chloride	0.2	<0.2
1,2-Dichloroethane	Ethylene chloride	0.2	<0.2
1,2,4-Trimethylbenzene	Pseudocumene	0.2	<0.2
1,2-Dibromoethane	EDB / Ethylene dibromide	0.2	<0.2
1,2-Dichlorobenzene	o-Dichlorobenzene	0.2	<0.2
1,2-Dichloropropane	Propylene dichloride	0.2	<0.2
1,3,5-Trimethylbenzene	Mesitylene	0.2	<0.2
1,3-Dichlorobenzene	m-Dichlorobenzene	0.2	<0.2
1,4-Dichlorobenzene	p-Dichlorobenzene	0.2	<0.2
Benzene	Cyclohexatriene	0.2	<0.2
Bromomethane	Methyl bromide	0.2	<0.2
Tetrachloromethane	Carbon tetrachloride	0.2	<0.2
Chlorobenzene	Phenyl chloride	0.2	<0.2
Chloroethane	Ethyl chloride	0.2	<0.2
Chloroform	Trichloromethane	0.2	<0.2
Chloromethane	Methyl chloride	0.2	<0.2
cis-1,2-Dichloroethene	cis-1,2-Dichloroethylene	0.2	<0.2
cis-1,3-Dichloropropene	cis-1,3-Dichloropropylene	0.2	<0.2
Ethylbenzene	Phenyl ethane	0.2	<0.2
Freon 12	Dichlorodifluoromethane	0.2	<0.2
Freon 11	Trichlorofluoromethane	0.2	<0.2
Freon 113	1,1,2-Trichloro-1,1,2-trifluoroethane	0.2	<0.2
Freon 114	1,2-Dichlorotetrafluoroethane	0.2	<0.2
Hexachlorobutadiene	Hexachloro-1,3-Butadiene	0.2	<0.2

## FOOTNOTES

Brisbane Adelaide Bendigo Canberra Croydon Gladstone Melbourne (Geelong), Melbourne (Springvale) Mordialloc Newcastle Newry Point Wollongong Sydney - Temora Toowoomba Wanneroo

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2
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Target Compound	Alt. Name	Verified to ppbv	Result ppbv
Dichloromethane	Methylene chloride	0.2	<0.2
m- & p-Xylene	1,3 & 1,4 -Dimethylbenzene	0.4	<0.4
o-Xylene	1,2-Dimethylbenzene	0.2	<0.2
Styrene	Vinyl benzene	0.2	<0.2
Tetrachloroethene	PCE / Perchloroethylene	0.2	<0.2
Toluene	Methyl Benzene	0.2	<0.2
trans-1,3-Dichloropropene	trans-1,3-Dichloropropylene	0.2	<0.2
Trichloroethene	TCE / Trichloroethylene	0.2	<0.2
Vinyl chloride	Chloroethene	0.2	<0.2
1,2,4-Trichlorobenzene		0.2	<0.2
1,3-Butadiene	Biethylene	0.2	<0.2
1,4-Dioxane	p-Dioxane	0.2	<0.2
2,2,4-Trimethylpentane	Isooctane	0.2	<0.2
4-Ethyltoluene	p-Ethyltoluene	0.2	<0.2
Acetone	2-Propanone	0.2	<0.2
Allyl chloride	3-Chloropropene	0.2	<0.2
Bromodichloromethane	Dichlorobromomethane	0.2	<0.2
Bromoform	Tribromomethane	0.2	<0.2
Carbon disulfide	CS2	0.2	<0.2
Cyclohexane		0.2	<0.2
Dibromochloromethane	Chlorodibromoethane	0.2	<0.2
Ethyl acetate	Acetic ester	0.2	<0.2
Isopropyl alcohol	Isopropanol / 2-Propanol	0.2	<0.2
Methyl butyl ketone	MBK / 2-Hexanone	0.2	<0.2
Methyl ethyl ketone	MEK / 2-Butanone	0.2	<0.2
Methyl isobutyl ketone	MIBK / 4-Methyl-2-pentanone	0.2	<0.2
Methyl tert-butyl ether	MTBE	0.2	<0.2
n-Heptane		0.2	<0.2
n-Hexane		0.2	<0.2
Propene	Propylene	0.2	<0.2
Tetrahydrofuran	THF	0.2	<0.2
trans-1,2-Dichloroethene	trans-1,2-Dichloroethylene	0.2	<0.2
Vinyl acetate	Acetic acid vinyl ester	0.2	<0.2
Bromoethene	Vinyl bromide	0.2	<0.2
Benzyl chloride	α-Chlorotoluene	0.2	<0.2
Ethanol	Ethyl alcohol	0.2	<0.2
Acetonitrile	Methyl cyanide	0.2	<0.2
Acrolein	2-Propenal	0.2	<0.2
Acrylonitrile	2-Propenenitrile	0.2	<0.2
tert-Butyl alcohol	TBA	0.2	<0.2
2-Chloroprene	2-Chloro-1,3-butadiene	0.2	<0.2
Diisopropyl Ether	DIPE	0.2	<0.2
Ethyl tert-butyl ether	ETBE	0.2	<0.2
tert-Amyl methyl ether	TAME	0.2	<0.2
Methyl methacrylate	MMA	0.2	<0.2
1,1,1,2-Tetrachloroethane	R-130a / Acetylene trichloride	0.2	<0.2
Isopropylbenzene	Cumene	0.2	<0.2
2-Chlorotoluene	o-Chlorotoluene	0.2	<0.2
n-Propylbenzene	Phenyl propane	0.2	<0.2
tert-Butylbenzene	1,1-Dimethylethylbenzene	0.2	<0.2
sec-Butylbenzene	1-Methylpropylbenzene	0.2	<0.2
2-Isopropyltoluene	o-Cymene	0.2	<0.2
n-Butylbenzene	Phenyl butane	0.2	<0.2
Naphthalene		0.2	<0.2

