



Our Ref: E17/7349/JF/006A

26th August 2021

(Email Only)

Dear Sir,

Re: Egypt Farm, Cliffe Lane, Gomersal

Further to the intrusive site investigation works detailed in the Haigh Huddleston & Associates Geo-Environmental Ground Investigation report (Ref: E17/7349/R002A Dated: April 2019), gas testing was undertaken at the above development to confirm if ground gas migration would adversely affect the existing garage.

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.

Three window samples were undertaken to depths of up to 3.0m beneath the site and evidence of shallow made ground was found in all 3 of the window samples. In addition to this, all three window samples were drilled and installed with gas monitoring standpipes consisting of between 0.6-1m 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. Due to the shallow depths of

made ground encountered in all three window samples, the length of plain pipe in WS01 was reduced from 1.0m to 0.60m. This was to gauge a better idea of any potential gases within the made ground that could have an effect on the property.

Six rounds of gas monitoring were undertaken between 4th June 2021 and 11th August 2021 using a Gas Data GFM 436. The readings taken on 27th July 2021 & 11th August 2021 were recorded under falling pressure. 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 997mb and 1011mb.

On site, no methane was detected. Carbon dioxide values were found between 1.3 and 11% with oxygen levels between 7.0 and 19.4%. No flow rates were detected throughout the duration of the visits.

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 (Where the peak flow rate is recorded at the start of the monitoring session, this can be discounted due to the artificially high pressure within the standpipe).

i.e. Carbon Dioxide - $0.110 \times 0.1 = 0.011$ 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.**

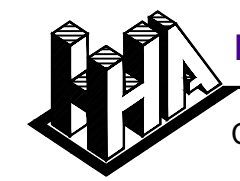
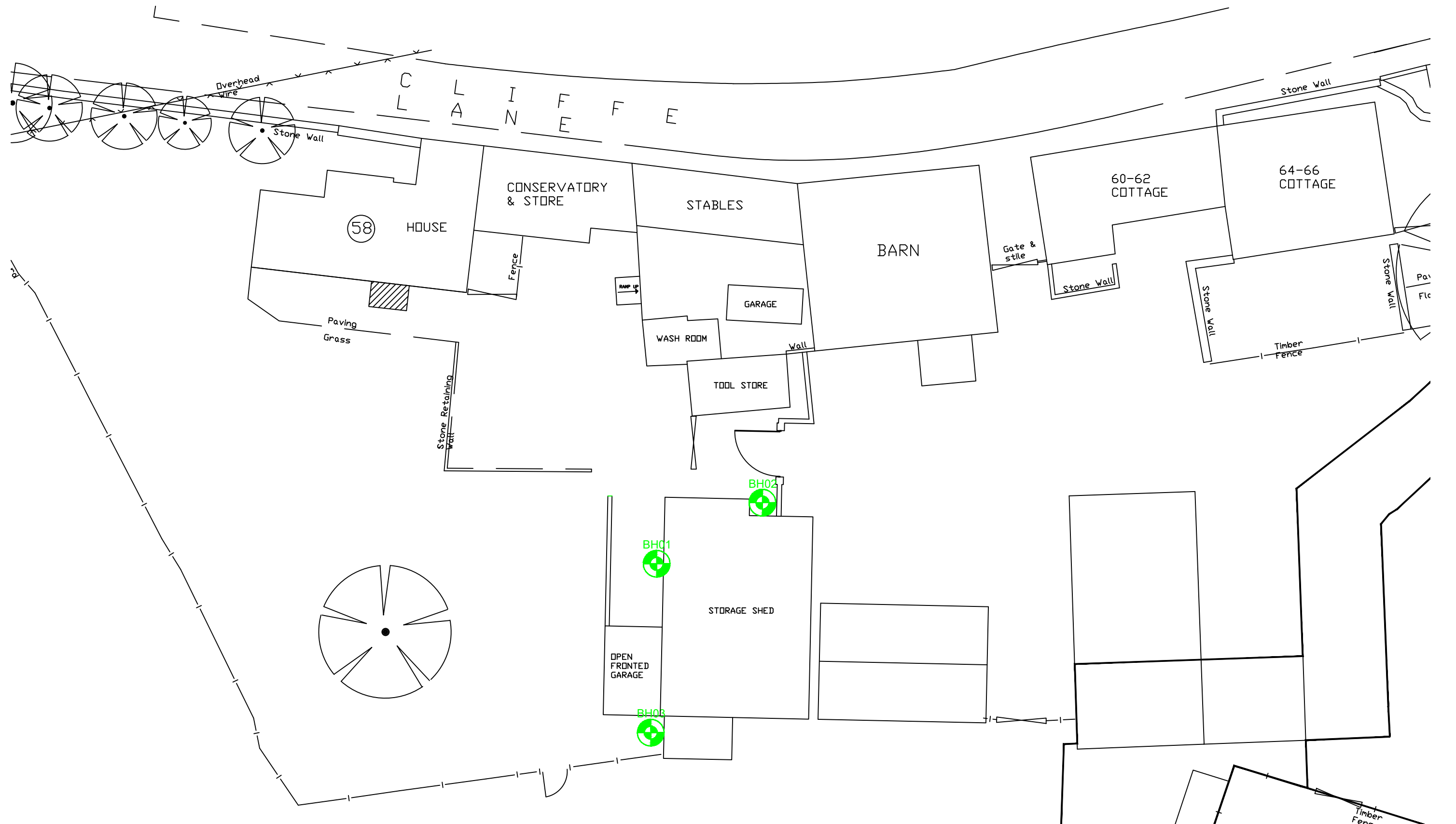
To conclude, we can confirm that there is no risk of gas build up within the existing building due to its current use as a ventilated garage & store room. However, if at a future date it is proposed to convert the garage into a habitable dwelling, the gas regime should be re-evaluated as part of the planning process and any required gas protection measures are implemented.

