



Method Statement

**Vastern Road, Reading – Geo-Environmental
Consultancy Support**

Chalk Groundwater Monitoring Boreholes

Ref: A10967-10/241111/L1

18th November 2024

Prepared for:

Rafal Chodkowski

Berkeley Homes

Prepared by:

Olivia Maxwell

Omnia Consulting

About Omnia



Geo-Environmental



Geotechnical



Acoustics



Air Quality

Omnia Consulting was established in 2013 with the aim of providing a more personal and responsible environmental consultancy service to a range of sectors.

With offices throughout the UK, we operate nationally, providing a professional, responsible and quality driven multi-disciplinary consultancy service to the development, construction, infrastructure and transport sectors.

We have teams of experienced professionals who can assist with Geo-Environmental, Geotechnical, Acoustic and Air Quality Consultancy. We often pull our range of services together in one multi-disciplinary package.

We believe that we put our clients' needs first, understanding the balance between unlocking a site's potential and providing cost-effective solutions. We know that no two projects are the same and will tailor our services to suit the specific project.

If our project understanding and/or scope of works listed below, do not meet your expectations, please don't hesitate to talk to our team.

Site Background

It is understood that since the previous investigation works, Berkely Homes have submitted an application for the site as detailed under Planning Application ref: [200188](#).

Following completion of a number of ground investigations, it is understood the client submitted a limited number of reports to the Local Planning Authority and the Environment Agency in respect of Condition 9 (De-Watering And Foundation Details).

Condition 9 states “No development shall commence on site [excluding demolition and any preparatory works necessary to inform de-watering and foundation details] until such time as a scheme to: a) secure de-watering of the site b) specify the form of foundations has been submitted to, and approved in writing by, the Local Planning Authority. The scheme shall be implemented in accordance with the approved details”

The EA consultee response reads as follows:

Thank you for reconsulting us on this application for discharge of Condition 9.

Further to our previous response (letter with reference WA/2023/130859/01-L01, dated 09 January 2024), the following documents have been submitted and reviewed:

Ground Investigation Report (Stantec, May 2023)

Site Piling Proposal (Berkeley, January 2024).

We do not consider that this is sufficient to allow the discharge of condition 9.

Reason Condition 9 requires that no development shall commence on site [excluding demolition and any preparatory works necessary to inform de-watering and foundation details] until such time as a scheme to:

a) secure de-watering of the site

b) specify the form of foundations, has been submitted to, and approved in writing by, the Local Planning Authority.

The scheme shall be implemented in accordance with the approved details.

The additional information provided still does not adequately address part B of the condition. With respect to the form of the foundations, it is now clear the intention is that the piles penetrate the overlying strata and into the Chalk below groundwater level.

The additional documents indicate five boreholes into the Chalk: 1001, 1002C, 1003E, 1004, 1005 but we have been unable to locate these on a legible map.

Further, there are no groundwater quality analyses for the Chalk groundwater. There appear to be no proposals for the monitoring of the Chalk groundwater quality during and following piling as part of the piling proposals. Please reconsult us on any additional information submitted.

Following review of the completed works to date, Omnia compiled all the information completed to date to provide a standalone groundwater risk assessment. It was considered that although the boreholes (installed by others) did not have a response zone within the chalk, that the groundwater sampled within the Kempton Park Gravels was in continuity with the chalk groundwater, and therefore was representative of the strata.

The EA have since been consulted, and confirmed that groundwater sampling is required specifically from the Chalk groundwater within letter WA/2023/130859/04-L01:

The first step is to obtain groundwater quality data from each of the Chalk boreholes on site. This should include a basic groundwater quality suite together with each of the contaminants that have been identified on site to an appropriate limit of detection, given the potential use as a drinking water supply. Thereafter we may be in a position to agree appropriate groundwater quality monitoring covering periods: before, during and after continuous flight auger piling.

Based on this information, our understanding of your proposed development and the provided brief, we detail herein our proposals for services to meet the objectives. This letter looks to set out the proposed method for the works.

It is understood the client intends to seek an amendment to Condition 9 to allow enabling works to commence on site, with the condition varied to a “pre-founding” condition.

The site location plan is presented as Figure 1.0 and the proposed development layout is presented as Figure 2.0.

Scope and Services

Based on the brief we propose to carry out the following:

1. Intrusive investigation (installation of monitoring boreholes with response zones within the Chalk saturated with Groundwater);
2. Laboratory Analysis of Chalk Groundwater; and
3. Tier 1 Letter Report.