RIGHT SOLUTIONS

Brisbane Adelaide Cairns Canberra Geelong Gladstone Melbourne (Scoresby) Melbourne (Springvale) Modere Newcastle Nowra Perth Wollongong Sydney Townsville Traralgon Warragatta

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## CERTIFICATE OF ANALYSIS

**Work Order** : **EN1805198**  
**Client** : **ECOTECH PTY LTD**  
**Contact** : **MS LARA NICHOLAS**  
**Address** : **1492 FERNTREE GULLY ROAD**  
**KNOXFIELD VICTORIA, AUSTRALIA 3180**  
**Telephone** : **+61 03 9730 7800**  
**Project** : **WD4 PRIMULA AVE**  
**Order number** : **235939**  
**C-O-C number** : **----**  
**Sampler** : **DANIEL RAYMOND**  
**Site** : **----**  
**Quote number** : **NE/070/17**  
**No. of samples received** : **5**  
**No. of samples analysed** : **5**

**Page** : 1 of 4  
**Laboratory** : Environmental Division Newcastle  
**Contact** : Hayley Withers  
**Address** : 5/585 Maitland Road Mayfield West NSW Australia 2304  
**Telephone** : +612 4014 2500  
**Date Samples Received** : 13-Aug-2018 11:37  
**Date Analysis Commenced** : 14-Aug-2018  
**Issue Date** : 20-Aug-2018 14:49



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

**Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.**

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dale Semple	Analyst	Newcastle - Organics, Mayfield West, NSW
Dale Semple	Analyst	Newcastle, Mayfield West, NSW
Daniel Juneke	Senior Air Analyst	Newcastle - Organics, Mayfield West, NSW



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EP101: Results reported in  $\mu\text{g}/\text{m}^3$  are calculated from PPBV results based on a temperature of 25°C and atmospheric pressure of 101.3 kPa.
- CAN-001: Results for Pressure - As Received are measured under controlled conditions using calibrated laboratory gauges. These results are expressed as an Absolute Pressure. Equivalent gauge pressures may be calculated by subtracting the Pressure - Laboratory Atmosphere taken at the time of measurement.
- CAN-001: Results for Pressure - Gauge as Received are obtained from uncalibrated field gauges and are indicative only. These results may not precisely match calibrated gauge readings and may vary from field measurements due to changes in temperature and pressure



## Analytical Results

Sub-Matrix: AMBIENT  
 (Matrix: AIR)

