68 Elsworthy Road
London
NW3 3BP

Ground Investigation &
Basement Impact Assessment

Mrs S Freeman

February 2024

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Rev 1

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Contents

Executive summary

This executive summary contains an overview of the key findings and conclusions. No reliance should be placed on any part of the executive summary until the whole of the report has been read. Other sections of the report may contain information that puts into context the findings that are summarised in the executive summary.

Brief

This report describes the findings of a site investigation carried out by Geotechnical and Environmental Associates Limited (GEA) on the instructions of Mrs. Serena Freeman, with respect to the construction of a new single-level basement below the existing building and part of the rear garden. The purpose of the investigation has been to determine the ground conditions, to carry out an assessment of ground movements resulting from excavation of the proposed basement, to assess the extent of any contamination and to provide information to assist with the design of the basement structure and suitable foundations. The report also includes information required to comply with London Borough of Camden Planning Guidance (CPG) Basements, relating to the requirement for a Basement Impact Assessment (BIA).

Site history

The earliest map studied, dated 1871, shows the site to be undeveloped and comprising part of an area of parkland. Much of the existing road network and buildings to the southwest and north of the site are shown on the map in their existing configuration and a pond is shown about 160 m to the southeast. The next map studied, dated 1896, shows a Nursery to be present immediately to the north of the site, while much of the surrounding area and the site itself remined essentially unchanged, although six trees are shown on the site. An air shaft for a rail tunnel is labelled about 200 m to the northwest of the site. The existing building on the site, as well as the rest of the buildings fronting onto Elsworthy Road and Wadham Gardens and the roads themselves, were constructed some time between 1896 and 1915. The Nursery to the north is no longer shown on the map. Between 1935 and 1953, a number of buildings located about 150 m to 200 m to the west of the site, on St John's Wood Park, are shown to have been removed, while those that remain are labelled as 'ruins'. This is likely as a result of damage sustained during World War II bombing. These ruins are shown to have been cleared on the map dated 1960 and to have been redeveloped as existing by the time of the map dated 1969. The site and surrounding area have since remained essentially unchanged.

Ground conditions

The investigation generally encountered the expected ground conditions, in that beneath a nominal thickness of made ground, the London Clay was encountered and extended to the full depth of the investigation, of 7.45 m. The made ground generally comprised dark brown slightly silty sandy clay with occasional rootlets and variable brick, ash and concrete fragments and gravel content ad extended to depths of between 0.30 m and 1.00 m. Below these depths, a layer of Head Deposits was encountered, comprising soft becoming firm and still slightly fissured, brown mottled pale grey slightly silty slightly sandy clay with occasional fine to medium subrounded gravel, and extending to depths of 0.80 m in Borehole Nos 1 and 2, located in the south of the site, and to the full depth of Borehole Nos 3 and 4, of 2.40 m and 2.60 m, located in the rear garden. The underlying London Clay comprised firm to stiff fissured brown clay with bluish grey veins, occasional partings or pockets of orange-brown fine sand and occasional selenite crystals, and extended to full depth of the investigation, of 7.45 m.

Groundwater was not encountered during the site works.

The results of the contamination testing have indicated the samples of made ground tested to be free from elevated concentrations of contaminants with the exception of the samples from BH2 at a depth of 0.20 m and BH4 at a depth of 0.50 m, which were found to contain marginally elevated concentrations of lead.

Recommendations

Formation level for the proposed basement will be within the stiff clay of the London Clay. Excavations for the proposed basement structure will require temporary support to maintain stability and to prevent any excessive ground movements. A bored piled wall is understood to be the preferred foundation. A contiguous piled wall will be suitable to support the excavation in the temporary and permanent condition.

Perched water may be encountered towards the base of the made ground, but significant groundwater inflows are not anticipated. The proposed use of piles extending into the London Clay to support the building will also be suitable.

Site workers should adopt suitable precautions when handling soil and areas of new soft landscaping / planting may need to be formed with a cover thickness of imported soils.

Basement Impact Assessment

The BIA has not indicated any concerns with regard to the effects of the proposed basement on the site and surrounding area. It has been concluded that the impacts identified can be mitigated by appropriate design and standard construction practice.

Part 1: Investigation Report

This section of the report details the objectives of the investigation, the work that has been carried out to meet these objectives and the results of the investigation. Interpretation of the findings is presented in Part 2.

1.0 Introduction

Geotechnical and Environmental Associates Limited (GEA) has been commissioned by Mrs Serena Freeman, to carry out a desk study, ground investigation and ground movement assessment at 68 Elsworthy Road, London NW3 3BP.

This report also forms part of a Basement Impact Assessment (BIA), which has been carried out in accordance with guidelines from the London Borough of Camden (LBC) in support of a planning application.

1.1 Proposed Development

It is understood that it is proposed to construct a new basement beneath the part of the front garden, the footprint of the building, extending to a depth of about 5.00 m. The basement will also extend beneath part of the rear garden, where a subbasement level will be included to house a swimming pool and associated plant area, which will extend to a depth of about 7.00 m. A single storey pavilion is also to be constructed in the rear garden and new areas of hardstanding are proposed.

This report is specific to the proposed development and the advice herein should be reviewed if the development proposals are amended.

1.2 Purpose of Work

The principal technical objectives of the work carried out were as follows:

- to check the history of the site with respect to previous contaminative uses;
- to provide an assessment of the risk of encountering UXO;
- to determine the ground conditions and their engineering properties;
- to use the above information to provide recommendations with respect to the design of suitable foundations and retaining walls;
- to assess the impact of the proposed basement on the local hydrogeology, hydrology and stability of the surrounding natural and build environment;
- to provide an indication of the degree of soil contamination present; and
- to assess the risk that any such contamination may pose to the proposed development, its users or the wider environment.

1.3 Scope of Work

In order to meet the above objectives, a desk study was carried out, followed by a ground investigation. The desk study comprised:

- a review of historical Ordnance Survey (OS) maps and environmental searches sourced from the Envirocheck database;
- a review of readily available geology maps;
- a walkover survey of the site carried out in conjunction with the fieldwork; and
- a preliminary UXO risk assessment carried out by 1st Line Defence, a specialist in the field.

In the light of this desk study an intrusive ground investigation was carried out which comprised, in summary, the following activities:

- a single opendrive percussive sampler borehole advanced to a depth of 7.45 m;
- a series of three hand held window sampler boreholes, advanced to refusal at depths of between 1.60 m and 2.60 m;
- a series of six hand excavated trial pits, advanced to depths of between 0.69 m and 1.33 m, to provide access to the foundations of the existing structures on the site;
- standard penetration tests (SPTs) carried out at regular intervals within the opendrive sampler borehole to provide quantitative data on the strength of the soils;
- the installation of three groundwater monitoring standpipes in a selection of the boreholes and two subsequent monitoring visits;

- testing of selected soil samples for contamination and geotechnical purposes; and
- provision of a report presenting and interpreting the above data, together with our advice and recommendations with respect to the proposed development.

This report includes a contaminated land assessment which has been undertaken by a suitably qualified and competent professional in accordance with the methodology presented by the Environment Agency in their Land contamination risk assessment (LCRM)[1] published 8 October 2020. This involves identifying, making decisions on, and taking appropriate action to deal with, land contamination in a way that is consistent with government policies and legislation within the United Kingdom. Risk management is divided into three stages; Risk Assessment, Options Appraisal and Remediation, and each stage comprises three tiers. The Risk Assessment stage includes preliminary risk assessment (PRA), generic quantitative risk assessment (GQRA) and detailed quantitative risk assessment (DQRA)and this report includes the PRA and GQRA.

The exploratory methods adopted in this investigation have been selected on the basis of the constraints of the site including but not limited to access and space limitations, together with any budgetary or timing constraints. Where it has not been possible to reasonably use an EC7 compliant investigation technique a practical alternative has been adopted to obtain indicative soil parameters and any interpretation is based upon engineering experience, local precedent where applicable and relevant published information.

1.3.1 Basement Impact Assessment

The work carried out includes a Hydrological and Hydrogeological Assessment and Land Stability Assessment (also referred to as Slope Stability Assessment). These assessments form part of the BIA procedure specified in the London Borough of Camden (LBC) Planning Guidance CPG[2] and their Guidance for Subterranean Development[3] prepared by Arup (the "Arup report") in accordance with Policy A5 of the Camden Local Plan 2017. The aim of the work is to provide information on surface water, groundwater and land stability and in particular to assess whether the development will affect neighbouring properties or groundwater movements and whether any identified impacts can be appropriately mitigated by the design of the development.

1.3.2 Qualifications

The land stability element of the Basement Impact Assessment (BIA) has been carried out by Martin Cooper, a BEng in Civil Engineering, a chartered engineer (CEng), member of the Institution of Civil Engineers (MICE), and Fellow of the Geological Society (FGS) who has over 20 years' specialist experience in ground engineering. The subterranean (groundwater) flow assessment has been carried out by Nick Mannix, MSc in Hydrogeology, Chartered Geologist (CGeol) and Fellow of the Geological Society of London (FGS). The surface water and flooding assessment has been carried out by Rupert Evans, a hydrologist with more than ten years consultancy experience in flood risk assessment, surface water drainage schemes and hydrology / hydraulic modelling. Rupert Evans is a Chartered Environmentalist, Chartered Water and Environmental Manager and a Member of CIWEM.

The assessments have been made in conjunction with Steve Branch, a BSc in Engineering Geology and Geotechnics, MSc in Geotechnical Engineering, a Chartered Geologist (CGeol) and Fellow of the Geological Society (FGS) with some 30 years' experience in geotechnical engineering and engineering geology.

