



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

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Our Ref: E22/7931/JF/001

27th October 2022

(Email Only)

FAO: Jonathan Mayo

jonathan.mayo@heywoodhomes.com

Dear Sir,

Re: Development at land off Wesley Avenue, Netherthong

Further to the intrusive site investigation works detailed in the Haigh Huddleston & Associates Geo-Environmental Ground Investigation report (Ref: E22/7931/R001 Dated: August 2022), gas testing was undertaken at the above development to confirm if ground gas migration from infilled quarry and pond located to the north of the site would adversely affect the development.

Kindly note that this letter only addresses issues with regards to ground gas migration affecting properties. It must be read in conjunction with the aforementioned report. For the preparation of this letter, the following best practice guidance has been taken into account:

- BS8485:2015+A1:2019 “Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings”;
- BS8576:2013 “Guidance on Investigations for Ground Gas – Permanent Gases and Volatile Organic Compounds (VOCs)”;
- CIRIA “Assessing Risks Posed by Hazardous Ground Gases to Buildings”, report C665, 2007;
- CIRIA “The VOCs Handbook. Investigating, Assessing and Managing Risks from Inhalation of VOCs at Land Affected by Contamination”, report C682, 2009;
- CL:AIRE “A Pragmatic Approach to Ground Gas Risk Assessment”, report ref. RB17, November 2012;
- NHBC “Guidance on Evaluation of Development Proposals on Sites Where Methane and Carbon Dioxide are Present”, report version 04, March 2007.

Eight boreholes were drilled to depths of between 3.1 - 9.0m beneath the site. In addition to this, five of the boreholes were installed with gas monitoring standpipes consisting of 1m of plain pipe at the surface and 2m of slotted pipe. The standpipes were constructed with lockable covers, backfilled with single size gravels and sealed with bentonite.

Six rounds of gas monitoring were undertaken between 29th June 2022 and 22nd September 2022 using a Gas Data GFM 436. The results are tabulated in the Appendix to the rear of this letter.

The gas monitoring was undertaken over a range in barometric pressure between 986mb and 1005mb. The readings taken on four out of the six visits were carried out under falling barometric pressure.

On site, no methane was detected. Carbon dioxide values were found between 0.5 and 1.8% with oxygen levels between 18.4 and 20.3%. No flow rates were detected throughout the duration of the monitoring. Due to no flow rates being detected throughout the duration of the visits, a value of 0.1 shall be used in the GSV calculation.

Discussions

Based on a high sensitivity end use under the NHBC traffic light system in conjunction with CIRIA C665, the GSV value corresponds to the site being characterised as **Green**. The GSV value is obtained by multiplying the maximum gas concentration by maximum steady borehole flow rate.

i.e. Carbon Dioxide - $0.018 \times 0.1 = 0.0018$ l/hr.

In addition to this, we can confirm that the site is not within a Radon Affected Area, as less than 1% of properties are above the action level. Therefore, **NO Radon Protection Measures are required for this development.**

The low level of carbon dioxide recorded and no methane indicates that the site may be classified as Green when referred to the NHBC standards or CS1 by BS 8485:2105 Table 2. We can confirm that no gas protection measures are required for the proposed development.