Client sample ID

				200718 C4763 S2826	260718 C4989 S2847	Un used C12646	Un used C12628	Un used C12638
Client sampling date / time				20-Jul-2018 23:30	26-Jul-2018 23:30	20-Jul-2018 00:00	20-Jul-2018 00:00	20-Jul-2018 00:00
Compound	CAS Number	LOR	Unit	EN1805198-001	EN1805198-002	EN1805198-003	EN1805198-004	EN1805198-005
				Result	Result	Result	Result	Result
<b>EP101: VOCs by USEPA Method TO15 (Calculated Concentration)</b>								
Benzene	71-43-2	1.6	µg/m³	<1.6	<1.6	----	----	----
Toluene	108-88-3	1.9	µg/m³	4.1	10.5	----	----	----
Ethylbenzene	100-41-4	2.2	µg/m³	<2.2	<2.2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	4.3	µg/m³	<4.3	<4.3	----	----	----
ortho-Xylene	95-47-6	2.2	µg/m³	<2.2	<2.2	----	----	----
Naphthalene	91-20-3	2.6	µg/m³	<2.6	<2.6	----	----	----
Total Xylenes	----	6.6	µg/m³	<6.6	<6.6	----	----	----
<b>EP101: VOCs by USEPA Method TO15r</b>								
Benzene	71-43-2	0.5	ppbv	<0.5	<0.5	----	----	----
Toluene	108-88-3	0.5	ppbv	1.1	2.8	----	----	----
Ethylbenzene	100-41-4	0.5	ppbv	<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	1.0	ppbv	<1.0	<1.0	----	----	----
ortho-Xylene	95-47-6	0.5	ppbv	<0.5	<0.5	----	----	----
Naphthalene	91-20-3	0.5	ppbv	<0.5	<0.5	----	----	----
Total Xylenes	----	1.5	ppbv	<1.5	<1.5	----	----	----
<b>Sampling Quality Assurance</b>								
Pressure - As received	PRESSURE	0.1	kPaa	88.7	104	<0.1	<0.1	<0.1
Pressure - Gauge as Received	----	1	Inches Hg	-4	-5	-32	-30	-28
Pressure - Laboratory Atmosphere	----	0.1	kPaa	102	102	102	102	102
Temperature as Received	----	0.1	°C	20.0	20.0	20.0	20.0	20.0
<b>USEPA Air Toxics Method TO15r Surrogates</b>								
4-Bromofluorobenzene	460-00-4	0.5	%	85.0	84.0	----	----	----





## Surrogate Control Limits

Sub-Matrix: **AMBIENT**

		Recovery Limits (%)	
Compound	CAS Number	Low	High
USEPA Air Toxics Method TO15r Surrogates			
4-Bromofluorobenzene	460-00-4	60	140

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: EN1805198</b>	<b>Page</b>	<b>: 1 of 3</b>
<b>Client</b>	<b>: ECOTECH PTY LTD</b>	<b>Laboratory</b>	<b>: Environmental Division Newcastle</b>
<b>Contact</b>	<b>: MS LARA NICHOLAS</b>	<b>Contact</b>	<b>: Hayley Withers</b>
<b>Address</b>	<b>: 1492 FERNTREE GULLY ROAD KNOXFIELD VICTORIA, AUSTRALIA 3180</b>	<b>Address</b>	<b>: 5/585 Maitland Road Mayfield West NSW Australia 2304</b>
<b>Telephone</b>	<b>: +61 03 9730 7800</b>	<b>Telephone</b>	<b>: +612 4014 2500</b>
<b>Project</b>	<b>: WD4 PRIMULA AVE</b>	<b>Date Samples Received</b>	<b>: 13-Aug-2018</b>
<b>Order number</b>	<b>: 235939</b>	<b>Date Analysis Commenced</b>	<b>: 14-Aug-2018</b>
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	<b>: 20-Aug-2018</b>
<b>Sampler</b>	<b>: DANIEL RAYMOND</b>		
<b>Site</b>	<b>: ----</b>		
<b>Quote number</b>	<b>: NE/070/17</b>		
<b>No. of samples received</b>	<b>: 5</b>		
<b>No. of samples analysed</b>	<b>: 5</b>		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report; Recovery and Acceptance Limits

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dale Semple	Analyst	Newcastle - Organics, Mayfield West, NSW
Dale Semple	Analyst	Newcastle, Mayfield West, NSW
Daniel Juneke	Senior Air Analyst	Newcastle - Organics, Mayfield West, NSW



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :  
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot  
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
 LOR = Limit of reporting  
 RPD = Relative Percentage Difference  
 # = Indicates failed QC

## Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **AIR**

Sub-Matrix: AIR				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP101: VOCs by USEPA Method TO15r (QC Lot: 1872078)									
EN1805192-001	Anonymous	EP101-H: Benzene	71-43-2	0.5	ppbv	5350	5040	6.02	0% - 20%
		EP101-H: Toluene	108-88-3	0.5	ppbv	3430	3300	3.78	0% - 20%
		EP101-H: Ethylbenzene	100-41-4	0.5	ppbv	462	454	1.82	0% - 20%
		EP101-H: ortho-Xylene	95-47-6	0.5	ppbv	544	530	2.55	0% - 20%
		EP101-H: meta- & para-Xylene	108-38-3 106-42-3	1	ppbv	2340	2260	3.43	0% - 20%



## Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control terms Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (DCS) refers to certified reference materials, or known interference free matrices spiked with target analytes. The purpose of these QC parameters are to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS and DCS.

Sub-Matrix: AIR		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
						LCS	DCS	Low	High	Value	Control Limit
Method: Compound	CAS Number										
<b>EP101: VOCs by USEPA Method TO15r (QCLot: 1872078)</b>											
EP101-H: Benzene	71-43-2	0.5	ppbv	<0.5	100 ppbv	99.3	98.3	77	114	25	25
EP101-H: Toluene	108-88-3	0.5	ppbv	<0.5	100 ppbv	97.2	95.7	78	115	25	25
EP101-H: Ethylbenzene	100-41-4	0.5	ppbv	<0.5	100 ppbv	99.2	97.9	82	121	25	25
EP101-H: meta- & para-Xylene	108-38-3	1	ppbv	<1.0	200 ppbv	106	104	82	122	25	25
	106-42-3										
EP101-H: ortho-Xylene	95-47-6	0.5	ppbv	<0.5	100 ppbv	103	101	83	122	25	25

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

## QA/QC Compliance Assessment to assist with Quality Review

Work Order : **EN1805198**

Page : 1 of 4

Client : **ECOTECH PTY LTD**  
Contact : **MS LARA NICHOLAS**  
Project : **WD4 PRIMULA AVE**  
Site : **----**  
Sampler : **DANIEL RAYMOND**  
Order number : **235939**

Laboratory : **Environmental Division Newcastle**  
Telephone : **+612 4014 2500**  
Date Samples Received : **13-Aug-2018**  
Issue Date : **20-Aug-2018**  
No. of samples received : **5**  
No. of samples analysed : **5**

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

### Summary of Outliers

#### Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

#### Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

#### Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**



## Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **AIR**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP101: VOCs by USEPA Method TO15r							
Summa style Canister - ALS Supplied Silonite (EP101-H) 200718 - C4763 S2826	20-Jul-2018	----	----	----	14-Aug-2018	19-Aug-2018	✓
Summa style Canister - ALS Supplied Silonite (EP101-H) 260718 - C4989 S2847	26-Jul-2018	----	----	----	14-Aug-2018	25-Aug-2018	✓
Sampling Quality Assurance							
Summa style Canister - ALS Supplied Silonite (CAN-001) 200718 - C4763 S2826,							



## Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **AIR**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Duplicate Control Samples (DCS)							
Hydrocarbons in Air by USEPA TO15	EP101-H	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Duplicates (DUP)							
Hydrocarbons in Air by USEPA TO15	EP101-H	1	10	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Hydrocarbons in Air by USEPA TO15	EP101-H	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Hydrocarbons in Air by USEPA TO15	EP101-H	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



## Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Canister Sampling - Field Data	CAN-001	AIR	In house: Referenced to USEPA TO14 / TO15
Hydrocarbons in Air by USEPA TO15	EP101-H	AIR	In house: Referenced to USEPA TO15r Volatile Organic Compounds in Air by USEPA TO15. Aliphatic and Aromatic Hydrocarbons
Hydrocarbons in Air by USEPA TO15 (mass/volume)	EP101-H-MV	AIR	In house: Referenced to USEPA TO15r Hydrocarbons in Air by USEPA TO15 (Calculated Concentration)





## Canister Verification Report

**Canister No:** 4763

<b>Specified Purpose:</b>	USEPA TO15 (Extended Suite) Ambient Air	<b>Verification Date:</b>	28-Jun-2018
		<b>Valid To (At least):</b>	26-Jul-2018
		<b>Verification File:</b>	180628_14.D
<b>Canister Type:</b>	Entech Silonite - Summa Style	<b>Last Stability Check:</b>	19-Feb-2018
<b>Canister Size:</b>	6L	<b>Next Check Scheduled:</b>	19-Feb-2020
<b>Valve Type:</b>	Nupro	<b>Analyst:</b>	Daniel Juneke
<b>Dispatch Pressure:</b>	<0.01 psia	<b>Approved for Dispatch by:</b>	<i>[Signature]</i> 2/7/18

### Canister Verification Protocol

Canisters are verified for the purpose for the requested analysis and analytes of interest. For most applications, canisters are verified clean according to the requirements of EPA Method TO15.

