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Our Ref: 5796G / SCS

6th January 2014

Dear Sir

RE: NEW ISLINGTON SCHOOL – UPDATED GAS RISK ASSESSMENT

Further to the issue of the following reports.

- Phase 2 Geoenvironmental Investigation and Assessment (Reference 5796/G/01, dated November 2013).

This letter provides further information with regards to the gas monitoring results and an updated risk assessment for potentially hazardous ground gas in relation to the above named site.

Methodology

Current guidance for the assessment of risk associated with the presence of hazardous ground gases (principally methane and carbon dioxide) is provided in two key documents, namely:

- Code of practice for the Characterisation and remediation from Ground Gas in Affected Developments. British Standard Institution (BS 8485: 2007); and
- Assessing Risks posed by Hazardous Ground Gases to Buildings CIRIA (C665, 2007).

The assessment presented herein is primarily based on the BS 8485 document.

Hazardous ground gas qualitative risk assessment is based on a conceptual model similar to that used for soil and groundwater contamination sources (i.e., source-pathway-receptor pollutant linkages). A semi-quantitative estimate of risk can be assessed based on knowledge of the conceptual model and a measure of hazardous gas concentration and gas flow at the site within monitoring standpipes.

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Based on the measured flow rates and hazardous gas concentrations, individual “hazardous gas flow rates” (Q_{hg}) can be derived for each monitoring point, from which the “site characteristic hazardous gas flow rate” (Q_{hgs}), and then the “Characteristic Situation” can be determined.

BS8485 provides guidance on the level of gas protection requirements based upon the characteristic situation and the type of development (e.g. non-managed property such as private housing, or managed properties such as public buildings, commercial buildings or industrial buildings).

Conceptual Model

The site is not in an area recorded as being affected by naturally occurring radon gas nor is it within an area at risk of mine gas. There are no landfills within influencing distance of the site.

Although, the site does include former in-filled canal basements, no significant volumes of degradable material with the potential to generate significant concentrations of ground gas have been identified during the ground investigations.

However, in consideration of the medium ground gas risk determined from the preliminary assessment, it has been considered prudent to undertake a programme of ground gas monitoring, primarily to include methane and carbon dioxide, with associated flow rates.

Monitoring Results

Ground gas monitoring was undertaken within 4no standpipes on 6no occasions between 27th September and 17th December 2013.

The monitoring results indicated concentrations of methane below detectable limits. Maximum concentrations of carbon dioxide of 2.1% by volume in air (v/v) were recorded although no positive gas flows were recorded. The Hazardous Gas Flow Rate, calculated from the maximum measured concentration (carbon dioxide 2.1% v/v) and flow (0.1l/hr) is therefore 0.002l/hr.

Assessment and Recommendations

On the basis of these results and in view of no detectable gas flow, the site would fall into Characteristic Situation (CGS) 1 – Very Low Hazard Potential as indicated in BS8485, confirming a very low gas risk.

Therefore the recommendations within the WML report as referenced above remain unchanged and under this circumstance, no specific gas protection measures are considered necessary for the proposed residential development.

We hope this assessment provides the information required at this time. However, should you have any comments or require any additional information, please do not hesitate to contact us.

Yours sincerely,



S. C Seddon
For WML CONSULTING

APPENDIX 01 - GAS MONITORING

Ground Gas Monitoring Record

| Borehole | Gas Flow (l/hr) | Borehole Pressure (Pa) | Methane (% v/v) | | Methane (%LEL*) | | Carbon Dioxide (%v/v) | | Oxygen (%v/v) | | Nitrogen (%v/v) | | Depth to water (m bgl) | Atmospheric Pressure (mB) | Comments |
|----------|--------------------|------------------------------|--------------------|--------|--------------------|--------|--------------------------|--------|------------------|--------|--------------------|--------|------------------------------|---------------------------------|----------|
| | | | Initial | Steady | Initial | Steady | Initial | Steady | Initial | Steady | Initial | Steady | | | |
| BH 1 | 0.0 | 0 | 0.0 | | | | 2.0 | | 16.2 | | 81.7 | | 1.70 | 1015 | |
| BH 2 | 0.0 | 0 | 0.0 | | | | 0.0 | | 21.0 | | 78.9 | | 1.15 | 1015 | |
| BH 3 | 0.0 | 0 | 0.0 | | | | 0.0 | | 19.8 | | 80.2 | | 1.80 | 1015 | |
| WS 3 | 0.0 | 0 | 0.0 | | | | 0.0 | | 21.1 | | 78.9 | | 1.85 | 1015 | |
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Notes:

Monitoring should be for not less than 3 Minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 mins.

