



Veolia Environmental Services (Australia) Pty Ltd

Tarago Community Ambient Air Composition Analysis Study

Tarago, New South Wales

Final Report (R1)

June 2024





THE ODOUR UNIT PTY LTD

ABN 53 091 165 061 ACN 091 165 061

Level 3, Suite 12 56 Church Avenue MASCOT, NSW 2020 P: +61 2 9209 4420

THE ODOUR UNIT (QLD) PTY LTD

ABN 87 102 255 765 ACN 102 255 765

2/57 Neumann Rd CAPALABA, QLD 4157 P: +61 7 3245 1700 F: +61 7 3245 1800

E: <u>info@odourunit.com.au</u> W: <u>www.odourunit.com.au</u>

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Report Preparation					
Stephen Munro B. Env. Mgt Senior Consultant					
Reviewed and Approved By:					
that					
Michael Assal MEngSc, B. Eng (Hon)/B.Sc, AMIChemE, MIEAust, CAQP Operations Manager					
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EXECUTIVE SUMMARY

In October 2023 & January 2024, Veolia Environmental Services (Australia) Pty Ltd (**Veolia**) engaged The Odour Unit (**TOU**) to undertake an ambient air composition analysis study (the **Air Study**) to evaluate the potential downwind contributions to the Tarago air shed from the Woodlawn Bioreactor Facility located at Collector Road, Tarago, New South Wales (the **Woodlawn Facility**).

The objective of the Air Study is to provide technical feedback on the levels of measurable gas analytes in the ambient environment, with a focus on characterising those gas compounds that are known to be odorous and potential markers for fugitive landfill gas from the Woodlawn Facility.

Relevant Background and Context

The Air Study consisted of two (2) sessions, namely:

- Session 1 The undertaking of an ambient air composition analysis at a single upwind and downwind location of the Woodlawn Facility. For Session 1, the gas composition analysis included sulphur gases, volatile organic compounds (VOCs), permanent and fixed gases, and spectral analysis for unknown gases. Session 1 was completed on 5 & 6 October 2023; and
- Session 2 The undertaking of an ambient air composition analysis at an upwind (similar to that adopted for Session 1) and two (2) downwind locations of the Woodlawn Facility. For Session 2 of the Air Study, an expanded spectrum of gas analytes was evaluated in addition to those included in Session 1. This expanded scope of gas analytes was used to identify if there were any measurable levels of air contaminants in the Tarago community when compared with a reference location (i.e., upwind of the Woodlawn Facility). Session 2 was completed on 29 May 2024.

The completion of the Air Study required an extended period of time to complete as to capture those meteorological conditions that were conducive with likely leading to downwind odour detection in the Tarago township.

Scope of Work

The scope of work for the Air Study involved the following:

Collection of gas samples over an eight (8) hour period at upwind and downwind locations of the Woodlawn Facility and Tarago township. The collection of a gas sample over an eight (8) hour period enabled the concentration data to be compared to the eight (8) hour time weighted average (TWA) representing the airbourne concentration of a particular substance or mixture that must not be exceeded under an occupational context as provided in the Safe Work Australia document titled *Workplace Exposure Standards For Airborne Contaminants* dated 16 December 2019 (the Workplace Standards). An eight (8) hour TWA



is defined as the maximum average airborne concentration of a substance when calculated over an eight (8)-hour working day, for a five (5) day working week.

- Session 1 consisted of the following components:
 - The collection of gas samples at a single upwind and downwind location of the Woodlawn Facility and Tarago township; and
 - Laboratory analysis of the collected gas samples using the following techniques:
 - VOCs using gas-chromatography mass spectrometry (GC-MS);
 - Sulphur gases using gas-chromatography sulphur chemiluminescence detector (GC-SCD);
 - Permanent & fixed gases using gas-chromatography flame ionisation detection (GC-FID); and
 - Spectral library scan for unknown gases. Note: this did not provide a concentration of a gas analyte but indicated the likely presence of other gases not included as part of the standard reportable TO-15 GC-MS gas analyte list. Any positive detection identified in the Air Study was assigned a concentration against toluene. This was used to guide the expanded gas analyte list evaluated as part of Session 2, where applicable.
- **Session 2** consisted of the following components:
 - The collection of gas samples at a single upwind and two (2) downwind locations of the Woodlawn Facility and Tarago township; and
 - Laboratory analysis of the collected gas samples using the following techniques:
 - VOCs using GC-MS;
 - Sulphur gases using GC-SCD;
 - Permanent & fixed gases using GC-FID;
 - Spectral library scan for unknown gases. Note: this did not provide a concentration of a gas analyte but indicated the likely presence of other gases not included as part of the standard reportable TO-15 GC-MS gas analyte list. Any positive detection identified in the Air Study was assigned a concentration against toluene. This was used to guide the expanded gas analyte list evaluated as part of Session 2, where applicable;



- Metallic oxides and silicates;
- Inorganic gases including chloride, fluoride, nitrate, sulphate, and phosphate;
- Fluorine including gas and particulate form;
- Hexavalent chromium; and
- Mercury in air.

All air quality laboratory analysis was conducted by an accredited laboratory.

Sampling Location Details

The Air Study was conducted at both upwind and downwind locations of the Woodlawn Facility, as follows:

- Session 1:
 - Upwind Location: Taylors Creek Road.
 - Downwind Location: Tarago Community Playground.
- Session 2:
 - Upwind Location: Taylors Creek Road.
 - Downwind Location 1: Tarago Community Playground.
 - Downwind Location 2: Tarago Showground.

Session 1 – 5 & 6 October 2023 Findings

The Tarago community ambient air composition analysis study results conducted between 5 October 2023 and 6 October 2023 indicated the following:

- There we no measurable or detectable gas analytes at levels that would pose a human health risk;
- There were trace VOC levels of isopropyl alcohol, hexane, heptane, toluene, xylene, 1,2,4-trimethylbenzene at Downwind Location 1 Tarago Community Playground at ambient concentrations that were less than 0.25 ppm and significantly below the TWA in the Workplace Standards. The likely source/s were from anthropogenic sources including but not limited to the petrol station, vehicle transport, and domestic fuel burning activities occurring in the local Tarago area at the time;



- The sulphur gases were below the detection limit of the gas chromatography (less than 5 parts per billion);
- The spectral analysis for unknown gases did not identify any gas analytes at levels that would pose a human health risk. However, gas analytes compounds that are likely from transport activities/domestic fuel burning occurring in the local area at the time of sampling for Session 1. The equivalent toluene concentrations for the identified gas analytes were less than 5 ppb and therefore unlikely to pose a human health risk, particularly when compared with the TWA limits outlined in the Workplace Standards; and
- CH₄ levels were below the detection limit of the GC-FID (less than 0.01%).

Session 2 – 29 May 2024 Findings

The Tarago community ambient air composition analysis study results conducted on 29 May 2024 indicated the following:

- There we no measurable or detectable gas analytes at levels that would pose a human health risk, despite intermittent events of odour being readily detectable by the TOU assessor during the sampling at Weak (Odour Intensity 1) to Distinct (Odour Intensity 3) odour intensities and of a 'sweet fermented garbage, pineapple' odour character. This suggests that the odour plume and its ambient air composition during Session 2 consisted of odorous compounds that are at extremely low concentrations and not within the detection capability of modern laboratory equipment for air quality testing in Australia. This infers that the human health risk for all detectable gas analytes during Session 2 is negligible, but it does not address the olfaction component and effects of odour nuisance;
- The sulphur gases were below the detection limit (less than 5 parts per billion). This is consistent with the fixed H₂S monitoring results at the time;
- The library scan for unknown gases did not identify any gaseous compounds. As such, the library scan for unknown gases did not identify any detectable gas analyte at levels that would pose a human health risk for Session 2;
- CH₄ levels were below the detection limit of the gas chromatography (less than 0.01%);
- Metallic oxides and silicates were below the lower detection limit;
- Inorganic gases including chloride, fluoride, nitrate, sulphate, and phosphate were below the lower detection limit;
- Fluorine including gas and particulate form were below the lower detection limit;
- Hexavalent chromium were below the lower detection limit; and
- Mercury in air was below the lower detection limit.



Overall, the ambient air composition analysis study results for Session 1 and Session 2 indicated that the air quality was good from a human health risk perspective at the time of sampling based on the TWA limited outlined in the Workplace Standards.

Discussion of Results and Concluding Remarks

Overall, the Air Study has identified that the measured air quality sampled at the nominated upwind and downwind locations of the Woodlawn Facility and Tarago township were all below the TWA limits documented in the Workplace Standards. For Session 1 and Session 2, the downwind locations generated similar results to the upwind locations, suggesting that there is no measurable impact on the local air shed from the activities at the Woodlawn Facility. Put simply, the measured ambient air quality was equivalent to an environment with relatively good air quality and not likely to pose human health risks based on Workplace Standards and given that all gas analytes were below the lower detection limit of the laboratory analysis protocol.

The spectral library scan identified compounds that were not quantifiable as part of the GC-MS scan. However, the presence of these gas analytes is not a cause of concern as they are likely to be indigenous to the area and not coming from the Woodlawn Facility. This infers that the human health risk for all detectable gas analytes during Session 1 and Session 2 in the Air Study were negligible.

The Air Study does not address the olfaction component and effects of odour nuisance from odorous compounds that are detectable by the human nose but not within the detection capability of modern air quality laboratory testing equipment in Australia. This is best addressed by field ambient odour assessment surveys.

Limitations and Disclaimer

The Air Study demonstrates that there are challenges with adopting standard air quality testing parameters which can accommodate for the complexity and diversity of odourcausing compounds that may be present in the ambient air during a positive odour event (such as the case for Session 2). Furthermore, it is difficult to quantify the lived experience and olfactory response to specific odorous compounds as they are often present in a receiving environment at below the lower detection limit of the current air quality laboratory techniques (noting that there are exceptions in specific circumstances). This is further exacerbated by the distance between the potential emission source and receptor, such is the case between the Woodlawn Facility and Tarago township. Furthermore, the Air Study did not account for the potential impacts of seasonal variation. To enhance the representativeness of the ambient air quality data, additional sampling under different seasonal conditions could be considered.

Notwithstanding the above, the results from Session 1 and Session 2 of the Air Study indicate that the sampled air quality at all locations was acceptable from a human health risk perspective based on the current TWA limits reported in the Workplace Standards. However, it does not address the lived experience by the community from an odour impact perspective. As previously mentioned, this is best addressed by field ambient odour assessment surveys.



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APPENDIX A: AIR QUALITY LABORATORY ANALYSIS RESULTS



LIST OF ABBREVIATIONS AND DEFINITIONS

Air Study	The ambient air composition analysis study to evaluate the potential downwind contributions to the Tarago air shed from the Woodlawn Bioreactor Facility located at Collector Road, Tarago, New South Wales		
AS/NZS 4323.3	Australian Standard/New Zealand Standard 4323.3: 2001: Determination of odour concentration by dynamic olfactometry		
GC-FID	gas-chromatography flame ionisation detection		
GC-MS	gas chromatography-mass spectrometry		
GC-SCD	gas-chromatography sulphur chemiluminescence detector		
ΝΑΤΑ	National Australia Testing Authority		
Workplace Standards	Safe Work Australia document titled <i>Workplace Exposure Standards For Airborne Contaminants</i> dated 16 December 2019		
ТОՍ	The Odour Unit Pty Ltd		
TWA	time-weighted average		
Veolia	Veolia Environmental Services (Australia) Pty Ltd		
VOCs	volatile organic compounds		
Woodlawn Facility	Woodlawn Bioreactor Facility, Collector Road, Tarago, NSW		



UNITS OF MEASUREMENTS

g	grams
kg	kilograms
l/min	litres per minute
m	metres
m/s	metres per second
m²	square metres
m ³	cubic metres
m³/hr	cubic metres per hour
µg/m³	micrograms per cubic metre
mg/m ³	milligram per cubic metre
min	minute
mm	millimetres
°C	Degrees Celsius
ou	odour units
Ра	Pascals
ppb	parts per billion, by volume
ppm	parts per million, by volume



CHEMICAL NOMENCLATURE

CH ₄	methane
СО	carbon monoxide
CO ₂	carbon dioxide
H ₂	hydrogen
H ₂ S	hydrogen sulphide
Не	helium
N2	nitrogen
O ₂	oxygen



1 INTRODUCTION

In October 2023 & January 2024, Veolia Environmental Services (Australia) Pty Ltd (**Veolia**) engaged The Odour Unit (**TOU**) to undertake an ambient air composition analysis study (the **Air Study**) to evaluate the potential downwind contributions to the Tarago air shed from the Woodlawn Bioreactor Facility located at Collector Road, Tarago, New South Wales (the **Woodlawn Facility**).

The objective of the Air Study is to provide technical feedback on the levels of measurable gas analytes in the ambient environment, with a focus on characterising those gas compounds that are known to be odorous and potential markers for fugitive landfill gas from the Woodlawn Facility.

The following document summarises the methodology, results and findings from the Air Study.

1.1 RELEVANT BACKGROUND AND CONTEXT

The Air Study consisted of two (2) sessions, namely:

- Session 1 The undertaking of an ambient air composition analysis at a single upwind and downwind location of the Woodlawn Facility. For Session 1, the gas composition analysis included sulphur gases, volatile organic compounds (VOCs), permanent and fixed gases, and spectral analysis for unknown gases. Session 1 was completed on 5 & 6 October 2023; and
- Session 2 The undertaking of an ambient air composition analysis at an upwind (similar to that adopted for Session 1) and two (2) downwind locations of the Woodlawn Facility. For Session 2 of the Air Study, an expanded spectrum of gas analytes was evaluated in addition to those included in Session 1. This expanded scope of gas analytes was used to identify if there were any measurable levels of air contaminants in the Tarago community when compared with a reference location (i.e., upwind of the Woodlawn Facility). Session 2 was completed on 29 May 2024.

The completion of the Air Study required an extended period of time to complete as to capture those meteorological conditions that were conducive with likely leading to downwind odour detection in the Tarago township.

1.2 SCOPE OF WORK

The scope of work for the Air Study involved the following:

 Collection of gas samples over an eight (8) hour period at upwind and downwind locations of the Woodlawn Facility and Tarago township. The collection of a gas sample over an eight (8) hour period enabled the concentration data to be compared to the eight (8) hour time weighted average (TWA) representing the airbourne concentration of a particular substance or mixture that must not be exceeded under an occupational context as provided in the Safe Work Australia document titled *Workplace Exposure Standards For Airborne Contaminants* dated 16 December 2019 (the Workplace Standards).



An eight (8) hour TWA is defined as the maximum average airborne concentration of a substance when calculated over an eight (8)-hour working day, for a five (5) day working week.