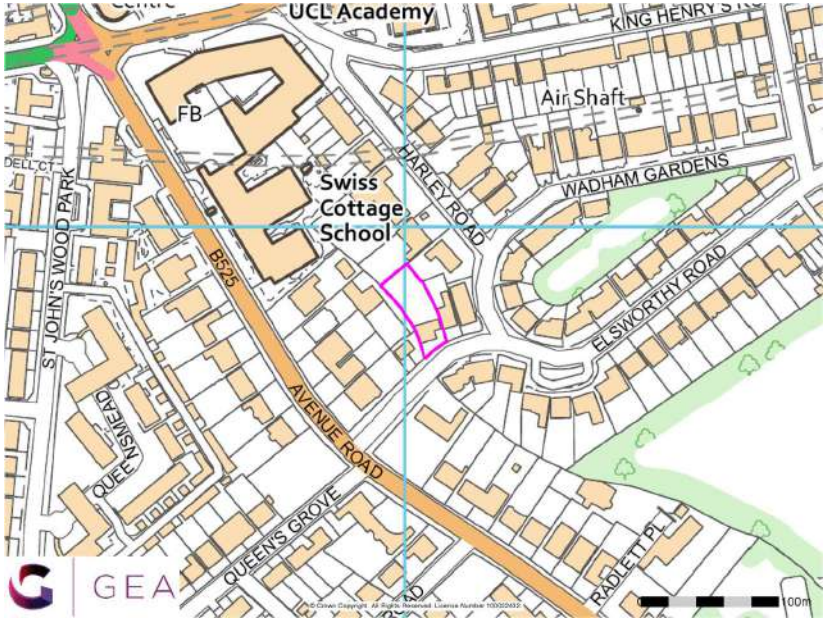
All assessors meet the qualification requirements of the Council guidance.

1 https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm
2 London Borough of Camden Planning Guidance CPG (January 2021) *Basements*
3 Ove Arup & Partners (2010) *Camden geological, hydrogeological and hydrological study. Guidance for Subterranean Development.* For London Borough of Camden November 2010

2.0 The Site

2.1 Site Description

The site is located in London Borough of Camden, approximately 500 m southeast of Swiss Cottage London Underground station and 640 m southwest of St John's Wood London Underground station. It fronts onto and is accessed from Elsworthy Road to the south and is bounded by similar residential properties with gardens to the north, east and west. The site may be additionally located by National Grid Reference 527016, 183927 and is shown on the map extract below.



A walkover of the site was carried out by a geotechnical engineer from GEA at the time of the fieldwork. The site is irregular in shape and measures approximately 60 m north-south by 22 m east-west, in maximum dimensions. The site is occupied by a two-storey detached house, with a converted attic, front and rear gardens and a driveway in the southeastern corner of the site. The front garden comprises a central lawn with planted beds around the perimeter. The rear garden is formed of a terrace immediately to the rear of the house, which extends approximately 10 m into the garden. The remainder of the garden is formed of a lawned area with planted beds around the perimeter. This area is formed approximately 1 m above that of the terrace and the house. The planted beds across the site are populated by well-established hedges, shrubs and mature trees.

2.1.1 Nearby Structures

Mews houses at Nos 70 and 72 Elsworthy Road, the adjacent properties to the southwest of the site, are adjoined two-storey semi-detached houses with dormer loft conversions. They are not known to have basement levels and it has therefore been assumed that they are founded at a depth of 0.50 m below ground level. It should be noted that the main structure of No 70 Elsworthy Road, which is significantly further away from the proposed basement, is known to have a basement. Due to the distance between that structure and the proposed basement, it has been ignored.

Nos 68 Elsworthy Road, the adjacent property to the northeast of the site, is a detached two-storey house with a loft conversion and a single-storey rear extension. It is not known to have a basement and it has therefore been assumed that the property if founded at a depth of 0.50 m below ground level.

2.2 Site History

The site history has been researched by reference to internet sources and historical Ordnance Survey (OS) maps obtained from the Envirocheck database.

The earliest map studied, dated 1871, shows the site to be undeveloped and comprising part of an area of parkland. Much of the existing road network and buildings to the southwest and north of the site are shown on the map in their existing configuration and a pond is shown about 160 m to the southeast.

The next map studied, dated 1896, shows a Nursery to be present immediately to the north of the site, while much of the surrounding area and the site itself remined essentially unchanged, although six trees are shown on the site. An air shaft for a rail tunnel is labelled about 200 m to the northwest of the site.

The existing building on the site, as well as the rest of the buildings fronting onto Elsworthy Road and Wadham Gardens and the roads themselves, were constructed some time between 1896 and 1915. The Nursery to the north is no longer shown on the map.

Between 1935 and 1953, a number of buildings located about 150 m to 200 m to the west of the site, on St John's Wood Park, are shown to have been removed, while those that remain are labelled as 'ruins'. This is likely as a result of damage sustained during World War II bombing. These ruins are shown to have been cleared on the map dated 1960 and to have been redeveloped as existing by the time of the map dated 1969. The site and surrounding area have since remained essentially unchanged.

2.3 Other Information

A search of public registers and databases has been made via the Envirocheck database and relevant extracts from the search are appended. Full results of the search can be provided if required.

The Envirocheck report has indicated no landfill sites located within 1 km of the site and additionally, no waste management or waste transfer sites are located within 900 m of the site and no areas of potentially infilled land or water are located within 500 m of the site.

No pollution incidents to controlled waters have been recorded within 700 m of the site and the site is not located within a nitrate vulnerable zone or any other sensitive land use.

Reference to records compiled by the Health Protection Agency (formerly the National Radiological Protection Board) indicates that the site falls within an area where less than 1% of homes are affected by radon emissions and therefore radon protective measures will not be necessary.

2.4 Preliminary UXO Risk Assessment

A Preliminary UXO Risk Assessment has been completed by 1st Line Defence (report ref PA19168-00, dated December 2023), and the report is included in the appendix. The risk assessment has been carried out in accordance with the guidelines provided by CIRIA[4], which state that the likelihood of encountering and detonating UXO below a site should be assessed along with establishing the consequences that may arise. The first phase comprises a preliminary risk assessment, which should be undertaken at an early stage of the development planning. If such an assessment identifies a high level of risk then a detailed risk assessment should be carried out by a UXO specialist, which will identify an appropriate course of action with regard to risk mitigation.

The report indicates that, during World War II (WWII), the site was located within the Metropolitan Borough of Hampstead, which sustained a very high bomb density. According to London Bomb Census mapping, an incendiary concentration is recorded over the general site area. However, no high explosive bombs are recorded on , or immediately surrounding the site. The closest of high explosive bombing incident is located approximately 100 m southwest of the site. London County Council bomb damage mapping and aerial photography dated 1946 corroborates the lack of bombing on the site, evidencing no damage. As a result, a minimal risk of encountering unexploded ordnance has been identified for the site and no further action is recommended in this respect.

2.5 Geology

The British Geological Survey (BGS) map of the area (Sheet 256) indicates the site is directly underlain by the London Clay. According to the BGS memoir, the London Clay is homogenous, slightly calcareous silty clay to very silty clay, with some beds of clayey silt grading to silty fine-grained sand. An area of Head propensity is detailed on the map within 100 m to the east of the site. According to the BGS map, dated 2006, the Head propensity is based on the geotechnical properties of the London Clay and Head may occur close to the Claygate Member / London Clay boundary. Head propensity is shown on the BGS map as areas denoted as most likely to be covered by Quaternary Head Deposits as interpreted from digital slope analysis and confirmed by borehole data.

GEA has previously carried out a ground investigation at No 70 Elsworthy Road, located immediately adjacent to the southwest of the site. The investigation confirmed the expected ground conditions in that, beneath a moderate thickness of made ground, London Clay was encountered and proved to the full depth of the investigation of 15.00 m. The made ground extended to depths of between 0.75 m and 1.20 m. The London Clay Formation initially comprised soft to stiff light brown mottled orange-brown mottled grey clay extending to a maximum depth of 5.00 m, below which stiff brown clay was encountered and extended to a depth of 12.00 m. This was underlain by stiff dark grey slightly silty fissured clay, extending to the full depth of investigation of 15.00 m.

4 CIRIA C681 (2009) *Unexploded ordnance (UXO) A guide for the construction industry*

2.6 Hydrology and Hydrogeology

The London Clay Formation is classified as an Unproductive Stratum (formerly Non-Aquifer), referring to rock layers or drift deposits with low permeability and that have negligible significance for water supply or river base flow.

As the London Clay is likely to comprise predominantly clay soils, it cannot support groundwater flow over any significant distance, nor can it be considered to support a "water table" or continuous piezometric surface. Boreholes constructed within clays do fill with water, due to the often high water content of shallow clays draining into the standpipe or by the collection of surface water drainage, which is unable to drain through the clay; however, this is not reflective of the type of groundwater flow that would occur in a porous and permeable saturated stratum.

The permeability of the weathered London Clay will be predominantly secondary, through fissures in the clay. Published data indicates the horizontal permeability of the London Clay to generally range between 1×10^{-11} m/s and 1×10^{-9} m/s.

Groundwater was encountered as seepages at depths of 0.30 m and 3.70 m in two of the boreholes advanced during the previous GEA investigation.

The nearest surface water feature is located 386 m to the northwest of the site.

The site is located within a Groundwater Source Protection Zone (SPZ) (Zone II – outer protection zone), classified as either 25% of the source area or a 400-day travel time, whichever is greater. The SPZ is likely to be associated with a public water supply from the Chalk Aquifer which is confined by the London Clay at a depth greater than 50 m. There is no hydraulic continuity between the London Clay and the Chalk aquifer at depth. The nearest water abstraction point is located 319 m to the northwest of the site.

The site is not listed within the London Borough of Camden report[5] and Figure 15 of the Arup report as having suffered from surface water flooding in the 1975 or 2002 flooding events.

The EA surface water flood map shows the central part of the site to be at high risk of surface water flooding, while the rest of the site is shown as being at no risk of surface water flooding.

Figure 11 of the Arup report and reference to the Lost Rivers of London[6] indicates that the nearest lost river is a tributary of the River Tyburn, which formerly flowed south from its source in the Belsize Park area, crossing Elsworthy Road approximately 175 m to the east of the site at its closest point, but now is thought to flow through a culvert which may have become part of London's sewer system.