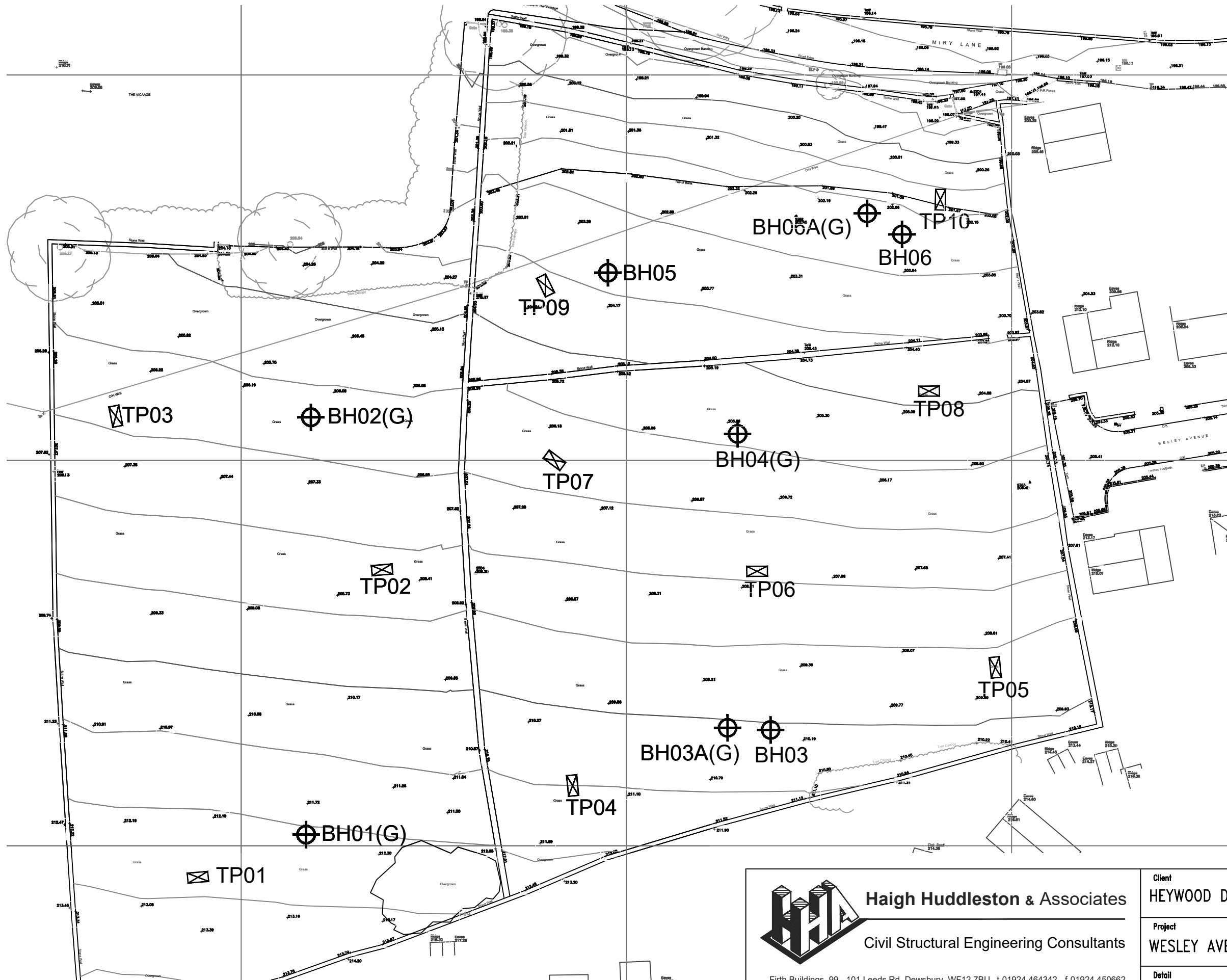
We hope that the above is sufficient for your requirements. However, should you have any queries please do not hesitate to contact me direct.

Yours sincerely,



JAMES FARRAR
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Appendix



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Client
HEYWOOD DEVELOPMENTS

Project
WESLEY AVENUE, NETHERTHONG

Detail
SITE INVESTIGATION PLAN

Scale	Dwn	Chkd	Date	Dwg No.
1:500@A3			Aug'22	E22/7931/03

SITE:	Wesley Avenue, Netherthong	
CLIENT:	Heywood Developments	
JOB NO:	7931	
SHEET NO:	1	