- **Session 1** consisted of the following components:
 - The collection of gas samples at a single upwind and downwind location of the Woodlawn Facility and Tarago township; and
 - Laboratory analysis of the collected gas samples using the following techniques:
 - VOCs using gas-chromatography mass spectrometry (GC-MS);
 - Sulphur gases using gas-chromatography sulphur chemiluminescence detector (GC-SCD);
 - Permanent & fixed gases using gas-chromatography flame ionisation detection (GC-FID); and
 - Spectral library scan for unknown gases. Note: this did not provide a concentration of a gas analyte but indicated the likely presence of other gases not included as part of the standard reportable TO-15 GC-MS gas analyte list. Any positive detection identified in the Air Study was assigned a concentration against toluene. This was used to guide the expanded gas analyte list evaluated as part of Session 2, where applicable.
- **Session 2** consisted of the following components:
 - The collection of gas samples at a single upwind and two (2) downwind locations of the Woodlawn Facility and Tarago township;
 - $\circ\,$ Laboratory analysis of the collected gas samples using the following techniques:
 - VOCs using GC-MS;
 - Sulphur gases using GC-SCD;
 - Permanent & fixed gases using GC-FID;
 - Spectral library scan for unknown gases. Note: this did not provide a concentration of a gas analyte but indicated the likely presence of other gases not included as part of the standard reportable TO-15 GC-MS gas analyte list. Any positive detection identified in the Air Study was assigned a concentration against toluene. This was used to guide the expanded gas analyte list evaluated as part of Session 2, where applicable.



- Metallic oxides and silicates;
- Inorganic gases including chloride, fluoride, nitrate, sulphate, and phosphate;
- Fluorine including gas and particulate form;
- Hexavalent chromium; and
- Mercury in air.

All air quality laboratory analysis was conducted by an accredited laboratory.

1.2.1 Sampling and Operating Conditions

TOU notes that during sample collection, normal activities were occurring at the Woodlawn Facility, i.e. the sample collection represents a typical working day, unless otherwise stated. In interpreting the air quality concentration data collected as part of the Air Study, it is important to note that not all chemical substances behave the same. Therefore, some present higher risks to humans than others. This is considered as part of the interpretation of the air quality concentration data documented in the Air Study.

1.2.1.1 Session 1 Meteorological Details

Session 1 was undertaken between 5 October 2023 at 1830 hrs and 6 October 2023 at 0600 hrs. The meteorological conditions were moderate (2-4 m/s) to strong (4-6 m/s) wind speeds blowing from the westerly direction (i.e., the wind vector was blowing from the Woodlawn Facility to the Tarago township).

1.2.1.2 Session 2 Meteorological Details

Session 2 was undertaken on 29 May 2024 between 0716 hrs and 1615 hrs. The meteorological conditions were calm (< 0.5 m/s) to moderate (2-4 m/s) wind speeds blowing from the westerly direction (i.e., the wind vector was blowing from the Woodlawn Facility to the Tarago township). During Session 2, the following observations were made by the TOU assessor and advised by Veolia:

- Odour was detectable in the Tarago township at both downwind locations (Tarago Showground and Tarago Community Playground). The recorded odour observations were as follows:
 - Odour character: sweet fermented garbage, pineapple. In TOU's opinion, this is likely reflective of fugitive emissions from the Bioreactor at the Woodlawn Facility;
 - Odour intensity: based on the guidance provided in the New South Wales Environment Protection Authority titled *Guide to conducting field odour surveys* dated June 2022, the odour intensity (strength) ranged from Very Weak (Odour Intensity 1) to Distinct (Odour Intensity 3); and



- Odour duration: the odour event was prevalent for several hours and corresponded with the gas sampling period for Session 2.
- The sampling corresponded with receipt of two (2) formal odour complaints for detection of odour in the morning at the Tarago township.

Overall, Session 2 is considered to be representative of the ambient air quality during an odour event in the Tarago township. This is a helpful set of sampling circumstances as it provides robust feedback to advise on the concentration of any detectable ambient airbourne contaminants that could serve as a tracer/marker for odour other than hydrogen sulphide (H_2S). The continuous monitoring of H_2S is currently being undertaken at the Woodlawn Facility and Tarago township (i.e. Tarago Community Playground and Tarago Showground).

1.2.2 Ambient H₂S Readings

As part of the Air Study, TOU obtained the weather and H₂S data from the fixed Acrulog monitoring stations at the Woodlawn Facility, Tarago Community Playground, and Tarago Showground. This provided an added level of contextualisation to the ambient air quality data collected as part of the Air Study.

1.3 INTERPRETATION OF AIR QUALITY DATA

As mentioned in **Section 1.2**, the air quality laboratory analysis results were compared to the eight (8) hour TWA representing the airborne concentration of a particular substance or mixture that must not be exceeded under an occupation context as provided in the Workplace Standards, where applicable. For the Air Study conducted upwind and downwind of the Woodlawn Facility, an eight (8) hour TWA is defined as the maximum average airborne concentration of a substance when calculated over an eight (8) hour working day.



2 AIR STUDY PROGRAMME

The Air Study was conducted at both upwind and downwind locations of the Woodlawn Facility, as follows:

- Session 1:
 - Upwind Location: Taylors Creek Road.
 - Downwind Location: Tarago Community Playground.
- Session 2:
 - Upwind Location: Taylors Creek Road.
 - Downwind Location 1: Tarago Community Playground.
 - Downwind Location 2: Tarago Showground.

An aerial map of the sampled locations across Session 1 and Session 2 is shown in **Figure 2.1**. The sampling and laboratory protocol followed at each of the targeted locations is described in **Section 2.1** and **Section 2.2**, respectively.



Figure 2.1 – An aerial map outlining the sampled locations during Session 1 and Session 2



2.1 Session 1 - SAMPLING LOCATIONS

A view of the upwind and downwind sampling locations as deployed on 5 & 6 October 2023 is shown in **Figure 2.2**.



Figure 2.2 – A view of the sampling locations as deployed on 5 & 6 October 2023

2.1.1 Session 1 - Sampling and Testing Protocol

For Session 1, the equipment utilised during the sampling protocol at the upwind and downwind locations on 5 & 6 October 2023 included:

• Four (4) single summa canisters collected at a restricted flow over an 8-hour period.

The air quality parameters tested at this location included:

- VOCs as per TO-15 via GC-MS;
- Sulphur gases via GC-SCD;
- Fixed gases (C1 to C6 Alkanes, CO2, CO, O2, H2, He) via GC-FID;
- GC-FID for permanent gases (N₂); and
- Spectral library scan for unknown gases.



2.1.2 Session 1 - Ambient H₂S Monitoring Data Readings

For Session 1, the following readings were recorded at the H_2S monitoring stations on 5 & 6 October 2023:

- Woodlawn Facility Average/Highest Reading: 0/0 ppm.
- Downwind Location 1 Tarago Community Playground Average/Highest Reading: 0/0 ppm.
- Downwind Location 2: Tarago Showground: Average/Highest Reading: 0/0 ppm.

2.2 Session 2 – SAMPLING LOCATIONS

A view of the upwind and downwind sampling locations as deployed on 29 May 2024 is shown in **Figure 2.3**.





Photo A – Upwind Location: Sampling
location along Taylors Creek RoadPhoto B – Downwind Location 1:
Sampling location at the Tarago
Community Playground



Photo C - Downwind Location 2: Sampling location at the Tarago Showground **Figure 2.3** - A view of the sampling locations as deployed on 29 May 2024



2.2.1 Session 2 – Sampling and Testing Protocol

For Session 1, the equipment utilised during the sampling protocol at the upwind and downwind locations on 5 & 6 October 2023 included:

- Six (6) single summa canisters collected at a restricted flow over an 8-hour period; and
- Five (5) XR5000 SKC pumps, each collecting at a nominated flow rate over an 8-hour period.

The air quality parameters tested at this location included:

- VOCs as per TO-15 via GC-MS;
- Sulphur gases via GC-SCD;
- Fixed gases (C₁ to C₆ Alkanes, CO₂, CO, O₂, H₂, He) via GC-FID;
- GC-FID for permanent gases (N₂);
- Spectral library scan for unknown gases;
- Metallic oxides and silicates (collected at 4 litres per minutes (I/min));
- Inorganic gases (collected at 2 l/min);
- Fluorine including gad and particulate form (collected at 1.5 l/min);
- Hexavalent chromium (collected at 1 l/min); and
- Mercury in air (0.2 l/min).

2.2.2 Session 2 - Ambient H₂S Monitoring Data Readings

For Session 2, the following were record at the H_2S monitoring stations on 29 May 2024:

- Upwind Location: Taylors Creek Road = Average: 0 ppm;
- Downwind Location 1: Tarago Community Playground = Average: 0 ppm; and
- Downwind Location 2: Tarago Showground = Average: 0 ppm.

2.3 LABORATORY ANALYSIS

2.3.1 Air Quality Laboratory Testing

The air quality laboratory analysis was carried out by Envirolab Services. All laboratory methods used to derive the results of the Air Study are provided in **Appendix A**. The samples for chemical laboratory testing were collected in either



special purpose canisters or on filters. Due to the reactive nature of a range of air quality analytes, all collected samples were analysed within the required holding times.

2.4 UNITS FOR WORKPLACE STANDARDS

The airborne concentrations of gases, vapours and particulate contaminants are expressed gravimetrically as milligrams of substance per cubic metre of air (mg/m^3) or micrograms cubic metre of air $(\mu g/m^3)$. The concentration is also indicated in parts per million (ppm) or parts per billion (ppb), by volume, for gases and vapours. Note: There are some exceptions. Where both gravimetric and volumetric values are given, the volumetric (ppm) value is exact and should be used as it is not affected by changes in temperature and pressure.

Because the gravimetric units of mg/m³ are affected by temperature and pressure variations, all exposure standards are expressed relative to standard conditions of 25°C and 1 atmosphere pressure (101.3 kPa), where applicable.



3 AIR STUDY RESULTS

The following section documents the results from gas samples collected during Session 1 and Session 2 of the Air Study. The Air Study results include the outcomes from air quality from all sampled locations.

3.1 INTERPRETATION OF AIR STUDY RESULTS

Given the extensive range of air quality data collected as part of the Air Study, all reported concentration values that were below the lower detection limit of the laboratory have **not** been reproduced in this section. This screening allows the Air Study to maintain relevance and highlight those air quality parameters that may be of interest from a human health risk perspective. For the purposes of the Air Study, if a gas analyte is reported below the lower detection limit, it is unlikely to pose a human health risk.

The full air quality laboratory analysis reports can be found in **Appendix A**.

3.2 SESSION 1 - RESULTS

3.2.1 VOCs

The VOC results from GC-MS laboratory analysis at all sampled locations for Session 1 were below the lower detection limit (refer to **Appendix A** for further details). However, there were trace levels of isopropyl alcohol, hexane, heptane, toluene, xylene, 1,2,4-trimethylbenzene at Downwind Location 1 – Tarago Community Playground at ambient concentrations that were less than 0.25 ppm and significantly below the TWA in the Workplace Standards. The likely source/s were from anthropogenic sources including but not limited to the petrol station, vehicle transport, and domestic fuel burning activities occurring in the local Tarago area at the time.

3.2.2 Sulphur Gases

The sulphur gases results from GC-SCD laboratory analysis at all sampled locations for Session 1 were below the lower detection limit (refer to **Appendix A** for further details). As such, these are reported as not detectable in the Air Study. This is consistent with the fixed H_2S monitoring results at the time (refer to **Section 2.1.2** for details).

3.2.3 Permanent & Fixed Gases

The permanent & fixed gases results from GC-FID laboratory analysis at all sampled locations for Session 1were below the lower detection limit (refer to **Appendix A** for further details) for all ambient air contaminants.

The results for N_2 and O_2 are typical for fresh air (78% and 20%, respectively).

There were trace levels of CO in the ambient air that is likely from transport activities/domestic fuel burning occurring in the local area at the time of sampling.

3.2.4 Spectral Analysis for Unknown Gases

The spectral analysis for unknown gases identified gas analytes that are likely from transport activities/domestic fuel burning occurring in the local area at the time of sampling (refer to **Appendix A** for further details) for Session 1. The equivalent toluene concentrations for the identified gas analytes were less than 5 ppb and therefore unlikely



to pose a human health risk, particularly when compared with the TWA limits outlined in the Workplace Standards.

3.3 SESSION 2 - RESULTS

3.3.1 VOCs

The VOC results from GC-MS laboratory analysis at all sampled locations were below the lower detection limit (refer to **Appendix A** for further details). As such, these are reported as not detectable in the Air Study for Session 2.

3.3.2 Sulphur Gases

The sulphur gases results from GC-SCD laboratory analysis at all sampled locations were below the lower detection limit (refer to **Appendix A** for further details). As such, these are reported as not detectable in the Air Study for Session 2 (refer to **Section 2.2.2** for details).

3.3.3 Permanent & Fixed Gases

The permanent & fixed gases results from GC-FID laboratory analysis at all sampled locations were below the lower detection limit (refer to **Appendix A** for further details) for all ambient air contaminants. As such, these are reported as not detectable in the Air Study for Session 2.

The results for N₂ and O₂ are typical for fresh air (77-78% and 20-21%, respectively).

3.3.4 Spectral Analysis for Unknown Gases

The spectral analysis for unknown gases did not identify any gas analytes that were above the detectable limit at all sampled locations. As such, the library scan for unknown gases did not identify any detectable gas analyte at levels that would pose a human health risk for Session 2.

3.3.5 Metallic Oxides and Silicates

The laboratory analysis for metallic oxides and silicates at all sampled locations were below the lower detection limit (refer to **Appendix A** for further details). As such, these are reported as not detectable in the Air Study for Session 2.

3.3.6 Inorganic Gases

The laboratory analysis for inorganic gases at all sampled locations were below the lower detection limit (refer to **Appendix A** for further details). As such, these are reported as not detectable in the Air Study for Session 2.

3.3.7 Fluorine (Gas and Particulate Form)

The laboratory analysis for fluorine (gas and particulate form) at all sampled locations were below the lower detection limit (refer to **Appendix A** for further details). As such, these are reported as not detectable in the Air Study for Session 2.

3.3.8 Hexavalent Chromium

The laboratory analysis at hexavalent chromium at all sampled locations was below the lower detection limit (refer to **Appendix A** for further details). As such, these are reported as not detectable in the Air Study for Session 2.





3.3.9 Mercury in Air

The laboratory analysis for mercury in air at all sampled locations was below the lower detection limit (refer to **Appendix A** for further details). As such, these are reported as not detectable in the Air Study for Session 2.