The existing garden is almost entirely covered by grass and as such, infiltration of rainwater is largely unimpeded in this area. However, the underlying clay will limit further infiltration, therefore resulting in a high proportion of runoff in this area. The front of the property is approximately 50% covered by tarmac, such that infiltration of rainwater is therefore generally restricted to surface water drains, and as such the majority of surface runoff currently drains into combined sewers in the road. As the development will only result in a marginal change to the present conditions, i.e., through a minimal loss of soft covered areas, there will not be a significant increase in runoff rate or volume into the existing sewer system, or that could have a potentially adverse impact on the surrounding area. There should not, therefore, be any requirement for any mitigation measures.

2.7 Preliminary Risk Assessment

Part IIA of the Environmental Protection Act 1990, which was inserted into that Act by Section 57 of the Environment Act 1995, provides the main regulatory regime for the identification and remediation of contaminated land. The determination of contaminated sites is based on a "suitable for use" approach which involves managing the risks posed by contaminated land by making risk-based decisions. This risk assessment is carried out on the basis of a source-pathway-receptor approach.

2.7.1 Source

The desk study findings indicate that the site does not have a potentially contaminative history as it has been developed with the existing house for its entire developed history.

No sources of soil gas have been identified on site or in the surrounding area.

5 London Borough of Camden (2003) *Floods in Camden, Report of the Floods Scrutiny Panel*

6 Barton, N, & Meyers, S (2016) *The Lost Rivers of London (revised and extended edition with colour maps).* Historical Publications Ltd.

2.7.2 Receptor

The occupants of the house will represent relatively high sensitivity receptors. Buried services are likely to come into contact with any contaminants present within the soils through which they pass, and site workers are likely to come into contact with any contaminants present during construction works. Perched water may be present in the made ground, particularly in the vicinity of existing foundations, although such pockets of water are likely to be localised and unlikely to form part of a general water table.

2.7.3 Pathway

Within the site, end users will be isolated from direct contact with any contaminants present within the made ground by the proposed house and surrounding hard surfacing, thus no potential contaminant exposure pathways will exist with respect to end users. Only in areas of proposed soft landscaping will end users potentially come into contact with contaminants. There will be a potential for contaminants to move onto or off the site horizontally within the made ground, although these pathways are already in existence. A pathway for ground workers to come into contact with any contamination will exist during construction work and services will come into contact with any contamination within the soils in which they are laid. There is thus considered to be a low potential for a contaminant pathway to be present between any potential contaminant source and a target for the particular contaminant.

2.7.4 Preliminary Risk Appraisal

On the basis of the above it is considered that there is a LOW risk of there being a significant contaminant linkage at this site which would result in a requirement for major remediation work. Furthermore, as there is no evidence of filled ground within the vicinity of the site and no landfill sites, there is not considered to be a significant potential for hazardous soil gas to be present on or migrating towards the site.

3.0 Screening

The Camden planning guidance suggests that any development proposal that includes a basement should be screened to determine whether or not a full BIA is required.

3.1 Screening Assessment

A number of screening tools are included in the Arup document and for the purposes of this report reference has been made to Appendices E1, E2 and E3 which include a series of questions within screening flowcharts for surface flow and flooding, subterranean (groundwater) flow and land stability. The flowchart questions and responses to these questions are tabulated below.

3.1.1 Subterranean (groundwater) Screening Assessment

Question	Response for 68 Elsworthy Road
1a. Is the site located directly above an aquifer?	No. The site is underlain by the London Clay which is designated as Unproductive Strata by the Environment Agency and cannot store and transmit water in sufficient quantities to support groundwater abstractions or watercourses.
1b. Will the proposed basement extend beneath the water table surface?	No. The London Clay and clay dominated Head Deposits, if present, cannot support groundwater flow and cannot therefore support a water table consistent with a permeable water bearing strata.
2. Is the site within 100 m of a watercourse, well (used/ disused) or potential spring line?	No.
3. Is the site within the catchment of the pond chains on Hampstead Heath?	No. Topographical maps acquired as part of the desk study and Figures 12 and 14 of the Arup report confirms that the site is not located within this catchment area
4. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	*Yes. The building and hard surfacing will cover a larger proportion of the site, including areas which are currently garden. However, the low permeability of the underlying London Clay would result in a low recharge in any case and consequently there would be little or no effect on groundwater.*
5. As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	No. Given that the site is underlain by clay soils and is unlikely to be suitable for a soakaway or similar SUDS based system, the site drainage will therefore be

Question	Response for 68 Elsworthy Road
	directed to public sewer. Site drainage will therefore be designed to generally maintain the existing situation.
6. Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to or lower than, the mean water level in any local pond or spring line?	No. There are no groundwater dependent ponds or spring lines present within 500 m of the site.

The above assessment has identified the following potential issues that need to be assessed:

Q4 The development will result in a change in the proportion of hard surface / paved areas.

3.1.2 Stability Screening Assessment

Question	Response for 68 Elsworthy Road
1. Does the existing site include slopes, natural or manmade, greater than 7°?	No, as indicated on the Slope Angle Map Fig 16 of the Arup report.
2. Will the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7°?	No. The site is not to be significantly re-profiled as part of the development.
3. Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?	No. As indicated on the Slope Angle Map Fig 16 of the Arup report.
4. Is the site within a wider hillside setting in which the general slope is greater than 7°?	No. As indicated on the Slope Angle Map Fig 16 of the Arup report.
5. Is the London Clay the shallowest strata at the site?	*Yes. As indicated on the geological map and Figures 3, 5 and 8 of the Arup report*
6. Will any trees be felled as part of the proposed development and / or are any works proposed within any tree protection zones where trees are to be retained?	*Yes. A number of trees are to be felled as part of the development in the west of the rear garden.*
7. Is there a history of seasonal shrink-swell subsidence in the local area and / or evidence of such effects at the site?	*Yes. The area is prone to these effects as a result of the presence of shrinkable London Clay.*
8. Is the site within 100 m of a watercourse or potential spring line?	No.
9. Is the site within an area of previously worked ground?	No. The geological map of the area and Figures 3, 4 and 8 of the Arup report do not indicate any worked ground.
10a. Is the site within an aquifer?	No. The site is underlain by the London Clay which is designated as Unproductive Strata by the Environment Agency and cannot store and transmit usable amounts of water.
10b. Will the proposed basement extend beneath the water table such that dewatering may be required during construction?	No.
11. Is the site within 50 m of Hampstead Heath ponds?	No.
12. Is the site within 5 m of a highway or pedestrian right of way?	*Yes. Although the site fronts on to Elsworthy Road, the proposed basement is located over 5 m away from the public footway and roads.*
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	*Yes. As the neighbouring sites are not known to have basements, it is likely that the development will increase the foundation depths relative to the neighbouring properties to a significant extent. A ground movement analysis has been completed as part of this investigation to predict the likely movements as a result of the excavation. This is reported in Part 3.0 of this report.*
14. Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?	No.

The above assessment has identified the following potential issues that need to be assessed:

Q5 The London Clay is the shallowest strata beneath the site.
Q6 A number of trees are to be felled as part of the development.
Q7 The site is in an area likely to be affected by seasonal shrink-swell.
Q12 The site is located within 5 m of a public highway.
Q13 The development will significantly increase the differential depth of foundations relative to neighbouring properties.

3.1.3 Surface Flow and Flooding Screening Assessment

Question	Response for 68 Elsworthy Road
1. Is the site within the catchment of the pond chains on Hampstead Heath?	No. Figure 14 of Arup report confirms that the site is not located within this catchment area.
2. As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?	No. Any additional surface water from the increase hardstanding area will be attenuated and discharged into the Thames Water sewers to ensure the surface water flow regime will be unchanged. The basement will mainly be beneath the footprint of the building and existing hardstanding areas, and the 1m distance between the roof of the basement and ground surface as recommended by section 3.2 of the CPG Basements 2021 does not apply across these areas. Where the basement extends outside of the footprint of the overlying building, sunken lightwells are proposed which will incorporate drainage.
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	*Yes. The proposed hardstanding will cover a larger proportion of the site, which is currently permeable (namely across some of the rear garden). However, SUDS attenuation prior to discharge into the sewers will reduce the impact to acceptable levels.*
4. Will the proposed basement development result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?	No. The use of SUDS attenuation to control how water is stored from additional hardstanding areas will result in no changes to the profile of inflows entering the ground. The proposed attenuation size should be based upon peak surface water flows and discharge rates.
5. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No. Although the amount of hardstanding will marginally increase, the presence of the impermeable London Clay beneath the site mean it is very unlikely that this will result in any changes to the quality of surface water being received by adjacent properties or downstream watercourses as the surface water drainage regime will be unchanged and the land uses will remain the same.
6. Is the site in an area identified to have surface water flood risk according to either the Local Flood Risk Management Strategy or the Strategic Flood Risk Assessment or is it at risk of flooding, for example because the proposed basement is below the static water level of nearby surface water feature?	*The Camden Flood Risk Management Strategy dated 2013 does not indicate the site to be at risk from flooding. However, reference to the surface water flood risk map within the Envirocheck report and Figures 3ii, 3vii, 3v and 3x of the SFRA dated 2014 indicate a small section to the rear of the house to be at high risk of surface water flooding and at moderate risk of a 1 in 1000 year flood event. The rest of the site is not shown as being at risk of flooding.* *It is possible that the basement will be constructed within pockets of perched water and the recommendations outlined in the BIA with regards to water-proofing and tanking of the basement will reduce the risk to acceptable levels.* *In accordance with paragraph 5.11 of the CPG, a positive pumped device will be installed in the basement in order to further protect the site from sewer flooding.*

The above assessment has identified the following potential issues that need to be assessed:

Q3 The development will result in a change in the proportion of hard surfaced / paved areas.

Q6 The site is in an area identified to have a risk of surface water flooding.

4.0 Scoping and Site Investigation

The purpose of scoping is to assess in more detail the factors to be investigated in the impact assessment. Potential impacts are assessed for each of the identified potential impact factors.

