

1 December 2020

J1925_02

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For the attention of: Sue Wheatcroft / Richard Peck

DPV Block, Royal Brewery, Denmark Road, Manchester

Further to the recent issue of our Geotechnical & Geo-Environmental Ground Investigation report for the above site, we have now completed the programme of ground-gas monitoring and have pleasure in reporting as follows.

4 post site works visits have been made to monitor the standpipes installed in the boreholes BH1 & BH2 at the site for a range of ground gases (including carbon dioxide and methane), together with measurement of gas flow and to take groundwater level readings. The monitoring visits were undertaken on 7th October; 13th October; 4th November; and 12th November 2020. The results of the monitoring visits are appended to this letter and can be summarised as follows.

Carbon Dioxide – Carbon Dioxide concentrations in the range 0.2%v/v to 4.2%v/v have generally been recorded in the standpipes at the time of the monitoring visits. However, a carbon dioxide concentration of 6.1%v/v was recorded in BH2 on 12th November. Furthermore, a short term 'peak' carbon dioxide concentration of 6%v/v was recorded from BH1 at the time of the 4th November monitoring visit.

Methane – No detectable concentrations of methane have been recorded in any of the available standpipes at the time of the monitoring visits.

Oxygen – Steady oxygen concentrations in the range 13.9%v/v to 20.6%v/v have been recorded in the standpipes at the time of the monitoring visits. (A short term oxygen concentration of 13.8%v/v was recorded from BH1 at the time of the 4th November monitoring visit).

Hydrogen Sulphide - No detectable concentrations of hydrogen sulphide have been recorded in any of the standpipes.

Carbon Monoxide – No detectable concentrations of carbon monoxide have generally been recorded in any of the standpipes at the time of the monitoring visits. However, steady carbon monoxide concentrations of 1ppm were recorded from BH1 on 13th October & 12th November; and a steady carbon monoxide concentration of 4ppm was recorded from BH1 on 7th October

Gas Flow – Gas flows in the range 0.0l/hr (i.e. no detectable gas flow) and 0.1l/hr (i.e. the lower detectable limit of the monitor) have been recorded at the time of the monitoring visits.

The atmospheric pressures at the time of the monitoring visits were in the range 1004mb (7th October) and 1030mb (4th November).

After obtaining the gas readings, the gas bungs/taps were removed and the standpipes 'dipped' for groundwater. The standpipes were generally 'dry to base' at the time of the monitoring visits. However, groundwater in BH1 was recorded at 3m bgl., on 7th October and 2.9m bgl., on 13th October.

The results of the post site works visits to monitor the standpipes installed at the site have revealed a maximum carbon dioxide concentration of 6.1%v/v and a maximum gas flow of 0.1l/hr. No detectable methane concentrations have been recorded in the standpipes at the site. In accordance with BS 8485:2015 +A1 2019 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new



buildings', a maximum borehole hazardous gas flow rate of 0.006l/hr for carbon dioxide has been calculated from the results of the on-site gas monitoring.

A check of the 'worst case' scenario for the gas monitoring data (i.e. maximum recorded gas concentration at the time of the maximum recorded gas flow), has also revealed worst case hazardous gas flow rates of 0.006l/hr for carbon dioxide.

From consideration of a GSV calculated from the borehole hazardous gas flow rates and typical gas concentrations, the site has been assigned a Characteristic Gas Situation (CS) CS1, in accordance with BS8485.

For a Characteristic Gas Situation CS1, no gas protection measures are considered necessary for the proposed development at the site.

We trust that the above and attached provides all the information you require. Should you have any comments or queries, however, or wish to discuss any of the above, please do not hesitate to contact us.

Yours faithfully

For & on behalf of Emcus Limited



Marcus Hanford
Technical Director
mhanford@emcus.co.uk



GAS MONITORING RECORD

J1925 DPV Heineken, Manchester.