4 DISCUSSION OF RESULTS AND CONCLUDING REMARKS

4.1 SESSION 1 – 5 & 6 OCTOBER 2023

The Tarago community ambient air composition analysis study results conducted between 5 October 2023 and 6 October 2023 indicated the following:

- There we no measurable or detectable gas analytes at levels that would pose a human health risk;
- There were trace VOC levels of isopropyl alcohol, hexane, heptane, toluene, xylene, 1,2,4-trimethylbenzene at Downwind Location 1 Tarago Community Playground at ambient concentrations that were less than 0.25 ppm and significantly below the TWA in the Workplace Standards. The likely source/s were from anthropogenic sources including but not limited to the petrol station, vehicle transport, and domestic fuel burning activities occurring in the local Tarago area at the time;
- The sulphur gases were below the detection limit of the gas chromatography (less than 5 parts per billion);
- The spectral analysis for unknown gases did not identify any gas analytes at levels that would pose a human health risk. However, gas analytes compounds that are likely from transport activities/domestic fuel burning occurring in the local area at the time of sampling for Session 1. The equivalent toluene concentrations for the identified gas analytes were less than 5 ppb and therefore unlikely to pose a human health risk, particularly when compared with the TWA limits outlined in the Workplace Standards; and
- CH₄ levels were below the detection limit of the GC-FID (less than 0.01%).

Overall, these results for Session 1 indicated that the air quality was acceptable from a human health risk perspective at the time of sampling based on the TWA limited outlined in the Workplace Standards.

4.2 SESSION 2 – 29 MAY 2024

The Tarago community ambient air composition analysis study results conducted on 29 May 2024 indicated the following:

There we no measurable or detectable gas analytes at levels that would pose a human health risk, despite intermittent events of odour being readily detectable by the TOU assessor during the sampling at Weak (Odour Intensity 1) to Distinct (Odour Intensity 3) and of a 'sweet fermented garbage, pineapple' odour character. This suggests that the odour plume and its ambient air composition during Session 2 consisted of odorous compounds that are at extremely low concentrations and not within the detection capability of modern laboratory equipment for air quality testing in Australia. This infers that the human health risk for all detectable gas analytes during Session 2 is negligible, but it does not address the olfaction component and effects of odour nuisance;



- The sulphur gases were below the detection limit (less than 5 parts per billion). This is consistent with the fixed H₂S monitoring results at the time;
- The library scan for unknown gases did not identify any gaseous compounds. As such, the library scan for unknown gases did not identify any detectable gas analyte at levels that would pose a human health risk for Session 2;
- CH₄ levels were below the detection limit of the gas chromatography (less than 0.01%);
- Metallic oxides and silicates were below the lower detection limit;
- Inorganic gases including chloride, fluoride, nitrate, sulphate, and phosphate were below the lower detection limit;
- Fluorine including gas and particulate form were below the lower detection limit;
- Hexavalent chromium were below the lower detection limit; and
- Mercury in air was below the lower detection limit.

Overall, these results for Session 2 indicated that the air quality was acceptable from a human health risk perspective at the time of sampling based on the TWA limited outlined in the Workplace Standards.

4.3 **CONCLUDING REMARKS**

Overall, the Air Study has identified that the measured air quality sampled at the nominated upwind and downwind locations of the Woodlawn Facility and Tarago township were all below the TWA limits documented in the Workplace Standards. For Session 1 and Session 2, the downwind locations generated similar results to the upwind locations, suggesting that there is no measurable impact on the local air shed from the activities at the Woodlawn Facility. Put simply, the measured ambient air quality was equivalent to an environment with relatively good air quality and not likely to pose human health risks based on Workplace Standards and given that all gas analytes were below the lower detection limit of the laboratory analysis protocol.

The spectral library scan identified compounds that were not quantifiable as part of the GC-MS scan. However, the presence of these gas analytes is not a cause of concern as they are likely to be indigenous to the area and not coming from the Woodlawn Facility. This infers that the human health risk for all detectable gas analytes during Session 1 and Session 2 in the Air Study were negligible.

The Air Study does not address the olfaction component and effects of odour nuisance from odorous compounds that are detectable by the human nose but not within the detection capability of modern air quality laboratory testing equipment in Australia. This is best addressed by field ambient odour assessment surveys.





4.4 LIMITATIONS AND DISCLAIMER

The Air Study demonstrates that there are challenges with adopting standard air quality testing parameters which can accommodate for the complexity and diversity of odourcausing compounds that may be present in the ambient air during a positive odour event (such as the case for Session 2). Furthermore, it is difficult to quantify the lived experience and olfactory response to specific odorous compounds as they are often present in a receiving environment at below the lower detection limit of the current air quality laboratory techniques (noting that there are exceptions in specific circumstances). This is further exacerbated by the distance between the potential emission source and receptor, such is the case between the Woodlawn Facility and Tarago township. Furthermore, the Air Study did not account for the potential impacts of seasonal variation. To enhance the representativeness of the ambient air quality data, additional sampling under different seasonal conditions could be considered.

Notwithstanding the above, the results from Session 1 and Session 2 of the Air Study indicate that the sampled air quality at all locations was acceptable from a human health risk perspective based on the current TWA limits reported in the Workplace Standards. However, it does not address the lived experience by the community from an odour impact perspective. As previously mentioned, this is best addressed by field ambient odour assessment surveys.





Veolia Environmental Services (Australia) Pty Ltd

Tarago Community Ambient Air Composition Analysis Study

Tarago, New South Wales

Appendices

June 2024





APPENDIX A:

AIR QUALITY LABORATORY ANALYSIS RESULTS





Session 1 Laboratory Results Reports



CERTIFICATE OF ANALYSIS 335172

Client Details	
Client	The Odour Unit Pty Ltd
Attention	Michael Assal
Address	Level 3, 12/56 Church Avenue,, MASCOT, NSW, 2020

Sample Details	
Your Reference	<u>N1806-11-LFG</u>
Number of Samples	4 Air
Date samples received	12/10/2023
Date completed instructions received	12/10/2023

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details		
Date results requested by	19/10/2023	
Date of Issue	19/10/2023	
NATA Accreditation Number 2901. This d	ocument shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *		

<u>Results Approved By</u> Amanda Chui, Air Toxics Team Leader <u>Authorised By</u> Nancy Zhang, Laboratory Manager



TO15 in Canisters/Bags			
Our Reference		335172-1	335172-3
Your Reference	UNITS	1806-11-GS-001- WS	1806-11-GS- 003-RL
Date Sampled		06/10/2023	06/10/2023
Type of sample		Air	Air
Air Kit Security No.		317	321
Vacuum before Shipment	Hg"	-30	-30
Vacuum before Analysis	Hg"	-0.67	-0.61
Date prepared	-	13/10/2023	13/10/2023
Date analysed	-	13/10/2023	13/10/2023
Propylene	ppbv	<0.5	<0.5
Dichlorodifluoromethane	ppbv	<0.5	<0.5
Chloromethane	ppbv	<0.5	<0.5
1,2-Dichlorotetrafluoroethane	ppbv	<0.5	<0.5
Vinyl chloride	ppbv	<0.5	<0.5
1,3-Butadiene	ppbv	<0.5	<0.5
Bromomethane	ppbv	<0.5	<0.5
Chloroethane	ppbv	<0.5	<0.5
Ethanol	ppbv	<5	<5
Acrolein	ppbv	<5	<5
Trichlorofluoromethane (Freon 11)	ppbv	<0.5	<0.5
Acetone	ppbv	<5	<5
Isopropyl Alcohol	ppbv	240	<5
1,1-Dichloroethene	ppbv	<0.5	<0.5
1,1,2-Trichlorotrifluoroethane	ppbv	<0.5	<0.5
Methylene chloride (Dichloromethane)	ppbv	<5	<5
Carbon Disulfide	ppbv	<5	<5
trans-1,2-dichloroethene	ppbv	<0.5	<0.5
МТВЕ	ppbv	<0.5	<0.5
1,1- Dichloroethane	ppbv	<0.5	<0.5
Vinyl Acetate	ppbv	<0.5	<0.5
MEK	ppbv	<5	<5
Hexane	ppbv	7.5	<0.5
cis-1,2-Dichloroethene	ppbv	<0.5	<0.5
Ethyl Acetate	ppbv	<0.5	<0.5
Chloroform	ppbv	<0.5	<0.5
Tetrahydrofuran	ppbv	<0.5	<0.5
1,1,1-Trichloroethane	ppbv	<0.5	<0.5
1,2-Dichloroethane	ppbv	<0.5	<0.5
Benzene	ppbv	<0.5	<0.5

TO15 in Canisters/Bags			
Our Reference		335172-1	335172-3
Your Reference	UNITS	1806-11-GS-001- WS	1806-11-GS- 003-RL
Date Sampled		06/10/2023	06/10/2023
Type of sample		Air	Air
Air Kit Security No.		317	321
Carbon tetrachloride	ppbv	<0.5	<0.5
Cyclohexane	ppbv	<0.5	<0.5
Heptane	ppbv	2	<0.5
Trichloroethene	ppbv	<0.5	<0.5
1,2-Dichloropropane	ppbv	<0.5	<0.5
1,4-Dioxane	ppbv	<0.5	<0.5
Bromodichloromethane	ppbv	<0.5	<0.5
Methyl Methacrylate	ppbv	<0.5	<0.5
МІВК	ppbv	<5	<5
cis-1,3-Dichloropropene	ppbv	<0.5	<0.5
trans-1,3-Dichloropropene	ppbv	<0.5	<0.5
Toluene	ppbv	1	<0.5
1,1,2-Trichloroethane	ppbv	<0.5	<0.5
Methyl Butyl Ketone	ppbv	<0.5	<0.5
Dibromochloromethane	ppbv	<0.5	<0.5
Tetrachloroethene	ppbv	<0.5	<0.5
1,2-Dibromoethane	ppbv	<0.5	<0.5
Chlorobenzene	ppbv	<0.5	<0.5
Ethylbenzene	ppbv	<0.5	<0.5
m-& p-Xylene	ppbv	1	<1
Styrene	ppbv	<0.5	<0.5
o-Xylene	ppbv	0.6	<0.5
Bromoform	ppbv	<0.5	<0.5
1,1,2,2-Tetrachloroethane	ppbv	<0.5	<0.5
4-ethyl toluene	ppbv	<0.5	<0.5
1,3,5-Trimethylbenzene	ppbv	<0.5	<0.5
1,2,4-Trimethylbenzene	ppbv	0.6	<0.5
1,3-Dichlorobenzene	ppbv	<0.5	<0.5
Benzyl chloride	ppbv	<0.5	<0.5
1,4-Dichlorobenzene	ppbv	<0.5	<0.5
1,2-Dichlorobenzene	ppbv	<0.5	<0.5
1,2,4-Trichlorobenzene	ppbv	<0.5	<0.5
Naphthalene	ppbv	<0.5	<0.5
Hexachloro- 1,3-butadiene	ppbv	<0.5	<0.5
Surrogate-Bromochloromethane	% rec	98	97

TO15 in Canisters/Bags			
Our Reference		335172-1	335172-3
Your Reference	UNITS	1806-11-GS-001- WS	1806-11-GS- 003-RL
Date Sampled		06/10/2023	06/10/2023
Type of sample		Air	Air
Air Kit Security No.		317	321
Surrogate -1,4-Difluorobenzene	% rec	96	96
Surrogate-Chlorobenzene-D5	% rec	96	95

TO15 in Canisters μg/m3			
Our Reference		335172-1	335172-3
Your Reference	UNITS	1806-11-GS-001- WS	1806-11-GS- 003-RL
Date Sampled		06/10/2023	06/10/2023
Type of sample		Air	Air
Air Kit Security No.		317	321
Vacuum before Shipment	Hg"	-30	-30
Vacuum before Analysis	Hg"	-0.67	-0.61
Date prepared	-	13/10/2023	13/10/2023
Date analysed	-	13/10/2023	13/10/2023
Propylene	µg/m³	<0.9	<0.9
Dichlorodifluoromethane	µg/m³	<2.5	<2.5
Chloromethane	µg/m³	<1	<1
1,2-Dichlorotetrafluoroethane	µg/m³	<2.5	<2.5
Vinyl chloride	µg/m³	<1.3	<1.3
1,3-Butadiene	µg/m³	<1.1	<1.1
Bromomethane	µg/m³	<1.9	<1.9
Chloroethane	µg/m³	<1.3	<1.3
Ethanol	µg/m³	<9	<9
Acrolein	µg/m³	<11	<11
Trichlorofluoromethane (Freon 11)	µg/m³	<2.8	<2.8
Acetone	µg/m³	<11.9	<11.9
Isopropyl Alcohol	µg/m³	590	<12
1,1-Dichloroethene	µg/m³	<2	<2
1,1,2-Trichlorotrifluoroethane	µg/m³	<3.8	<3.8
Methylene chloride (Dichloromethane)	µg/m³	<17	<17
Carbon Disulfide	µg/m³	<16	<16
trans-1,2-dichloroethene	µg/m³	<2	<2
МТВЕ	µg/m³	<1.8	<1.8
1,1- Dichloroethane	µg/m³	<2	<2
Vinyl Acetate	µg/m³	<1.8	<1.8
МЕК	µg/m³	<15	<15
Hexane	µg/m³	26	<1.8
cis-1,2-Dichloroethene	µg/m³	<2	<2
Ethyl Acetate	µg/m³	<1.8	<1.8
Chloroform	µg/m³	<2.4	<2.4
Tetrahydrofuran	µg/m³	<1.5	<1.5
1,1,1-Trichloroethane	µg/m³	<2.7	<2.7
1,2-Dichloroethane	µg/m³	<2	<2
Benzene	µg/m³	<1.6	<1.6