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

Appendix



Haigh Huddleston & Associates

Civil Structural Engineering Consultants

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Client	N Ward		
Project	Egypt Farm, Cliffe Lane, Cleckheaton		
Detail	Gas Monitoring Station Location Plan		
Scale	Dwn	Chkd	Date
NTS	MD		Aug'21
		Dwg No.	E18/7349/03/02

SITE:	Egypt Farm, Cliffe Lane, Gomersal - Phase 2	
CLIENT:	MWA / Mr N. Ward	
JOB NO:	7349	
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 ()	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	19.2	19.2	ND	ND	0.027	1.0	ND	ND	ND	ND	NR	NR	NR	NR	NR	1011	Time: 8:45 Date: 04.06.21	
WS01	ND	ND	ND	ND	6.9	6.9	19.7	11.3	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0069	1.70	2.00	0.60-1.7	1010		
WS02	ND	ND	ND	ND	2.3	2.3	16.2	16.2	ND	ND	0.014	1.0	ND	ND	ND	ND	NR	0.0023	1.40	2.80	1.0-1.4	1011	Sunny, Warm, Dry	
WS03	ND	ND	ND	ND	1.7	1.7	17.4	17.4	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0017	1.90	1.90	1.0-1.9	1009		
AIR	ND	ND	ND	ND	ND	ND	18.9	18.9	ND	ND	0.008	1.0	ND	ND	ND	ND	NR	NR	NR	NR	NR	1007	Time: 11:15 Date: 14.06.21	
WS01	ND	ND	ND	ND	6.6	6.6	11.0	11.0	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0066	1.80	2.00	0.60-1.80	1007		
WS02	ND	ND	ND	ND	3.3	3.3	16.0	16.0	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0033	1.50	2.80	1.0-1.50	1007	Windy, Warm, Dry	
WS03	ND	ND	ND	ND	1.3	1.3	17.8	17.8	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0013	1.90	1.90	1.0-1.90	1007		
AIR	ND	ND	ND	ND	ND	ND	20.8	20.8	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	NR	NR	NR	NR	1008	Time: 13:00 Date: 30.06.21	
WS01	ND	ND	ND	ND	8.3	8.3	8.5	8.5	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0083	1.80	2.00	0.60-1.80	1007		
WS02	ND	ND	ND	ND	4.5	4.5	15.7	15.7	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0045	1.50	2.80	1.0-1.50	1007	Cloudy, Warm, Dry	
WS03	ND	ND	ND	ND	1.7	1.7	19.4	19.4	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0017	1.90	1.90	1.0-1.90	1007		
AIR	ND	ND	ND	ND	ND	ND	20.7	20.7	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	NR	NR	NR	NR	1008	Time: 13:15 Date: 14.07.21	
WS01	ND	ND	ND	ND	7.0	7.0	8.6	8.6	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.007	1.40	2.00	0.60-1.40	1008		
WS02	ND	ND	ND	ND	2.9	2.9	13.8	13.8	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0029	1.20	2.80	1.0-1.20	1008	Sunny, Warm, Breeze	
WS03	ND	ND	ND	ND	1.8	1.8	18.3	18.3	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0018	1.40	1.90	1.0-1.40	1008		
AIR	ND	ND	ND	ND	ND	ND	20.8	20.8	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	NR	NR	NR	NR	997	Time: 10:30 Date: 27.07.21	
WS01	ND	ND	ND	ND	11.0	11.0	7.0	7.0	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.011	1.20	2.00	0.60-1.20	997		
WS02	ND	ND	ND	ND	1.6	1.6	19.2	19.2	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0016	1.80	2.80	1.0-1.80	997	Cloudy, Warm, Dry	
WS03	ND	ND	ND	ND	1.9	1.9	19.0	19.0	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0019	1.90	1.90	1.0-1.90	997	FALLING A.P	
AIR	ND	ND	ND	ND	0.1	0.1	20.6	20.6	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0001	NR	NR	NR	1004	Time: 8:45 Date: 11.08.21	
WS01	ND	ND	ND	ND	8.4	8.4	8.9	8.9	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0084	1.30	2.00	0.60-1.20	1004		
WS02	ND	ND	ND	ND	3.6	3.6	16.3	16.3	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0036	1.80	2.80	1.0-1.80	1004	Cloudy, Warm, Dry	
WS03	ND	ND	ND	ND	1.9	1.9	19.0	19.0	ND	ND	0.000	1.0	ND	ND	ND	ND	NR	0.0019	1.90	1.90	1.0-1.90	1004	FALLING A.P	

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.