Date: 07/10/2020
 Atmospheric Pressure: 1004mb
 Atmospheric O₂: 20.7%v/v
 Gas Analyser: GA5000
 Serial Number: G503422

BH No.	Ground level (m AOD)	Response Zone	CH ₄		CO ₂		O ₂		CO		H ₂ S		Flow	Depth to Water (m bgl)	Hazardous Gas Flow Rate (L/Hr)	
			(%v/v)		(%v/v)		(%v/v)		(ppm)		(ppm)		(L/Hr)		CH ₄	CO ₂
			P.R.	S.R.	P.R.	S.R.	P.R.	S.R.	P.R.	S.R.	P.R.	S.R.				
BH1		2.0m - 5.0m bgl	0.0	0.0	1.8	1.8	17.5	17.5	5.0	4.0	0.0	0.0	0.0	3.00	0.0000	0.0000
BH2		2.0m - 5.0m bgl	0.0	0.0	0.4	0.4	20.3	20.3	0.0	0.0	0.0	0.0	0.1	DTB	0.0000	0.0004

Notes:

P.R. - Peak Reading
 S.R. - Steady Reading
 D.T.B. - Dry to Base

N.R.T - No Reading Taken

Recorded Checked

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GAS MONITORING RECORD

J1925 DPV Heineken, Manchester.

Date: 13/10/2020
 Atmospheric Pressure: 1008mb
 Atmospheric O₂: 20.4%v/v
 Gas Analyser: GA5000
 Serial Number: G503422

BH No.	Ground level (m AOD)	Response Zone	CH ₄		CO ₂		O ₂		CO		H ₂ S		Flow	Depth to Water (m bgl)	Hazardous Gas Flow Rate (L/Hr)	
			(%v/v)		(%v/v)		(%v/v)		(ppm)		(ppm)		(L/Hr)		CH ₄	CO ₂
			P.R.	S.R.	P.R.	S.R.	P.R.	S.R.	P.R.	S.R.	P.R.	S.R.				
BH1		2.0m - 5.0m bgl	0.0	0.0	4.0	2.0	13.9	13.9	1.0	1.0	0.0	0.0	0.0	2.90	0.0000	0.0000
BH2		2.0m - 5.0m bgl	0.0	0.0	0.2	0.2	20.6	20.6	0.0	0.0	0.0	0.0	0.0	DTB	0.0000	0.0000

Notes:

P.R. - Peak Reading
 S.R. - Steady Reading
 D.T.B. - Dry to Base

N.R.T - No Reading Taken

Recorded Checked

JST



GAS MONITORING RECORD

J1925 DPV Heineken, Manchester.

Date: 04/11/2020
 Atmospheric Pressure: 1030mb
 Atmospheric O₂: 20.5%v/v
 Gas Analyser: GA5000
 Serial Number: G503422

BH No.	Ground level (m AOD)	Response Zone	CH ₄		CO ₂		O ₂		CO		H ₂ S		Flow	Depth to Water (m bgl)	Hazardous Gas Flow Rate (L/Hr)	
			(%v/v)		(%v/v)		(%v/v)		(ppm)		(ppm)		(L/Hr)		CH ₄	CO ₂
			P.R.	S.R.	P.R.	S.R.	P.R.	S.R.	P.R.	S.R.	P.R.	S.R.				
BH1		2.0m - 5.0m bgl	0.0	0.0	6.0	4.2	13.8	13.9	0.0	0.0	0.0	0.0	0.1	DTB	0.0000	0.0042
BH2		2.0m - 5.0m bgl	0.0	0.0	2.1	2.1	19.6	19.6	0.0	0.0	0.0	0.0	0.1	DTB	0.0000	0.0021

Notes: P.R. - Peak Reading S.R. - Steady Reading D.T.B. - Dry to Base	N.R.T - No Reading Taken	Recorded JST	Checked
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GAS MONITORING RECORD

J1925 DPV Heineken, Manchester.

Date: 12/11/2020
 Atmospheric Pressure: 1007
 Atmospheric O₂: 20.6%v/v
 Gas Analyser: GA5000
 Serial Number: G503422

BH No.	Ground level (m AOD)	Response Zone	CH ₄		CO ₂		O ₂		CO		H ₂ S		Flow	Depth to Water (m bgl)	Hazardous Gas Flow Rate (L/Hr)	
			(%v/v)		(%v/v)		(%v/v)		(ppm)		(ppm)		(L/Hr)		CH ₄	CO ₂
			P.R.	S.R.	P.R.	S.R.	P.R.	S.R.	P.R.	S.R.	P.R.	S.R.				
BH1		2.0m - 5.0m bgl	0.0	0.0	4.2	2.5	15.6	15.6	1.0	1.0	0.0	0.0	0.1	DTB	0.0000	0.0025
BH2		2.0m - 5.0m bgl	0.0	0.0	6.1	6.1	16.0	16.0	0.0	0.0	0.0	0.0	0.1	DTB	0.0000	0.0061

Notes:

P.R. - Peak Reading
 S.R. - Steady Reading
 D.T.B. - Dry to Base

N.R.T - No Reading Taken

Recorded Checked

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