TO15 in Canisters μg/m3			
Our Reference		335172-1	335172-3
Your Reference	UNITS	1806-11-GS-001- WS	1806-11-GS- 003-RL
Date Sampled		06/10/2023	06/10/2023
Type of sample		Air	Air
Air Kit Security No.		317	321
Carbon tetrachloride	µg/m³	<3.1	<3.1
Cyclohexane	µg/m³	<1.7	<1.7
Heptane	µg/m³	7	<2
Trichloroethene	µg/m³	<2.7	<2.7
1,2-Dichloropropane	µg/m³	<2.3	<2.3
1,4-Dioxane	µg/m³	<1.8	<1.8
Bromodichloromethane	µg/m³	<3.4	<3.4
Methyl Methacrylate	µg/m³	<2	<2
МІВК	µg/m³	<20	<20
cis-1,3-Dichloropropene	µg/m³	<2.3	<2.3
trans-1,3-Dichloropropene	µg/m³	<2.3	<2.3
Toluene	µg/m³	5	<1.9
1,1,2-Trichloroethane	µg/m³	<2.7	<2.7
Methyl Butyl Ketone	µg/m³	<2	<2
Dibromochloromethane	µg/m³	<1.6	<1.6
Tetrachloroethene	µg/m³	<3.4	<3.4
1,2-Dibromoethane	µg/m³	<3.8	<3.8
Chlorobenzene	µg/m³	<2.3	<2.3
Ethylbenzene	µg/m³	<2.2	<2.2
m-& p-Xylene	µg/m³	4	<4.3
Styrene	µg/m³	<2.1	<2.1
o-Xylene	µg/m³	3	<2.2
Bromoform	µg/m³	<5.2	<5.2
1,1,2,2-Tetrachloroethane	µg/m³	<3.4	<3.4
4-ethyl toluene	µg/m³	<2.5	<2.5
1,3,5-Trimethylbenzene	µg/m³	<2.5	<2.5
1,2,4-Trimethylbenzene	µg/m³	3	<2.5
1,3-Dichlorobenzene	µg/m³	<3	<3
Benzyl chloride	µg/m³	<2.6	<2.6
1,4-Dichlorobenzene	μg/m³	<3	<3
1,2-Dichlorobenzene	µg/m³	<3	<3
1,2,4-Trichlorobenzene	µg/m³	<3.7	<3.7
Naphthalene	µg/m³	<2.6	<2.6
Hexachloro- 1,3-butadiene	µg/m³	<5.3	<5.3
Surrogate-Bromochloromethane	% rec	98	97
TO15 in Canisters μg/m3			
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Our Reference		335172-1	335172-3
Your Reference	UNITS	1806-11-GS-001- WS	1806-11-GS- 003-RL
Date Sampled		06/10/2023	06/10/2023
Type of sample		Air	Air
Air Kit Security No.		317	321
Surrogate -1,4-Difluorobenzene	% rec	96	96
Surrogate-Chlorobenzene-D5	% rec	96	95

Fixed Gas Analysis					
Our Reference		335172-1	335172-2	335172-3	335172-4
Your Reference	UNITS	1806-11-GS-001- WS	1806-11-GS-002- WS	1806-11-GS-003- RL	1806-11-GS- 004-RL
Date Sampled		06/10/2023	06/10/2023	06/10/2023	06/10/2023
Type of sample		Air	Air	Air	Air
Air Kit Security No.		317	346	321	335
Date prepared	-	13/10/2023	13/10/2023	13/10/2023	13/10/2023
Date analysed	-	13/10/2023	13/10/2023	13/10/2023	13/10/2023
Methane (CH₄)	%	<0.01	[NA]	<0.01	<0.01
Ethane	%	<0.01	[NA]	<0.01	
Ethylene	%	<0.01	[NA]	<0.01	
Propane	%	<0.01	[NA]	<0.01	
Propylene	%	<0.01	[NA]	<0.01	
iso-Butane	%	<0.01	[NA]	<0.01	
n-Butane	%	<0.01	[NA]	<0.01	
1, 2-Propadiene	%	<0.01	[NA]	<0.01	
Acetylene	%	<0.01	[NA]	<0.01	
trans-2-butene	%	<0.01	[NA]	<0.01	
1-butene	%	<0.01	[NA]	<0.01	
i-butylene	%	<0.01	[NA]	<0.01	
cis-2-butene	%	<0.01	[NA]	<0.01	
i-pentane	%	<0.01	[NA]	<0.01	
n-pentane	%	<0.01	[NA]	<0.01	
1,3-butadiene	%	<0.01	[NA]	<0.01	
trans-2-pentene	%	<0.01	[NA]	<0.01	
1-pentene	%	<0.01	[NA]	<0.01	
2-methyl-2-butene	%	<0.01	[NA]	<0.01	
cis-2-pentene	%	<0.01	[NA]	<0.01	
Carbon Dioxide (CO ₂)	%	<0.01	[NA]	<0.01	
Hexane C6+	%	<0.01	[NA]	<0.01	
Oxygen (O ₂)	%	20	[NA]	20	
Nitrogen (N ₂)	%	[NA]	78	[NA]	78
Carbon Monoxide (CO)	%	0.04	[NA]	0.04	
Hydrogen (H ₂)	%	<0.01	[NA]	<0.01	
Helium (He)	%	<0.01	[NA]	<0.01	

Sulphur spec'n in cans/bags			
Our Reference		335172-1	335172-3
Your Reference	UNITS	1806-11-GS-001- WS	1806-11-GS- 003-RL
Date Sampled		06/10/2023	06/10/2023
Type of sample		Air	Air
Air Kit Security No.		317	321
Date prepared	-	13/10/2023	13/10/2023
Date analysed	-	13/10/2023	13/10/2023
Hydrogen Sulphide	ppbv	<5	<5
Carbonyl Sulphide	ppbv	<5	<5
Methyl Mercaptan	ppbv	<5	<5
Ethyl Mercaptan	ppbv	<5	<5
Dimethyl Sulphide	ppbv	<5	<5

Sulphur spec'n in cans/bags			
Our Reference		335172-1	335172-3
Your Reference	UNITS	1806-11-GS-001- WS	1806-11-GS- 003-RL
Date Sampled		06/10/2023	06/10/2023
Type of sample		Air	Air
Air Kit Security No.		317	321
Date prepared	-	13/10/2023	13/10/2023
Date analysed	-	13/10/2023	13/10/2023
Hydrogen Sulphide	µg/m³	<7	<7
Carbonyl Sulphide	μg/m³	<12	<12
Methyl Mercaptan	μg/m³	<9.8	<9.8
Ethyl Mercaptan	μg/m³	<13	<13
Dimethyl Sulphide	µg/m³	<13	<13

GC/MS Scan			
Our Reference		335172-1	335172-3
Your Reference	UNITS	1806-11-GS-001- WS	1806-11-GS- 003-RL
Date Sampled		06/10/2023	06/10/2023
Type of sample		Air	Air
Air Kit Security No.		317	321
Date prepared	-	13/10/2023	13/10/2023
Date analysed	-	13/10/2023	13/10/2023
GC/MS Scan	-	SEE REPORT	SEE REPORT

Method ID	Methodology Summary
AT-003	Gases determined by GC-FID/TCD using methods ASTM 1945, 1946 and USEPA 3C.
AT-004	Sulphur Compounds in Cansiters and Air Bags, determined by GC-SCD based on methods:- ASTM 5504, USEPA TO15 and USEPA m18
GC-MS scan	GC-MS Scan - extracts or air samples are analysed and identified peaks are checked against either the NIST and/or Wiley GC- MS libraries (or another suitable library) and a qualitative identification reported where the match is greater 80% for the peak(s) of interest.
TO15	USEPA TO15 - Analysis of VOC's in air using USEPA TO15 and in house method AT-002. Note, longer term stability of some oxygenated compounds is questionable where significant humidity is present.
USEPA 18	Measurement of Gaseous Organic Compound Emissions by Gas Chromatography using USEPA m18.

QUALITY CC	NTROL: TO	15 in Car	Duplicate				Spike Re	covery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Vacuum before Shipment	Hg"			[NT]	3	-30	-30	0	[NT]	[NT]
Vacuum before Analysis	Hg"			[NT]	3	-0.61	-0.61	0	[NT]	[NT]
Date prepared	-			13/10/2023	3	13/10/2023	13/10/2023		13/10/2023	[NT]
Date analysed	-			13/10/2023	3	13/10/2023	13/10/2023		13/10/2023	[NT]
Propylene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	112	[NT]
Dichlorodifluoromethane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
Chloromethane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichlorotetrafluoroethane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
Vinyl chloride	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
1,3-Butadiene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
Bromomethane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
Chloroethane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
Ethanol	ppbv	5	TO15	<5	3	<5	<5	0	[NT]	[NT]
Acrolein	ppbv	5	TO15	<5	3	<5	<5	0	[NT]	[NT]
Trichlorofluoromethane (Freon 11)	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
Acetone	ppbv	5	TO15	<5	3	<5	<5	0	[NT]	[NT]
Isopropyl Alcohol	ppbv	5	TO15	<5	3	<5	<5	0	[NT]	[NT]
1,1-Dichloroethene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
1,1,2-Trichlorotrifluoroethane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
Methylene chloride (Dichloromethane)	ppbv	5	TO15	<5	3	<5	<5	0	[NT]	[NT]
Carbon Disulfide	ppbv	5	TO15	<5	3	<5	<5	0	[NT]	[NT]
trans-1,2-dichloroethene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
МТВЕ	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
1,1- Dichloroethane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
Vinyl Acetate	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
MEK	ppbv	5	TO15	<5	3	<5	<5	0	[NT]	[NT]
Hexane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	94	[NT]
cis-1,2-Dichloroethene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
Ethyl Acetate	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
Chloroform	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
Tetrahydrofuran	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
1,1,1-Trichloroethane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichloroethane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
Benzene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	92	[NT]
Carbon tetrachloride	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
Cyclohexane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	75	[NT]
Heptane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	98	[NT]

QUALITY CC	NTROL: TO	15 in Car		Du	plicate		Spike Re	covery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Trichloroethene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
1,2-Dichloropropane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
1,4-Dioxane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
Bromodichloromethane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
Methyl Methacrylate	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
МІВК	ppbv	5	TO15	<5	3	<5	<5	0		[NT]
cis-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
trans-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
Toluene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	97	[NT]
1,1,2-Trichloroethane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
Methyl Butyl Ketone	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
Dibromochloromethane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
Tetrachloroethene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
1,2-Dibromoethane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
Chlorobenzene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
Ethylbenzene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	98	[NT]
m-& p-Xylene	ppbv	1	TO15	<1	3	<1	<1	0	97	[NT]
Styrene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	96	[NT]
o-Xylene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	98	[NT]
Bromoform	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
1,1,2,2-Tetrachloroethane	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
4-ethyl toluene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	102	[NT]
1,3,5-Trimethylbenzene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	100	[NT]
1,2,4-Trimethylbenzene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0	103	[NT]
1,3-Dichlorobenzene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
Benzyl chloride	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
1,4-Dichlorobenzene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
1,2-Dichlorobenzene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
1,2,4-Trichlorobenzene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
Naphthalene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
Hexachloro- 1,3-butadiene	ppbv	0.5	TO15	<0.5	3	<0.5	<0.5	0		[NT]
Surrogate-Bromochloromethane	% rec		TO15	109	3	97	95	2	107	[NT]
Surrogate -1,4-Difluorobenzene	% rec		TO15	103	3	96	93	3	103	[NT]
Surrogate-Chlorobenzene-D5	% rec		TO15	104	3	95	93	2	102	[NT]

QUALITY COI	NTROL: TO	15 in Can	isters µg/m3			Du	plicate		Spike Re	covery %
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Vacuum before Shipment	Hg"			[NT]	3	-30	-30	0	[NT]	
Vacuum before Analysis	Hg"			[NT]	3	-0.61	-0.61	0	[NT]	
Date prepared	-			13/10/2023	3	13/10/2023	13/10/2023		[NT]	
Date analysed	-			13/10/2023	3	13/10/2023	13/10/2023		[NT]	
Propylene	µg/m³	0.9	TO15	<0.9	3	<0.9	<0.9	0	[NT]	
Dichlorodifluoromethane	µg/m³	2.5	TO15	<2.5	3	<2.5	<2.5	0	[NT]	
Chloromethane	µg/m³	1.0	TO15	<1.0	3	<1	<1	0	[NT]	
1,2-Dichlorotetrafluoroethane	µg/m³	2.5	TO15	<2.5	3	<2.5	<2.5	0	[NT]	
Vinyl chloride	µg/m³	1.3	TO15	<1.3	3	<1.3	<1.3	0	[NT]	
1,3-Butadiene	µg/m³	1.1	TO15	<1.1	3	<1.1	<1.1	0	[NT]	
Bromomethane	µg/m³	1.9	TO15	<1.9	3	<1.9	<1.9	0	[NT]	
Chloroethane	µg/m³	1.3	TO15	<1.3	3	<1.3	<1.3	0	[NT]	
Ethanol	µg/m³	9	TO15	<9	3	<9	<9	0	[NT]	
Acrolein	µg/m³	11	TO15	<11	3	<11	<11	0	[NT]	
Trichlorofluoromethane (Freon 11)	µg/m³	2.8	TO15	<2.8	3	<2.8	<2.8	0	[NT]	
Acetone	µg/m³	11.9	TO15	<11.9	3	<11.9	<11.9	0	[NT]	
Isopropyl Alcohol	µg/m³	12	TO15	<12	3	<12	<12	0	[NT]	
1,1-Dichloroethene	µg/m³	2.0	TO15	<2.0	3	<2	<2	0	[NT]	
1,1,2-Trichlorotrifluoroethane	µg/m³	3.8	TO15	<3.8	3	<3.8	<3.8	0	[NT]	
Methylene chloride (Dichloromethane)	µg/m³	17	USEPA 18	<17	3	<17	<17	0	[NT]	
Carbon Disulfide	µg/m³	16	TO15	<16	3	<16	<16	0	[NT]	
trans-1,2-dichloroethene	µg/m³	2.0	TO15	<2.0	3	<2	<2	0	[NT]	
МТВЕ	µg/m³	1.8	TO15	<1.8	3	<1.8	<1.8	0	[NT]	
1,1- Dichloroethane	µg/m³	2.0	TO15	<2.0	3	<2	<2	0	[NT]	
Vinyl Acetate	µg/m³	1.8	TO15	<1.8	3	<1.8	<1.8	0	[NT]	
MEK	µg/m³	15	TO15	<15	3	<15	<15	0	[NT]	
Hexane	µg/m³	1.8	TO15	<1.8	3	<1.8	<1.8	0	[NT]	
cis-1,2-Dichloroethene	µg/m³	2.0	TO15	<2.0	3	<2	<2	0	[NT]	
Ethyl Acetate	µg/m³	1.8	TO15	<1.8	3	<1.8	<1.8	0	[NT]	
Chloroform	µg/m³	2.4	TO15	<2.4	3	<2.4	<2.4	0	[NT]	
Tetrahydrofuran	µg/m³	1.5	TO15	<1.5	3	<1.5	<1.5	0	[NT]	
1,1,1-Trichloroethane	µg/m³	2.7	TO15	<2.7	3	<2.7	<2.7	0	[NT]	
1,2-Dichloroethane	µg/m³	2.0	TO15	<2.0	3	<2	<2	0	[NT]	
Benzene	µg/m³	1.6	TO15	<1.6	3	<1.6	<1.6	0	[NT]	
Carbon tetrachloride	µg/m³	3.1	TO15	<3.1	3	<3.1	<3.1	0	[NT]	
Cyclohexane	µg/m³	1.7	TO15	<1.7	3	<1.7	<1.7	0	[NT]	
Heptane	µg/m³	2.0	TO15	<2.0	3	<2	<2	0	[NT]	[NT]

