

Our ref: ARC-PPC-00-XX-RP-G-0014

Mr A. Whalley
Bowsall Developments
Bowsall House
3 King Street
Salford
M3 7DG

07 August 2023

Dear Adam,

**FINAL GAS RISK ASSESSMENT
ALBANY ROAD, CHORLTON**

Further to our Phase II Site Appraisal Report dated July 2023 the gas monitoring at the above site is now complete and the final gas risk assessment is outlined below.

Three gas/groundwater monitoring standpipes have been installed in three of the window sample exploratory holes across the site (WS02, WS04 and WS05). Response zones were targeted in the natural soils within WS02 and WS04 and the Made Ground identified within WS05.

It is understood that the site is to be redeveloped to provide a four-story apartment block which is classified as a Type B building.

The standpipes were monitored between the 09 June 2023 and 04 August 2023 using a GA5000 Multi-Function Gas Analyser; the complete set of gas monitoring results are enclosed for reference.

In summary, a maximum concentration of carbon dioxide of 9.00 % v/v was recorded, and a minimum oxygen level of 0.40% v/v has been recorded. A maximum methane concentration of 22.7% v/v were recorded during the monitoring period. Maximum carbon monoxide and hydrogen sulphide concentrations of 3ppm and 1ppm respectively were recorded.

The risk from ground gases has been assessed using 'Situation A' and 'Situation B' as outlined in CIRIA C665.

Using a maximum steady flow rate of 0.2 l/hr the maximum carbon dioxide concentration of 9.00% v/v equates to a GSV of 0.018 l/hr. Using a maximum steady flow rate of 0.2 l/hr and the maximum methane concentration of 22.7 % v/v equates to a GSV of 0.0454 l/hr.

The recorded concentrations of carbon monoxide and hydrogen sulphide are below the relevant exposure limits and no further consideration is considered to be required.

BIRMINGHAM OFFICE

 40 St. Paul's Square, Birmingham, B3 1FQ
 +44 (0) 121 592 0000
 birmingham@patrickparsons.co.uk
 www.patrickparsons.co.uk

The calculated GSV for carbon dioxide and methane classify the site as Characteristic Situation 2 (CS2).

While elevated carbon dioxide and methane levels have been recorded the recorded flows are negligible, and as such it is considered that while gas concentrations were initially recorded to be high these dropped over the subsequent visits, indicating that there is not a significant gas generation potential.

As such allowances should be made for gas protection measures in line with CS2 classification which are considered adequate to mitigate the worst case ground gas risk.

In accordance with BS8485 Apartment blocks are classified as 'Type B' properties in table 3 and as such in accordance with table 4 for CS2 conditions will require a gas protection score of 3.5 points.

The appropriate combination of elements should be chosen from Tables 5, 6 and 7 of BS8485:2019 to achieve the required point score (or greater). No more than one element of each type (i.e. each table) should be combined to achieve the recommended minimum level of mitigation.

Examples of how this score may be achieved is as follows:

CS2 Conditions		
Gas Protection Element		Score
Table 5	Precast suspended segmental subfloor (i.e. beam and block)	0
Table 6	Passive sub floor dispersal layer with min. good performance: Media used to provide the dispersal layer are: • Clear void • Polystyrene void former blanket • Geocomposite void former blanket • No-fines gravel layer with gas drains • No-fines gravel layer Performance criteria for methane and carbon dioxide are shown in BS8485:2019 Annex B Figure B.6 and Figure B.7, respectively.	1.5
Table 7	Gas resistant membrane	2
Total		3.5

Gas Protection Measure Validation

To achieve the two points for the gas membranes they will need to be independently validated, this will require the membrane to be visually inspected by an independent 3rd party to ensure it has been correctly installed to a high standard. The visual inspection will include, but not be limited to, the following checks:

- Visual inspection to check for presence of tears and holes in the membrane.
- Inspection of service entries to make sure a full seal has been achieved.
- Checking of joints to ensure correct tape and minimum overlap has been achieved.
- Checking of air bricks to ensure underfloor venting has been provided.

The local authority may require minimum qualifications of the installing personnel.

Photographic evidence should be collected during the validation process.

A validation letter report will be produced following the satisfactory installation of the gas protection membrane and will include a photographic record.

This letter should be submitted to the relevant authority to confirm their requirements regarding installation and inspection. We trust the above meets your requirements, should you have any queries or questions please do not hesitate to contact the undersigned.

Yours faithfully,



Peter Searing
Engineer

enc. 10569 Gas Monitoring Results
10569 Exploratory Hole Location Plan



1.1. THIS DRAWING IS COPYRIGHT AND SHOULD NOT BE REPRODUCED IN WHOLE OR PART WITHOUT THE WRITTEN CONSENT OF PATRICK PARSONS LTD.
1.2. DO NOT SCALE FROM THIS DRAWING.



