HESI
Herts & Essex Site Investigations
Unit J8 | Peek Business Park | Woodside | Bishops Stortford | CM23 5RG
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Geotechnical Assessments | Environmental Assessments | Desktop Studies | Contamination Analysis

21st June 2023

Our ref : CSG/18272

Mr P Snell
phil@psnell.co.uk

Dear Sir,

Re: Lower Broomfield, Stortford Road, Little Hallingbury, Herts. CM22 7RT - 18272

Land Gas Investigation

Following the Environmental Report completed at the above site, and in accordance with CLR11, BS 10175:2011, BS 8485:2007, CIRIA C665 and CIRIA R149, risks from land gas due to the potential made ground within the site and infilled gravel pit and ponds surrounding the site, Land Gas risk assessments have been completed. These will include the potential for contamination migration from on and off-site sources which may be present in concentrations where risk is recorded.

Land gas monitoring has specifically targeting the following land uses.

Table 1 Land Gas Risk Assessment - Response Zone

Feature	*Targeted Response Zone*	*Location to Target*	*Vapour or Gas risk*
Infilled Gravel Pits	Made Ground / Lowestoft Formation	Site Wide	Land Gases - CO_2, CH_4.
Infilled Ponds	Made Ground / Lowestoft Formation	Site Wide	Land Gases - CO_2, CH_4.

Within the site one standpipe was installed within WS1 as noted on the attached plan and log.

The geology within the site is recorded as a topsoil fill over sand and gravel to about 0.80m where clay soil was in place to the close of the borehole, as such the response zone of the standpipe was installed within this.

The results of the six monitoring rounds are recorded below:-

Table 1 *Gas Monitoring Data Sheet*

Date	*BH ID*	*Flow Rate*				*Concentration, (CH_4)*				*Concentration, (CO_2)*				*Concentration, (O_2)*				*Q_{ng}, CH_4*	*Q_{ng}, CO_2*	*Stratum Screened*	*Flooded Response Zone*	*Barometric Pressure*	*Other Gases.*
		Peak	*Steady*			*Peak*	*Steady*			*Peak*	*Steady*			*Peak*	*Steady*								
			15 secs	*30 Secs*	*45 Secs*		*15 Secs*	*30 Secs*	*15 secs*		*15 secs*	*30 Secs*	*45 Secs*		*15 secs*	*30 Secs*	*45 Secs*	*(Peak)A)*	*(Peak)A)*		*(Yes / No)*		
		L/h	*L/h*	*L/h*	*L/h*	*%*				*%*				*%*								*mB*	
22/5/23	WS1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	2.1	2.1	2.1	2.1	19.5	19.5	19.5	19.5	0.0	0.0021	SAND & GRAVEL over CLAY	N	999	No VOC's
26/5/23	WS1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.3	2.3	2.3	2.3	19.6	19.6	19.6	19.6	0.0	0.0023		N	1019	No VOC's
1/6/23	WS1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	2.4	2.4	2.4	19.1	19.1	19.1	19.1	0.0	0.0		N	1010	No VOC's
5/6/23	WS1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	19.5	19.5	19.5	19.5	0.0	0.0		N	1001	No VOC's
13/6/23	WS1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	2.1	2.1	2.1	19.2	19.2	19.2	19.2	0.0	0.0		N	1014	No VOC's
20/6/23	WS1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	2.1	2.1	2.1	19.2	19.2	19.2	19.2	0.0	0.0		N	1010	No VOC's

A) Calculated using peak concentration and steady state flow (see **6.3.4**). Works and table completed in accordance with ***BS 8485 : 2015,*** (Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings).

Table prepared after Table F2, (Gas Monitoring Data).

Considering the results of the gas testing no significantly elevated levels were recorded in place within the site on a couple of the visits there was a very slightly flow rate recorded within the site and as such, the following calculation was completed.

$$Q_{hg} = q\left(\frac{C_{hg}}{100}\right)$$

q = is the measured flow rate, (in litres per hour) of combined gases from the monitoring standpipe

C_{hg} = is the measured hazardous gas concentration, (in percentage volume / volume)

Therefore :-

$$Q_{hg} = 0.1\left(\frac{2.3}{100}\right) = 0.0023$$

As such, the Hazardous Gas Flow Rate has been calculated as 0.0023 and we would therefore suggest gas generation within the site area is low and would return a Characteristic Situation in line with CIRIA C665, CLR11 and BS8485:2015 of CS = 1 and no mitigation measures required.

I hope the foregoing is sufficient for your requirements, although, please do not hesitate to contact me should you require any additional information or assistance.