QUALITY CO	NTROL: TO	15 in Can	isters µg/m3			Du	plicate		Spike Re	covery %
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Trichloroethene	µg/m³	2.7	TO15	<2.7	3	<2.7	<2.7	0	[NT]	[NT]
1,2-Dichloropropane	µg/m³	2.3	TO15	<2.3	3	<2.3	<2.3	0	[NT]	[NT]
1,4-Dioxane	µg/m³	1.8	TO15	<1.8	3	<1.8	<1.8	0	[NT]	[NT]
Bromodichloromethane	µg/m³	3.4	TO15	<3.4	3	<3.4	<3.4	0	[NT]	[NT]
Methyl Methacrylate	µg/m³	2.0	TO15	<2.0	3	<2	<2	0	[NT]	[NT]
МІВК	µg/m³	20	TO15	<20	3	<20	<20	0	[NT]	[NT]
cis-1,3-Dichloropropene	µg/m³	2.3	TO15	<2.3	3	<2.3	<2.3	0	[NT]	[NT]
trans-1,3-Dichloropropene	µg/m³	2.3	TO15	<2.3	3	<2.3	<2.3	0	[NT]	[NT]
Toluene	µg/m³	1.9	TO15	<1.9	3	<1.9	<1.9	0	[NT]	[NT]
1,1,2-Trichloroethane	µg/m³	2.7	TO15	<2.7	3	<2.7	<2.7	0	[NT]	[NT]
Methyl Butyl Ketone	µg/m³	2.0	TO15	<2.0	3	<2	<2	0	[NT]	[NT]
Dibromochloromethane	µg/m³	1.6	TO15	<1.6	3	<1.6	<1.6	0	[NT]	[NT]
Tetrachloroethene	µg/m³	3.4	TO15	<3.4	3	<3.4	<3.4	0	[NT]	[NT]
1,2-Dibromoethane	µg/m³	3.8	TO15	<3.8	3	<3.8	<3.8	0	[NT]	[NT]
Chlorobenzene	µg/m³	2.3	TO15	<2.3	3	<2.3	<2.3	0	[NT]	[NT]
Ethylbenzene	µg/m³	2.2	TO15	<2.2	3	<2.2	<2.2	0	[NT]	[NT]
m-& p-Xylene	µg/m³	4.3	TO15	<4.3	3	<4.3	<4.3	0	[NT]	[NT]
Styrene	µg/m³	2.1	TO15	<2.1	3	<2.1	<2.1	0	[NT]	[NT]
o-Xylene	µg/m³	2.2	TO15	<2.2	3	<2.2	<2.2	0	[NT]	[NT]
Bromoform	µg/m³	5.2	TO15	<5.2	3	<5.2	<5.2	0	[NT]	[NT]
1,1,2,2-Tetrachloroethane	µg/m³	3.4	TO15	<3.4	3	<3.4	<3.4	0	[NT]	[NT]
4-ethyl toluene	µg/m³	2.5	TO15	<2.5	3	<2.5	<2.5	0	[NT]	[NT]
1,3,5-Trimethylbenzene	µg/m³	2.5	TO15	<2.5	3	<2.5	<2.5	0	[NT]	[NT]
1,2,4-Trimethylbenzene	µg/m³	2.5	TO15	<2.5	3	<2.5	<2.5	0	[NT]	[NT]
1,3-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	3	<3	<3	0	[NT]	[NT]
Benzyl chloride	µg/m³	2.6	TO15	<2.6	3	<2.6	<2.6	0	[NT]	[NT]
1,4-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	3	<3	<3	0	[NT]	[NT]
1,2-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	3	<3	<3	0	[NT]	[NT]
1,2,4-Trichlorobenzene	µg/m³	3.7	TO15	<3.7	3	<3.7	<3.7	0	[NT]	[NT]
Naphthalene	µg/m³	2.6	TO15	<2.6	3	<2.6	<2.6	0	[NT]	[NT]
Hexachloro- 1,3-butadiene	µg/m³	5.3	TO15	<5.3	3	<5.3	<5.3	0	[NT]	[NT]
Surrogate-Bromochloromethane	% rec		TO15	109	3	97	95	2	[NT]	[NT]
Surrogate -1,4-Difluorobenzene	% rec		TO15	103	3	96	93	3	[NT]	[NT]
Surrogate-Chlorobenzene-D5	% rec		TO15	104	3	95	93	2	[NT]	[NT]

QUALITY (CONTROL: I	Fixed Gas	s Analysis			Du	plicate		Spike Re	covery %
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			13/10/2023	1	13/10/2023	13/10/2023		13/10/2023	[NT]
Date analysed	-			13/10/2023	1	13/10/2023	13/10/2023		13/10/2023	[NT]
Methane (CH ₄)	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	101	[NT]
Ethane	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	101	[NT]
Ethylene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	102	[NT]
Propane	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	100	[NT]
Propylene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	101	[NT]
iso-Butane	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	105	[NT]
n-Butane	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	106	[NT]
1, 2-Propadiene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	107	[NT]
Acetylene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	108	[NT]
trans-2-butene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	103	[NT]
1-butene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	100	[NT]
i-butylene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	105	[NT]
cis-2-butene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	103	[NT]
i-pentane	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	104	[NT]
n-pentane	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	107	[NT]
1,3-butadiene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	104	[NT]
trans-2-pentene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	103	[NT]
1-pentene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	106	[NT]
2-methyl-2-butene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	104	[NT]
cis-2-pentene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	104	[NT]
Carbon Dioxide (CO ₂)	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	102	[NT]
Hexane C6+	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	108	[NT]
Oxygen (O ₂)	%	0.1	AT-003	<0.1	1	20	20	0	104	[NT]
Nitrogen (N ₂)	%	0.5	AT-003	<0.5	[NT]	[NT]	[NT]	[NT]	99	[NT]
Carbon Monoxide (CO)	%	0.01	AT-003	<0.01	1	0.04	0.04	0	102	[NT]
Hydrogen (H ₂)	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	114	[NT]
Helium (He)	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	115	[NT]

QUALITY CON	TROL: Sulph	nur spec'r	n in cans/bags		Duplicate Spike F					covery %
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			13/10/2023	1	13/10/2023	13/10/2023		13/10/2023	
Date analysed	-			13/10/2023	1	13/10/2023	13/10/2023		13/10/2023	
Hydrogen Sulphide	ppbv	5	AT-004	<5	1	<5	<5	0	87	
Carbonyl Sulphide	ppbv	5	AT-004	<5	1	<5	<5	0	91	
Methyl Mercaptan	ppbv	5	AT-004	<5	1	<5	<5	0	103	
Ethyl Mercaptan	ppbv	5	AT-004	<5	1	<5	<5	0	93	
Dimethyl Sulphide	ppbv	5	AT-004	<5	1	<5	<5	0	95	[NT]

QUALITY CONTROL: Sulphur spec'n in cans/bags				Duplicate			Spike Recovery %			
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			13/10/2023	1	13/10/2023	13/10/2023		[NT]	
Date analysed	-			13/10/2023	1	13/10/2023	13/10/2023		[NT]	
Hydrogen Sulphide	µg/m³	7	AT-004	<7	1	<7	<7	0	[NT]	
Carbonyl Sulphide	µg/m³	12	AT-004	<12	1	<12	<12	0	[NT]	
Methyl Mercaptan	µg/m³	9.8	AT-004	<9.8	1	<9.8	<9.8	0	[NT]	
Ethyl Mercaptan	µg/m³	13	AT-004	<13	1	<13	<13	0	[NT]	[NT]
Dimethyl Sulphide	µg/m³	13	AT-004	<13	1	<13	<13	0	[NT]	[NT]

Result Definiti	ons
NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions						
Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.					
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.					
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.					
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.					
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.					

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Envirolab Services Pty Ltd GCMS Scan repo

Date:	13/10/2023
Our ref:	335172 (2 canisters)
Client Ref:	N1806-11-LFG
Client Name:	The Odour Unit Pty Ltd

Sample ID:	335172-1	Canister ID:	317		dilution factor:	1.91
R.T.			Qual		as Toluene	as Toluene
(min)	Library/ID detected by GCMS-SCAN	CAS#	(out of 100)	peak area	ppbv	ug/m3
18.329	Decane	000124-18-5	95	916653	2.2	8.3
15.945	Nonane	000111-84-2	93	846681	2.0	7.7
13.368	Octane	000111-65-9	83	772506	1.9	7.0
18.567	Mesitylene	000108-67-8	97	596955	1.4	5.4
17.725	Benzene, 1-ethyl-3-methyl-	000620-14-4	87	549088	1.3	5.0
7.081	Pentane, 2-methyl-	000107-83-5	86	464351	1.1	4.2
13.953	Heptane, 2,4-dimethyl-	002213-23-2	83	454018	1.1	4.1
11.576	Cyclohexane, methyl-	000108-87-2	90	339132	0.8	3.1
9.951	Hexane, 3-methyl-	000589-34-4	87	236343	0.6	2.1
20.535	Undecane	001120-21-4	81	225554	0.5	2.0
					0.00	0.00
	Toluene in TO-15 Standard (15ppbv)			11906975	NA	NA

Sample ID:	335172-3	Canister ID:	321		dilution factor:	1.93
R.T.			Qual		as Toluene	as Toluene
(min)	Library/ID detected by GCMS-SCAN	CAS#	(out of 100)	peak area	ppbv	ug/m3
3.857	Sulfur dioxide	007446-09-5	83	1521771	3.7	13.9
					0.0	0.0
	Toluene in TO-15 Standard (15ppbv)			11906975	NA	NA

Report Comments

1) The scaned mass was between 33 to 450 amu and the match quality refers to the statistical probability that the compound detected in the sample is identified as a compound present in the NIST/EPA/NIH Mass Spectral Library 2014.

2) The closer the match value to 100, the more accurate the identification, consequently the lower the match value, the greater the error in the compound identification.

3) A compound is listed above if the library match quality was greater than 80%; Please note that 80% is a considered industry standard;
The semi-quant results as toluene are estimated only (based on the responses of toluene);
If the result divided by the dilution factor is greater than 125ppbv, this means the result is over the calibration range of toluene.

4) Envirolab Services is not NATA accredited for non specific GCMS scan analysis.

5) If the analytes have been reported in TO-15 and Sulphur Speciation report, they will not be included in this GCMS scan report





Session 2 Laboratory Results Reports



CERTIFICATE OF ANALYSIS 352831

Client Details	
Client	The Odour Unit Pty Ltd
Attention	Michael Assal
Address	Level 3, 12/56 Church Avenue,, MASCOT, NSW, 2020

Sample Details	
Your Reference	<u>N1806-MA-002-LFG</u>
Number of Samples	6 Air Canister, 12 Filter, 3 Carbon Tube
Date samples received	31/05/2024
Date completed instructions received	31/05/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details	
Date results requested by	07/06/2024
Date of Issue	07/06/2024
NATA Accreditation Number 2901. This do	ocument shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17	7025 - Testing. Tests not covered by NATA are denoted with *

<u>Results Approved By</u> Amanda Chui, LC/Air Toxics Supervisor <u>Authorised By</u> Nancy Zhang, Laboratory Manager



Sulphur spec'n in cans/bags				
Our Reference		352831-1	352831-3	352831-5
Your Reference	UNITS	Location #1 - 10658	Location #2 - 51590	Location #3 - 315
Date Sampled		29/05/2024	29/05/2024	29/05/2024
Type of sample		Air Canister	Air Canister	Air Canister
Air Kit Security No.		10658	S1590	315
Date prepared	-	03/06/2024	03/06/2024	03/06/2024
Date analysed	-	03/06/2024	03/06/2024	03/06/2024
Hydrogen Sulphide	ppbv	<5	<5	<5
Carbonyl Sulphide	ppbv	<5	<5	<5
Methyl Mercaptan	ppbv	<5	<5	<5
Ethyl Mercaptan	ppbv	<5	<5	<5
Dimethyl Sulphide	ppbv	<5	<5	<5

Sulphur spec'n in cans/bags				
Our Reference		352831-1	352831-3	352831-5
Your Reference	UNITS	Location #1 - 10658	Location #2 - 51590	Location #3 - 315
Date Sampled		29/05/2024	29/05/2024	29/05/2024
Type of sample		Air Canister	Air Canister	Air Canister
Air Kit Security No.		10658	S1590	315
Date prepared	-	03/06/2024	03/06/2024	03/06/2024
Date analysed	-	03/06/2024	03/06/2024	03/06/2024
Hydrogen Sulphide	µg/m³	<7	<7	<7
Carbonyl Sulphide	µg/m³	<12	<12	<12
Methyl Mercaptan	µg/m³	<9.8	<9.8	<9.8
Ethyl Mercaptan	µg/m³	<13	<13	<13
Dimethyl Sulphide	µg/m³	<13	<13	<13

TO15 in Canisters/Bags				
Our Reference		352831-1	352831-3	352831-5
Your Reference	UNITS	Location #1 - 10658	Location #2 - 51590	Location #3 - 315
Date Sampled		29/05/2024	29/05/2024	29/05/2024
Type of sample		Air Canister	Air Canister	Air Canister
Air Kit Security No.		10658	S1590	315
Vacuum before Shipment	Hg"	-30	-30	-30
Vacuum before Analysis	Hg"	-7	-8	-7
Date prepared	-	03/06/2024	03/06/2024	03/06/2024
Date analysed	-	03/06/2024	03/06/2024	03/06/2024
Propylene	ppbv	<0.5	<0.5	<0.5
Dichlorodifluoromethane	ppbv	<0.5	<0.5	<0.5
Chloromethane	ppbv	<0.5	<0.5	<0.5
1,2-Dichlorotetrafluoroethane	ppbv	<0.5	<0.5	<0.5
Vinyl chloride	ppbv	<0.5	<0.5	<0.5
1,3-Butadiene	ppbv	<0.5	<0.5	<0.5
Bromomethane	ppbv	<0.5	<0.5	<0.5
Chloroethane	ppbv	<0.5	<0.5	<0.5
Ethanol	ppbv	<5	<5	<5
Acrolein	ppbv	<5	<5	<5
Trichlorofluoromethane (Freon 11)	ppbv	<0.5	<0.5	<0.5
Acetone	ppbv	<5	<5	<5
Isopropyl Alcohol	ppbv	<5	<5	<5
1,1-Dichloroethene	ppbv	<0.5	<0.5	<0.5
1,1,2-Trichlorotrifluoroethane	ppbv	<0.5	<0.5	<0.5
Methylene chloride (Dichloromethane)	ppbv	<5	<5	<5
Carbon Disulfide	ppbv	<5	<5	<5
trans-1,2-dichloroethene	ppbv	<0.5	<0.5	<0.5
МТВЕ	ppbv	<0.5	<0.5	<0.5
1,1- Dichloroethane	ppbv	<0.5	<0.5	<0.5
Vinyl Acetate	ppbv	<0.5	<0.5	<0.5
MEK	ppbv	<5	<5	<5
Hexane	ppbv	<0.5	<0.5	<0.5
cis-1,2-Dichloroethene	ppbv	<0.5	<0.5	<0.5
Ethyl Acetate	ppbv	<0.5	<0.5	<0.5
Chloroform	ppbv	<0.5	<0.5	<0.5
Tetrahydrofuran	ppbv	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	ppbv	<0.5	<0.5	<0.5
1,2-Dichloroethane	ppbv	<0.5	<0.5	<0.5
Benzene	ppbv	<0.5	<0.5	<0.5

