

Our Ref C337/19/E/GM  
23<sup>rd</sup> of August 2021

**Environmental  
Geotechnical  
Specialists**



Adrian Mosley  
The Old Parsonage  
2 Park Lane  
Bretton  
Wakefield  
West Yorkshire  
WF4 4JT

**For the attention of Adrian Mosley C/O Farrar Bamforth Associates Ltd**

Dear Adrian,

Ref: Gas Monitoring at Stile Common Road, Newsome, Huddersfield

Further to our report on a coal mining investigation (C337/19/E/1956) which was presented in June 2021, we have now completed four rounds of gas monitoring and present our findings.

### Monitoring

A gas monitoring standpipe was installed to 2m in BH01, which was the sole borehole undertaken during the site investigation. The installation details are shown on the borehole log, the location of which is provided on the site plan presented as Appendix 1 of the original report. Visits were made to the site between the 4<sup>th</sup> June and the 29<sup>th</sup> June 2021. The results of this work are tabulated below:

| Table 1: Gas Monitoring |          |                        |                        |                       |      |                                |                       |                        |
|-------------------------|----------|------------------------|------------------------|-----------------------|------|--------------------------------|-----------------------|------------------------|
| Location                | Date     | CH <sub>4</sub><br>(%) | CO <sub>2</sub><br>(%) | O <sub>2</sub><br>(%) | Flow | Barometric<br>Pressure<br>(mb) | Water<br>Level<br>(m) | Standpipe Depth<br>(m) |
| BH01                    | 04.06.21 | 0.0                    | 0.1                    | 20.9                  | 0.1  | 1012↑                          | —                     | 1.9                    |
|                         | 14.06.21 | 0.1                    | 0.1                    | 21.2                  | 0.1  | 1010↑                          | —                     |                        |
|                         | 22.06.21 | 0.0                    | 0.1                    | 21.1                  | 0.1  | 1012↑                          | —                     |                        |
|                         | 29.06.21 | 0.0                    | 0.1                    | 21.0                  | 0.1  | 1006↓                          | —                     |                        |
| ↑ rising pressure       |          | ↓ falling pressure     |                        | → steady pressure     |      |                                |                       |                        |

The monitoring visits were undertaken using a Geotechnical Instruments (UK) Ltd. GA5000 (serial No G503524) which was last calibrated on the 5<sup>th</sup> May 2021.

### Gas Concentrations

With respect to ground gas, the results of the monitoring visits indicated negligible methane, with low concentrations of carbon dioxide of 0.1%, in association with oxygen levels of between 20.9% and 21.2%. It should be appreciated that on non contaminated sites there is generally about 20% by volume of oxygen, associated with low levels of carbon dioxide. In addition, a maximum flow rate of 0.1 litres per hour was recorded and will be employed in the following calculations.

The principal driving force for initiating the movement of gas in the ground is a change in barometric pressure. The most onerous gas condition on a site is usually observed on days of low or falling barometric pressure. It has been noted that measurements undertaken solely during high pressure conditions may be of lesser value. At this site the readings undertaken

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to date were at atmospheric pressures of between 1006mb and 1012mb. Nonetheless, the fourth visit was undertaken during a period of falling barometric pressure.

## Risk Assessment

In order to establish the gas screening value (GSV) for carbon dioxide or methane, the maximum gas concentration (expressed as a decimal) is multiplied by the borehole flow rate (l/hr). In this case 0.1% (0.001) methane was recorded along with 0.1% (0.001) carbon dioxide, in association with a maximum flow rate of 0.1 l/hr. This results in a GSV of 0.0001 l/hr for methane and a GSV of 0.0001 l/hr for carbon dioxide.

In accordance with Table 8.5, *Modified Wilson and Card classification* of the CIRIA report C665, *Assessing risks posed by ground gasses to building*, the site may be characterised as *Characteristic Situation Level 1*. It is therefore considered that there is a low risk of harm to end users and site operatives and no special precautionary measures are required in accordance to Table 8.6, *Typical scope of gas protection measures*, of CIRIA report C665. Nonetheless, the local authority are the final arbiters on such matters, therefore this letter report should be submitted for review as part of the planning process.

## References

- British Standards Institution (2013), BS 8576 Guidance on Investigations for Ground Gas – Permanent Gases and Volatile Organic Compounds.
- British Standards Institution (2015 +A1:2019) BS8485: *Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*, B.S.I., London.
- CIRIA Report C665, *Assessing risks posed by ground gasses to building*.

We trust that this information is of interest and should you have any other requirements do not hesitate to contact us.

For Rogers Geotechnical Services Ltd,

Yours Faithfully



**Rob Palmer** MSc FGS ACIEH  
Senior Geo-environmental Engineer