Yours faithfully

Rebecca Chamberlain
Contract Engineer

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Lower Broomfield, Stortford Road, Little Hallingbury, Herts. CM22 7RT

Location Plan

N

Not to Scale
Sketch No. : GAS / 18727 / 01 / 01

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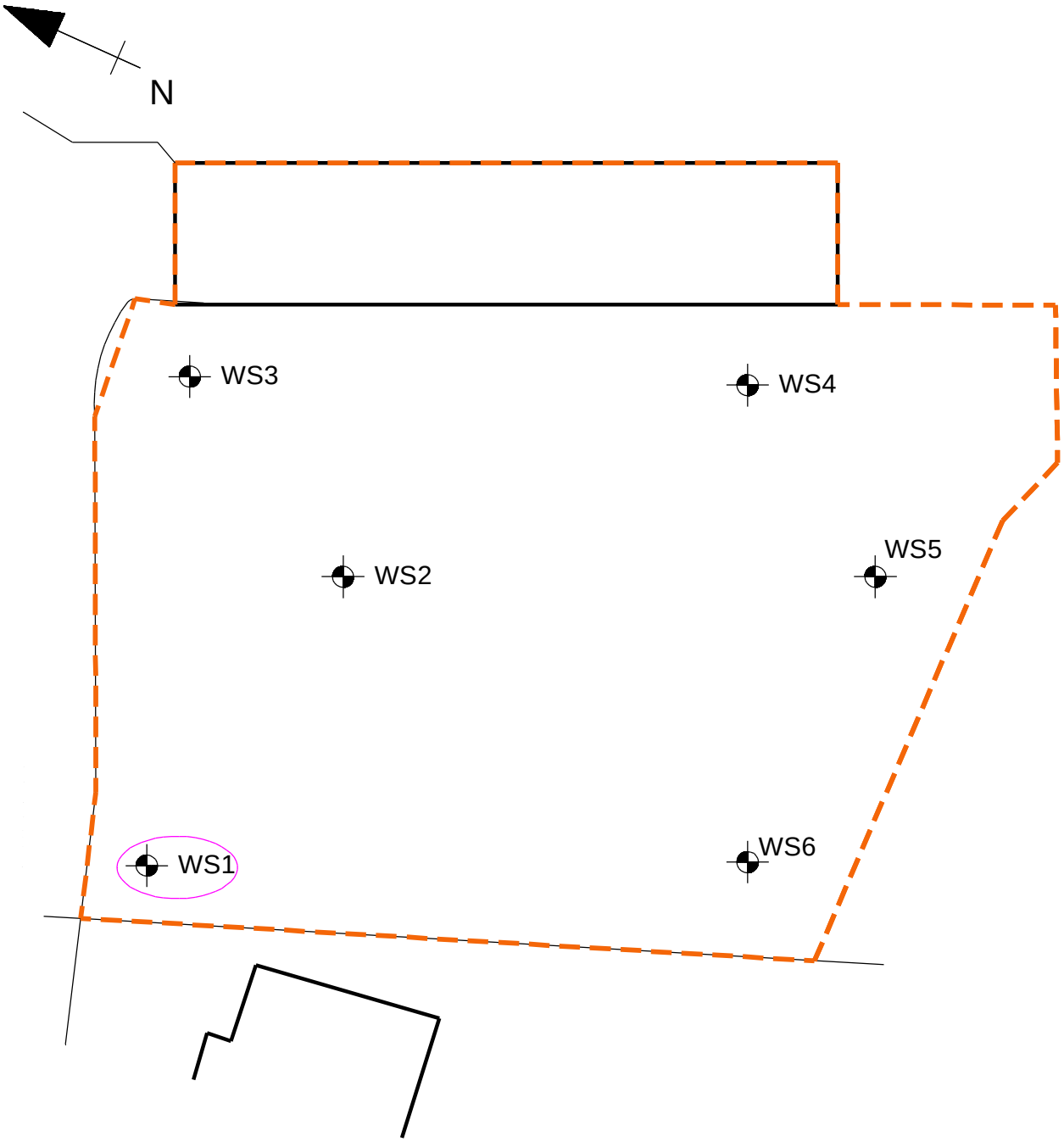
Existing Site Plan