4.1 Potential Impacts

The following potential impacts have been identified by the screening process.

Potential Impact	Consequence
London Clay is the shallowest stratum at the site.	The London Clay is prone to seasonal shrink-swell (subsidence and heave).
Seasonal shrink-swell can result in foundation movements.	Multiple potential impacts depending on the specific setting of the basement development. For example, the implications of a deepened basement/foundation system on neighbouring properties should be considered.
A number of trees will be felled as part of the development.	Whilst shrinkable soils are present at shallow depth, there are no critical slope angles that are dependent on the presence of the existing trees to aid long term stability.
The site is within 5 m of Elsworthy Road.	Should the design of retaining walls and foundations not take into account the presence of nearby infrastructure, it may lead to the structural damage of footways, highways and associated buried services.
Increase in the proportion of hard-standing and paved areas.	Less soft covering for surface water infiltration. However, the London Clay is of relatively low permeability so will not make much difference.
The development will significantly increase the differential depth of foundations relative to neighbouring properties.	The stability of neighbouring structures will need to be ensured throughout the development. A ground movement analysis is proposed to predict the likely movements as a result of the excavation.

These potential impacts have been investigated through the site investigation, as detailed in Section 13.0.

4.2 Exploratory Work

In order to meet the objectives described in Section 1.2, a single borehole was advanced to a depth of 7.45 m using an opendrive percussive sampling rig. Additionally, three boreholes were advanced to refusal at depths of between 1.60 m and 2.60 m using window sampling equipment to provide coverage across the rest of the site. A series of six trial pits was hand excavated to depths of between 0.69 m and 1.33 m to expose foundations of the existing structures. Disturbed samples were obtained from the boreholes for subsequent laboratory examination and testing. Standard Penetration Tests (SPTs) were carried out at regular intervals to provide additional quantitative data on the strength of soils encountered.

Three groundwater monitoring standpipes have been installed in the boreholes to facilitate groundwater monitoring, which has been carried out on two occasions to date.

A selection of the samples recovered from the boreholes was submitted to a soil mechanics laboratory for geotechnical testing and an analytical laboratory for contamination testing.

All of the above work was carried out under the supervision of a geotechnical engineer from GEA. The borehole and trial pit records are appended, together with a site plan indicating their positions. The Ordnance Datum (OD) levels on the records have been interpolated from spot heights shown on a topographical survey drawing provided by the consulting engineers (drawing no 23.007.000, dated 24th March 2023).

4.3 Sampling Strategy

The trial pit positions were specified by Form Structural Design, the consulting engineers for the project, and were positioned as close to the specified positions as possible whilst avoiding buried services. The boreholes were positioned on site by a geotechnical engineer from GEA in accessible areas, with due regard to the proposed development and the locations of known buried services. Five samples of the made ground have been tested for the presence of contamination. The analytical suite of testing was selected to identify a range of typical industrial contaminants for the purposes of general coverage. For this investigation the analytical suite for the soil included a range of metals, speciation of total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH), total cyanide and monohydric phenols. The samples were also screened for the presence of asbestos. The contamination analyses were carried out at an MCERTs accredited laboratory with the majority of the testing suite accredited to MCERTS standards. A summary of the MCERTs accreditation and test methods are included with the attached results and further details are available upon request.

5.0 Ground Conditions

The investigation generally encountered the expected ground conditions, in that beneath a nominal thickness of made ground, Head Deposits were encountered and were underlain by the London Clay which extended to the full depth of the investigation, of 7.45 m.

5.1 Made Ground

The made ground generally comprised dark brown slightly silty sandy clay with occasional rootlets and variable brick, ash and concrete fragments and gravel content ad extended to depths of between 0.30 m and 1.00 m.

Apart from the presence of fragments of extraneous material noted above, no visual or olfactory evidence of contamination was observed during the fieldwork. Five samples of the made ground have however been analysed for a range of contaminants as a precautionary measure and the results are detailed within Section 5.4.

5.2 Head Deposits

The Head Deposits initially comprised soft becoming firm and still slightly fissured, brown mottled pale grey slightly silty slightly sandy clay with occasional fine to medium subrounded gravel, extending to depths of 0.80 m in Borehole Nos 1 and 2, located in the south of the site, and to the full depth of Borehole Nos 3 and 4, of 2.40 m and 2.60 m, located in the rear garden.

5.3 London Clay

The London Clay comprised firm to stiff fissured brown clay with bluish grey veins, occasional partings or pockets of orange-brown fine sand and occasional selenite crystals, and extended to full depth of the investigation, of 7.45 m.

The results of plasticity index tests indicate the clay to be of high volume change potential.

5.4 Groundwater

Groundwater was not encountered during the site works.

Standpipes were installed in Borehole Nos 1, 2 and 4, to depths of 5.00 m, 2.50 m and 1.50 m to enable future groundwater monitoring, and the findings of two groundwater monitoring visits are presented in the table below.

Borehole No	Date	Depth of standpipe (m)	Depth to water (m) [Level (m OD)]
1	22/12/2023	5.00	DRY
	17/01/2024	5.00	DRY
2	22/12/2023	2.50	DRY
	17/01/2024	2.50	No Access
4	22/12/2023	1.50	DRY
	17/01/2024	1.50	No Access

5.5 Soil Contamination

The table below sets out the values measured within the five samples analysed; all concentrations are in mg/kg unless otherwise stated.

Determinant	BH2 0.20 m	TP3 0.50 m	BH4 0.50 m	BH1 0.30 m	BH3 0.60 m
pH	6.6	7.9	7.3	9.0	7.5
Arsenic	23	18	19	15	13
Cadmium	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	39	53	41	54	49
Lead	**380**	54	**260**	62	40
Mercury	0.8	<0.3	1	<0.3	<0.3
Copper	77	34	47	29	22
Nickel	23	44	26	23	17
Zinc	150	79	110	80	130

Determinant	BH2 0.20 m	TP3 0.50 m	BH4 0.50 m	BH1 0.30 m	BH3 0.60 m
Selenium	1.1	<1.0	<1.0	<1.0	1.3
Total PAH	27.9	<0.80	1.1	2.44	2.18
Sulphide	9.7	2.1	1.6	2.5	4.6
Phenols	<1.0	<1.0	<1.0	<1.0	<1.0
Cyanide	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	3.2	<0.05	0.13	0.26	0.21
Naphthalene	<0.05	<0.05	<0.05	<0.05	<0.05
TPH	39	<10	<10	<10	14
Total Organic Carbon %	2.6	0.4	1.4	0.6	0.6
Note: Figures in bold indicate values in excess of the generic guideline screening values.					

In addition, all five samples of the made ground have been screened for the presence of asbestos and none was detected.

5.5.1 Generic Quantitative Risk Assessment

The use of a risk-based approach has been adopted to provide an initial screening of the test results to assess the need for subsequent site-specific risk assessments. Contaminants of concern are those that have values in excess of generic human health risk-based guideline values, which are either the CLEA[7] Soil Guideline Values where available, the Suitable 4 Use Values[8] (S4UL) produced by LQM/CIEH calculated using the CLEA UK Version 1.07[9] software, or the DEFRA Category 4 Screening values[10], assuming a residential end use with plant uptake. The key generic assumptions for this end use are as follows:

- that groundwater will not be a critical risk receptor;
- that the critical receptor for human health will be young female children aged less than six years old;
- that the exposure duration will be six years;
- that the critical exposure pathways will be direct soil and indoor dust ingestion, consumption of home grown produce, consumption of soil adhering to home grown produce, skin contact with soils and dust, and inhalation of dust and vapours; and
- that the building type equates to a terraced house.

It is considered that these assumptions are acceptable for this generic assessment of this site. The tables of generic screening values derived by GEA and an explanation of how each value has been derived are included in the Appendix.

Where contaminant concentrations are measured at concentrations below the generic screening value it is considered that they pose an acceptable level of risk and thus further consideration of these contaminant concentrations is not required. However, where concentrations are measured in excess of these generic screening values there is considered to be a potential that they could pose an unacceptable risk and thus further action will be required which could include;

- additional testing to zone the extent of the contaminated material and thus reduce the uncertainty with regard to its potential risk;
- site specific risk assessment to refine the assessment criteria and allow an assessment to be made as to whether the concentration present would pose an unacceptable risk at this site; or
- soil remediation or risk management to mitigate the risk posed by the contaminant to a degree that it poses an acceptable risk.

The results of the contamination testing have indicated the samples of made ground tested to be free from elevated concentrations of contaminants with the exception of the sample from BH2 at a depth of 0.20 m and BH4 at a depth of 0.50 m, which were found to contain marginally elevated concentrations of lead.

The significance of these results is considered further in Part 2 of the report.

7 *Updated Technical Background to the CLEA Model (Science Report SC050021/SR3) Jan 2009* and Soil Guideline Value reports for specific contaminants; all DEFRA and Environment Agency.
8 *The LQM/CIEH S4Uls for Human Health Risk Assessment* S4UL3065 November 2014
9 Contaminated Land Exposure Assessment (CL|EA) Software Version 1.071 Environment Agency 2015
10 CL:AIRE (2013) *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination* Final Project Report SP1010 and DEFRA (2014) *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination* Policy Companion Document SP1010

5.6 Existing Foundations

The findings of the trial pits are summarised in the table below. Sketches and photographs of each pit are included in the Appendix.