GAS MONITORING RESULTS

	GAS CONCENTRATIONS												FLOW DATA				Qhg per borehole		WELL AND WATER DATA				A Pressure (mB)	Comments	
Monitoring Point	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Oxygen (%v/v)		H2S (ppm)	CO (ppm)	Hex (%)	PIDCf (l)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Methane (l/hr)	CO2 (l/hr)	Water level (mbgl)	Depth of well (m)	Response Zone				
	Peak	Steady	Peak	Steady	Peak	Steady	Min	Steady					Steady	Peak											
AIR	ND	ND	ND	ND	ND	ND	20.6	20.6	ND	ND	0.011	1.0	ND	ND	ND	ND	NR	NR	NR	NR	NR	986	Time: 10:30	Date: 29.06.22	
BH01	ND	ND	ND	ND	1.5	1.5	19.7	19.7	ND	ND	ND	1.0	ND	ND	ND	ND	NR	0.0015	3.10	3.10	1.0-3.10	986			
BH02	ND	ND	ND	ND	1.2	1.2	19.9	19.9	ND	ND	ND	1.0	ND	ND	ND	ND	NR	0.0012	3.10	3.10	1.0-3.10	986	Sunny, Warm, Wet		
BH03A	ND	ND	ND	ND	1.2	1.2	19.6	19.6	ND	ND	ND	1.0	ND	ND	ND	ND	NR	0.0012	3.10	3.10	1.0-3.10	985			
BH04	ND	ND	ND	ND	0.8	0.8	20.0	20.0	ND	ND	ND	1.0	ND	ND	ND	ND	NR	0.0008	3.10	3.10	1.0-3.10	984	Falling A.P		
BH06A	ND	ND	ND	ND	0.6	0.6	20.2	20.2	ND	ND	ND	1.0	ND	ND	ND	ND	NR	0.0006	3.10	3.10	1.0-3.10	985			
AIR	ND	ND	ND	ND	ND	ND	20.7	20.7	ND	ND	0.001	1.0	ND	ND	ND	ND	NR	NR	NR	NR	NR	995	Time: 13:15	Date: 27.07.22	
BH01	ND	ND	ND	ND	1.6	1.6	19.6	19.6	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0016	3.10	3.10	1.0-3.10	995			
BH02	ND	ND	ND	ND	1.7	1.4	18.4	18.4	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0017	3.10	3.10	1.0-3.10	995	Sunny, Dry, Warm		
BH03A	ND	ND	ND	ND	0.8	0.8	20.0	20.0	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0008	3.10	3.10	1.0-3.10	995			
BH04	ND	ND	ND	ND	0.9	0.9	19.9	19.9	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0009	3.10	3.10	1.0-3.10	995	Rapid fluctuating levels of CO2 &		
BH06A	ND	ND	ND	ND	0.6	0.6	19.8	19.8	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0006	3.10	3.10	1.0-3.10	997	O2 in BH02		
AIR	ND	ND	ND	ND	ND	ND	20.7	20.7	ND	ND	0.008	1.0	ND	ND	ND	ND	NR	NR	NR	NR	NR	1002	Time: 11:00	Date: 10.08.22	
BH01	ND	ND	ND	ND	1.6	1.6	19.8	19.8	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0016	3.10	3.10	1.0-3.10	1003			
BH02	ND	ND	ND	ND	1.6	1.6	19.9	19.9	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0016	3.10	3.10	1.0-3.10	1004	Sunny, Warm, Dry		
BH03A	ND	ND	ND	ND	0.7	0.7	20.3	20.3	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0007	3.10	3.10	1.0-3.10	1003			
BH04	ND	ND	ND	ND	0.9	0.9	20.2	20.2	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0009	3.10	3.10	1.0-3.10	1004	Falling A.P		
BH06A	ND	ND	ND	ND	0.7	0.7	20.2	20.2	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0007	3.10	3.10	1.0-3.10	1005			
AIR	ND	ND	ND	ND	ND	ND	20.6	20.6	ND	ND	0.001	1.0	ND	ND	ND	ND	NR	NR	NR	NR	NR	991	Time: 11:00	Date: 26.08.22	
BH01	ND	ND	ND	ND	1.8	1.8	19.6	19.6	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0018	3.10	3.10	1.0-3.10	990			
BH02	ND	ND	ND	ND	1.5	1.5	19.9	19.9	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0015	3.10	3.10	1.0-3.10	991	Cloudy, Windy, Damp		
BH03A	ND	ND	ND	ND	0.5	0.5	20.2	20.2	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0005	3.10	3.10	1.0-3.10	989			
BH04	ND	ND	ND	ND	0.8	0.8	20.0	20.0	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0008	3.10	3.10	1.0-3.10	989			
BH06A	ND	ND	ND	ND	0.8	0.8	19.8	19.8	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0008	3.10	3.10	1.0-3.10	989			
																	0	0							

ND - Not detected

NR - Not recorded

NB: where no flow (ND) recorded Qhg values are calculated using equipment limit of detection (0.1 l/hr). Where negative flows recorded, these are converted to positive values for calculation of Qhg.



GAS MONITORING RESULTS

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NR - Not recorded
NB: where no flow (ND) recorded Qhg values are calculated using equipment limit of detection (0.1 l/hr). Where negative flows recorded, these are converted to positive values for calculation of Qhg.