PATRICK PARSONS

Client
Bowsall Developments Ltd

Drawing
Proposed Exploratory Hole Location
Plan

Date	08/03/2023	Drawn by	Checked by
		HA	JPB

Status Preliminary

Drawing No. ARC-PPC-00-XX-DR-G-703 Rev.

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client: Bowsall Development
Site: Albany Road, Chorlton
Date: 09/06/2023

Job No: 10569
Visit No: 1 **of** 4
Operator: PGS

Project Manager: HA

[illegible]**METEOROLOGICAL AND SITE INFORMATION:**

(Select correct box with X or enter data, as applicable)

X Dry

X	Calm
---	------

X	None
---	------

X	None
---	------

1015 Before

X	Falling
---	---------

22 Before

☐ Moist

Light

☐ Slight

☐ Slight

1015 Before

X	Falling
---	---------

22 Before

☐ Wet

Moderate

Cloudy

☐ Moderate

☐ Steady

☐ Strong

☐ Overcast

--	--

1014	After
------	-------

☐ Rising

22 After

☐ Frozen

Ground Gas and Groundwater Monitoring Record

JOB DETAILS:

Client: Bowsall Development
 Site: Albany Road, Chorlton
 Date: 21/07/2023

Job No: 10569
 Visit No: 3 of 4
 Operator: PGS Project Manager: HA

	GAS CONCENTRATIONS												VOCs		GAS FLOWS				WELL AND GROUNDWATER DATA					Comments
Monitoring Point	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppm)		Hydrogen sulphide (ppm)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	Reduced level (mAOD)	Water level (mAOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady								
WS02	3.5	1.5			2.8	2.3	3	2	0	0	11.5	14.9			0.0	0.0			2.17	3.44				
WS04	0.3	0.3			2.1	2.1	0	0	0	0	18.3	18.3			0.0	0.0			1.62	2.76				
WS05	0.3	0.3			8.5	8.5	0	0	0	0	9.8	9.8			0.2	0.2			DRY	1.81				
Max	3.5	1.5	0	0	8.5	8.5	3	2	0	0	18.3	18.3			0.2	0.2			2.17	3.44				
Min	0.3	0.3	0	0	2.1	2.1	0	0	0	0	9.8	9.8			0.0	0.0			1.62	1.81				
GSV (l/hr)	0.007				0.017																			

METEOROLOGICAL AND SITE INFORMATION:

State of ground:

☒ Dry
☐ Calm
☐ None
☒ None

Wind:

Cloud cover:

Precipitation:

Barometric pressure (mbar):

Pressure trend:

Air Temperature (Deg. C):

(Select correct box with X or enter data, as applicable)

☐ Moist
☒ Light
☐ Slight
☐ Slight
☐ Before
☐ Falling
☐ Before

☐ Wet
☐ Moderate
☒ Cloudy
☐ Moderate
☐ Steady

☐ Snow
☐ Strong
☐ Overcast
☐ Heavy
☐ 1012 After
☐ Rising
☐ 15 After

☐ Frozen

Summary of Ground Gas and Groundwater Monitoring

JOB DETAILS:

Client: Bowsall Development
Site: Albany Road, Chorlton

Job No: #####

Project Manager: HA

	GAS CONCENTRATIONS										VOLATILES		FLOW DATA		WELL AND WATER DATA					Comments	
Monitoring Point	Methane (%v/v)		Carbon dioxide (%v/v)		Carbon monoxide (ppm)		Hydrogen sulphide (ppm)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Average Water level (mbgl)	Depth of well (m)	Reduced level (mAOD)	Water level (mAOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady							
WS02	22.70	22.50	3.00	2.30	3	2	1	1	0.40	0.60	-	-	0.1	0.1	-	2.18	3.23	-	-	-	
WS04	1.20	0.90	2.20	2.10	0	0	0	0	17.90	17.90	-	-	0.1	0.1	-	1.62	2.72	-	-	-	
WS05	0.90	0.90	9.00	9.00	1	1	0	0	9.10	9.10	-	-	0.2	0.2	-	Dry	1.80	-	-	-	
Max	22.70	22.50	9.00	9.00	3	2	1	1	17.90	17.90			0.2	0.2		1.62	3.23				
Min	0.00	0.00	0.00	0.00	0	0	0	0	0.00	0.00			0.0	0.0		2.18	0.00				
GSV (l/hr)	0.0454		0.018																		

Summary of Ground Gas Concentrations