Trial Pit No	Structure	Section	Foundation detail	Bearing Stratum
1	Front Facade	A-A'	Mass concrete strip / trench fill Top 0.31 m Base 0.60 m Lateral projection 350 mm	Firm brown slightly silty slightly sandy CLAY with occasional fine to medium subrounded gravel
	Bay Window	B-B'	Mass concrete strip / trench fill Top 0.31 m Base 0.60 m Lateral projection 380 mm	Firm brown slightly silty slightly sandy CLAY with occasional fine to medium subrounded gravel
2	No 66 Elsworthy Road	A-A'	Mass concrete strip / trench fill Top 0.36 m Base 0.66 m Lateral projection 270 mm	Firm brown slightly silty slightly sandy CLAY with occasional fine to medium subrounded gravel
3	Rear Elevation	A-A'	Mass concrete strip / trench fill Top 0.83 m Base 1.18 m Lateral projection 290 mm	Made Ground (orange-brown sandy clay with gravel, brick fragments and occasional ash fragments)
4	Western Garden Wall - Rear	A-A'	Mass concrete strip / trenchfill Top 0.31 m Base 0.56 m Lateral projection 140 mm	Firm brown partially fissured CLAY with occasional fine to coarse subrounded gravel
5	Western Garden Wall - Front	A-A'	Mass concrete strip / trenchfill Top 0.47 m Base 0.62 m Lateral projection 190 mm	Firm brown partially fissured CLAY with occasional fine to coarse subrounded gravel
6	Eastern Garden Wall - Rear	A-A'	Brick Footing Top 0.10 m Base 0.60 m Lateral projection 100 mm	Firm brown partially fissured CLAY with occasional fine to coarse subrounded gravel

Part 2: Design Basis Report

This section of the report provides an interpretation of the findings detailed in Part 1, in the form of a ground model, and then provides advice and recommendations with respect to the proposed development.

6.0 Ground Model

It is proposed to construct a basement beneath part of the front garden and the footprint of the building, extending to a depth of about 5.00 m. The basement will also extend beneath part of the rear garden, where a subbasement level will be included to house a swimming pool and associated plant area, extending to a depth of about 7.00 m. A single-storey pavilion is also to be constructed in the rear garden and new areas of hardstanding are proposed.

The loads of the new development are proposed to be supported by piled foundations and the basement excavation will be supported by a contiguous piled wall. The loads of the new garden pavilion will be supported by shallow spread foundations.

The desk study has revealed that the site does not have a potentially contaminative history as it has been developed with the existing residential buildings for its entire developed history. On the basis of the fieldwork, the ground conditions at this site can be characterised as follows:

- beneath a nominal thickness of made ground, Head Deposits are present over the London Clay, which extends to the full depth of the investigation, of 7.45 m;
- the made ground generally comprises dark brown slightly silty sandy clay with occasional rootlets and variable brick, ash and concrete fragments and gravel content and extends to depths of between 0.30 m and 1.00 m;
- the Head Deposits comprise soft becoming firm and stiff slightly fissured, slightly silty slightly sandy brown mottled pale grey clay with occasional fine to medium subrounded gravel, extending to a depth of about 0.80 m in the south of the site, and to depths in excess of 2.40 m and 2.60 m in the north of the site;
- the London Clay comprises firm to stiff fissured brown clay with bluish grey veins, occasional partings or pockets of orange-brown fine sand and occasional selenite crystals, and extends to full depth of the investigation, of 7.45 m;
- groundwater is not present at shallow depths beneath the site; and
- contamination testing has revealed the presence of marginally elevated concentrations of lead.

7.0 Advice & Recommendations

Excavations for the proposed basement structure will require temporary support to maintain stability and to prevent any excessive ground movements.

Formation level for the basement will be within the London Clay at a depths of between 5.00 m and 7.00 m.

A bored piled wall is understood to be the preferred foundation and a contiguous piled wall should be suitable to support the excavation in the temporary and permanent conditions. Perched water may be encountered towards the base of the made ground, but significant groundwater inflows during the excavation are not anticipated.

The proposed use of piles extending into the London Clay to support the new building will also be suitable.

7.1 Basement Construction

Formation level for the basement and sub-basement is likely to be within the stiff clay of the London Clay at depth of about 5.00 m and 7.00 m.

Inflows of perched water should be anticipated from within the made ground. However, any such inflows are likely to be relatively minor in nature and should be adequately dealt with through sump pumping, although it would be prudent for the chosen contractor to have a contingency plan in place to deal with more significant or prolonged inflows as a precautionary measure.

The design of basement support in the temporary and permanent conditions needs to take account of the need to maintain the stability of the excavation and surrounding structures, and to protect against potential shallow groundwater inflows.

It is understood that it is likely that a contiguous bored pile wall is to be adopted to support the majority of the proposed basement excavations, which will have the advantage of being incorporated into the permanent works and being able to provide support for structural loads. Localised grouting and / or sump pumping may be necessary where perched water inflows are encountered.

Careful workmanship will therefore be required to ensure that movement of the surrounding structures does not occur and the contractor should be required to provide details of how they intend to control groundwater and instability of excavations, should it arise.

The ground movements associated with the basement excavation will depend on the method of excavation and support and the overall stiffness of the basement structure in the temporary condition. Thus, a suitable amount of propping will be required to provide the necessary rigidity. In this respect the timing of the provision of support to the wall will have an important effect on movements. An assessment of the movements has been carried out and is discussed in Part 3.

7.1.1 Basement Retaining Walls

The following parameters are suggested for the design of the permanent basement retaining walls.

Stratum	Bulk Density (kg/m^3)	Effective Cohesion (c' – kN/m^2)	Effective Friction Angle (ϕ' – degrees)
Made ground	1700	Zero	27
London Clay	1950	Zero	23

Significant groundwater inflows are not anticipated within the basement, although monitoring of the standpipes should be continued to confirm this view, along with trial excavations.

Provided that a fully effective drainage system can be ensured in order to prevent the build-up of groundwater behind the retaining walls, it should be possible to design the basement on the basis that water will not collect behind the walls. If an effective drainage system cannot be ensured, then a water level of two-thirds of the basement depth, subject to a minimum depth of 1.0 m, should be assumed. The advice in BS8102:2009[11] should be followed in this respect and with regard to the provision of suitable waterproofing.

11 BS8102 (2009) *Code of practice for protection of below ground structures against water from the ground*

7.1.2 Basement Heave

The 5.00 m to 7.00 m deep excavation of the basement will result in a differential net unloading of between around 95 kN/m² to 130 kN/m², which will result in differential heave of the underlying London Clay. This will comprise immediate elastic movement, which will account for approximately 40 % of the total movement and be expected to be complete during the construction period, and long term movements, which will theoretically take many years to complete. These movements will, to some extent, be mitigated by the loads applied by the proposed development, however the ground movements associated with the proposed basement excavation and construction have been considered in more detail in Part 3 of this report.

7.2 Spread Foundations

For the garden pavilion, moderate width strip or pad foundations bearing on the firm Head Deposits should be placed at a minimum depth of 1.50 m, allowing for restricted new planting in accordance with Table 4 of NBHC Standards Chapter 4.2 (2023). If trees are excluded within the zone of influence shown in Table 4 of the NHBC guidance, the minimum depth can be reduced to 1.00 m subject also to the further advice on new tree and shrub planting as detailed in the NHBC guidelines. The foundations may be designed to apply a net allowable bearing pressure of 100 kN/m². This value incorporates an adequate factor of safety against bearing capacity failure and should ensure that settlement remains within normal tolerable limits. The recommended bearing pressure takes account of the variable nature of the soils and any foundations should be nominally reinforced where they span clay and granular material to protect against differential settlement.

Foundations will need to be deepened in the vicinity of existing and proposed trees and National House Building Council (NHBC) guidelines should be followed in this respect. High shrinkability clays should be assumed. Where trees are to be removed the required founding depth should be determined on the basis of the existing tree height if it is less than 50% of the mature height and on the basis of full mature height if the current height is more than 50% of the mature height. Where a tree is to be retained the final mature height should be adopted. Notwithstanding NHBC guidelines, all foundations should extend beyond the zone of desiccation. In this respect it would be prudent to have all foundation excavations inspected by a suitably experienced engineer. Due allowance should be made for future growth of the trees.

The guidelines indicate that for spread foundations within non-shrinkable soils over shrinkable soils the total depth of the non-shrinkable soils has to be greater than ¾ of the depth of the foundation requirement for the site, taking into account the type and height of the trees and the shrinkability of the soil, if it is assumed that the soils are shrinkable. It also requires that there be consistent soil conditions across the site and the thickness of the non-shrinkable soil below the foundation is greater than the width of the foundation.

The requirement for compressible material alongside foundations should be determined by reference to the NHBC guidelines. If trees are to be planted in close proximity to the new buildings founding depths should be deepened in accordance with NHBC guidelines and using the mature height of the tree. Medium shrinkability clay should be assumed.

Where the made ground extends to depths that spread foundations become uneconomic piled foundations should be considered as an alternative.

The depth of the basement excavation is expected to be such that foundations will be placed below the depth of actual or potential desiccation, but this should be checked once the proposals have been finalised.

Notwithstanding NHBC guidelines, all foundations should extend beyond the zone of desiccation. In this respect, it would be prudent to have all foundation excavations inspected by a suitably experienced engineer. Due allowance should be made for future growth of existing / proposed trees. The requirement for compressible material alongside foundations should be determined by reference to the NHBC guidelines.

7.3 Shallow Excavations

On the basis of the borehole findings, it is considered that it will be generally feasible to form relatively shallow excavations terminating within the Head Deposits without the requirement for lateral support, although localised instabilities may occur where more granular material or groundwater is encountered.

Significant inflows of groundwater into shallow excavations are not generally anticipated, although seepages may be encountered from perched water tables within the made ground, particularly within the vicinity of existing foundations, although such inflows should be suitably controlled by sump pumping.

If deeper excavations are considered or if excavations are to remain open for prolonged periods it is recommended that provision be made for battered side slopes or lateral support. Where personnel are required to enter excavations, a risk assessment should be carried out and temporary lateral support or battering of the excavation sides considered in order to comply with normal safety requirements.

7.4 Basement Floor Slab

Following excavation of the basement, the floor slab will need to be suspended over a void or a layer of compressible material to accommodate the anticipated heave and any potential uplift forces from groundwater pressures, unless the slab can be suitably reinforced to cope with these movements.

