Ruabon Business Park, Adjacent to A483, Ruabon Wrexham, LL14 6TE

Planning approval P/2018/0053 to discharge pre-commencement condition 31 for phase 1 of the residential section of land (phase 1 Reserved Matters approval P/2020/0673).

Phase 1 Contamination Assessment Report, dated 16th November 2015 and Phase 2 Geoenvironmental Assessment Report, dated 27 November 2015, both produced by MLM Environmental, have been provided for the overall development site. On Page ii of the Phase 2 report (as table copied below), in reference to Soil Contamination it states "*soil contamination was not present*" and in reference to the Gas/Vapour Contamination and Remediation it states, "*Slightly elevated levels of carbon dioxide were noted*" and remediation measures could be *"Possible incorporation of gas protection measures"* and "*Incorporation of radon protective measures within the new construction at the site"*

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Details	Summary of Main Text
Contamination	
Soil Contamination	Soil contamination was not present with respect to human health for the proposed mixed residential and commercial development.
Gas/Vapour Contamination	Slightly elevated levels of carbon dioxide were noted. Based on these isolated elevated levels the site is designated CIRIA Characteristic 2/NHBC Amber 1
Remediation	Possible incorporation of gas protective measures within new construction at the site. Incorporation of radon protective measures within new construction at the site.
Further Work	
	A tree survey is required prior to site clearance, to determine the potential influence of trees on and adjacent to the site. Further gas and groundwater monitoring to better define and delineate the ground gas regime. Further deeper boreholes across the site area to confirm the findings of the site investigation and to determine the characteristics of the deeper ground conditions and to confirm the foundation design for the development.

Since soil contamination was not present, a further ground investigation was undertaken in May 2022, by E-geo Solutions, and report produced to investigate both ground gas and radon gas. On page 8 of this report (as sections 5.2 and 5.3 copied below) it states, *"All concentrations were consistent during the monitoring period and well below the 5.0% trigger concentration", a*nd the radon report provided states "*BASIC Radon protection measures are required for the site area*".

5.2 Ground Gas Monitoring Results Assessment

5.2.1 In the assessment of soil gasses reference has been made to the NHBC Guidance on Methane and Carbon Dioxide Report Edition No04 (March 2007), BS8485 and CIRIA Publication C659 Assessing Risks Posed by Hazardous Ground Gases To Buildings. The monitoring results have been compared to the standard trigger concentrations of 1% v/v for methane and 5.0% v/v for carbon dioxide.

5.2.2 No detectable concentrations of methane were recorded in boreholes WS2, WS6, WS11, WS15, WS18, WS21 by % volume or % lower explosive limit (LEL) on any of the 6 monitoring visits.

5.2.3 Very low concentrations of carbon dioxide, with slightly depleted oxygen concentrations were detected in all monitoring installations (WS2, WS6, WS11, WS15, WS18, WS21) on most occasions but concentrations were only in the range 0.4% to 2.2% (steady readings) with a maximum of 2.3% (peak reading) detected in WS18 on 04/03/22. All concentrations were consistent during the monitoring period and well below the 5.0% trigger concentration.

5.2.4 When the gas monitoring equipment (GA5000 Gas Analyser Serial Nr. G507303) potential margin of error is taken into consideration the potential maximum peak carbon dioxide concentration is still significantly less than 5.0%.

5.2.5 Gas flows in all monitoring installations were 0.1 l/hr or less.

5.2.6 With reference to the CIRIA and NHBC Guidance and the 'Traffic Light' system of ground gas risk assessment the results have been screened using the method for low rise housing developments. No methane was detected. For a maximum peak carbon dioxide concentration of 2.3% and a flow rate of 0.1l/hr the Gas Screening Value (GSV) is 0.0023l/hr. With a GSV of 0.0023 and maximum carbon dioxide concentration of 4.8% the site would be classified as 'Characteristic Situation 1'.

5.3 Radon Report

5.3.1 A site specific radon report indicating the potential risk from radon gas is presented as Appendix 5. According to BGS Radon Report BGS_326495/34724 BASIC Radon protection measures are required for the site area.

Based on the information/reports provided, and since there is no soil contamination present and any monitored ground gas was well below the trigger concentration level, it is proposed to install **Basic radon protection measures only on all properties constructed on site**.

In the event that any unexpected contamination is found during the construction works, the work will stop, the material will be isolated, and Wrexham County Borough Council will be contacted to agree a way forward in consultation with our retained Ground Investigation Consultants E-geo Solutions Ltd.