TO15 in Canisters/Bags				
Our Reference		352831-1	352831-3	352831-5
Your Reference	UNITS	Location #1 - 10658	Location #2 - 51590	Location #3 - 315
Date Sampled		29/05/2024	29/05/2024	29/05/2024
Type of sample		Air Canister	Air Canister	Air Canister
Air Kit Security No.		10658	S1590	315
Carbon tetrachloride	ppbv	<0.5	<0.5	<0.5
Cyclohexane	ppbv	<0.5	<0.5	<0.5
Heptane	ppbv	<0.5	<0.5	<0.5
Trichloroethene	ppbv	<0.5	<0.5	<0.5
1,2-Dichloropropane	ppbv	<0.5	<0.5	<0.5
1,4-Dioxane	ppbv	<0.5	<0.5	<0.5
Bromodichloromethane	ppbv	<0.5	<0.5	<0.5
Methyl Methacrylate	ppbv	<0.5	<0.5	<0.5
МІВК	ppbv	<5	<5	<5
cis-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5
Toluene	ppbv	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	ppbv	<0.5	<0.5	<0.5
Methyl Butyl Ketone	ppbv	<0.5	<0.5	<0.5
Dibromochloromethane	ppbv	<0.5	<0.5	<0.5
Tetrachloroethene	ppbv	<0.5	<0.5	<0.5
1,2-Dibromoethane	ppbv	<0.5	<0.5	<0.5
Chlorobenzene	ppbv	<0.5	<0.5	<0.5
Ethylbenzene	ppbv	<0.5	<0.5	<0.5
m-& p-Xylene	ppbv	<1	<1	<1
Styrene	ppbv	<0.5	<0.5	<0.5
o-Xylene	ppbv	<0.5	<0.5	<0.5
Bromoform	ppbv	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	ppbv	<0.5	<0.5	<0.5
4-ethyl toluene	ppbv	<0.5	<0.5	<0.5
1,3,5-Trimethylbenzene	ppbv	<0.5	<0.5	<0.5
1,2,4-Trimethylbenzene	ppbv	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5
Benzyl chloride	ppbv	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	ppbv	<0.5	<0.5	<0.5
Naphthalene	ppbv	<0.5	<0.5	<0.5
Hexachloro- 1,3-butadiene	ppbv	<0.5	<0.5	<0.5
Surrogate-Bromochloromethane	% rec	117	114	112

TO15 in Canisters/Bags				
Our Reference		352831-1	352831-3	352831-5
Your Reference	UNITS	Location #1 - 10658	Location #2 - 51590	Location #3 - 315
Date Sampled		29/05/2024	29/05/2024	29/05/2024
Type of sample		Air Canister	Air Canister	Air Canister
Air Kit Security No.		10658	S1590	315
Surrogate -1,4-Difluorobenzene	% rec	118	116	115
Surrogate-Chlorobenzene-D5	% rec	118	116	114

TO15 in Canisters μg/m3				
Our Reference		352831-1	352831-3	352831-5
Your Reference	UNITS	Location #1 - 10658	Location #2 - 51590	Location #3 - 315
Date Sampled		29/05/2024	29/05/2024	29/05/2024
Type of sample		Air Canister	Air Canister	Air Canister
Air Kit Security No.		10658	S1590	315
Vacuum before Shipment	Hg"	-30	-30	-30
Vacuum before Analysis	Hg"	-7	-8	-7
Date prepared	-	03/06/2024	03/06/2024	03/06/2024
Date analysed	-	03/06/2024	03/06/2024	03/06/2024
Propylene	µg/m³	<0.9	<0.9	<0.9
Dichlorodifluoromethane	µg/m³	<2.5	<2.5	<2.5
Chloromethane	µg/m³	<1	<1	<1
1,2-Dichlorotetrafluoroethane	µg/m³	<2.5	<2.5	<2.5
Vinyl chloride	µg/m³	<1.3	<1.3	<1.3
1,3-Butadiene	µg/m³	<1.1	<1.1	<1.1
Bromomethane	µg/m³	<1.9	<1.9	<1.9
Chloroethane	µg/m³	<1.3	<1.3	<1.3
Ethanol	µg/m³	<9	<9	<9
Acrolein	µg/m³	<11	<11	<11
Trichlorofluoromethane (Freon 11)	µg/m³	<2.8	<2.8	<2.8
Acetone	µg/m³	<11.9	<11.9	<11.9
Isopropyl Alcohol	µg/m³	<12	<12	<12
1,1-Dichloroethene	µg/m³	<2	<2	<2
1,1,2-Trichlorotrifluoroethane	µg/m³	<3.8	<3.8	<3.8
Methylene chloride (Dichloromethane)	µg/m³	<17	<17	<17
Carbon Disulfide	µg/m³	<16	<16	<16
trans-1,2-dichloroethene	µg/m³	<2	<2	<2
МТВЕ	µg/m³	<1.8	<1.8	<1.8
1,1- Dichloroethane	µg/m³	<2	<2	<2
Vinyl Acetate	µg/m³	<1.8	<1.8	<1.8
МЕК	µg/m³	<15	<15	<15
Hexane	µg/m³	<1.8	<1.8	<1.8
cis-1,2-Dichloroethene	µg/m³	<2	<2	<2
Ethyl Acetate	µg/m³	<1.8	<1.8	<1.8
Chloroform	µg/m³	<2.4	<2.4	<2.4
Tetrahydrofuran	µg/m³	<1.5	<1.5	<1.5
1,1,1-Trichloroethane	µg/m³	<2.7	<2.7	<2.7
1,2-Dichloroethane	µg/m³	<2	<2	<2
Benzene	µg/m³	<1.6	<1.6	<1.6

TO15 in Canisters μg/m3				
Our Reference		352831-1	352831-3	352831-5
Your Reference	UNITS	Location #1 - 10658	Location #2 - 51590	Location #3 - 315
Date Sampled		29/05/2024	29/05/2024	29/05/2024
Type of sample		Air Canister	Air Canister	Air Canister
Air Kit Security No.		10658	S1590	315
Carbon tetrachloride	µg/m³	<3.1	<3.1	<3.1
Cyclohexane	µg/m³	<1.7	<1.7	<1.7
Heptane	µg/m³	<2	<2	<2
Trichloroethene	µg/m³	<2.7	<2.7	<2.7
1,2-Dichloropropane	µg/m³	<2.3	<2.3	<2.3
1,4-Dioxane	µg/m³	<1.8	<1.8	<1.8
Bromodichloromethane	µg/m³	<3.4	<3.4	<3.4
Methyl Methacrylate	µg/m³	<2	<2	<2
МІВК	µg/m³	<20	<20	<20
cis-1,3-Dichloropropene	µg/m³	<2.3	<2.3	<2.3
trans-1,3-Dichloropropene	µg/m³	<2.3	<2.3	<2.3
Toluene	µg/m³	<1.9	<1.9	<1.9
1,1,2-Trichloroethane	µg/m³	<2.7	<2.7	<2.7
Methyl Butyl Ketone	µg/m³	<2	<2	<2
Dibromochloromethane	µg/m³	<1.6	<1.6	<1.6
Tetrachloroethene	µg/m³	<3.4	<3.4	<3.4
1,2-Dibromoethane	µg/m³	<3.8	<3.8	<3.8
Chlorobenzene	µg/m³	<2.3	<2.3	<2.3
Ethylbenzene	µg/m³	<2.2	<2.2	<2.2
m-& p-Xylene	µg/m³	<4.3	<4.3	<4.3
Styrene	µg/m³	<2.1	<2.1	<2.1
o-Xylene	µg/m³	<2.2	<2.2	<2.2
Bromoform	µg/m³	<5.2	<5.2	<5.2
1,1,2,2-Tetrachloroethane	µg/m³	<3.4	<3.4	<3.4
4-ethyl toluene	µg/m³	<2.5	<2.5	<2.5
1,3,5-Trimethylbenzene	µg/m³	<2.5	<2.5	<2.5
1,2,4-Trimethylbenzene	µg/m³	<2.5	<2.5	<2.5
1,3-Dichlorobenzene	µg/m³	<3	<3	<3
Benzyl chloride	µg/m³	<2.6	<2.6	<2.6
1,4-Dichlorobenzene	µg/m³	<3	<3	<3
1,2-Dichlorobenzene	µg/m³	<3	<3	<3
1,2,4-Trichlorobenzene	µg/m³	<3.7	<3.7	<3.7
Naphthalene	µg/m³	<2.6	<2.6	<2.6
Hexachloro- 1,3-butadiene	µg/m³	<5.3	<5.3	<5.3
Surrogate-Bromochloromethane	% rec	117	114	112

TO15 in Canisters μg/m3				
Our Reference		352831-1	352831-3	352831-5
Your Reference	UNITS	Location #1 - 10658	Location #2 - 51590	Location #3 - 315
Date Sampled		29/05/2024	29/05/2024	29/05/2024
Type of sample		Air Canister	Air Canister	Air Canister
Air Kit Security No.		10658	S1590	315
Surrogate -1,4-Difluorobenzene	% rec	118	116	115
Surrogate-Chlorobenzene-D5	% rec	118	116	114

Fixed Gas Analysis						
Our Reference		352831-1	352831-2	352831-3	352831-4	352831-5
Your Reference	UNITS	Location #1 - 10658	Location #1 - 332 & 10658	Location #2 - 51590	Location #2 - 339 & 51590	Location #3 - 315
Date Sampled		29/05/2024	29/05/2024	29/05/2024	29/05/2024	29/05/2024
Type of sample		Air Canister	Air Canister	Air Canister	Air Canister	Air Canister
Air Kit Security No.		10658	322	S1590	339	315
Date prepared	-	03/06/2024	03/06/2024	03/06/2024	03/06/2024	03/06/2024
Date analysed	-	03/06/2024	03/06/2024	03/06/2024	03/06/2024	03/06/2024
Methane (CH ₄)	%	<0.01	[NA]	<0.01	[NA]	<0.01
Ethane	%	<0.01	[NA]	<0.01	[NA]	<0.01
Ethylene	%	<0.01	[NA]	<0.01	[NA]	<0.01
Propane	%	<0.01	[NA]	<0.01	[NA]	<0.01
Propylene	%	<0.01	[NA]	<0.01	[NA]	<0.01
iso-Butane	%	<0.01	[NA]	<0.01	[NA]	<0.01
n-Butane	%	<0.01	[NA]	<0.01	[NA]	<0.01
1, 2-Propadiene	%	<0.01	[NA]	<0.01	[NA]	<0.01
Acetylene	%	<0.01	[NA]	<0.01	[NA]	<0.01
trans-2-butene	%	<0.01	[NA]	<0.01	[NA]	<0.01
1-butene	%	<0.01	[NA]	<0.01	[NA]	<0.01
i-butylene	%	<0.01	[NA]	<0.01	[NA]	<0.01
cis-2-butene	%	<0.01	[NA]	<0.01	[NA]	<0.01
i-pentane	%	<0.01	[NA]	<0.01	[NA]	<0.01
n-pentane	%	<0.01	[NA]	<0.01	[NA]	<0.01
1,3-butadiene	%	<0.01	[NA]	<0.01	[NA]	<0.01
Methyl acetylene	%	<0.01	[NA]	<0.01	[NA]	<0.01
trans-2-pentene	%	<0.01	[NA]	<0.01	[NA]	<0.01
1-pentene	%	<0.01	[NA]	<0.01	[NA]	<0.01
2-methyl-2-butene	%	<0.01	[NA]	<0.01	[NA]	<0.01
cis-2-pentene	%	<0.01	[NA]	<0.01	[NA]	<0.01
Carbon Dioxide (CO ₂)	%	0.04	[NA]	0.04	[NA]	0.04
Hexane C6+	%	<0.01	[NA]	<0.01	[NA]	<0.01
Oxygen (O ₂)	%	20	[NA]	21	[NA]	20
Nitrogen (N ₂)	%	[NA]	78		77	[NA]
Carbon Monoxide (CO)	%	<0.01	[NA]	<0.01	[NA]	<0.01
Helium (He)	%	<0.01	[NA]	<0.01	[NA]	<0.01
Hydrogen (H ₂)	%	<0.01	[NA]	<0.01	[NA]	<0.01

Fixed Gas Analysis		
Our Reference		352831-6
Your Reference	UNITS	Location #3 - 331 & 315
Date Sampled		29/05/2024
Type of sample		Air Canister
Air Kit Security No.		331
Date prepared	-	03/06/2024
Date analysed	-	03/06/2024
Nitrogen (N ₂)	%	76

GC/MS Scan				
Our Reference		352831-1	352831-3	352831-5
Your Reference	UNITS	Location #1 - 10658	Location #2 - 51590	Location #3 - 315
Date Sampled		29/05/2024	29/05/2024	29/05/2024
Type of sample		Air Canister	Air Canister	Air Canister
Air Kit Security No.		10658	S1590	315
Date prepared	-	31/05/2024	31/05/2024	31/05/2024
Date analysed	-	07/06/2024	07/06/2024	07/06/2024
GC/MS Scan	-	See report	See report	See report

Method ID	Methodology Summary
AT-003	Gases determined by GC-FID/TCD using methods ASTM 1945, 1946 and USEPA 3C.
AT-004	Sulphur Compounds in Cansiters and Air Bags, determined by GC-SCD based on methods:- ASTM 5504, USEPA TO15 and USEPA m18
GC-MS scan	GC-MS Scan - extracts or air samples are analysed and identified peaks are checked against either the NIST and/or Wiley GC-MS libraries (or another suitable library) and a qualitative identification reported where the match is greater 80% for the peak(s) of interest.
TO15	USEPA TO15 - Analysis of VOC's in air using USEPA TO15 and in house method AT-002. Note, longer term stability of some oxygenated compounds is questionable where significant humidity is present.
USEPA 18	Measurement of Gaseous Organic Compound Emissions by Gas Chromatography using USEPA m18.