7.5 Effect of Sulphates

Chemical analyses have revealed relatively low concentrations of soluble sulphate and near-neutral pH in accordance with Class DS-1 conditions of Table C2 of BRE Special Digest 1:SD Third Edition (2005). The measured pH values of the samples show that an ACEC class of AC-1s would be appropriate for the site. This assumes a static water condition at the site. The guidelines contained in the digest should be followed in the design of foundation concrete.

7.6 Contamination Risk Assessment

The desk study findings indicate that the site does not have a potentially contaminative history as it has only been developed with houses for its entire developed history. Furthermore, no there are no potential offsite sources of contamination that are considered to pose a risk to the site.

The results of the contamination testing have indicated the samples of made ground tested to be free from elevated concentrations of contaminants with the exception of the sample from BH2 at a depth of 0.20 m and BH4 at a depth of 0.50 m, which were found to contain marginally elevated concentrations of lead, of 380 mg/kg and 260 mg/kg.

The source of the lead contamination is unknown. However, the made ground was noted as containing variable amounts of extraneous material, including clinker, and it is therefore likely that a fragment of such material was present within the samples tested, accounting for the elevated concentrations. Information on Urban Soil Chemistry provided by the BGS also indicates that background concentrations for lead in the vicinity of the site are between 300 mg/kg and 900 mg/kg, such that a significant proportion of the measured concentrations could be the result of residual airborne sources.

Lead compounds are relatively immobile, unlikely to be in a soluble form and are considered to be non-volatile or of a low volatility. The contamination does not therefore present a significant vapour risk or a significant risk of leaching and migration within any perched groundwater within the made ground. As the site is underlain by the London Clay, which cannot support a continuous groundwater table, a risk to groundwater is also not identified.

7.6.1 End Users

End users will be effectively isolated from any potential contamination within the extent of the building and surrounding hardstanding, such that, only in proposed garden areas could end users conceivably come into direct contact with the contaminated soils, although this pathway is already in existence.

At this stage it is recommended that a cover thickness of imported subsoil and topsoil of 600 mm in thickness should be specified for any areas of new landscaping in accordance with recommendations from BRE[12]. It is likely to be possible to reduce the final thickness of cover required, but this will need to be determined once final levels have been established and the concentrations of potential contaminants within the imported material and in the soils at formation level are known.

7.6.2 Protection of Site Workers

Site workers should be made aware of the potential contamination and a programme of working should be identified to protect workers handling any soil. The method of site working should be in accordance with guidelines set out by HSE[13] and CIRIA[14] and the requirements of the Local Authority Environmental Health Officer.

A watching brief should be maintained during the site works and if any suspicious soil is encountered, it should be inspected by a suitably qualified engineer and further testing carried out if required.

BRE (2004) *Cover systems for land regeneration. Thickness of cover systems for contaminated land.* BRE pub 465

13 HSE (1992) HS(G)66 *Protection of workers and the general public during the development of contaminated land* HMSO

14 CIRIA (1996) *A guide for safe working on contaminated sites.* Report 132, Construction Industry. Research and Information Association

7.6.3 Services

Consideration may need to be given to the protection of buried potable water supply pipes laid within the made ground. Details of the proposed protection measures for buried plastic services will in any case need to be approved by the EHO and the relevant service authority prior to the adoption of any scheme. It is possible that barrier pipe will be required, or additional testing will need to be carried out.

7.7 Waste Disposal

Under the European Waste Directive, waste is classified as being either Hazardous or Non-Hazardous and landfills receiving waste are classified as accepting hazardous or non-hazardous wastes or the non-hazardous sub-category of inert waste in accordance with the Waste Directive. Waste classification is a staged process and this investigation represents the preliminary sampling exercise of that process. Once the extent and location of the waste that is to be removed has been defined, further sampling and testing may be necessary. The results from this ground investigation should be used to help define the sampling plan for such further testing, which could include WAC leaching tests where the totals analysis indicates the soil to be a hazardous waste or inert waste from a contaminated site. It should however be noted that the Environment Agency guidance WM3[15] states that landfill WAC analysis, specifically leaching test results, must not be used for waste classification purposes.

Any spoil arising from excavations or landscaping works, which is not to be re-used in accordance with the CL:AIRE[16] guidance, will need to be disposed of to a licensed tip. Waste going to landfill is subject to landfill tax at either the standard rate of £98.60 per tonne (about £185 per m^3) or at the lower rate of £3.15 per tonne (roughly £5.85 per m^3). However, the classifications for tax purposes and disposal purposes differ and currently all made ground and topsoil is taxable at the 'standard' rate and only naturally occurring soil and stones, which are accurately described as such in terms of the 2011 Order, would qualify for the 'lower rate' of landfill tax.

Based on the technical guidance provided by the EA it is considered likely that the soils encountered during this ground investigation, as represented by the chemical analyses carried out, would be generally classified as follows.

Soil Type	Waste Classification (Waste Code)	WAC Testing Required Prior to Landfill Disposal?	Current applicable rate of Landfill Tax
Made ground	Inert non-hazardous (17 05 04)	No	£98.60/tonne (Standard rate)
Natural Soils	Inert (17 05 04)	Should not be required but confirm with receiving landfill	£3.15 / tonne (Reduced rate for uncontaminated naturally occurring rocks and soils)

Under the requirements of the European Waste Directive all waste needs to be pre-treated prior to disposal. The pre-treatment process must be physical, thermal, chemical or biological, including sorting. It must change the characteristics of the waste in order to reduce its volume, hazardous nature, facilitate handling or enhance recovery. The waste producer can carry out the treatment but they will need to provide documentation to prove that this has been carried out. Alternatively, the treatment can be carried out by an approved contractor. The Environment Agency has issued a position paper[17] which states that in certain circumstances, segregation at source may be considered as pre-treatment and thus excavated material may not have to be treated prior to landfilling if the soils can be segregated onsite prior to excavation by sufficiently characterising the soils insitu prior to excavation.

The above opinion with regard to the classification of the excavated soils is provided for guidance only and should be confirmed by the receiving landfill once the soils to be discarded have been identified.

The local waste regulation department of the Environment Agency (EA) should be contacted to obtain details of tips that are licensed to accept the soil represented by the test results. The tips will be able to provide costs for disposing of this material but may require further testing.

15 Environment Agency 2015. *Guidance on the classification and assessment of waste.* Technical Guidance WM3 First Edition
16 CL:AIRE March 2011. *The Definition of Waste: Development Industry Code of Practice* Version 2
17 Environment Agency 23 Oct 2007 *Regulatory Position Statement Treating non-hazardous waste for landfill - Enforcing the new requirement*

Part 3: Ground Movement Analysis

This section of the report comprises an analysis of the ground movements arising from the proposed basement and foundation scheme discussed in Part 2 and the information obtained from the investigation, presented in Part 1 of the report.

8.0 Introduction

The sides of an excavation will move to some extent regardless of how they are supported. The movement will typically be both horizontal and vertical and will be influenced by the engineering properties of the ground, groundwater level and flow, the efficiency of the various support systems employed and the efficiency or stiffness of any support structures used.

An analysis has been carried out of the likely movements arising from the proposed excavation and the results of this analysis have been used to predict the effect of these movements on surrounding structures.

8.1 Basis of Ground Movement Assessment

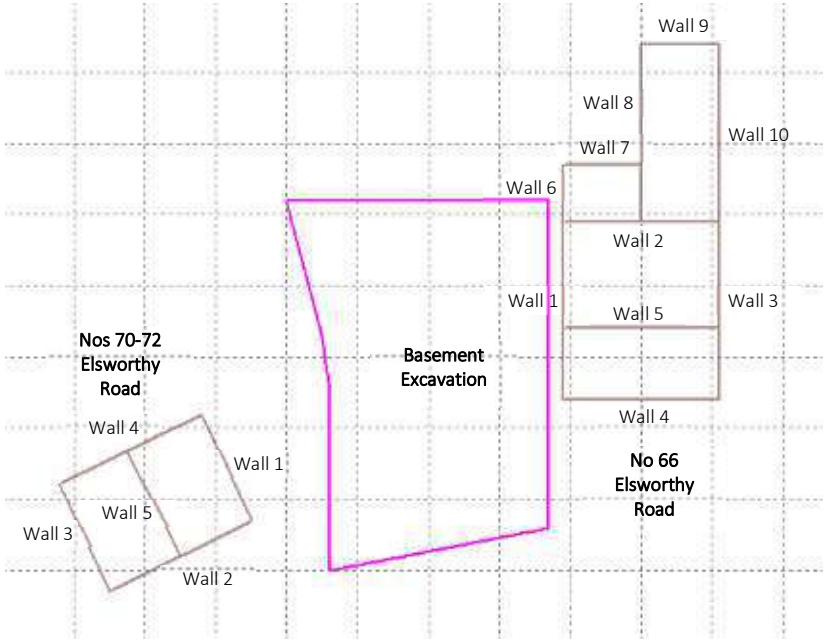
Sensitive structures relevant to this assessment include Nos 66, 70 and 72 Elsworthy Road to the southwest and east.

Formation level for each of the sensitive structures has been assumed to extend to a depth of 1.20 m. The structures are assumed to not have basements. A plan outlining the nearby sensitive structures is shown opposite.

8.2 Construction Sequence

Formation level for the majority of the basement will be at a depth of about 5.00 m below ground level, with a deeper section extending to a depth of 7.00 m towards the rear.

It is understood that the preferred method of retaining wall construction is through the installation of a contiguous piled wall with the exception of a small section of party wall along the eastern boundary will be advanced in a traditional underpinning style hit and miss approach.



In general, the sequence of work for excavation and construction will comprise the following stages;

1. partial demolition of the existing building on site and installation of piling mat;
2. installation of contiguous bored pile retaining wall and temporary support piles and cast capping beams;
3. cast ground floor slab and allow to cure;
4. construct temporary support to walls and floors that are to be retained;

5. excavation down to formation level of shallow basement, propping wall sections as necessary;

6. casting of 400 mm reinforced concrete basement floor slab and construction of reinforced concrete columns and liner walls;

7. excavation or rear section of lower basement level and break down bearing and tension piles to required levels;

8. cast 600 mm basement slab on void former onto support piles;

9. cast vertical basement structure; and,

10. progress with superstructure works and remove temporary support piles.

