Site Investigations
♣
Geologists
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Environmental &
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JC Consulting Ltd

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GROUND GAS RISK ASSESSMENT

99 PLYMOUTH GROVE, MANCHESTER
NE-26-004/GAS

INTRODUCTION

Authorisation

The site investigation undertaken was carried out by Solmek to the instructions of JC Consulting, on a parcel of land at the former Rensaw House Methodist Church, 99 Plymouth Grove, Manchester, M13 9HX. A site location plan is presented as Figure 1 to the rear of this report.

Sources of information, including previous work undertaken at the site, are detailed below:

- *Ground and Project Consultants Ltd, Phase 1 Desk Study (100948, February 2024)*
- *Solmek Phase 2 Site Investigation Report (NE-26-004 – Rev 1, March 2026)*
- *Solmek Post Demolition Contamination Assessment (NE-26-004/PD, May 2026)*

Reference should be made to the above reports for details of the environmental/geotechnical setting and underlying geological conditions at the site.

Scope of Works

The proposed development is expected to comprise new student residential accommodation with peripheral soft landscaping.

The information provided in this Ground Gas Assessment is based on the investigation fieldwork and is subject to the comments and approval of the various Regulatory Authorities. There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report.

Solmek reserve the right to alter conclusions and recommendations should further information be available or provided. Any schematic representation or opinion of the possible configuration of ground conditions between exploratory holes is conjectural and given for guidance only and confirmation of intermediate ground conditions should be considered if deemed necessary.

GROUND GAS ASSESSMENT

Ground gases such as carbon dioxide (CO_2) and methane (CH_4) can be classed as a form of contamination where there is a potential risk to human health. As a result, gas monitoring has been undertaken. Six visits have been carried out between January 2026 and April 2026 to assess the potential risks posed by ground gases.

The gas was monitored by measuring emissions from monitoring points installed into CP01, BH02 and BH05 during the fieldwork. Figure 2 to the rear of this report, showing the borehole locations.

The monitoring was generally carried out in accordance with current guidance provided within CIRIA C665:2007.

The results are presented to the rear of this report.

Ground Gas Results

The atmospheric pressure has an impact on the concentrations of gas released. The atmospheric pressure ranged between 981 and 1024 millibars during the surveys. Times of steady, falling and rising atmospheric pressure regional trends were noted during the survey. This is considered to be a good range of conditions for the time of year.

- Carbon Monoxide and Hydrogen Sulphide were not detected.
- Methane was not detected.
- VOC's were not detected.
- Carbon dioxide concentrations were recorded between 0.00% and 0.70%.
- Oxygen levels were between 19.00% and 20.30%.
- Flow rates were recorded between 0.00l/hr and 2.20l/hr.

The monitoring well in BH02 had been damaged during excavation works prior to monitoring visit 4. No further monitoring took place from this position.

Ground Gas Analysis

The results obtained have been compared with relevant guidance that includes the following:

- BRE/Environment Agency BR414 (2001) – Protective Measures for Housing on Gas-Contaminated Land
- Wilson & Card (1999) – Reliability and Risk in Gas Protection Design
- CIRIA 149 (1995) – Protecting Development from Methane
- CIRIA C665 (2007) – Assessing Risks Posed by Hazardous Ground Gases to Buildings.
- BS8485 (2015) + A1 (2019) – Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings

The Building Regulations set action levels for both methane and carbon dioxide from which an initial assessment can be made. The action threshold for methane is 1% while for carbon dioxide an initial consideration should be undertaken if gas concentrations exceed 1.5%. Action might be required if carbon dioxide concentrations exceed 5%. If these thresholds are exceeded, reference should be made to specific documentation to determine the nature and extent of the gas control measures required.

A Characteristic Situation ranking of between 1 and 6 is given based on the ground gas monitoring results coupled with the gas flow rate. This combined produces a Gas Screening Value (GSV). Where no flow is recorded a flow rate of 0.1l/hr is assumed.

The GSV and risk classification define the characteristic situation, which are comparable to the table below, taken from CIRIA C665, and derived from CIRIA R149. Given that the site will be largely covered by hardstanding, gardens and the buildings will be for residential use, the protection measures required are based on CIRIA R149, as shown below.

CIRIA R149 GAS REGIMES

Characteristic Situation (CS)	Risk Classification	Gas Screening Value CH4 or CO2 (l/hr)	Additional Factors
1	Very Low Risk	<0.07	*CS1 where CH_4 is <1% and/or CO_2 is <5%, Otherwise increase to CS2*
2	Low Risk	<0.7	
3	Moderate Risk	<3.5	
4	Moderate to High Risk	<15	
5	High Risk	<70	
6	Very High Risk	>70	

The worst case GSV can be taken from the highest flow rate recorded over the visits (2.2/hr) along with the greatest volume of gas, in this case carbon dioxide (0.70%). Based on these figures the worst GSV has been calculated as 0.0154 (l/hr).

The gas screening values from the monitoring visits would therefore place the site in **Characteristic Situation (CS) 1.**

A series of tables adapted from **BS:8485** are presented in to the rear of this report. The type of building and gas protection level generate a minimum gas protection points score, in this case a private residential building (Type B) combined with CS1 has a score of **0 points**. Based on these results no gas precautions are therefore required.

RADON

The site is not in a Radon Affected Area, as less than 1% of properties are estimated to be at or above the Action Level.

In accordance with the procedure described in BRE Publication BR211 Radon: Guidance on Protective Measures for New Dwellings, **no radon protection measures are necessary** for new buildings or extensions on the site.

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