QUALITY CONTROL: Sulphur spec'n in cans/bags						Du	plicate		Spike Re	covery %
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			03/06/2024	1	03/06/2024	03/06/2024		03/06/2024	
Date analysed	-			03/06/2024	1	03/06/2024	03/06/2024		03/06/2024	
Hydrogen Sulphide	ppbv	5	AT-004	<5	1	<5	<5	0	114	
Carbonyl Sulphide	ppbv	5	AT-004	<5	1	<5	<5	0	99	
Methyl Mercaptan	ppbv	5	AT-004	<5	1	<5	<5	0	108	
Ethyl Mercaptan	ppbv	5	AT-004	<5	1	<5	<5	0	94	
Dimethyl Sulphide	ppbv	5	AT-004	<5	1	<5	<5	0	98	[NT]

QUALITY CONTROL: Sulphur spec'n in cans/bags						Duplicate Sp				covery %
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			03/06/2024	1	03/06/2024	03/06/2024		[NT]	
Date analysed	-			03/06/2024	1	03/06/2024	03/06/2024		[NT]	
Hydrogen Sulphide	µg/m³	7	AT-004	<7	1	<7	<7	0	[NT]	
Carbonyl Sulphide	µg/m³	12	AT-004	<12	1	<12	<12	0	[NT]	
Methyl Mercaptan	µg/m³	9.8	AT-004	<9.8	1	<9.8	<9.8	0	[NT]	
Ethyl Mercaptan	µg/m³	13	AT-004	<13	1	<13	<13	0	[NT]	
Dimethyl Sulphide	µg/m³	13	AT-004	<13	1	<13	<13	0	[NT]	[NT]

QUALITY CONTROL: TO15 in Canisters/Bags				Du	plicate		Spike Re	covery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Vacuum before Shipment	Hg"			[NT]	1	-30	-30	0	[NT]	
Vacuum before Analysis	Hg"			[NT]	1	-7	-7	0	[NT]	
Date prepared	-			03/06/2024	1	03/06/2024	03/06/2024		03/06/2024	
Date analysed	-			03/06/2024	1	03/06/2024	03/06/2024		03/06/2024	
Propylene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	118	
Dichlorodifluoromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
Chloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
1,2-Dichlorotetrafluoroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
Vinyl chloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
1,3-Butadiene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
Bromomethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
Chloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
Ethanol	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	
Acrolein	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	
Trichlorofluoromethane (Freon 11)	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
Acetone	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	
Isopropyl Alcohol	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	
1,1-Dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
1,1,2-Trichlorotrifluoroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
Methylene chloride (Dichloromethane)	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	
Carbon Disulfide	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	
trans-1,2-dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
МТВЕ	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
1,1- Dichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
Vinyl Acetate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
MEK	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	
Hexane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	99	
cis-1,2-Dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
Ethyl Acetate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
Chloroform	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
Tetrahydrofuran	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
1,1,1-Trichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
1,2-Dichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
Benzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	99	
Carbon tetrachloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	
Cyclohexane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	79	
Heptane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	99	[NT]

QUALITY CC	NTROL: TO	15 in Car	nisters/Bags			Du	plicate		Spike Re	covery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]	
Trichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
1,2-Dichloropropane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
1,4-Dioxane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
Bromodichloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
Methyl Methacrylate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
МІВК	ppbv	5	TO15	<5	1	<5	<5	0		[NT]	
cis-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
trans-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
Toluene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	103	[NT]	
1,1,2-Trichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
Methyl Butyl Ketone	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
Dibromochloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
Tetrachloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
1,2-Dibromoethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
Chlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
Ethylbenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	103	[NT]	
m-& p-Xylene	ppbv	1	TO15	<1	1	<1	<1	0	105	[NT]	
Styrene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	109	[NT]	
o-Xylene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	107	[NT]	
Bromoform	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
1,1,2,2-Tetrachloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
4-ethyl toluene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	115	[NT]	
1,3,5-Trimethylbenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	110	[NT]	
1,2,4-Trimethylbenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	112	[NT]	
1,3-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
Benzyl chloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
1,4-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
1,2-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
1,2,4-Trichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
Naphthalene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
Hexachloro- 1,3-butadiene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0		[NT]	
Surrogate-Bromochloromethane	% rec		TO15	102	1	117	115	2	101	[NT]	
Surrogate -1,4-Difluorobenzene	% rec		TO15	100	1	118	116	2	101	[NT]	
Surrogate-Chlorobenzene-D5	% rec		TO15	100	1	118	116	2	99	[NT]	

QUALITY CONTROL: TO15 in Canisters µg/m3						Du	plicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]	
Vacuum before Shipment	Hg"			[NT]	1	-30	-30	0	[NT]		
Vacuum before Analysis	Hg"			[NT]	1	-7	-7	0	[NT]		
Date prepared	-			03/06/2024	1	03/06/2024	03/06/2024		[NT]		
Date analysed	-			03/06/2024	1	03/06/2024	03/06/2024		[NT]		
Propylene	µg/m³	0.9	TO15	<0.9	1	<0.9	<0.9	0	[NT]		
Dichlorodifluoromethane	µg/m³	2.5	TO15	<2.5	1	<2.5	<2.5	0	[NT]		
Chloromethane	µg/m³	1.0	TO15	<1.0	1	<1	<1	0	[NT]		
1,2-Dichlorotetrafluoroethane	µg/m³	2.5	TO15	<2.5	1	<2.5	<2.5	0	[NT]		
Vinyl chloride	µg/m³	1.3	TO15	<1.3	1	<1.3	<1.3	0	[NT]		
1,3-Butadiene	µg/m³	1.1	TO15	<1.1	1	<1.1	<1.1	0	[NT]		
Bromomethane	µg/m³	1.9	TO15	<1.9	1	<1.9	<1.9	0	[NT]		
Chloroethane	µg/m³	1.3	TO15	<1.3	1	<1.3	<1.3	0	[NT]		
Ethanol	µg/m³	9	TO15	<9	1	<9	<9	0	[NT]		
Acrolein	µg/m³	11	TO15	<11	1	<11	<11	0	[NT]		
Trichlorofluoromethane (Freon 11)	µg/m³	2.8	TO15	<2.8	1	<2.8	<2.8	0	[NT]		
Acetone	µg/m³	11.9	TO15	<11.9	1	<11.9	<11.9	0	[NT]		
Isopropyl Alcohol	µg/m³	12	TO15	<12	1	<12	<12	0	[NT]		
1,1-Dichloroethene	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]		
1,1,2-Trichlorotrifluoroethane	µg/m³	3.8	TO15	<3.8	1	<3.8	<3.8	0	[NT]		
Methylene chloride (Dichloromethane)	µg/m³	17	USEPA 18	<17	1	<17	<17	0	[NT]		
Carbon Disulfide	µg/m³	16	TO15	<16	1	<16	<16	0	[NT]		
trans-1,2-dichloroethene	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]		
МТВЕ	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]		
1,1- Dichloroethane	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]		
Vinyl Acetate	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]		
MEK	µg/m³	15	TO15	<15	1	<15	<15	0	[NT]		
Hexane	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]		
cis-1,2-Dichloroethene	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]		
Ethyl Acetate	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]		
Chloroform	µg/m³	2.4	TO15	<2.4	1	<2.4	<2.4	0	[NT]		
Tetrahydrofuran	µg/m³	1.5	TO15	<1.5	1	<1.5	<1.5	0	[NT]		
1,1,1-Trichloroethane	µg/m³	2.7	TO15	<2.7	1	<2.7	<2.7	0	[NT]		
1,2-Dichloroethane	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]		
Benzene	µg/m³	1.6	TO15	<1.6	1	<1.6	<1.6	0	[NT]		
Carbon tetrachloride	µg/m³	3.1	TO15	<3.1	1	<3.1	<3.1	0	[NT]		
Cyclohexane	µg/m³	1.7	TO15	<1.7	1	<1.7	<1.7	0	[NT]		
Heptane	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]	

QUALITY CO	QUALITY CONTROL: TO15 in Canisters µg/m3					Du	plicate		Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Trichloroethene	µg/m³	2.7	TO15	<2.7	1	<2.7	<2.7	0		[NT]
1,2-Dichloropropane	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0		[NT]
1,4-Dioxane	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0		[NT]
Bromodichloromethane	µg/m³	3.4	TO15	<3.4	1	<3.4	<3.4	0		[NT]
Methyl Methacrylate	µg/m³	2.0	TO15	<2.0	1	<2	<2	0		[NT]
МІВК	µg/m³	20	TO15	<20	1	<20	<20	0		[NT]
cis-1,3-Dichloropropene	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0		[NT]
trans-1,3-Dichloropropene	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0		[NT]
Toluene	µg/m³	1.9	TO15	<1.9	1	<1.9	<1.9	0		[NT]
1,1,2-Trichloroethane	µg/m³	2.7	TO15	<2.7	1	<2.7	<2.7	0		[NT]
Methyl Butyl Ketone	µg/m³	2.0	TO15	<2.0	1	<2	<2	0		[NT]
Dibromochloromethane	µg/m³	1.6	TO15	<1.6	1	<1.6	<1.6	0		[NT]
Tetrachloroethene	µg/m³	3.4	TO15	<3.4	1	<3.4	<3.4	0		[NT]
1,2-Dibromoethane	µg/m³	3.8	TO15	<3.8	1	<3.8	<3.8	0		[NT]
Chlorobenzene	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0		[NT]
Ethylbenzene	µg/m³	2.2	TO15	<2.2	1	<2.2	<2.2	0		[NT]
m-& p-Xylene	µg/m³	4.3	TO15	<4.3	1	<4.3	<4.3	0		[NT]
Styrene	µg/m³	2.1	TO15	<2.1	1	<2.1	<2.1	0		[NT]
o-Xylene	µg/m³	2.2	TO15	<2.2	1	<2.2	<2.2	0		[NT]
Bromoform	µg/m³	5.2	TO15	<5.2	1	<5.2	<5.2	0		[NT]
1,1,2,2-Tetrachloroethane	µg/m³	3.4	TO15	<3.4	1	<3.4	<3.4	0		[NT]
4-ethyl toluene	µg/m³	2.5	TO15	<2.5	1	<2.5	<2.5	0		[NT]
1,3,5-Trimethylbenzene	µg/m³	2.5	TO15	<2.5	1	<2.5	<2.5	0		[NT]
1,2,4-Trimethylbenzene	µg/m³	2.5	TO15	<2.5	1	<2.5	<2.5	0		[NT]
1,3-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	1	<3	<3	0		[NT]
Benzyl chloride	µg/m³	2.6	TO15	<2.6	1	<2.6	<2.6	0		[NT]
1,4-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	1	<3	<3	0		[NT]
1,2-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	1	<3	<3	0		[NT]
1,2,4-Trichlorobenzene	µg/m³	3.7	TO15	<3.7	1	<3.7	<3.7	0		[NT]
Naphthalene	µg/m³	2.6	TO15	<2.6	1	<2.6	<2.6	0		[NT]
Hexachloro- 1,3-butadiene	µg/m³	5.3	TO15	<5.3	1	<5.3	<5.3	0		[NT]
Surrogate-Bromochloromethane	% rec		TO15	102	1	117	115	2		[NT]
Surrogate -1,4-Difluorobenzene	% rec		TO15	100	1	118	116	2		[NT]
Surrogate-Chlorobenzene-D5	% rec		TO15	100	1	118	116	2		[NT]
Client Reference: N1806-MA-002-LFG

QUALITY (CONTROL: F	Fixed Gas	s Analysis			Du	plicate		Spike Re	covery %
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			03/06/2024	1	03/06/2024	03/06/2024		03/06/2024	
Date analysed	-			03/06/2024	1	03/06/2024	03/06/2024		03/06/2024	
Methane (CH ₄)	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	98	
Ethane	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	110	
Ethylene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	110	
Propane	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	110	
Propylene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	110	
iso-Butane	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	109	
n-Butane	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	110	
1, 2-Propadiene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	111	
Acetylene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	110	
trans-2-butene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	111	
1-butene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	111	
i-butylene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	110	
cis-2-butene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	111	
i-pentane	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	111	
n-pentane	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	111	
1,3-butadiene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	98	
Methyl acetylene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	[NT]	
trans-2-pentene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	111	
1-pentene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	111	
2-methyl-2-butene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	[NT]	
cis-2-pentene	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	117	
Carbon Dioxide (CO ₂)	%	0.01	AT-003	<0.01	1	0.04	0.04	0	97	
Hexane C6+	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	105	
Oxygen (O ₂)	%	0.1	AT-003	<0.1	1	20	20	0	96	
Nitrogen (N ₂)	%	0.5	AT-003	<0.5	2	78	77	1	97	
Carbon Monoxide (CO)	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	98	
Helium (He)	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	101	
Hydrogen (H ₂)	%	0.01	AT-003	<0.01	1	<0.01	<0.01	0	101	
		Eived Gas	Analysis			יוס	nlicate		Snike Re	covery %

QUALITY CONTROL: Fixed Gas Analysis				Duplicate			Spike Recovery %			
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	2	03/06/2024	03/06/2024		[NT]	[NT]
Date analysed	-			[NT]	2	03/06/2024	03/06/2024		[NT]	[NT]

Client Reference: N1806-MA-002-LFG

Result Definiti	Result Definitions					
NT	Not tested					
NA	Test not required					
INS	Insufficient sample for this test					
PQL	Practical Quantitation Limit					
<	Less than					
>	Greater than					
RPD	Relative Percent Difference					
LCS	Laboratory Control Sample					
NS	Not specified					
NEPM	National Environmental Protection Measure					
NR	Not Reported					

Client Reference: N1806-MA-002-LFG

Quality Control Definitions					
Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.				
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.				
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.				
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.				
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.				