* LEL = Explosive Limit = 5%v/v

ND - Not Detected

| Relevant Information at times of monitoring | | | | | | | | | |
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| Monitored by: Weather : Equipment used: Visible signs of vegetation stress: Boreholes sampled for laboratory analysis: Other comments / observations: | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Contract:</td> <td style="text-align: center; padding: 5px;">New Islington</td> </tr> <tr> <td style="padding: 5px;">Date:</td> <td style="text-align: center; padding: 5px;">26/09/13</td> </tr> <tr> <td style="padding: 5px;">Job No.</td> <td style="padding: 5px;"> </td> </tr> <tr> <td style="padding: 5px;">Sheet No.</td> <td style="text-align: center; padding: 5px;">1</td> </tr> </table> | Contract: | New Islington | Date: | 26/09/13 | Job No. | | Sheet No. | 1 |
| Contract: | New Islington | | | | | | | | |
| Date: | 26/09/13 | | | | | | | | |
| Job No. | | | | | | | | | |
| Sheet No. | 1 | | | | | | | | |

Ground Gas Monitoring Record

| Borehole | Gas Flow (l/hr) | Borehole Pressure (Pa) | Methane (% v/v) | | Methane (%LEL*) | | Carbon Dioxide (%v/v) | | Oxygen (%v/v) | | Nitrogen (%v/v) | | Depth to water (m bgl) | Atmospheric Pressure (mB) | Comments |
|----------|--------------------|------------------------------|--------------------|--------|--------------------|--------|--------------------------|--------|------------------|--------|--------------------|--------|------------------------------|---------------------------------|----------|
| | | | Initial | Steady | Initial | Steady | Initial | Steady | Initial | Steady | Initial | Steady | | | |
| BH 1 | 0.0 | 0 | 0.0 | | | | 1.9 | | 15.9 | | 82.2 | | 1.70 | 1021 | |
| BH 2 | 0.0 | 0 | 0.0 | | | | 0.0 | | 20.9 | | 79.0 | | 1.13 | 1021 | |
| BH 3 | 0.0 | 0 | 0.0 | | | | 0.0 | | 19.1 | | 80.8 | | 1.78 | 1021 | |
| WS 3 | 0.0 | 0 | 0.0 | | | | 0.0 | | 21.0 | | 79.0 | | 1.85 | 1021 | |
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Notes:

Monitoring should be for not less than 3 Minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 mins.

* LEL = Explosive Limit = 5%v/v

ND - Not Detected

Relevant Information at times of monitoring

| | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Monitored by: Weather : Equipment used: Visible signs of vegetation stress: Boreholes sampled for laboratory analysis: Other comments / observations: | J. Crook LMS Type G3 xi Gas Meter | Contract: <p style="text-align: center;">New Islington</p> Date: <p style="text-align: center;">07/10/13</p> Job No. Sheet No. <p style="text-align: center;">2</p> |
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Geo-Ventures (UK) Limited

70 Riverside Close, Waterside, Howley, Warrington, Cheshire WA1 2JD
 Tel. 01925 240476 email: paul.platt@geoventures.co.uk

Ground Gas Monitoring Record

| Borehole | Gas Flow (l/hr) | Borehole Pressure (Pa) | Methane (% v/v) | | Methane (%LEL*) | | Carbon Dioxide (%v/v) | | Oxygen (%v/v) | | Nitrogen (%v/v) | | Depth to water (m bgl) | Atmospheric Pressure (mB) | Comments |
|----------|--------------------|------------------------------|--------------------|--------|--------------------|--------|--------------------------|--------|------------------|--------|--------------------|--------|------------------------------|---------------------------------|----------|
| | | | Initial | Steady | Initial | Steady | Initial | Steady | Initial | Steady | Initial | Steady | | | |
| BH 1 | 0.0 | 0 | 0.0 | | | | 2.1 | | 15.1 | | 82.7 | | 1.68 | 1011 | |
| BH 2 | 0.0 | 0 | 0.0 | | | | 0.0 | | 21.1 | | 78.8 | | 1.11 | 1011 | |
| BH 3 | 0.0 | 0 | 0.0 | | | | 0.0 | | 15.1 | | 84.8 | | 1.76 | 1011 | |
| WS 3 | 0.0 | 0 | 0.0 | | | | 0.0 | | 21.2 | | 78.8 | | 1.82 | 1011 | |
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Notes:

Monitoring should be for not less than 3 Minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 mins.

* LEL = Explosive Limit = 5%v/v

ND - Not Detected

Relevant Information at times of monitoring

| | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Monitored by: Weather : Equipment used: Visible signs of vegetation stress: Boreholes sampled for laboratory analysis: Other comments / observations: | J. Crook Overcast LMS Type G3 xi Gas Meter | Contract: <p style="text-align: center;">New Islington</p> Date: <p style="text-align: center;">18/10/13</p> Job No. Sheet No. <p style="text-align: center;">3</p> |
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Geo-Ventures (UK) Limited

70 Riverside Close, Waterside, Howley, Warrington, Cheshire WA1 2JD
 Tel. 01925 240476 email: paul.platt@geoventures.co.uk

