

# Landfill Gas Monitoring Report

EPL 13366

February 2023



## *Document information*

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### *Prepared for:*

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## *Acknowledgement of Country*

4Pillars acknowledges the Traditional Owners of the land on which this study was conducted, the people of the Gundungurra and Tharawal nations. We pay our respects to their Elders past and present.

## Introduction and background

### *Objectives and scope of work*

Bowral Landfill Pty Ltd engaged 4Pillars Environmental Consulting Pty Ltd (4Pillars) to conduct landfill gas monitoring for Bowral Waste Centre (8 Kiama Street, Bowral, NSW – the Site), to ensure compliance with Environment Protection Licence (EPL) 13366.

4Pillars' scope of work was as follows:

- Measure landfill gas accumulation, in accordance with licence requirements;
- Assess data against relevant licence limits (where they exist); and
- Prepare the monitoring report.

### *Site details and monitoring requirements*

The subject Site is 8 Kiama Street, Bowral, NSW, 2576 – part lots 13 and 14 DP1022146. The landfill site is located within the Wingecarribee Shire local government area (LGA). The landfill site falls within the IN1 (general industrial) development zone under the *Wingecarribee Local Environment Plan 2010*. Surrounding land zoning includes IN1 and IN2 (light industrial), R3 and R2 (medium and low density residential), RU4 (primary production small lots) and RE1 (public recreation). The majority of the surrounding land uses are agricultural or industrial, such as horticulture, landscaping supply, self-contained storage, sewerage treatment, car repairs, etc. The nearest residential area is medium density and occurs immediately to the east of the Site, along Railway Parade. Residential and business receivers are located to the east and west of the Site (refer Figure 1).

The landfill licence was transferred to Bowral Waste Centre Pty Ltd (the Licensee) in July 2019. The site was not operational until November 2019. Since the commencement, the site progressively reached full scale of operations in February 2020.

As noted above, the Site is subject to EPL 13366 (the EPL). Conditions P1.1 and M2.2 of the EPL require landfill gas (methane - CH<sub>4</sub>) to be monitored every six months in two locations;

1. anywhere intermediate or final cover has been placed (EPL point 9); and
2. inside all buildings within 250 m of deposited waste (EPL point 10).

Conditions R2.3 and R2.4 of the EPL detail notification requirements if methane is detected above 500 ppm (v/v) (surface gas monitoring), or above 1% (v/v) (gas accumulation monitoring).

## Monitoring methodology

Where relevant, the sampling and analysis program was undertaken in accordance with the *NSW EPA Environmental Guidelines: Solid Waste Landfills (2016)* and in accordance with the Site Landfill Environmental Management Plan (LEMP).

### *Monitoring*

Neither intermediate nor final cover was placed in the landfill on the day of monitoring; therefore, landfill gas measurements were not taken on the active cell. As per the Site's EPL, the measurement of methane in buildings within 250 m of deposited waste (see Figure 2) was undertaken.

Attended landfill gas monitoring was carried out on 25 January 2023 by two qualified and experienced environmental scientists (Ms I Ehighibe and Ms M Shrestha) using a portable gas analyser (see details below). Accumulated landfill gas measurements were taken inside residences and businesses on Kiama Street, Alcorn Street, Loftus Street, Carrington Street, Belmore Street, and Railway Parade. All buildings were approached, but not all were accessible on the day of sampling, either because the occupant refused access, or the occupier was not present. Where measurements were possible, they were taken within the first enclosed space encountered inside the door of the property (generally the living room or hallway). A total of 43 individual readings were obtained.

### *Description of Gas Analyser*

A calibrated Geotech GA5000 portable landfill and contaminated land gas analyser was used for the monitoring. The GA5000 unit measures methane gas and has a range of 0% - 100% (v/v) with typical accuracy of ±0.5% (vol) at 0-70% methane and ±1.5% (vol) at 70-100% methane. The GA5000 unit is suitable for the requirements of the EPL.

