Our Ref C5148/25/E/GM
22nd August 2025

50 Orchard Street,
Dewsbury,
West Yorkshire,
WF12 9LH

For the attention of Irfan Patel,

Dear Sir,

Ref: Gas Monitoring at Land Adjoining 50 Orchard Street.

Further to our report on a geo-environmental investigation (C5148/25/E/7872) which was presented in August 2025, we have now completed the gas monitoring and present our findings.

Monitoring

Gas monitoring standpipes were installed to between 2.0m and 3.0m depth in boreholes WS01, WS02 and WS04, the locations of which are provided on the site plan presented as Appendix 1 of the geo-environmental report. Visits were made to the site between the 28th July and the 12th September 2025. The results of this work are tabulated below.

Table 1: Gas Monitoring

Location	Date	CH_4 (%)	CO_2 (%)	O_2 (%)	Flow	Barometric Pressure (mb)	Water Level (m)	Standpipe Depth (m)
WS01	28.07.25	0.0	2.5	18.9	0.0	1017 ↓	2.56	3.00
	04.08.25	0.0	1.0	20.4	0.0	1010 ↓	2.52	
	13.08.25	0.0	1.1	20.0	0.0	1013 ↓	2.60	
	20.08.25	0.0	2.0	19.1	0.0	1016 ↓	2.61	
	29.08.25	0.0	1.9	19.2	0.0	990 ↑	2.62	
	12.09.25	0.0	0.0	20.7	0.0	1004 ↑	2.60	
WS02	28.07.25	0.0	4.3	17.0	0.0	1017 ↓	Dry	2.50
	04.08.25	0.0	0.4	21.0	0.0	1010 ↓	Dry	
	13.08.25	0.0	0.4	20.8	0.0	1013 ↓	Dry	
	20.08.25	0.0	2.3	19.2	0.0	1016 ↓	Dry	
	29.08.25	0.0	2.5	19.0	0.0	990 ↑	Dry	
	12.09.25	0.0	0.0	20.8	0.0	1004 ↑	Dry	
WS04	28.07.25	0.0	3.5	17.0	0.0	1017 ↓	1.29	2.00
	04.08.25	0.0	2.8	18.5	0.0	1010 ↓	1.71	
	13.08.25	0.0	2.9	18.9	0.0	1013 ↓	1.50	
	20.08.25	0.0	2.4	19.1	0.0	1016 ↓	1.58	
	29.08.25	0.0	2.2	19.3	0.0	990 ↑	1.61	
	12.09.25	0.0	0.0	20.9	0.0	1004 ↑	1.81	

↑ rising pressure ↓ falling pressure → steady pressure

The monitoring visits were undertaken using a GFM Series (serial No 13747/270525) which was last calibrated on the 27th May 2025.

Gas Concentrations

With respect to ground gas, the results of the completed monitoring regime indicated negligible (0.0%) methane, with concentrations of carbon dioxide ranging between 0.0% and 4.3% in association with oxygen levels of between 17.0% and 21.0%. It should be appreciated that on non-contaminated sites there is generally about 20% by volume of oxygen, associated with low levels of carbon dioxide. In addition, a maximum flow rate of 0.0 litres per hour was recorded, as such, a presumed value of 0.1% will be employed in the any calculations.

The principal driving force for initiating the movement of gas in the ground is a change in barometric pressure. The most onerous gas condition on a site is usually observed on days of low or falling barometric pressure, preferably below 1000mb. It has been noted that measurements undertaken solely during high pressure conditions may be of lesser value. At this site the readings undertaken to date were at atmospheric pressures of between 990mb and 1017mb.

In view of the above, it may be appreciated that the continued gas monitoring has revealed no increases in methane concentrations, carbon dioxide or flow rates. Moreover, the fifth visit took place during a period of barometric pressure below 1000mb. Therefore, the risk assessment and remediation strategy provided in the geo-environmental report should be considered with the comments below.

Risk Assessment

In order to establish the gas screening value (GSV) for carbon dioxide or methane, the maximum gas concentration (expressed as a decimal) is multiplied by the borehole flow rate (l/hr). In this case 0.0% (0.000) methane was recorded along with 4.3% (0.043) carbon dioxide, in association with a maximum flow rate of 0.1 l/hr. This results in a negligible GSV for methane and a GSV of 0.0043 l/hr for carbon dioxide.

In accordance with Table 8.5, *Modified Wilson and Card classification* of the CIRIA report C665, *Assessing risks posed by ground gasses to building,* the site may be characterised as *Characteristic Situation Level 1*. It is therefore considered that there is a very low risk of harm to end users and site operatives and no special precautionary measures are required in accordance to Table 8.6, *Typical scope of gas protection measures,* of CIRIA report C665.