Ground Gas Monitoring Record

| Borehole | Gas Flow (l/hr) | Borehole Pressure (Pa) | Methane (% v/v) | | Methane (%LEL*) | | Carbon Dioxide (%v/v) | | Oxygen (%v/v) | | Nitrogen (%v/v) | | Depth to water (m bgl) | Atmospheric Pressure (mB) | Comments |
|----------|--------------------|------------------------------|--------------------|--------|--------------------|--------|--------------------------|--------|------------------|--------|--------------------|--------|------------------------------|---------------------------------|----------|
| | | | Initial | Steady | Initial | Steady | Initial | Steady | Initial | Steady | Initial | Steady | | | |
| BH 1 | 0.0 | 0 | 0.0 | | | | 1.2 | | 14.8 | | 83.9 | | 1.67 | 1003 | |
| BH 2 | 0.0 | 0 | 0.0 | | | | 0.0 | | 20.0 | | 79.9 | | 1.12 | 1003 | |
| BH 3 | 0.0 | 0 | 0.0 | | | | 0.8 | | 18.4 | | 80.7 | | 1.78 | 1003 | |
| WS 3 | 0.0 | 0 | 0.0 | | | | 0.0 | | 3.9 | | 96.0 | | 1.82 | 1003 | |
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| Relevant Information at times of monitoring | | | | | | | | | |
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| Contract: | New Islington | | | | | | | | |
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| Job No. | | | | | | | | | |
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Ground Gas Monitoring Record

| Borehole | Gas Flow (l/hr) | Borehole Pressure (Pa) | Methane (% v/v) | | Methane (%LEL*) | | Carbon Dioxide (%v/v) | | Oxygen (%v/v) | | Nitrogen (%v/v) | | Depth to water (m bgl) | Atmospheric Pressure (mB) | Comments |
|----------|--------------------|------------------------------|--------------------|--------|--------------------|--------|--------------------------|--------|------------------|--------|--------------------|--------|------------------------------|---------------------------------|----------|
| | | | Initial | Steady | Initial | Steady | Initial | Steady | Initial | Steady | Initial | Steady | | | |
| BH 1 | 0.0 | 0 | 0.0 | | | | 1.2 | | 14.8 | | 83.9 | | 1.40 | 1032 | |
| BH 2 | 0.0 | 0 | 0.0 | | | | 0.0 | | 21.0 | | 79.0 | | 1.40 | 1032 | |
| BH 3 | 0.0 | 0 | 0.0 | | | | 0.0 | | 17.8 | | 82.2 | | 1.60 | 1032 | |
| WS 3 | 0.0 | 0 | 0.0 | | | | 0.1 | | 20.2 | | 79.6 | | 1.86 | 1032 | |
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| Contract: | New Islington | | | | | | | | |
| Date: | 28/11/13 | | | | | | | | |
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Ground Gas Monitoring Record

| Borehole | Gas Flow (l/hr) | Borehole Pressure (Pa) | Methane (% v/v) | | Methane (%LEL*) | | Carbon Dioxide (%v/v) | | Oxygen (%v/v) | | Nitrogen (%v/v) | | Depth to water (m bgl) | Atmospheric Pressure (mB) | Comments |
|----------|--------------------|------------------------------|--------------------|--------|--------------------|--------|--------------------------|--------|------------------|--------|--------------------|--------|------------------------------|---------------------------------|----------|
| | | | Initial | Steady | Initial | Steady | Initial | Steady | Initial | Steady | Initial | Steady | | | |
| BH 1 | 0.0 | 0 | 0.0 | | | | 0.6 | | 18.2 | | 81.2 | | 1.41 | 1011 | |
| BH 2 | 0.0 | 0 | 0.0 | | | | 0.0 | | 20.4 | | 79.5 | | 1.53 | 1011 | |
| BH 3 | 0.0 | 0 | 0.0 | | | | 0.0 | | 10.2 | | 89.7 | | 1.95 | 1011 | |
| WS 3 | 0.0 | 0 | 0.0 | | | | 0.2 | | 20.0 | | 79.7 | | 1.58 | 1011 | |
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* LEL = Explosive Limit = 5%v/v

ND - Not Detected

| Relevant Information at times of monitoring | | | | | | | | | |
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| Monitored by: Weather : Equipment used: Visible signs of vegetation stress: Boreholes sampled for laboratory analysis: Other comments / observations: | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Contract:</td> <td style="text-align: center; padding: 5px;">New Islington</td> </tr> <tr> <td style="padding: 5px;">Date:</td> <td style="text-align: center; padding: 5px;">17/12/13</td> </tr> <tr> <td style="padding: 5px;">Job No.</td> <td style="padding: 5px;"> </td> </tr> <tr> <td style="padding: 5px;">Sheet No.</td> <td style="text-align: center; padding: 5px;">6</td> </tr> </table> | Contract: | New Islington | Date: | 17/12/13 | Job No. | | Sheet No. | 6 |
| Contract: | New Islington | | | | | | | | |
| Date: | 17/12/13 | | | | | | | | |
| Job No. | | | | | | | | | |
| Sheet No. | 6 | | | | | | | | |
| S Edwards | | | | | | | | | |
| LMS Type G3 xi Gas Meter | | | | | | | | | |