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Envirolab Services Pty Ltd GCMS Scan repo

Date:	7/06/2024
Our ref:	352831
Client Ref:	N1806-MA-002-LFG
Client Name:	The Odour Unit Pty Ltd

Sample ID:	352831-1	Canister ID:	10658		dilution factor:	2.61
R.T.			Qual		as Toluene	as Toluene
(min)	Library/ID detected by GCMS-SCAN	CAS#	(out of 100)	peak area	ppbv	ug/m3
	There is NO extra peak detected at library match (Qual) greater than 80%				0.0	0.0
					0.0	0.0
	Toluene in TO-15 Standard (15ppbv)			3860313	NA	NA
Sample ID:	352831-3	Canister ID:	\$1590		dilution factor:	2.7

sample ID:	352831-3	Canister ID:	21220		dilution factor:	2.7
R.T.			Qual		as Toluene	as Toluene
(min)	Library/ID detected by GCMS-SCAN	CAS#	(out of 100)	peak area	ppbv	ug/m3
	There is NO extra peak detected at library match (Qual) greater than 80%				0.0	0.0
					0.0	0.0
	Toluene in TO-15 Standard (15ppbv)	3860313	NA	NA		

Sample ID:	352831-5	Canister ID:	315		dilution factor:	2.96
R.T.			Qual		as Toluene	as Toluene
(min)	Library/ID detected by GCMS-SCAN	CAS#	(out of 100)	peak area	ppbv	ug/m3
	There is NO extra peak detected at library match (Qual) greater than 80%				0.0	0.0
					0.0	0.0
Toluene in TO-15 Standard (15ppbv)				3860313	NA	NA

Report Comments

1) The scaned mass was between 33 to 450 amu and the match quality refers to the statistical probability that the compound detected in the sample is identified as a compound present in the NIST/EPA/NIH Mass Spectral Library 2014.

2) The closer the match value to 100, the more accurate the identification, consequently the lower the match value, the greater the error in the compound identification.

3) A compound is listed above if the library match quality was greater than 80%; Please note that 80% is a considered industry standard;
 The semi-quant results as toluene are estimated only (based on the responses of toluene);
 If the result divided by the dilution factor is greater than 125ppbv, this means the result is over the calibration range of toluene.

4) Envirolab Services is not NATA accredited for non specific GCMS scan analysis.

5) If the analytes have been reported in TO-15 report and Sulphur Speciation, they will not be included in this GCMS scan report



16-18 Hayden Court Myaree WA 6154 ph +61 8 9317 2505 lab@mpl.com.au www.mpl.com.au

Certificate of Analysis PFF0014

Client Details

Client	Envirolab (Sydney)
Contact	Jacinta Hurst
Address	12 Ashley St, Chatswood, NSW, 2067
Comula Dataila	

Sample Details

Your Reference	352831
Number of Samples	12 Filter, 3 SKC 226-17-3A
Date Samples Received	04/06/2024
Date Instructions Received	05/06/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data. Samples were analysed as received from the client. Results relate specifically to the samples as received. Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date Results Requested by	07/06/2024			
Date of Issue	07/06/2024			

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Authorisation Details

 Results Approved By
 Ben Carpenter, Metals Technician

 Michael Mowle, Inorganics Supervisor

Laboratory Manager

Michael Kubiak

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PFF0014-01	352831-7	Filter	29/05/2024	05/06/2024
PFF0014-02	352831-8	Filter	29/05/2024	05/06/2024
PFF0014-03	352831-9	Filter	29/05/2024	05/06/2024
PFF0014-04	352831-10	Filter	29/05/2024	05/06/2024
PFF0014-05	352831-11	SKC 226-17-3A	29/05/2024	05/06/2024
PFF0014-06	352831-12	Filter	29/05/2024	05/06/2024
PFF0014-07	352831-13	Filter	29/05/2024	05/06/2024
PFF0014-08	352831-14	Filter	29/05/2024	05/06/2024
PFF0014-09	352831-15	Filter	29/05/2024	05/06/2024
PFF0014-10	352831-16	SKC 226-17-3A	29/05/2024	05/06/2024
PFF0014-11	352831-17	Filter	29/05/2024	05/06/2024
PFF0014-12	352831-18	Filter	29/05/2024	05/06/2024
PFF0014-13	352831-19	Filter	29/05/2024	05/06/2024
PFF0014-14	352831-20	Filter	29/05/2024	05/06/2024
PFF0014-15	352831-21	SKC 226-17-3A	29/05/2024	05/06/2024

Acid Extractable Metals (Filter)

Envirolab ID	Units	PQL	PFF0014-01	PFF0014-06	PFF0014-11	
Your Reference			352831-7	352831-12	352831-17	
Date Sampled			29/05/2024	29/05/2024	29/05/2024	
Silver	µg/sample	0.50	<0.50	<0.50	<0.50	
Aluminium	µg/sample	2.0	<2.0	<2.0	<2.0	
Boron	µg/sample	5.0	<5.0	<5.0	<5.0	
Barium	µg/sample	0.50	<0.50	<0.50	<0.50	
Calcium	µg/sample	10	<10	<10	<10	
Cadmium	µg/sample	0.10	<0.10	<0.10	<0.10	
Cobalt	µg/sample	0.50	<0.50	<0.50	<0.50	
Chromium	µg/sample	0.50	<0.50	<0.50	<0.50	
Copper	µg/sample	0.50	<0.50	<0.50	<0.50	
Iron	µg/sample	5.0	<5.0	<5.0	<5.0	
Potassium	µg/sample	5.0	<5.0	<5.0	<5.0	
Lithium	µg/sample	0.50	<0.50	<0.50	<0.50	
Magnesium	µg/sample	10	<10	<10	<10	
Manganese	µg/sample	0.50	<0.50	<0.50	<0.50	
Molybdenum	µg/sample	1.0	<1.0	<1.0	<1.0	
Sodium	µg/sample	10	<10	<10	<10	
Nickel	µg/sample	1.0	<1.0	<1.0	<1.0	
Phosphorus	µg/sample	2.0	<2.0	<2.0	<2.0	
Lead	µg/sample	1.0	<1.0	<1.0	<1.0	
Sulfur	µg/sample	10	<10	<10	<10	
Antimony	µg/sample	10	<10	<10	<10	
Silicon	µg/sample	10	<10	<10	<10	
Tin	µg/sample	2.0	<2.0	<2.0	<2.0	
Strontium	µg/sample	0.50	<0.50	<0.50	<0.50	
Titanium	µg/sample	2.0	<2.0	<2.0	<2.0	
Vanadium	µg/sample	0.50	<0.50	<0.50	<0.50	
Zinc	µg/sample	2.0	<2.0	<2.0	<2.0	
Arsenic	µg/sample	0.50	<0.50	<0.50	<0.50	
Beryllium	µg/sample	0.010	<0.010	<0.010	<0.010	
Selenium	µg/sample	0.50	<0.50	<0.50	<0.50	
Thallium	µg/sample	1.0	<1.0	<1.0	<1.0	
Magnesium Oxide*	µg/sample	20	<20	<20	<20	
Sodium Hydroxide*	µg/sample	10	<10	<10	<10	

Envirolab ID	Units	PQL	PFF0014-05	PFF0014-10	PFF0014-15
Your Reference			352831-11	352831-16	352831-21
Date Sampled			29/05/2024	29/05/2024	29/05/2024
Mercury	µg/sample	0.010	<0.010	<0.010	<0.010

Acid Extractable Metals (SKC 226-17-3A)

Inorganic Acid Mists (Filter)

Envirolab ID Your Reference	Units	PQL	PFF0014-02 352831-8	PFF0014-03 352831-9	PFF0014-07 352831-13	PFF0014-08 352831-14	PFF0014-12 352831-18
Date Sampled			29/05/2024	29/05/2024	29/05/2024	29/05/2024	29/05/2024
Total Fluoride (as F)	µg/filter	10	<10.0	<10.0	<10.0	<10.0	<10.0
Hydrofluoric Acid	µg/filter	10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Fluoride	µg/filter	10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Hydrochloric acid	µg/filter	50	<50	[NA]	<50	[NA]	<50
Nitric Acid	µg/filter	10	<10	[NA]	<10	[NA]	<10
Phosphoric Acid	µg/filter	10	<10	[NA]	<10	[NA]	<10
Sulfuric Acid	µg/filter	50	<50	[NA]	<50	[NA]	<50
Envirolah ID	Unite	POI	DEE0014-13				
Your Reference	Units	FQL	352831-19				
Date Sampled			29/05/2024				
Total Fluoride (as F)	µg/filter	10	<10.0				
Hydrofluoric Acid	µg/filter	10.0	<10.0				
Fluoride	µg/filter	10.0	<10.0				
Hydrochloric acid	µg/filter	50	[NA]				
Nitric Acid	µg/filter	10	[NA]				
Phosphoric Acid	µg/filter	10	[NA]				
Sulfuric Acid	µg/filter	50	[NA]				

Inorganic Mists (Filter)

Envirolab ID	Units	PQL	PFF0014-04	PFF0014-09	PFF0014-14
Your Reference			352831-10	352831-15	352831-20
Date Sampled			29/05/2024	29/05/2024	29/05/2024
Hexavalent Chromium	µg/filter	0.050	<0.050	<0.050	0.054

Method Summary

Method ID	Methodology Summary
Calc	Calculation
INORG-118_FILTER_ OSHA	Hexavalent Chromium by Ion Chromatographic separation and colourimetric determination. For air sampling media, samples are extracted with an alkaline buffered solution as per OSHA.
METALS-020	Determination of various metals by ICP-OES.
METALS-020/022	Determination of various metals by ICP-OES or ICP-MS.
METALS-021_VAP	Determination of Mercury by Cold Vapour AAS.
METALS-022	Determination of various metals by ICP-MS.Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements.Salt forms and/or anion/cation forms (e.g. FeO, PbO, ZnO, BO3) are determined stoichiometrically from the base metal concentration.
NIOSH 7906	The sample is desorbed in eluent and analysed for Fluoride Gas by Ion Chromatography as per NIOSH 7906.
NIOSH 7907	The sample is desorbed in eluent and analysed for Chloride, Bromide and Nitrate ions by Ion Chromatography as per NIOSH 7907.
NIOSH 7908	The sample is extracted in Na2CO3/NaHCO3 eluent and analysed for Sulphate and Phosphate ion's as per NIOSH 7908.

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of TLVs and BEIs Threshold Limits by ACGIH.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PFF0014

Client Details

Client	Envirolab (Sydney)
Your Reference	352831
Date Issued	07/06/2024

Recommended Holding Time Compliance

Recommended holding time exceedances exist - See detailed list below

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PFF0014

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Metals OHS Filter	1, 6, 11	29/05/2024	06/06/2024	06/06/2024	Yes
Metals OHS (LL) Filter	1, 6, 11	29/05/2024	06/06/2024	07/06/2024	Yes
Hg in Air SKC 226-17-3A	5, 10, 15	29/05/2024	06/06/2024	06/06/2024	Yes
Fluoride Particulate Filter	2-3, 7-8, 12-13	29/05/2024	07/06/2024	07/06/2024	Yes
H2SO4 Acid Mist Filter	2, 7, 12	29/05/2024	07/06/2024	07/06/2024	Yes
H3PO4 Acid Mist Filter	2, 7, 12	29/05/2024	07/06/2024	07/06/2024	Yes
HCI Acid Mist Filter	2, 7, 12	29/05/2024	07/06/2024	07/06/2024	Yes
HNO3 Acid Mist Filter	2, 7, 12	29/05/2024	07/06/2024	07/06/2024	Yes
Hydrofluoric Acid as HF Filter	2-3, 7-8, 12-13	29/05/2024	07/06/2024	07/06/2024	Yes
Cr6+ (LL) Filter	4, 9, 14	29/05/2024	07/06/2024	07/06/2024	No

Quality Control PFF0014

METALS-022 | Acid Extractable Metals (Filter) | Batch BFF0687

Analyte	Units	POL	Blank	LCS %
,				
Arsenic	µg/sample	0.50	<0.50	98.0
Beryllium	µg/sample	0.010	<0.010	85.3
Selenium	µg/sample	0.50	<0.50	106
Thallium	µg/sample	1.0	<1.0	90.2

METALS-020/022 | Acid Extractable Metals (Filter) | Batch BFF0688

				LCS %
Analyte	Units	PQL	Blank	
Aluminium	µg/sample	2.0	<2.0	91.9
Antimony	µg/sample	10	<10	102
Barium	µg/sample	0.50	<0.50	98.2
Boron	µg/sample	5.0	<5.0	89.1
Cadmium	µg/sample	0.10	<0.10	95.0
Calcium	µg/sample	10	<10	90.8
Chromium	µg/sample	0.50	<0.50	96.9
Cobalt	µg/sample	0.50	<0.50	97.0
Copper	µg/sample	0.50	<0.50	98.1
Iron	µg/sample	5.0	<5.0	101
Lead	µg/sample	1.0	<1.0	96.0
Lithium	µg/sample	0.50	<0.50	105
Magnesium	µg/sample	10	<10	90.7
Manganese	µg/sample	0.50	<0.50	94.0
Molybdenum	µg/sample	1.0	<1.0	95.3
Nickel	µg/sample	1.0	<1.0	98.7
Phosphorus	µg/sample	2.0	<2.0	90.2
Potassium	µg/sample	5.0	<5.0	96.5
Silicon	µg/sample	10	<10	113
Silver	µg/sample	0.50	<0.50	89.6
Sodium	µg/sample	10	<10	89.2
Strontium	µg/sample	0.50	<0.50	94.8
Sulfur	µg/sample	10	<10	94.9
Tin	µg/sample	2.0	<2.0	94.8
Titanium	µg/sample	2.0	<2.0	90.4
Vanadium	µg/sample	0.50	<0.50	97.0
Zinc	µg/sample	2.0	<2.0	96.4
Magnesium Oxide	µg/sample	20	<20	90.7
Sodium Hydroxide	µg/sample	10	<10	89.1

METALS-021_VAP | Acid Extractable Metals (SKC 226-17-3A) | Batch BFF0616

Analyte	Units	PQL	Blank	LCS %
Mercury	µg/sample	0.010	<0.010	104
NIOSH 7906 Inorganic	Acid Mists	(Filter)	Batch BFF0838	
				LCS %

Analyte	Units	PQL	Blank	
Hydrofluoric Acid	µg/filter	10.0	<10.0	102

NIOSH 7906 | Inorganic Acid Mists (Filter) | Batch BFF0839

Analyte	Units	PQL	Blank	LCS %
Fluoride	µg/filter	10.0	<10.0	102

Quality Control PFF0014

NIOSH 7908 | Inorganic Acid Mists (Filter) | Batch BFF0912

Analyte	Units	PQL	Blank	LCS %
Phosphoric Acid	µg/filter	10	<10	111

NIOSH 7907 | Inorganic Acid Mists (Filter) | Batch BFF0944

Analyte	Units	PQL	Blank	LCS %
Hydrochloric acid	µg/filter	50	<50	105
Nitric Acid	µg/filter	10	<10	99.5

NIOSH 7908 | Inorganic Acid Mists (Filter) | Batch BFF0990

Analyte	Units	PQL	Blank	LCS %
Sulfuric Acid	µg/filter	50	<50	105

INORG-118_FILTER_OSHA | Inorganic Mists (Filter) | Batch BFF0888

Analyte	Units	PQL	Blank	LCS %
Hexavalent Chromium	µg/filter	0.050	<0.050	115