With regard to the number of monitoring visits required reference is made to Tables 5.5a and 5.5b of CIRIA report C665 (2007)[1].

[1] Adapted from tables 5.5a and 5.5b of CIRIA C665, 2007, *Assessing risks posed by hazardous ground gas to buildings, p60.*

Accepting that the proposed development is of high sensitivity (residential with gardens) and that the generation potential is very low, these tables suggest that 6 readings could be undertaken over a period of at least 3 months. In this case, a total of 6 monitoring visits were undertaken over a 3 month time period as per the guidance.

In view of the above it is considered that with respect to gas monitoring, the site is fully characterised.

Remediation Strategy for Ground Gas

As a consequence of the above, the site may be characterised as *Characteristic Situation Level 1*. This conclusion was provisionally considered in the geo-environmental report. In this instance, it should be appreciated that the final monitoring regime has reinforced the characterisation of a low risk. As such, no specific remediation will be required to protect against bulk ground gases.

References

- British Standards Institution (2013), BS 8576 Guidance on Investigations for Ground Gas – Permanent Gases and Volatile Organic Compounds.
- British Standards Institution (2015 +A1:2019) BS8485: *Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings,* B.S.I., London.
- CIRIA Report C665, *Assessing risks posed by ground gasses to building.*

We trust that this information is of interest and should you have any other requirements do not hesitate to contact us.

For Rogers Geotechnical Services Ltd,

Yours Faithfully,

Redacted

Steven Hale BSc FGS
Geo-environmental Engineer

Post Fieldworks Discrete Well Monitoring Site Record

Job No:	C/5148/25/E/7872	Client:	Irfan Patel	Visit:	1	Of	6
Site:	50 Orchard Street Dewsbury WF12 9LH	Date:	28.07.2025				

RGS Environmental Geotechnical Specialists

Rogers Geotechnical Services Ltd , Offices 1 & 2 Barncliffe Business Park, Shelley, Huddersfield, HD8 8LU

Tel: 01484 604 354
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Location ID	Methane (%)		Carbon Dioxide (%)		Carbon Monoxide (ppm)		Hydrogen Sulphide (ppm)		Oxygen (%)		VOCs (ppm)		Flowrate (l/hr)		Water Depth (m)	Well Depth (m)	Installed Depth (m)	Comments
	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Minimum	Steady	Peak	Steady	Peak				
1	0.0		2.5		0		0		18.9				0.0		2.56		3.24	
2	0.0		4.3		0		0		17.0				0.0		DRY		2.51	
4	0.0		3.3		0		0		17.0				0.0		1.29		2.18	
Max.	0.0	0.0	4.3	0.0	0	0	0	0	18.9	0.0	0	0	0.0	0.0	2.56			
Min.	0.0	0.0	2.5	0.0	0	0	0	0	17.0	0.0	0	0	0.0	0.0	1.29			

ND - Not detected DRY - No water in well NM - Not Monitored (State Reason in comments)

Meteorological & Site Information	
General Ground Condition	Dry
Precipitation	0l/m2 in last 12 hours
Wind	14
Temperature	18
Barometric Pressure	
Pressure Trend	

Monitor Technical Specifications								
Gas Monitor Used:	GFM Series							
Serial No:	13747/270525							
Monitor Gas Range	CH_4	5>60	CO_2	5<40	O_2	21.2		
Gas Flow Range	0-10 l/hr							
Date of Calibration	27.05.2025							
PID Monitor (If used)								
PID Monitor Serial No.								
Calibration Date.								

Monitoring Period Summary (All Visits)	Peak	Steady
Max CH_4	0.0	0.0
Max CO_2	4.3	0.0
Max CO	0	0
Max H_2S	0	0
Max O_2	21.0	0.0
Min O_2	19.1	0.0
Flow rate	0.0	0.0

	Start	End
Barometric Pressure	1016	1017

Operative Details.	M.Tuck

Post Fieldworks Discrete Well Monitoring Site Record

Job No:	C/5148/25/E/7872	Client:	Irfan Patel	Visit:	2	Of	6
Site:	50 Orchard Street Dewsbury WF12 9LH	Date:	04.08.2025				

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Location ID	Methane (%)		Carbon Dioxide (%)		Carbon Monoxide (ppm)		Hydrogen Sulphide (ppm)		Oxygen (%)		VOCs (ppm)		Flowrate (l/hr)		Water Depth (m)	Well Depth (m)	Installed Depth (m)	Comments
	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Minimum	Steady	Peak	Steady	Peak				
1	0.0		1.0		0		0		20.4				0.0		2.52		3.24	
2	0.0		0.4		0		0		21.0				0.0		DRY		2.59	
4	0.0		2.8		0		0		18.5				0.0		1.71		2.18	
Max.	0.0	0.0	2.8	0.0	0	0	0	0	21.0	0.0	0	0	0.0	0.0	2.52			
Min.	0.0	0.0	0.4	0.0	0	0	0	0	18.5	0.0	0	0	0.0	0.0	1.71			

