

Your ref:

Our ref: ADJ/DJM/11274

Date: 19th April 2022

Mr. M. Parrott
Jones Homes (Yorkshire) Limited
Green Bank House
Green Bank
Cleckheaton
BD19 5LQ

Dear Mike

Primrose Lane, Liversedge - Ground Gas Risk Assessment Report No. 4157

The risks associated with ground gases have been considered in accordance with British Standard BS 8485:2015 "Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings", CIRIA report C665, "Assessing Risks Posed by Hazardous Ground Gases to Buildings" and NHBC Report No. 4 "Guidance on Evaluation of Development Proposals on Sites Where Methane and Carbon Dioxide are Present".

Following the provision of Michael D Joyce Associates LLP's report number 4157, the geological and Geoenvironmental setting has been reviewed, together with the results from six subsequent site monitoring visits.

In-situ Gas Monitoring

The in-situ gas testing was with a portable meter, which measures the methane content as its percentage volume in air. The corresponding oxygen, carbon dioxide and Volatile Organic Compounds (VOC) concentrations are also measured. No methane, hydrogen sulphide or VOC gases were detected. Carbon dioxide was low ranging from 0.2% to 3.1% by volume. No flows were recorded.

Methane is the dominant constituent of landfill gas, and can form an explosive mixture in air at concentrations of between 5% and 15%. Thus 5% methane in air is known as the Lower Explosive Limit (LEL). Concentrations less than this do not normally ignite. Carbon dioxide can also be a potential problem, where it occurs in concentrations greater than 5%.

Calculated Gas Screening Value (GSV)

Due to the nominal ground gas concentrations recorded, the below Ground Gas Risk Assessment is regarded as adequate for appraising risk to the above site. The GSV is calculated on the basis of the worst case scenario in order to establish appropriate gas protection measures

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Michael D Joyce HonDSc (Consultant) Christine M Joyce

The worst-case ground gas regime identified on the site during the monitoring period was a maximum steady carbon dioxide concentration of 3.1% v/v. No methane was detected.

Consequently, the GSV for carbon dioxide is calculated accordingly. $GSV \text{ (litres of gas per hour)} = 0 \text{ l/hr} \times 0.031\% \text{ v/v} = 0 \text{ l/hr}$. A GSV calculated at 0 l/hr classifies the site within the NHBC Green classification where no gas protection measures required.

Conclusion

The GSV places the site for both carbon dioxide and methane within Characteristic Situation CS1 and the NHBC Green classification. On the basis of the above, the site does not require any gas protection measures.

Yours sincerely

A D Joyce

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Michael D Joyce Associates LLP Geotechnical and Geoenvironmental Consultants				GAS MEASUREMENTS		
				Date: 24 th August 2021		
Client Jones Homes (Yorkshire) Limited				Report No: 4157		
Site Primrose Lane						
Location Liversedge						
Barometric Pressure 1017 mB falling				Air Temperature: 20°C		
Weather Warm and overcast						
Instrument Gas Data GFM436						
Borehole No.	Methane (% gas)	Carbon Dioxide (% gas)	Oxygen (% gas)	PID (ppm)	Carbon Monoxide (ppm)	Flow (l/h)
WS1	0	0.4	20.4	0	0	0
WS2	0	2.2	18.9	0	0	0
WS4	0	2.3	18.8	0	0	0
WS5	0	1.0	19.9	0	0	0
WS7	0	1.8	19.2	0	0	0
WS8	0	1.8	19.1	0	0	0
WS9	0	0.9	19.8	0	0	0
WS11	0	0.9	19.7	0	0	0
WS12	0	0.9	19.8	0	0	0
WS13	0	0.5	20.4	0	0	0
WS14	0	0.9	19.4	0	0	0
WS15	0	0.8	19.2	0	0	0
WS16	0	0.2	20.6	0	0	0

L.E.L. = Lower Explosive Limit, equivalent to 5% methane in air, i.e. 20% LEL is 1% gas
Normal Oxygen concentration is 20.9% of air

*NR = NOT RECORDED

Michael D Joyce Associates LLP Geotechnical and Geoenvironmental Consultants				GAS MEASUREMENTS		
				Date: 8 th September 2021		
Client Jones Homes (Yorkshire) Limited				Report No: 4157		
Site Primrose Lane						
Location Liversedge						
Barometric Pressure 1002 mB rising				Air Temperature: 28°C		
Weather Hot and sunny						
Instrument Gas Data GFM436						
Borehole No.	Methane (% gas)	Carbon Dioxide (% gas)	Oxygen (% gas)	PID (ppm)	Carbon Monoxide (ppm)	Flow (l/h)
WS1	0	0.2	20.6	0	0	0
WS2	0	1.7	19.2	0	0	0
WS4	0	2.1	18.6	0	0	0
WS5	0	0.9	20.0	0	0	0
WS8	0	1.6	20.0	0	0	0
WS9	0	1.5	19.7	0	0	0
WS11	0	0.5	20.2	0	0	0
WS12	0	3.1	18.9	0	0	0
WS13	0	2.0	19.7	0	0	0
WS14	0	0.9	20.4	0	0	0
WS15	0	0.2	20.7	0	0	0
WS16	0	0.4	20.7	0	0	0
L.E.L. = Lower Explosive Limit, equivalent to 5% methane in air, i.e. 20% LEL is 1% gas Normal Oxygen concentration is 20.9% of air						

