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Client	CambridgeHOK	Date	21/04/2026

Ground Gas Risk Assessment

Introduction

Pick Everard undertook a Phase I and Phase II geo-environmental investigation for Royal Botanical Gardens Kew in 2021-22 to support the proposed development of a nursery at Wakehurst, Selsfield Road, Haywards Heath, RH17 6TN (the Site).

Pick Everard have been commissioned by CambridgeHOK (the Client) to undertake a revision of the ground gas risk assessment within the Phase II Geo-Environmental Site Investigation Report (ref. MC/EBE/210453/17-2/R002, dated 30th May 2022). The revision has been requested in order to satisfy the local planning authority and support the progression of the development.

It is recommended that this document is read in conjunction with MC/EBE/210453/17-2/R002 Phase II Geo-Environmental Site Investigation Report.

Summary of Previous Report Findings

The ground investigation undertaken by Pick Everard in September 2021 identified the Site to be underlain by Made Ground to a maximum depth of 1.1m below ground level (bgl), overlying natural weathered soils of the Grinstead Clay Member to a maximum explored depth of 3.45m bgl. Resting groundwater was encountered within the Grinstead Clay Member.

The investigation noted the occasional presence of degradable organic materials within the deposits of the Grinstead Clay Member and subsequently a sole round of ground gas monitoring was undertaken on 13th September 2021. The monitoring covered three wells with response zones that targeted the Grinstead Clay Member, and it is noted that all three response zones were partially flooded with groundwater during the monitoring visit.

The ground gas monitoring identified a maximum steady state CO₂ concentration of 4.6%, CH₄ of 0.1%, and a maximum flow rate of 0.11/hr, with a gas screening value of 0.0046/hr calculated in general accordance with BS 8485:2015+A1:2019. Whilst the results of the gas monitoring placed the Site within Characteristic Situation I (very low risk), additional monitoring was recommended on account of the limited dataset. The report concluded that a low to moderate risk was posed to future site users by ground gas, subject to further investigation.

Ground Gas Risk Assessment

This risk assessment has been undertaken with reference to the following key guidance:

- BS 8485: 2015+A1: 2019 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings
- CL:AIRE RB17 2019 A Pragmatic Approach to Ground Gas Risk Assessment
- CL:AIRE TB18 2019 Continuous Ground-Gas Monitoring and the Lines of Evidence Approach to Risk Assessment
- Environment Agency 2025 Land contamination risk management (LCRM)

A common theme linking these documents, which is particularly emphasised within CL:AIRE RB17 and LCRM and forms an integral part of BS8485 is the development of a robust conceptual ground model which may then inform the assessment of ground gas generation potential and possible ground gas migration pathways. This approach is captured within Figure 3 within BS 8485:2015+A1:2019, which presents a flow path for site and risk assessment. The development of a conceptual ground model also draws on the line of evidence approach, which is central to a robust appraisal of ground risk. This approach has been adopted below.

Ground Conditions

The ground investigation encountered thin made ground deposits across the site, comprising mainly of granular “hardcore” type material, typified by clay bound sandstone, flint, concrete and brick fragments, typically gravel sized. The made ground was 0.2m - 1.2m thick, but typically 0.5m or less. Where thinner deposits were found the material was entirely granular. Negligible organic material was observed within the made ground.

Underlying the made ground, or topsoil where made ground was absent, were clays from the Grinstead Clay Member. This natural stratum was variable, notwithstanding its formal name, varying between a clayey sand with sandstone lithorelicts to silty clay with sandstone lithorelicts and organic inclusions. Where noted, the organic material was plant remains deposited with the clay at the time of deposition of the strata, some 135 million years ago.

Groundwater was encountered within the natural strata, being recorded at 0.9-1.3m below ground level. It is anticipated that groundwater is present within the more granular horizons of the stratum.

Gas Monitoring

A round of ground gas monitoring was undertaken which identified a maximum steady state CO₂ concentration of 4.6%, CH₄ of 0.1%, and a maximum flow rate of 0.1l/hr. This is considered typical of microbial respiration within a newly formed borehole.

Risk Assessment

The above findings indicate a thin veneer of made ground over the Site, typically less than 0.5m, but locally extending up to 1.2m. The Made Ground is largely granular and free from significant organic or other degradable content.

The underlying soils are an interbedded sequence of sands and clays. The clays were observed to have organic inclusion, which are believed to be typical of “plant bed” associated with the Grinstead Clay Member; these are plant remains laid down at the time of deposition, some 135 million years ago and are not considered to present a potential gas generation source.

The investigation has not identified a credible source of ground gas generation and based on the nature of the geological sequence the risk of future gas generation is negligible.

Adopting the logic within BS 8485:2015+A1:2019 Figure 3, it is considered that the data available is sufficient to demonstrate that no hazard is present and therefore that no further investigation is required.

Conclusion

In conclusion, it is considered that the Site does not pose a risk of significant ground gas generation and can be assigned Characteristic Situation I (very low risk) without the need for further ground gas monitoring. No ground gas protection measures are considered necessary for the proposed development.

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