Each verification involves a check for permeation, leaks and desorption values. Stability checks are performed after 2 years of field storage to the extent it is suspected that more than two years, and in the designated holding time to ensure that canisters capable of holding the target analytes without significant degradation.

ALS Method TO15: 100%

REUSE OF CANISTERS: Canisters are used for a maximum of 2 years from the date of verification. Canisters are not to be used for any other purpose than the one for which they were verified.

ALS Method TO15: 100%

Target Compound	Alt. Name	Qualifiers	Verification	Result
			Goal (<) ppbv	
1,1,1-Trichloroethane	1,1,1-TCA / Methyl chloroform		0.2	<0.2
1,1,2,2-Tetrachloroethane	R-130 / Acetylene tetrachloride		0.2	<0.2
1,1,2-Trichloroethane	Vinyl trichloride		0.2	<0.2
1,1-Dichloroethane	Ethylidene chloride		0.2	<0.2
1,1-Dichloroethene	1,1-DCE / Vinylidene chloride		0.2	<0.2
1,2-Dichloroethane	Ethylene chloride		0.2	<0.2
1,2,4-Trimethylbenzene	Pseudocumene		0.2	<0.2
1,2-Dibromoethane	EDB / Ethylene dibromide		0.2	<0.2
1,2-Dichlorobenzene	o-Dichlorobenzene		0.2	<0.2
1,2-Dichloropropane	Propylene dichloride		0.2	<0.2
1,3,5-Trimethylbenzene	Mesitylene		0.2	<0.2
1,3-Dichlorobenzene	m-Dichlorobenzene		0.2	<0.2
1,4-Dichlorobenzene	p-Dichlorobenzene		0.2	<0.2
Benzene	Cyclohexatriene		0.2	<0.2
Bromomethane	Methyl bromide		0.2	<0.2
Tetrachloromethane	Carbon tetrachloride		0.2	<0.2
Chlorobenzene	Phenyl chloride		0.2	<0.2
Chloroethane	Ethyl chloride		0.2	<0.2
Chloroform	Trichloromethane		0.2	<0.2
Chloromethane	Methyl chloride		0.2	<0.2
cis-1,2-Dichloroethene	cis-1,2-Dichloroethylene		0.2	<0.2
cis-1,3-Dichloropropene	cis-1,3-Dichloropropylene		0.2	<0.2
Ethylbenzene	Phenyl ethane		0.2	<0.2
Freon 12	Dichlorodifluoromethane		0.2	<0.2
Freon 11	Trichlorofluoromethane		0.2	<0.2
Freon 113	1,1,2-Trichloro-1,2,2-trifluoroethane		0.2	<0.2
Freon 114	1,2-Dichlorotetrafluoroethane		0.2	<0.2
Hexachlorobutadiene	Hexachloro-1,3-Butadiene		0.2	<0.2