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Michael D Joyce Associates LLP Geotechnical and Geoenvironmental Consultants				GAS MEASUREMENTS		
				Date: 21 st September 2021		
Client Jones Homes (Yorkshire) Limited				Report No: 4157		
Site Primrose Lane						
Location Liversedge						
Barometric Pressure 1029 mB rising				Air Temperature: 17°C		
Weather Warm and sunny						
Instrument Gas Data GFM436						
Borehole No.	Methane (% gas)	Carbon Dioxide (% gas)	Oxygen (% gas)	PID (ppm)	Carbon Monoxide (ppm)	Flow (l/h)
WS1	0	0.3	20.6	0	0	0
WS2	0	1.9	19.1	0	0	0
WS4	0	1.7	19.6	0	0	0
WS5	0	0.8	20.2	0	0	0
WS7	0	2.4	18.6	0	0	0
WS8	0	1.3	19.6	0	0	0
WS9	0	0.4	20.6	0	0	0
WS11	0	1.9	19.2	0	0	0
WS12	0	1.2	19.9	0	0	0
WS13	0	0.6	20.4	0	0	0
WS14	0	1.6	19.3	0	0	0
WS15	0	1.2	19.5	0	0	0
WS16	0	0.6	20.4	0	0	0
L.E.L. = Lower Explosive Limit, equivalent to 5% methane in air, i.e. 20% LEL is 1% gas Normal Oxygen concentration is 20.9% of air						

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Michael D Joyce Associates LLP Geotechnical and Geoenvironmental Consultants				GAS MEASUREMENTS		
				Date: 8 th October 2021		
Client Jones Homes (Yorkshire) Limited				Report No: 4157		
Site Primrose Lane						
Location Liversedge						
Barometric Pressure 1012 mB falling				Air Temperature: 20°C		
Weather Warm and sunny						
Instrument Gas Data GFM436						
Borehole No.	Methane (% gas)	Carbon Dioxide (% gas)	Oxygen (% gas)	PID (ppm)	Carbon Monoxide (ppm)	Flow (l/h)
WS1	0	0.7	20.0	0	0	0
WS2	0	1.6	19.2	0	0	0
WS4	0	1.4	19.7	0	0	0
WS5	0	0.5	20.4	0	0	0
WS7	0	2.2	18.7	0	0	0
WS8	0	1.3	19.6	0	0	0
WS9	0	0.5	20.2	0	0	0
WS11	0	2.2	18.4	0	0	0
WS12	0	1.4	19.6	0	0	0
WS13	0	0.7	20.4	0	0	0
WS14	0	1.0	19.8	0	0	0
WS15	0	1.6	19.1	0	0	0
WS16	0	0.7	20.2	0	0	0
L.E.L. = Lower Explosive Limit, equivalent to 5% methane in air, i.e. 20% LEL is 1% gas Normal Oxygen concentration is 20.9% of air						

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Michael D Joyce Associates LLP Geotechnical and Geoenvironmental Consultants				GAS MEASUREMENTS		
				Date: 22 nd October 2021		
Client Jones Homes (Yorkshire) Limited				Report No: 4157		
Site Primrose Lane						
Location Liversedge						
Barometric Pressure 1019 mB falling				Air Temperature: 10°C		
Weather Overcast						
Instrument Gas Data GFM436						
Borehole No.	Methane (% gas)	Carbon Dioxide (% gas)	Oxygen (% gas)	PID (ppm)	Carbon Monoxide (ppm)	Flow (l/h)
WS1	0	0.4	20.5	0	0	0
WS2	0	1.7	19.3	0	0	0
WS4	0	2.0	18.8	0	0	0
WS5	0	0.6	20.4	0	0	0
WS7	0	2.5	18.0	0	0	0
WS8	0	1.2	19.7	0	0	0
WS9	0	0.6	20.0	0	0	0
WS11	0	2.1	18.7	0	0	0
WS12	0	1.0	19.9	0	0	0
WS13	0	0.6	20.1	0	0	0
WS14	0	1.7	19.0	0	0	0
WS15	0	1.4	19.5	0	0	0
WS16	0	0.9	19.7	0	0	0
L.E.L. = Lower Explosive Limit, equivalent to 5% methane in air, i.e. 20% LEL is 1% gas Normal Oxygen concentration is 20.9% of air						

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Michael D Joyce Associates LLP Geotechnical and Geoenvironmental Consultants				GAS MEASUREMENTS		
				Date: 8 th November 2021		
Client Jones Homes (Yorkshire) Limited				Report No: 4157		
Site Primrose Lane						
Location Liversedge						
Barometric Pressure 1020 mB stable				Air Temperature: 10°C		
Weather Overcast						
Instrument Gas Data GFM436						
Borehole No.	Methane (% gas)	Carbon Dioxide (% gas)	Oxygen (% gas)	PID (ppm)	Carbon Monoxide (ppm)	Flow (l/h)
WS1	0	0.5	20.1	0	0	0
WS2	0	1.9	19.0	0	0	0
WS4	0	1.4	19.7	0	0	0
WS5	0	1.0	19.6	0	0	0
WS7	0	2.7	18.1	0	0	0
WS8	0	1.4	19.2	0	0	0
WS9	0	0.6	20.2	0	0	0
WS11	0	2.1	18.6	0	0	0
WS12	0	1.0	19.9	0	0	0
WS13	0	0.4	20.2	0	0	0
WS14	0	1.7	19.0	0	0	0
WS15	0	1.3	19.3	0	0	0
WS16	0	0.8	19.7	0	0	0
L.E.L. = Lower Explosive Limit, equivalent to 5% methane in air, i.e. 20% LEL is 1% gas Normal Oxygen concentration is 20.9% of air						

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