## Results and discussion

### *Landfill gas*

Tabulated accumulated landfill gas measurements for each of the accessible residences are provided in Appendix 2. The results were consistently ranging between 0.0-0.1% v/v. Therefore, no methane accumulation was identified in any structures within 250 m of the landfill, indicating that the facility was below the threshold specified in Condition R2.3 and R2.4 of EPL 13366. As such, no notifications were required.

## Conclusion

### *Compliance*

The result of the attended landfill gas monitoring indicate that the Site is compliant with its legal obligations related to landfill gas management.

## Limitations of this assessment

To the best of our knowledge and based on information provided to us by the client or their representatives, the information contained in this report is accurate at the date of issue. 4Pillars has used a degree of care and skill ordinarily exercised in similar investigations by reputable members of the environmental sector in Australia. No other warranty, expressed or implied, is made or intended. The opinions and judgements expressed in this report should not be construed as legal opinions or advice. 4Pillars is also not responsible or liable for any third-Party use or reliance on this report.

## Appendices

Appendix 1. Figures

Appendix 2. Landfill gas measurement results





## Site details



Figure 1: Simulated oblique image showing Site layout, key features and nearby sensitive receivers.



## Gas monitoring

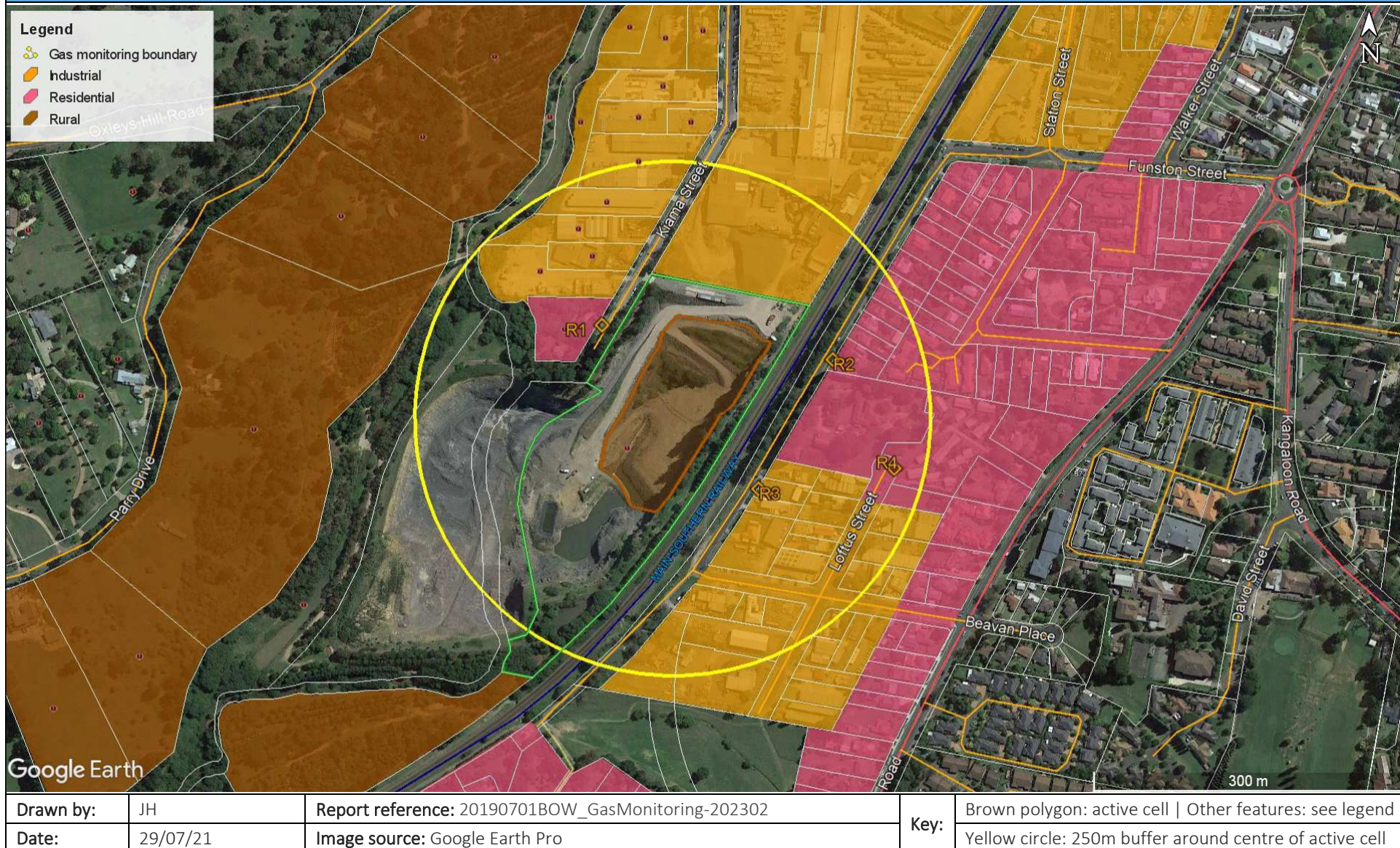


Figure 2: Figure showing all properties with buildings within a 250 m radius of deposited waste. The purple and light green lots fall within the scope of gas monitoring.

## Appendix 2 – Landfill gas measurement results

### Gas Accumulation Monitoring

EPL 13366 Monitoring Point 10