Qualifiers - F: Fails Stability Check, V: Fails Verification

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Target Compound	Alt. Name	Qualifiers	Verification	Result
			Goal (<) ppbv	
Dichloromethane	Methylene chloride		0.2	<0.2
m -& p-Xylene	1,3 & 1,4 -Dimethylbenzene		0.4	<0.4
o-Xylene	1,2-Dimethylbenzene		0.2	<0.2
Styrene	Vinyl benzene		0.2	<0.2
Tetrachloroethene	PCE / Perchloroethylene		0.2	<0.2
Toluene	Methyl Benzene		0.2	<0.2
trans-1,3-Dichloropropene	trans-1,3-Dichloropropylene		0.2	<0.2
Trichloroethene	TCE / Trichloroethylene		0.2	<0.2
Vinyl chloride	Chloroethene		0.2	<0.2
1,2,4-Trichlorobenzene			0.2	<0.2
1,3-Butadiene	Biethylene		0.2	<0.2
1,4-Dioxane	p-Dioxane		0.2	<0.2
2,2,4-Trimethylpentane	Isooctane		0.2	<0.2
4-Ethyltoluene	p-Ethyltoluene		0.2	<0.2
Acetone	2-Propanone		0.2	<0.2
Allyl chloride	3-Chloropropene		0.2	<0.2
Bromodichloromethane	Dichlorobromomethane		0.2	<0.2
Bromoform	Tribromomethane		0.2	<0.2
Carbon disulfide	CS2		0.2	<0.2
Cyclohexane			0.2	<0.2
Dibromochloromethane	Chlorodibromoethane		0.2	<0.2
Ethyl acetate	Acetic ester		0.2	<0.2
Isopropyl alcohol	Isopropanol / 2-Propanol		0.2	<0.2
Methyl butyl ketone	MBK / 2-Hexanone		0.2	<0.2
Methyl ethyl ketone	MEK / 2-Butanone		0.2	<0.2
Methyl isobutyl ketone	MIBK / 4-Methyl-2-pentanone		0.2	<0.2
Methyl tert-butyl ether	MTBE		0.2	<0.2
n-Heptane			0.2	<0.2
n-Hexane			0.2	<0.2
Propene	Propylene		0.2	<0.2
Tetrahydrofuran	THF		0.2	<0.2
trans-1,2-Dichloroethene	trans-1,2-Dichloroethylene		0.2	<0.2
Vinyl acetate	Acetic acid vinyl ester		0.2	<0.2
Bromoethene	Vinyl bromide		0.2	<0.2
Benzyl chloride	α-Chlorotoluene		0.2	<0.2
Ethanol	Ethyl alcohol		0.2	<0.2
Acetonitrile	Methyl cyanide		0.2	<0.2
Acrolein	2-Propenal		0.2	<0.2
Acrylonitrile	2-Propenenitrile		0.2	<0.2
tert-Butyl alcohol	TBA		0.2	<0.2
2-Chloroprene	2-Chloro-1,3-butadiene		0.2	<0.2
Diisopropyl Ether	DIPE		0.2	<0.2
Ethyl tert-butyl ether	ETBE		0.2	<0.2
tert-Amyl methyl ether	TAME		0.2	<0.2
Methyl methacrylate	MMA		0.2	<0.2
1,1,1,2-Tetrachloroethane	R-130a / Acetylene trichloride		0.2	<0.2
Isopropylbenzene	Cumene		0.2	<0.2
2-Chlorotoluene	o-Chlorotoluene		0.2	<0.2
n-Propylbenzene	Phenyl propane		0.2	<0.2
tert-Butylbenzene	1,1-Dimethylethylbenzene		0.2	<0.2
sec-Butylbenzene	1-Methylpropylbenzene		0.2	<0.2
2-Isopropyltoluene	o-Cymene		0.2	<0.2
n-Butylbenzene	Phenyl butane		0.2	<0.2
Naphthalene			0.2	<0.2

Qualifiers - F: Fails Stability Check, V: Fails Verification

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## Sampler Verification Report

**Sampler No:** 2826

**Specified Purpose:** USEPA TO15 (Extended Suite)  
**LORs Required:** Ambient Air  
**Sampler Type:** Passive Sampler

**Verification Date:** 17-May-2018  
**Valid To (At least):** 14-Jun-2018  
**Verification File:** 180517\_02B.D

**Flow Rate Calibrated at:** 3.5 mL/min ml/min

**Analyst:** K. Gelderman

**Calibrated by:** 23/5/18 PF

**Approved for Dispatch by:** PF 24/5/18

### Sampler Verification Protocol

Samplers are generally verified for use for the required analyses and applications. For most applications, samplers are verified clean according to the requirements of USEPA method TO-15.

Each verification involves a check for contamination, leaks and damage to fittings.

### Accepted Compounds

Use of this report is limited to the compounds listed in the table below. Any use of this report for compounds not listed is at the user's risk. The user must ensure that the compounds listed in the table are suitable for the intended use. The user must also ensure that the compounds listed in the table are suitable for the intended use.