8.2.1 Temporary Support to Piled Walls

Following the installation of the bored pile wall and capping beams, the ground floor slab will be cast at the head of the piles providing permanent support. Following the casting and curing of the slab, the basement excavation will proceed. The detail of section sizes and spacings will be finalised by the contractor and the temporary works designer. Additional propping will be installed as necessary, as the excavation progresses.

Although the detail of the propping is to be finalised there is the option to use hydraulic 'active' props where the propping force is applied prior to excavation in order to minimise movement at critical locations.

This analysis is based on a top down construction methodology such that the walls can be considered to be of high stiffness. However, high stiffness walls could also be achieved through propping being applied to the capping beam or pile head. If that detail is changed, the analysis will need to be reviewed to ensure that the movements are appropriate and that the building damage assessment remains valid.

Excavation will proceed in stages and in broad terms the order of operations will be to install capping beam props, excavate to a suitable depth below the next propping level, install props and then repeat the operation until the final excavation level has been reached.

8.2.2 Permanent Works

When the final excavation depths have been reached, the permanent works will be formed. The basement is understood to comprise reinforced concrete walls with a drained cavity lining inside of the bored pile wall. Reinforced concrete will be used for floor slabs while reinforced concrete piles extending into the clay will support the new structure.

It has been assumed that the floor slabs will be constructed basement first followed by ground floor and then progressively up to roof height.

9.0 Ground Movements

An assessment of ground movements within and surrounding the excavation has been undertaken using the P-Disp and X-Disp computer programs licensed from the OASYS suite of geotechnical modelling software from Arup. These programs are commonly used within the ground engineering industry and are considered to be appropriate tools for this analysis.

The X-Disp and P-Disp programs have been used to predict ground movements likely to arise from the excavation and construction of the proposed basement. This includes the heave / settlement of the ground (vertical movement) and the lateral movement of soil behind the proposed retaining walls (horizontal movement). Both the P-Disp and X-Disp programs are commonly used within the ground engineering industry and are considered to be appropriate tools for the purpose of this analysis.

For the purpose of these analyses, the corners have been defined by x and y coordinates, with the x-direction approximately parallel with the orientation east-west, whilst the y-direction is approximately parallel with the orientation of north-south. Vertical movement is in the z-direction.

The basement structure has been modelled as a single polygon, which will be formed through the construction of a contiguous bored pile wall. It should be noted that the proposed basement footprint contains a single re-entrant corners, which, due to limitations within the software, will cause a doubling up of movements that creates an issue for any analysis, as the opposite is likely to be the case in reality, with an overall reduction in ground movements more likely due to the increased stiffness of the structure at these points. Where possible, the shape of the proposed basement has been simplified to remove these features to mitigate these effects and provide a more realistic model that can be used in the subsequent damage assessment.

It is assumed that suitable propping will be provided during the construction of the basement and in the permanent condition, such that the walls can be considered to be stiff for the purpose of the ground movement modelling.

The full outputs of all the analyses can be provided on request but samples of the output movement contour plots are included within the appendix.

9.1 Ground Movements – Surrounding the Basement

9.1.1 Model Used

For the X-Disp analysis, the soil movement relationships used for the embedded retaining walls are the default values within CIRIA report C760[18], which were derived from a number of historic case studies.

Installation of piled retaining walls:

The predicted soil movements from the installation of the proposed contiguous bored pile walls which will be used to form the basement have been based on the values in Table 6.1 of CIRIA C760. This indicates the normalised horizontal movement for a contiguous wall to be 0.04% of the installed pile length. However, monitoring of wall movements reported by Ball, Langdon and Creighton[19] of a contiguous bored pile wall in central London that represents, in scale and currency of data, a reasonable representation to this site, indicated measured wall installation movements normalised to between 0.006% and 0.012% of pile length. The paper then suggests that a normalised relationship of 0.02%, i.e. half of the C760 movements, could be appropriate for a contiguous wall whilst remaining relatively conservative and subject to careful control of installation. On the understanding that equally tight controls of pile installation are maintained, and that this reduction in movement has been accepted previously for other similar sites within the London Borough of Camden, it follows that there is no reason why a similar relationship cannot be adopted for this site.

An embedment to exposure ratio of 1 to 1 (toe level of 14 m) would be reasonable for a propped wall such as this. The X-Disp model has been analysed on this basis.

Excavation Phase:

As it is assumed that the piles will be embedded into the clay and adequately propped at the head, the ground movement curves for 'excavations in front of a high stiffness wall' have been adopted to provide an estimate of the likely movements from the subsequent excavations.

9.1.2 Results

The movements predicted by X-Disp are summarised in the table below; the results are presented below subsequent tables to the degree of accuracy required and in to allow predicted variations in ground

18 Gaba, A, Hardy, S, Powrie, W, Doughty, L and Selemetas, D (2017) *Embedded retaining walls – guidance for economic design* CIRIA Report C760

19 Ball, R, Langdon, N, and Creighton, M (2014) Prediction of party wall movements using Ciria report C580. *GE Technical Paper*

movements around the structure to be illustrated but may not reflect the anticipated accuracy of the predictions.

Phase of Works	Wall Movement (mm)	
	Vertical Settlement	Horizontal Movement
Installation of contiguous bored pile wall	2.5	3.0
Combined Installation and Excavation Movements	8.0	12.0

The analysis has indicated that the maximum vertical settlement and horizontal movements that will result from wall installation are between 2.5 and 3.0 mm, with the movements arising from the combined wall installation and excavation phases increasing to between 7 mm and 8 mm of vertical settlement and between 11 mm and 12 mm of horizontal movement.

The movements set out in the table and discussed above are the maximum movements and the analysis has indicated that they occur immediately or just outside the line of the retaining walls, and also account for the likely overprediction of movements within re-entrant corners included within the model.

9.2 Ground Movements – Resulting from Excavation

9.2.1 Model Used

Unloading of the London Clay will take place as a result of the excavation of the proposed basements and the reduction in vertical stress will cause heave to take place. Undrained soil parameters have been used to estimate the potential short-term movements, which include the "immediate" or elastic movements as a result of the basement excavation. Drained parameters have been used to provide an estimate of the total long-term movement.

The elastic analysis requires values of soil stiffness at various levels to calculate displacements. Values of stiffness for the soils at this site are readily available from published data[20] and a well-established method has been used to provide estimated values.

Relationships of $E_u = 500\ C_u$ and $E' = 300\ C_u$ for the cohesive soils have been used to obtain values of Young's modulus.

The 5.00 m to 7.00 m deep excavation of the basement will result in a differential net unloading of between around 95 kN/m^2 to 130 kN/m^2, which will result in differential heave of the underlying London Clay.

The loading on the basement slab has been modelled as a uniform distributed load (UDL) of 45 kN/m^2 where the basement extends to a depth of 5.00 m, and 18kN/m^2 where the basement extends to a depth of 7.00 m. These figures are based on a load takedown drawing provided by Form Structural Design.

The soil parameters used in this analysis and tabulated below have been primarily derived from the onsite investigation but supplemented with the data from the nearby GEA investigation.

A rigid boundary for the analysis has been set at a depth of about 77 m below existing ground level, where nearby BGS records indicate that the base of the London Clay is likely to be present.

Stratum	Depth Range (m)	Eu (MPa)	E'(MPa)
Made Ground	GL to 1.0	10.00	10.00
London Clay	1.0 to 77.0	30.00 to 160.00	18.0 to 96.00

9.2.2 Results

The predicted movements are summarised in the table below; the results are presented below and in subsequent tables to the degree of accuracy required to allow predicted variations in ground movements around the structure(s) to be illustrated, but may not reflect the anticipated accuracy of the predictions. In the table overleaf, heave movements are shown as negative.

20 Burland JB, Standing, JR, and Jardine, FM (2001) *Building response to tunnelling, case studies from construction of the Jubilee Line Extension.* CIRIA Special Publication 200

	Short-term Movement		Total Movement	
	Basement Excavation	Additional Pool Excavation	Basement Excavation	Additional Pool Excavation
Centre of proposed basement	-18.0	-18.0	-44.0	-34.0
Edge of proposed basement	-2.0 to -12.0	-4.0 to -12.0	-6.0 to -24.0	-10.0 to -20.0

The P-Disp analysis indicates that, by the time the basement construction is complete, up to 44.0 mm of heave is likely to have taken place beneath the area of the basement.

If a compressible material is used beneath the slab, it will need to be designed to be able to resist the potential uplift forces generated by the ground movements. In this respect, potential heave pressures are typically taken to equate to around 40% of the total unloading pressure.

10.0 Damage Assessment

In addition to the above assessment of the likely movements that will result from the proposed development, any neighbouring buildings within the zone of influence of the excavations are considered to be sensitive structures, requiring Building Damage Assessments, on the basis of the classification given in Table 6.4 of CIRIA report C760[21].

The sensitive structures outlined previously have been modelled as displacement lines in the analysis along which the damage assessment has been undertaken.

10.1 Damage to Neighbouring Structures

The ground movements resulting from the piling and basement excavation phases have been calculated using X-Disp modelling software to carry out an assessment of the likely damage to adjacent properties and the results are discussed below.

The building damage reports for sensitive structures highlighted above are included in the appendix and indicate that predominantly the damage to the adjoining and nearby structures due to basement construction are between damage categories 'Negligible (0)', with the exception of four sensitive structures predicted as 'Very Slight (1)'.

A summary of the structures indicated as affected is included below, and the structures suffering damage exceeding category 'Negligible (0)' are highlighted in bold in the table overleaf.