Sample ID	Date sampled	Street number	Street	Access (Y/N)	Methane (% v/v)
1	25/01/2023	10/2--4	Carrington Street	Y	0
2	25/01/2023	1/2--4	Carrington Street	Y	0.1
4	25/01/2023	3/2--4	Carrington Street	Y	0.1
6	25/01/2023	5/2--4	Carrington Street	Y	0
7	25/01/2023	6/2--4	Carrington Street	Y	0
12	25/01/2023	12/2--4	Carrington Street	Y	0
13	25/01/2023	17	Belmore Street	Y	0
17	25/01/2023	12	Railway Parade	Y	0
18	25/01/2023	14	Railway Parade	Y	0
20	25/01/2023	18	Railway Parade	Y	0.1
21	25/01/2023	20	Railway Parade	Y	0.1
22	25/01/2023	22	Railway Parade	Y	0.1
24	25/01/2023	2/-24	Railway Parade	Y	0
29	25/01/2023	38	Railway Parade	Y	0
30	25/01/2023	40	Railway Parade	Y	0.1
28	25/01/2023	2	Alcorn Street	Y	0
31	25/01/2023	1/-3	Alcorn Street	Y	0.1
32	25/01/2023	5	Alcorn Street	Y	0.1
33	25/01/2023	6A	Alcorn Street	y	0.1
34	25/01/2023	6B	Alcorn Street	Y	0.1
35	25/01/2023	1/8 Vet	Alcorn Street	y	0.1
40	25/01/2023	2/-12	Loftus Street	Y	0.1
43	25/01/2023	4/-12	Loftus Street	Y	0.1
47	25/01/2023	14-16	Loftus Street	Y	0.1
49	25/01/2023	1/-26	Loftus Street	Y	0.1
56	25/01/2023	8/-26	Loftus Street	Y	0.1



Sample ID	Date sampled	Street number	Street	Access (Y/N)	Methane (% v/v)
59	25/01/2023	11/-26	Loftus Street	Y	0.1
61	25/01/2023	13/26	Loftus Street	Y	0.1
62	25/01/2023	13	Loftus Street	Y	0.1
63	25/01/2023	14/26	Loftus Street	Y	0.1
65	25/01/2023	16/26	Loftus Street	Y	0.1
66	25/01/2023	17/26	Loftus Street	Y	0.1
69	25/01/2023	20/26	Loftus Street	Y	0.1
70	25/01/2023	21	Loftus Street	Y	0.1
75	25/01/2023	1	Kiama Street	Y	0
76	25/01/2023	3	Kiama Street	Y	0
77	25/01/2023	5	Kiama Street	Y	0
78	25/01/2023	6-7 Timber yard	Kiama Street	Y	0
79	25/01/2023	1/-8	Kiama Street	Y	0
80	25/01/2023	2/-8	Kiama Street	Y	0
83	25/01/2023	5/-8	Kiama Street	Y	0
86	25/01/2023	8/-8	Kiama Street	Y	0
95	25/01/2023	Austral Bricks	Kiama Street	Y	0