Target Compound	Alt. Name	Verified to ppbv	Result ppbv
1,1,1-Trichloroethane	1,1,1-TCA / Methyl chloroform	0.2	<0.2
1,1,2,2-Tetrachloroethane	R-130 / Acetylene tetrachloride	0.2	<0.2
1,1,2-Trichloroethane	Vinyl trichloride	0.2	<0.2
1,1-Dichloroethane	Ethylidene chloride	0.2	<0.2
1,1-Dichloroethene	1,1-DCE / Vinylidene chloride	0.2	<0.2
1,2-Dichloroethane	Ethylene chloride	0.2	<0.2
1,2,4-Trimethylbenzene	Pseudocumene	0.2	<0.2
1,2-Dibromoethane	EDB / Ethylene dibromide	0.2	<0.2
1,2-Dichlorobenzene	o-Dichlorobenzene	0.2	<0.2
1,2-Dichloropropane	Propylene dichloride	0.2	<0.2
1,3,5-Trimethylbenzene	Mesitylene	0.2	<0.2
1,3-Dichlorobenzene	m-Dichlorobenzene	0.2	<0.2
1,4-Dichlorobenzene	p-Dichlorobenzene	0.2	<0.2
Benzene	Cyclohexatriene	0.2	<0.2
Bromomethane	Methyl bromide	0.2	<0.2
Tetrachloromethane	Carbon tetrachloride	0.2	<0.2
Chlorobenzene	Phenyl chloride	0.2	<0.2
Chloroethane	Ethyl chloride	0.2	<0.2
Chloroform	Trichloromethane	0.2	<0.2
Chloromethane	Methyl chloride	0.2	<0.2
cis-1,2-Dichloroethene	cis-1,2-Dichloroethylene	0.2	<0.2
cis-1,3-Dichloropropene	cis-1,3-Dichloropropylene	0.2	<0.2
Phenylbenzene	Phenyl ethane	0.2	<0.2
Freon 12	Dichlorodifluoromethane	0.2	<0.2
Freon 11	Trichlorofluoromethane	0.2	<0.2
Freon 113	1,1,2-Trichloro-1,1,2-trifluoroethane	0.2	<0.2
Freon 114	1,2-Dichlorotetrafluoroethane	0.2	<0.2
Hexachlorobutadiene	Hexachloro-1,3-Butadiene	0.2	<0.2

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Target Compound	Alt. Name	Verified to ppbv	Result ppbv
Dichloromethane	Methylene chloride	0.2	<0.2
m- & p-Xylene	1,3 & 1,4 -Dimethylbenzene	0.4	<0.4
o-Xylene	1,2-Dimethylbenzene	0.2	<0.2
Styrene	Vinyl benzene	0.2	<0.2
Tetrachloroethene	PCE / Perchloroethylene	0.2	<0.2
Toluene	Methyl Benzene	0.2	<0.2
trans-1,3-Dichloropropene	trans-1,3-Dichloropropylene	0.2	<0.2
Trichloroethene	TCE / Trichloroethylene	0.2	<0.2
Vinyl chloride	Chloroethene	0.2	<0.2
1,2,4-Trichlorobenzene		0.2	<0.2
1,3-Butadiene	Biethylene	0.2	<0.2
1,4-Dioxane	p-Dioxane	0.2	<0.2
2,2,4-Trimethylpentane	Isooctane	0.2	<0.2
4-Ethyltoluene	p-Ethyltoluene	0.2	<0.2
Acetone	2-Propanone	0.2	<0.2
Allyl chloride	3-Chloropropene	0.2	<0.2
Bromodichloromethane	Dichlorobromomethane	0.2	<0.2
Bromoform	Tribromomethane	0.2	<0.2
Carbon disulfide	CS2	0.2	<0.2
Cyclohexane		0.2	<0.2
Dibromochloromethane	Chlorodibromoethane	0.2	<0.2
Ethyl acetate	Acetic ester	0.2	<0.2
Isopropyl alcohol	Isopropanol / 2-Propanol	0.2	<0.2
Methyl butyl ketone	MBK / 2-Hexanone	0.2	<0.2
Methyl ethyl ketone	MEK / 2-Butanone	0.2	<0.2
Methyl isobutyl ketone	MIBK / 4-Methyl-2-pentanone	0.2	<0.2
Methyl tert-butyl ether	MTBE	0.2	<0.2
n-Heptane		0.2	<0.2
n-Hexane		0.2	<0.2
Propene	Propylene	0.2	<0.2
Tetrahydrofuran	THF	0.2	<0.2
trans-1,2-Dichloroethene	trans-1,2-Dichloroethylene	0.2	<0.2
Vinyl acetate	Acetic acid vinyl ester	0.2	<0.2
Bromoethene	Vinyl bromide	0.2	<0.2
Benzyl chloride	α-Chlorotoluene	0.2	<0.2
Ethanol	Ethyl alcohol	0.2	<0.2
Acetonitrile	Methyl cyanide	0.2	<0.2
Acrolein	2-Propenal	0.2	<0.2
Acrylonitrile	2-Propenenitrile	0.2	<0.2
tert-Butyl alcohol	TBA	0.2	<0.2
2-Chloroprene	2-Chloro-1,3-butadiene	0.2	<0.2
Diisopropyl Ether	DIPE	0.2	<0.2
Ethyl tert-butyl ether	ETBE	0.2	<0.2
tert-Amyl methyl ether	TAME	0.2	<0.2
Methyl methacrylate	MMA	0.2	<0.2
1,1,1,2-Tetrachloroethane	R-130a / Acetylene trichloride	0.2	<0.2
Isopropylbenzene	Cumene	0.2	<0.2
2-Chlorotoluene	o-Chlorotoluene	0.2	<0.2
n-Propylbenzene	Phenyl propane	0.2	<0.2
tert-Butylbenzene	1,1-Dimethylethylbenzene	0.2	<0.2
sec-Butylbenzene	1-Methylpropylbenzene	0.2	<0.2
2-Isopropyltoluene	o-Cymene	0.2	<0.2
n-Butylbenzene	Phenyl butane	0.2	<0.2
Naphthalene		0.2	<0.2