Details of each element and rationale are as follows:

1. Phase II Ground Investigation

This stage of works will consist of the physical site investigation as set out below. The works will be undertaken by our experienced in-house team and will generally be in accordance with British Standard BS5930, incorporating Amendment 2, Code of Practice for Site Investigation (BS5930), BS10175 Investigation of Potentially Contaminated Sites - Code of Practice and all other relevant current good practice.

The aim of the investigation is to install groundwater monitoring boreholes with the response zones confined to the Chalk only. Groundwater samples will then be obtained to provide results for the baseline condition on-site.

The intrusive works will comprise:

- Health and Safety Plan prior to attending site;
- Breaking out of hardstanding where required to facilitate drilling works;
- Advancement of three (3no.) Cable Percussive (CP) boreholes to an anticipated target depth of 20.00m bgl;

- A clean drilling methodology will be adopted using a 200mm (8”) diameter casing and tools to reach the base of Made Ground. Once the base of Made Ground is reached, a 1.0m thick bentonite seal will be installed and allowed to fully hydrate prior to advancing to greater depths using a 150mm (6”) diameter clean casing and tools.
- This methodology will prevent the creation of a smear zone with the bentonite seal preventing the downward migration of any impact into the underlying strata.
- Installation of groundwater monitoring standpipes within the three (3no.) boreholes to a maximum depth of 20.0m bgl to facilitate groundwater monitoring.
 - Borehole response zones will be restricted to the Chalk only with 1.0m thick bentonite seals installed at the base of Made Ground and immediately above the filter pack at the start of the borehole response zone.
 - The filter pack will comprise clean 10mm diameter pea gravel installed for the length of the borehole response zone *;
- Borehole standpipes will be left upstanding and will be fitted with lockable upstanding ('Top-Hat') headworks to aid visibility;
- One (1no.) return groundwater sampling visit; and,
- Chemical laboratory testing of selected samples.

*From review of existing boreholes logs from the site, it is anticipated the top of the Chalk will be encountered at a depth of approximately 10.0m bgl. The response zone of the boreholes is therefore anticipated to be installed between 10 – 20m bgl. However, the exact depths of the response zone will be determined by ground conditions encountered at each borehole location during drilling works.

Following installation, groundwater monitoring wells will require protection to ensure that they remain serviceable. It is recommended that protection takes the form of concrete rings and HERAS fencing with high visibility netting. Borehole locations have been selected taking this into account

A proposed intrusive location plan is presented as Figure 2.0.

All works will be supervised full time by a qualified and experienced engineer with a full understanding of the project objectives to enable us to react to any unexpected ground conditions encountered on site and adjust scope accordingly, in conjunction with you, if required. This will assist in ensuring that the investigation obtains as much necessary data as possible to fulfill the project objectives and that works are completed safely, efficiently and to the required standards.

Please note that ground investigation is an iterative process and whilst every effort would be made to avoid, additional works cannot be ruled out.

Groundwater Sampling

The low-flow (micropurging/minimal drawdown) sampling methodology will be adopted for all phases of groundwater sampling with a 'Bladder Pump' utilised to facilitate the collection of groundwater samples due to the anticipated groundwater depth (>8.00m bGL).

The low-flow sampling methodology allows for a sample to be collected directly from formation water without overt agitation of the water column present within the monitoring pipe. This minimises the mobilisation of either product residue adhered to the well casing, or of suspended fines with sorbed contaminants and therefore provides a reliable estimate of dissolved-phase

contaminants and will allow collection of water samples from Chalk groundwater prior to piling to ensure that a record of ‘baseline’ conditions is obtained prior to the commencement of piling.

Pre-Piling

One (1no.) groundwater monitoring visit will be undertaken prior to the commencement of piling works to obtain a ‘baseline’ Chalk groundwater samples from each of the three (3no.) new groundwater monitoring wells.

Piling Phase

Piling is proposed to be completed over a 9 week programme, and therefore a further 4 groundwater sampling visits will be undertaken during the course of the piling phase, to be completed every-other week during piling. This will ensure that samples are collected at regular intervals throughout the duration of the piling programme and will allow the early identification of any groundwater quality issues associated with the commencement of piling works.

Post-Piling

Following completion of the piling works, a further two visits will be undertaken at 2 weeks and 4 weeks post completion of the piling works to allow for ground disturbance to settle and for the groundwater system to re-equilibrate. This will ensure that samples are obtained which provide an accurate representation of Chalk groundwater conditions following the completion of piling works.