# Landfill Gas Monitoring Report

EPL 13366

July 2023



## *Document information*

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### *Prepared for:*

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## Results and discussion

### *Landfill gas*

Tabulated accumulated landfill gas measurements for each of the accessible residences are provided in Appendix 2. The results were consistent across all residences with a result of 0.0% v/v. Therefore, no methane accumulation was identified in any structures within 250 m of the landfill, indicating that the facility was below the threshold specified in Condition R2.3 and R2.4 of EPL 13366. As such, no notifications were required.

## Conclusion

### *Compliance*

The result of the attended landfill gas monitoring indicate that the Site is compliant with its legal obligations related to landfill gas management.

## Limitations of this assessment

To the best of our knowledge and based on information provided to us by the client or their representatives, the information contained in this report is accurate at the date of issue. 4Pillars has used a degree of care and skill ordinarily exercised in similar investigations by reputable members of the environmental sector in Australia. No other warranty, expressed or implied, is made or intended. The opinions and judgements expressed in this report should not be construed as legal opinions or advice. 4Pillars is also not responsible or liable for any third-Party use or reliance on this report.

## Appendices

Appendix 1. Figures

Appendix 2. Landfill gas measurement results





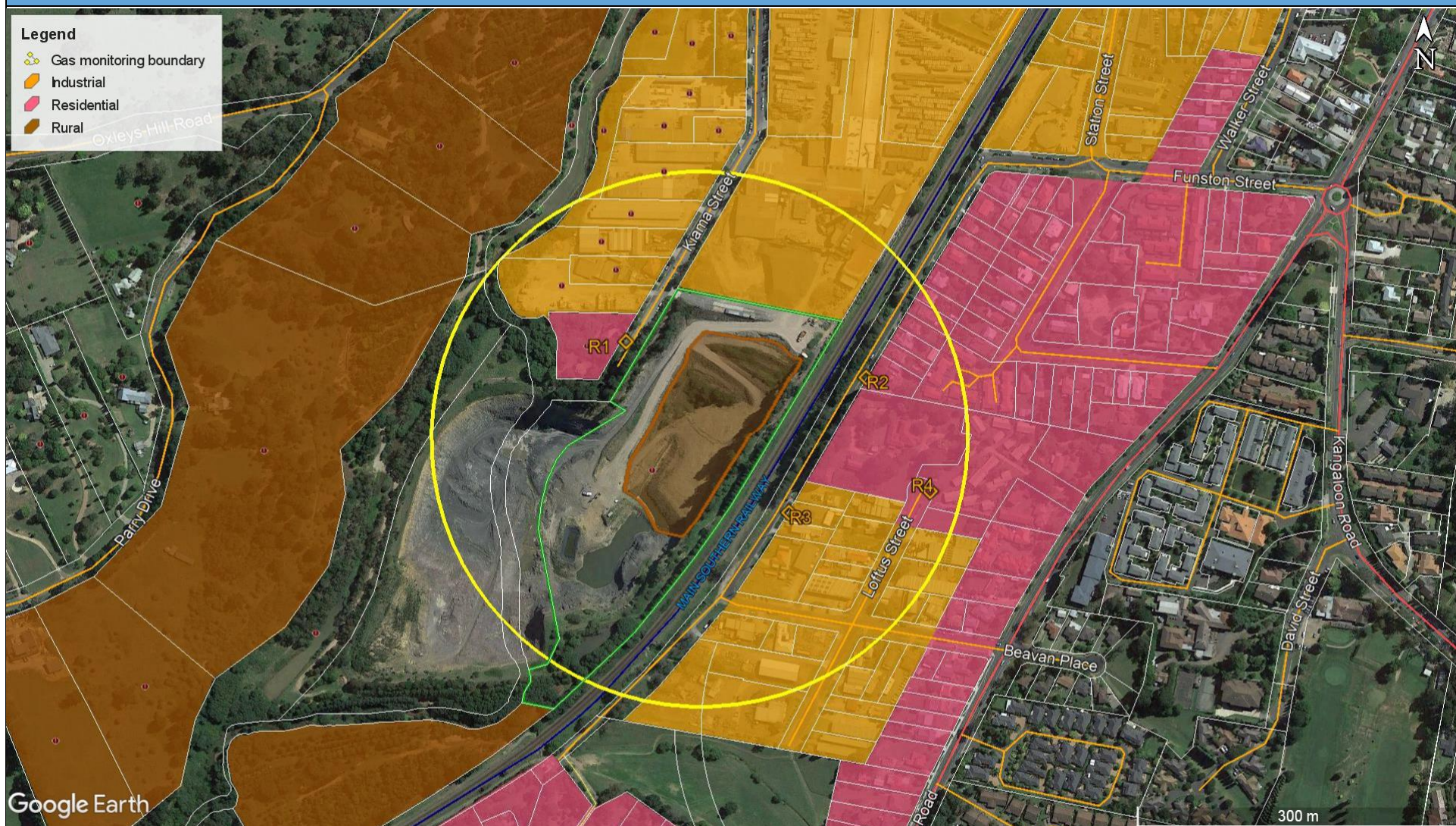
## Site details



Figure 1: Simulated oblique image showing Site layout, key features and nearby sensitive receivers.