*If sourced from an ALS Laboratory: please tick →*

Client Supplied Canister(s)? Y / N

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2004年12月24日 星期四 第1111期

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## AIR SAMPLING EQUIPMENT

## DISPATCH RECORD

Inquiries: Client Services - Newcastle Phone: +61 (02) 4014 2500 E-mail: samples.newcastle@alsenviro.com

Dispatch to:		ALS Use ONLY	
Client / Office:	ECOTECH	Request Received By:	HW
Contact:	Lara Nicholas	Deliver By:	asap
Telephone:	03 9730 7800	Dispatched By:	asap
ALS Quotation:	NE/070/17	Workorder:	
Delivery Address:	1492 Ferntree Gully Rd Knoxfield VIC 3180	Agreed Rent Free Period:	14 days

SPECIAL INSTRUCTIONS: PLEASE EMAIL CLEAN CERTIFICATES TO lara.nicholas@ecotech.com ON DISPATCH .....

## Air Sampling Equipment Request

## CANISTERS

No.	Canister Type	Size	Gauge	Valve	Cap	Rental <sup>1</sup>	No. Returned	Leak Checked	Certified OK
4	Entech Silonite Canister (Summa™)	6L	Yes	S	Yes	\$200 ea		15	24/5/18

## CONNECTORS AND FLOW CONTROL DEVICES

No.	Equipment Type	Duration (hrs)	Flow (ml/min)	T. Piece	Gauge	Certified	Sealed / Vacuum	Connection (Quick Connect / Swagelok)	No. Returned	Rental <sup>1</sup>
4	Passive Sampler - TWA	24hr		No	Yes	Yes	Yes / No	S		Incl Above
4	Flow Sampler Caps			No	No	No	Yes / No			\$20 ea. Replacement
2	ECOTECH Autosampler			No	No	No	Yes / No			N/A
7	1/4" Swagelok connectors and ferrules (spares)			-	-	-	-			\$5 ea. Replacement

☒ Other (specify) T piece
<sup>1</sup> Refer to Acceptance of Terms

ALS use only	
Sampling Guide Included (Y/N)	Packed by: <u>15</u>
Number of Boxes:	Dispatch Time / Date: <u>15 24/5/18</u>
Courier / Dispatcher:	Consignment Note Number: <u>ECN009911844</u>
	Consignment Dispatched by: <u>K Jones</u> <u>24/5/18</u>

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## AIR SAMPLING EQUIPMENT

## DISPATCH RECORD

## ALS SUPPLIED EQUIPMENT

Item	Quantity	Item Description	Serial Nos
		6L Silonite Summa™ canister	4757 ✓ Rec. 14/6 4989 ✓ 29/16 12621 ✓ 15/6 12645 ✓ # 23/06
		Passive Sampler - TWA - 24hr #4 3.5 ml/min	1621 / 15/6 2825 ✓ 29/16 2826 ✓ rec'd 13/8/18 2856 / 15/6

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