Chemical Laboratory Testing (Water)

As part of the assessment, samples obtained from the exploratory holes will be tested for a suite of contaminants, which at this stage it is anticipated will comprise:

Water

- Heavy Metals (As, B, Cd, Cr (Total), Cu, Hg, Pb, Se, & Ni);
- Speciated Polycyclic Aromatic Hydrocarbons (UPEPA 16);
- Speciated Total Petroleum Hydrocarbons (TPH-CWG);
- BTEX;
- Cyanide;
- Phenol;
- Hardness;
- Turbidity; and,
- pH and Sulphate

However, the above testing suite and proposed monitoring programme should be discussed and agreed with the Environment Agency prior to the commencement of monitoring works.

The above testing suite has been selected to assess the risks posed to controlled waters in the underlying Principal Aquifer within Chalk bedrock. As such, laboratory results will be compared to the UK Drinking Water Standards (UKDWS).

Should laboratory test results identify a significant issue in Chalk groundwater at any stage then contact should be made with the regulator (EA) and further testing scheduled on an as needed basis following regulator agreement.

2. **Tier 1 Letter Report**

Upon completion of the intrusive works and receipt of test results (monitoring round 1), we will issue an interpretative report that will include the following:

- Factual information on the intrusive investigation including borehole logs and details regarding the ground and baseline groundwater conditions encountered
- Tier 1 Controlled Waters Risk Assessment using the UK DWS screening values;
- Conclusions regarding baseline groundwater conditions.

This report will serve to confirm baseline Chalk Groundwater conditions prior to the commencement of intrusive piling works.

Following completion of the during and post-piling monitoring works, a further Tier 1 Letter report is recommended, that will also include the following:

- Factual information on the intrusive investigation;
- Tier 1 Controlled Waters Risk Assessment using the UK DWS screening values;
- Discussion and interpretation of the results;
- Conclusions and recommendations

3. **Borehole Decommissioning**

Upon completion of the groundwater monitoring phase, the submission of the monitoring reports to the LPA and EA and following regulator signoff of the reports being obtained, the monitoring boreholes will need to be decommissioned to ensure that they do not form preferential pathways for contaminant migration directly into the underlying Chalk aquifer.

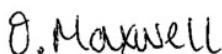
Decommissioning should be undertaken by a specialist contractor in accordance with guidance set out in the following documents :

- [*EA Good practice for decommissioning redundant boreholes and wells;*](#)
- [*EA Science Report SC020093 - Guidance on the design and installation of groundwater quality monitoring points;*](#) and,
- [*ASTM D5299/D5299M – 18 - Standard Guide for Decommissioning of Groundwater Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities*](#)

Following decommissioning, a borehole decommissioning report should be produced and submitted to the regulatory authority to confirm details of the decommissioning methodology used and location(s) of the decommissioned borehole(s).

Yours sincerely,

For and on behalf of Omnia Consulting,



Olivia Maxwell
Principal Consultant

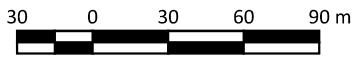


Dr Adrian King
Principal Consultant

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between Omnia and the Client as indicated in Section 1.2.
2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information, it has been assumed it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination, which are enforced, by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
4. During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.
8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
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10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

Key

Site Boundary



Scale
1:3,000

Paper Size
A4

Contains OpenStreetMap

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Project Number:
A10967-10

Client:
Berkeley Homes (Oxford
& Chiltern) Ltd

Drawn By:
O. Maxwell

Drawing Title:

Job Title:
Vastern Road

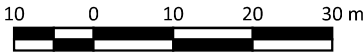
Date:
11/11/2024

Authorised By:
A. King

Figure 1.0
Site Location

Key

Site Boundary



Scale 1:950 Paper Size A4

Contains Contains Berkely Drawing - Landscape General Arrangement Plan ref: 448.LA.101 dated January 2020

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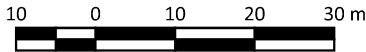
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Project Number: A10967-10	Client: Berkeley Homes (Oxford & Chiltern) Ltd	Drawn By: O. Maxwell	Drawing Title: Figure 2.0 Proposed Development Layout
Job Title: Vastern Road	Date: 11/11/2024	Authorised By: A. King	

Key

- Site Boundary
- Proposed Chalk GW Locations



Scale

1:950

Paper Size

A4

Contains Contains Berkely Drawing - Landscape General
Arrangement Plan ref: 448.LA.101 dated January 2020

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Project Number: A10967-10	Client: Berkeley Homes (Oxford & Chiltern) Ltd	Drawn By: O. Maxwell	Drawing Title: Figure 3.0 Proposed Chalk GW Monitoring Boreholes
Job Title: Vastern Road	Date: 11/11/2024	Authorised By: A. King	