ND - Not detected DRY - No water in well NM - Not Monitored (State Reason in comments)

Meteorological & Site Information	
General Ground Condition	DRY
Precipitation	3l/m2 in last 12 hours
Wind	25
Temperature	20
Barometric Pressure	
Pressure Trend	

Monitor Technical Specifications								
Gas Monitor Used:	GFM Series							
Serial No:	13747/270525							
Monitor Gas Range	CH_4	5>60	CO_2	5<40	O_2	21.2		
Gas Flow Range	0-10 l/hr							
Date of Calibration	27.05.2025							
PID Monitor (If used)								
PID Monitor Serial No.								
Calibration Date.								

Monitoring Period Summary (All Visits)	Peak	Steady
Max CH_4	0.0	0.0
Max CO_2	2.9	0.0
Max CO	0	0
Max H_2S	0	0
Max O_2	21.0	0.0
Min O_2	19.1	0.0
Flow rate	0.0	0.0

	Start	End
Barometric Pressure	1010	1010

Operative Details.	M.Tuck

Post Fieldworks Discrete Well Monitoring Site Record

Job No:	C/5148/25/E/7872	Client:	Irfan Patel	Visit:	3	Of	6
Site:	50 Orchard Street Dewsbury WF12 9LH	Date:	13.08.2025				

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Location ID	Methane (%)		Carbon Dioxide (%)		Carbon Monoxide (ppm)		Hydrogen Sulphide (ppm)		Oxygen (%)		VOCs (ppm)		Flowrate (l/hr)		Water Depth (m)	Well Depth (m)	Installed Depth (m)	Comments
	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Minimum	Steady	Peak	Steady	Peak				
1	0.0		1.1		0.0		0		20.0				0.0		2.60		3.24	
2	0.0		0.4		0.0		0		20.8				0.0		DRY		2.59	
4	0.0		2.9		0.0		0		18.9				0.0		1.50		2.18	
Max	0.0	0.0	2.9	0.0	0.0	0.0	0	0	20.8	0.0	0	0	0.0	0.0				
Min.	0.0	0.0	0.4	0.0	0.0	0.0	0	0	18.9	0.0	0	0	0.0	0.0				

ND - Not detected DRY - No water in well NM - Not Monitored (State Reason in comments)

Meteorological & Site Information	
General Ground Condition	Dry
Precipitation	0l/m2 in last 12 hours
Wind	7
Temperature	26
Barometric Pressure	
Pressure Trend	

Monitor Technical Specifications								
Gas Monitor Used:	GFM Series							
Serial No:	13747/270525							
Monitor Gas Range	CH_4	5>60	CO_2	5<40	O_2	21.2		
Gas Flow Range	0-10 l/hr							
Date of Calibration	27.05.2025							
PID Monitor (If used)								
PID Monitor Serial No.								
Calibration Date.								

Monitoring Period Summary (All Visits)	Peak	Steady
Max CH_4	0.0	0.0
Max CO_2	2.9	0.0
Max CO	0	0
Max H_2S	0	0
Max O_2	21.0	0.0
Min O_2	19.1	0.0
Flow rate	0.0	0.0

	Start	End
Barometric Pressure	1013	1013

Operative Details.	M.Tuck

Post Fieldworks Discrete Well Monitoring Site Record

Job No:	C/5148/25/E/7872	Client:	Irfan Patel	Visit:	4	Of	6
Site:	50 Rogers Geotechnical Services Ltd , Offices 1 & 2 Barncliffe Business Park, Shelley, Huddersfield, HD8 8LU	Date:	20.08.2025				

Environmental Geotechnical Specialists

Tel: 01484 604 354
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Location ID	Methane (%)		Carbon Dioxide (%)		Carbon Monoxide (ppm)		Hydrogen Sulphide (ppm)		Oxygen (%)		VOCs (ppm)		Flowrate (l/hr)		Water Depth (m)	Well Depth (m)	Installed Depth (m)	Comments
	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Minimum	Steady	Peak	Steady	Peak				
1	0		2		0		0		19.1				0		2.61		3.14	
2	0		2.3		0		0		19.2				0		DRY		2.59	
4	0		2.4		0		0		19.1				0		1.58		2.18	
Max	0	0	2.4	0	0	0	0	0	19.2	0	0	0	0	0	2.61			
Min.	0	0	2	0	0	0	0	0	19.1	0	0	0	0	0	1.58			

ND - Not detected DRY - No water in well NM - Not Monitored (State Reason in comments)

Meteorological & Site Information	
General Ground Condition	DRY
Precipitation	0
Wind	4
Temperature	15
Barometric Pressure	
Pressure Trend	

Monitor Technical Specifications								
Gas Monitor Used:	GFM Series							
Serial No:	13747/270525							
Monitor Gas Range	CH_4	5>60	CO_2	5<40	O_2	21.2		
Gas Flow Range	0-10 l/hr							
Date of Calibration	27.05.2025							
PID Monitor (If used)								
PID Monitor Serial No.								
Calibration Date.								