## Gas monitoring



Drawn by:	JH	Report reference:	20190701BOW_GasMonitoring-202302	Key:	Brown polygon: active cell   Other features: see legend
Date:	29/07/21	Image source:	Google Earth Pro		Yellow circle: 250m buffer around centre of active cell

Figure 2: Figure showing all properties with buildings within a 250 m radius of deposited waste. The purple and light green lots fall within the scope of gas monitoring.

## Appendix 2 – Landfill gas measurement results

### Gas Accumulation Monitoring

#### EPL 13366 Monitoring Point 10

Sample ID	Date sampled	Street number	Street	Access (Y/N)	Methane (% v/v)
7	25/07/2023	6/2--4	Carrington Street	Y	0
9	25/07/2023	8/2--4	Carrington Street	Y	0
11	25/07/2023	11/2--4	Carrington Street	Y	0
13	25/07/2023	17	Belmore Street	Y	0
18	25/07/2023	14	Railway Parade	Y	0
20	25/07/2023	18	Railway Parade	Y	0
21	25/07/2023	20	Railway Parade	Y	0
26	25/07/2023	4/24	Railway Parade	Y	0
30	25/07/2023	40	Railway Parade	Y	0
31	25/07/2023	1/3	Alcorn Street	Y	0
34	25/07/2023	6B	Alcorn Street	Y	0
35	25/07/2023	1/8 Vet	Alcorn Street	y	0
38	25/07/2023	6	Loftus Street	Y	0
41	25/07/2023	2/12	Loftus Street	Y	0
43	25/07/2023	4/12	Loftus Street	Y	0
47	25/07/2023	14-16	Loftus Street	Y	0
51	25/07/2023	3/26	Loftus Street	Y	0
56	25/07/2023	8/26	Loftus Street	Y	0
63	25/07/2023	14/26	Loftus Street	Y	0
64	25/07/2023	15/26	Loftus Street	Y	0
69	25/07/2023	20/26	Loftus Street	Y	0
70	25/07/2023	21	Loftus Street	Y	0
77	25/07/2023	5	Kiama Street	Y	0
79	25/07/2023	1/8	Kiama Street	Y	0
80	25/07/2023	2/8	Kiama Street	Y	0
83	25/07/2023	5/8	Kiama Street	Y	0
84	25/07/2023	6/8	Kiama Street	Y	0



Sample ID	Date sampled	Street number	Street	Access (Y/N)	Methane (% v/v)
85	25/07/2023	7/8	Kiama Street	Y	0
86	25/07/2023	8/8	Kiama Street	Y	0
87	25/07/2023	9/8	Kiama Street	Y	0
88	25/07/2023	10/8	Kiama Street	Y	0
95	25/07/2023	Austral Bricks	Kiama Street	Y	0