Not to Scale
Sketch No. : GAS / 18727 / 01 / 02

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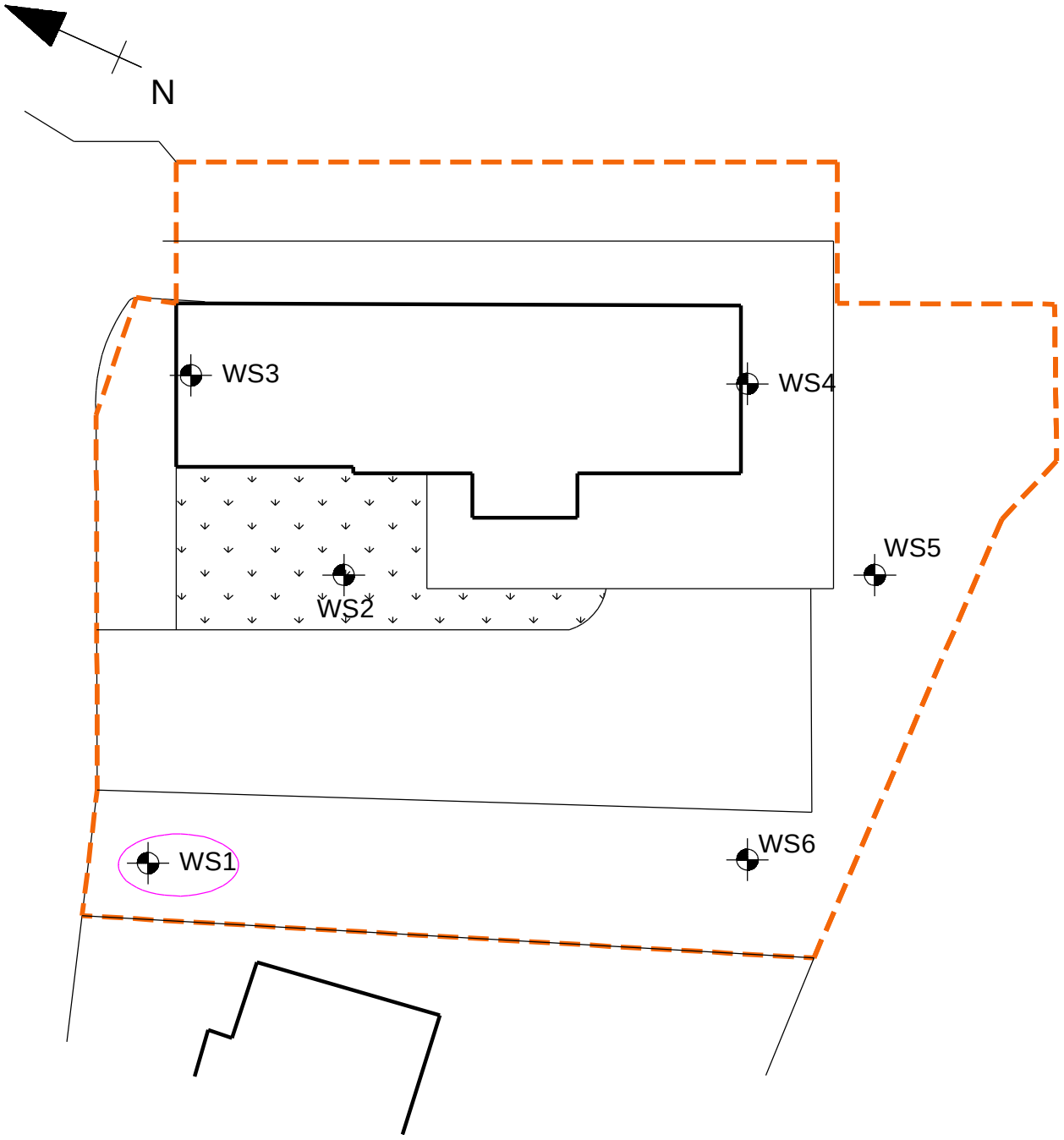
Proposed Site Plan



Not to Scale

Sketch No. : GAS / 18727 / 01 / 03

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Appendix No 2
Sheet No 1
Job No 18272
Date May 2023 [redacted]

Lower Broomfield, Stortford Road, Little Hallingbury, Herts, CM[redacted]

Window Sampler One [redacted]

Description Of Stratum	[redacted]	[redacted]	[redacted]	[redacted]	Samples No	[redacted]	[redacted]epth (m)	[redacted] Strength	[redacted]	[redacted]	[redacted]
Loose dark brown topsoil FILL		0.20	0.20		1	U	GL - 1.00		[redacted]		
Medium dense brown slightly clayey SAND & GRAVEL		0.80	0.60						[redacted]		
Firm to stiff brown sligtly to moderately sandy slightly silty CLAY			[redacted]		2	U	1.00- 2.00		[redacted]	[redacted]	1.00
			2.20		3	U	2.00 - 3.00				
Becoming more less sandy from 2.70m											
Roots to 3.00m Borehole Complete at 3.00m		3.00									

Remarks

Key : U - Undisturbed Sample (100mm diameter) | B - Bulk Sample | D - Disturbed Sample | W - Water Sample | N - SPT N-Value
- Water Struck | - Water Standing | T - Chemical Tub | V - Vane Test, (kN.m²)