Monitoring Period Summary (All Visits)	Peak	Steady
Max CH_4	0.0	0.0
Max CO_2	2.9	0.0
Max CO	0	0
Max H_2S	0	0
Max O_2	21.0	0.0
Min O_2	19.1	0.0
Flow rate	0.0	0.0

	Start	End
Barometric Pressure	1016	1016

Operative Details.	M.Tuck

Post Fieldworks Discrete Well Monitoring Site Record

Job No:	C/5148/25/E/7872	Client:	Irfan Patel	Visit:	5	Of	6
Site:	50 Orchard Street Dewsbury WF12 9LH	Date:	29.08.2025				

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Location ID	Methane (%)		Carbon Dioxide (%)		Carbon Monoxide (ppm)		Hydrogen Sulphide (ppm)		Oxygen (%)		VOCs (ppm)		Flowrate (l/hr)		Water Depth (m)	Well Depth (m)	Installed Depth (m)	Comments
	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Minimum	Steady	Peak	Steady	Peak				
1	0		1.9		0		0		19.2				0		2.62		3.15	
2	0		2.5		0		0		19				0		DRY		2.59	
4	0		2.2		0		0		19.3				0		1.61		2.18	
Max																		
Min.																		

ND - Not detected DRY - No water in well NM - Not Monitored (State Reason in comments)

Meteorological & Site Information	
General Ground Condition	DRY
Precipitation	0.8l/m2 in last 6 hours
Wind	12
Temperature	17
Barometric Pressure	
Pressure Trend	

Monitor Technical Specifications								
Gas Monitor Used:	GFM Series							
Serial No:	13747/270525							
Monitor Gas Range	CH_4	5>60	CO_2	5<40	O_2	21.2		
Gas Flow Range	0-10 l/hr							
Date of Calibration	27.05.2025							
PID Monitor (If used)								
PID Monitor Serial No.								
Calibration Date.								

Monitoring Period Summary (All Visits)	Peak	Steady
Max CH_4	0.0	0.0
Max CO_2	2.9	0.0
Max CO	0	0
Max H_2S	0	0
Max O_2	21.0	0.0
Min O_2	19.1	0.0
Flow rate	0.0	0.0

	Start	End
Barometric Pressure	990	990

Operative Details.	M.Tuck

Post Fieldworks Discrete Well Monitoring Site Record

Job No:	C/5148/25/E/7872	Client:	Irfan Patel	Visit:	6	Of	6
Site:	50 Orchard Street Dewsbury WF12 9LH	Date:	12.09.2025				

RGS Environmental Geotechnical Specialists

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Location ID	Methane (%)		Carbon Dioxide (%)		Carbon Monoxide (ppm)		Hydrogen Sulphide (ppm)		Oxygen (%)		VOCs (ppm)		Flowrate (l/hr)		Water Depth (m)	Well Depth (m)	Installed Depth (m)	Comments
	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Minimum	Steady	Peak	Steady	Peak				
1	0.0		0.0	0.1	0		0		20.7				0.0		2.60		3.15	
2	0.0		0.0	0.1	0		0		20.8				0.0		DRY		2.59	
4	0.0		0.0	0.0	0		0		20.9				0.0		1.81		2.18	
Max																		
Min.																		

ND - Not detected DRY - No water in well NM - Not Monitored (State Reason in comments)

Meteorological & Site Information	
General Ground Condition	WET
Precipitation	05/m2 in last 12 hours
Wind	14
Temperature	13
Barometric Pressure	
Pressure Trend	

Monitor Technical Specifications								
Gas Monitor Used:	GFM Series							
Serial No:	13747/270525							
Monitor Gas Range	CH_4	5>60	CO_2	5<40	O_2	21.2		
Gas Flow Range	0-10 l/hr							
Date of Calibration	27.05.2025							
PID Monitor (If used)								
PID Monitor Serial No.								
Calibration Date.								

Monitoring Period Summary (All Visits)	Peak	Steady
Max CH_4	0.0	0.0
Max CO_2	2.9	0.0
Max CO	0	0
Max H_2S	0	0
Max O_2	21.0	0.0
Min O_2	19.1	0.0
Flow rate	0.0	0.0

	Start	End
Barometric Pressure	1002	1004

Operative Details.	M.Tuck