21 Gaba, A, Hardy, S, Powrie, W, Doughty, L and Selemetas, D (2017) *Embedded retaining walls – guidance for economic design* CIRIA Report C760

Structure	Elevation	Max tensile strain %	Category*
No 66 Elsworthy Road	Wall 1	0.027	Negligible (0)
	Wall 2	0.071	Negligible (0) to Very Slight (1)
	Wall 3	0.039	Negligible (0)
	Wall 4	0.064	Very Slight (1)
	Wall 5	0.071	Negligible (0) to Very Slight (1)
	Wall 6	0.043	Negligible (0)
	Wall 7	0.015	Negligible (0)
	Wall 8	0.048	Negligible (0)
	Wall 9	0.001	Negligible (0)
	Wall 10	0.008	Negligible (0)
Nos 70-72 Elsworthy Road	Wall 1	0.009	Negligible (0)
	Wall 2	0.044	Negligible (0)
	Wall 3	0.001	Negligible (0)
	Wall 4	0.039	Negligible (0)
	Wall 5	0.011	Negligible (0)

*From Table 6.4 of C760: Classification of visible damage to walls.

The results discussed above are based on individual building lines, or walls, that in some instances, have been further divided up within the analysis into a series of segments that are assumed to be able to move independently of one another, with the most critical segment determining the result for the entire wall. In reality, this is unlikely to be the case as the walls will behave as single stiff elements that are also joined continuously with the rest of the structure.

The results therefore provide a conservative estimate of the behaviour of each of the sensitive structures and overestimate the degree of damage, although they provide a useful indication of the most critical structures within the adjoining properties that may require further assessment, as detailed below.

10.2 Monitoring of Ground Movements

The predictions of ground movement based on the ground movement analysis should be checked by monitoring of the adjacent properties and structures. The structures to be monitored during the construction stages should include the existing property and the neighbouring structure assessed above. Condition surveys of the above existing structures should be carried out before and after the proposed works.

The precise monitoring strategy will be developed at a later stage, and it will be subject to discussions and agreements with the owners of the adjacent properties and structures. Contingency measures will be implemented if movements of the adjacent structures exceed predefined trigger levels. Both contingency measures and trigger levels will need to be developed within a future monitoring specification for the works.

10.3 Impact on Existing Services

The results of statutory services searches have indicated the presence of a Thames Water sewer and a clean water supply main close to the centre of Elsworthy Road, a 90 mm PE gas pipe within the public path on the northside of Elsworthy Road, and a 63 mm PE gas pipe beneath the adjacent site to the west. The exact lines and levels of these services are not known at this stage but lines representing these features have been in included in the assessment, each at a depth of 1.20 m below the top of the proposed retaining walls.

The Thames Water services are shown to be likely to move by approximately 2 mm horizontally and 1 mm vertically and are therefore considered unlikely to be significantly affected. The gas pipes are predicted to sustain movements of less than 5 mm and as they are PE pipes, they will likely be sufficiently flexible to allow such movements, however, the 63 mm pipe is predicted to sustain peak movements of 10 mm in the vertical and 15 mm in the horizontal. This movement could cause damage to the services. We would therefore suggest that the client consult with Cadent Gas and provisions are made to ensure that the pipe is protected. A line labelled as ‘streetline’ has also been included, which denotes the lime where the property meets the public street. This line is predicted to move by 4mm to 5 mm. As such, any damage should be limited to within acceptable limits.

11.0 GMA Conclusions

The analysis has concluded that the predicted damage to the neighbouring properties from the construction of the proposed basements would be 'Negligible' to 'Very Slight'.

On this basis, the damage that has been predicted to occur as a result of the construction the proposed basement falls within the limits acceptable to the London Borough of Camden assuming that the careful control is taken during construction of the proposed excavations, and monitoring will be required to ensure that no excessive movements occur that would lead to damage in excess of these limits.

The separate phases of work, including piling and subsequent excavation of the proposed basement, will in practice be separated by a number of weeks. This will provide an opportunity for the ground movements during and immediately after installation of the retaining walls to be measured and the data acquired can be fed back into the design and compared with the predicted values. Such a comparison will allow the ground model to be reviewed and the predicted wall movements to be reassessed prior to the main excavation taking place so that propping arrangements can be adjusted if required.

Part 4: Basement Impact Assessment

This section of the report evaluates the direct and indirect implications of the proposed project, based on the findings of the previous screening and scoping, site investigation and ground movement assessment.

12.0 Introduction

The screening identified a number of potential impacts. The desk study and ground investigation information has been used below to review the potential impacts, to assess the likelihood of them occurring and the scope for reasonable engineering mitigation.

12.1 Potential Impacts

The table below summarises the previously identified potential impacts and the additional information that is now available from the ground investigation in consideration of each impact.

Potential Impact	Consequence
London Clay is the shallowest stratum at the site.	The London Clay is prone to seasonal shrink-swell (subsidence and heave).
Seasonal shrink-swell can result in foundation movements.	Multiple potential impacts depending on the specific setting of the basement development. For example, the implications of a deepened basement/foundation system on neighbouring properties should be considered.
A number of trees will be felled as part of the development.	Whilst shrinkable soils are present at shallow depth, there are no critical slope angles that are dependent on the presence of the existing trees to aid long term stability.
The site is within 5 m of Elsworthy Road.	Should the design of retaining walls and foundations not take into account the presence of nearby infrastructure, it may lead to the structural damage of footways, highways and associated buried services.
Increase in the proportion of hard-standing and paved areas.	Less soft covering for surface water infiltration. However, the London Clay is of relatively low permeability so will not make much difference.
The development will significantly increase the differential depth of foundations relative to neighbouring properties.	The stability of neighbouring structures will need to be ensured throughout the development. A ground movement analysis is proposed to predict the likely movements as a result of the excavation.

The results of the site investigation have therefore been used below to review the remaining potential impacts, to assess the likelihood of them occurring and the scope for reasonable engineering mitigation.

London Clay is the shallowest stratum / Seasonal Shrink-Swell

The investigation indicated that beneath a variable thickness of made ground, the London Clay is present. The London Clay has been classified as being of high volume change potential, which are prone to seasonal shrink-swell (settlement and heave).

Shrinkable clay is present within a depth that can be affected by tree roots. Numerous trees are present on the site, although desiccation was not observed within the natural soils. The proposed basement is likely to extend below the potential depth of root action, but this should be confirmed once proposals have been finalised.

A number of trees will be felled as part of the development

Whilst shrinkable soils are present at shallow depth, there are no critical slope angles that are dependent on the presence of the existing trees to aid long term stability. Foundations of shallow structures will need to bypass any desiccation.

The site is within 5 m of Elsworthy Road and the adjoining footpath

Should the design of retaining walls and foundations not take into account the presence of nearby infrastructure, it may lead to the structural damage of footways, highways and associated buried services.

In any case, the proposed basement is set back over 5 m from the site boundaries, such that the impact on surrounding infrastructure will be largely nominal. Consultation with the services providers should be carried out.

Increase in hardstanding and paved areas

The proposed development for the site will increase the amount of hard-standing and paved areas, but this will have little effect as the ground is of low permeability. The ground conditions will not be suitable for a soakaway or similar SUDS based system. It is understood that attenuation systems will be adopted to mitigate any potential impact on surface water inflows and run-off.

12.2 BIA Conclusions

A Basement Impact Assessment has been carried out following the information and guidance published by the London Borough of Camden. It has been concluded that the proposed development is unlikely to result in any impacts of concern.

12.3 Non-Technical Summary of Evidence

This section provides a short summary of the evidence acquired and used to form the conclusions made within the BIA.

12.3.1 Screening

The following table provides the evidence used to answer the subterranean (groundwater flow) screening questions.

The following table provides the evidence used to answer the slope stability screening questions.

Question	Evidence
1. Does the existing site include slopes, natural or manmade, greater than 7°?	Topographical maps and Figures 16 and 17 of the Arup report and confirmed during a site walkover
2. Will the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7°?	The details of the proposed development provided do not include the re-profiling of the site to create new slopes
3. Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?	Topographical maps and Figures 16 and 17 of the Arup report
4. Is the site within a wider hillside setting in which the general slope is greater than 7°?	
5. Is the London Clay the shallowest strata at the site?	Geological maps and Figures 3, 5 and 8 of the Arup report
6. Will any trees be felled as part of the proposed development and / or are any works proposed within any tree protection zones where trees are to be retained?	The details of the proposed development.
7. Is there a history of seasonal shrink-swell subsidence in the local area and / or evidence of such effects at the site?	Knowledge on the ground conditions of the area and reference to NHBC guidelines were used to make an assessment of this, in addition to a visual inspection of the buildings carried out during the site walkover.
8. Is the site within 100 m of a watercourse or potential spring line?	Topographical maps acquired as part of the desk study and Figures 11 and 12 of the Arup report
9. Is the site within an area of previously worked ground?	Geological maps and Figures 3, 5 and 8 of the Arup report
10. Is the site within an aquifer?	Aquifer designation maps acquired from the Environment Agency as part of the desk study and Figures 3, 5 and 8 of the Arup report.
11. Is the site within 50 m of Hampstead Heath ponds?	Topographical maps acquired as part of the desk study and Figures 12 and 14 of the Arup report
12. Is the site within 5 m of a highway or pedestrian right of way?	Site plans and the site walkover.
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	Camden planning portal and the site walkover confirmed the position of the proposed basement relative the neighbouring properties.
14. Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?	Maps and plans of infrastructure tunnels were reviewed.

The following table provides the evidence used to answer the surface water flow and flooding screening questions.

Question	Evidence
1. Is the site within the catchment of the pond chains on Hampstead Heath?	Topographical maps acquired as part of the desk study and Figures 12 and 14 of the Arup report
2. As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?	A site walkover confirmed the current site conditions and the details provided on the proposed

Question	Evidence
1a. Is the site located directly above an aquifer?	Aquifer designation maps acquired from the Environment Agency as part of the desk study and Figures 3, 5 and 8 of the Arup report.
1b. Will the proposed basement extend beneath the water table surface?	Previous nearby GEA investigations and BGS archive borehole records.
2. Is the site within 100 m of a watercourse, well (used/ disused) or potential spring line?	Topographical and historical maps acquired as part of the desk study, reference to the Lost Rivers of London and Figures 11 and 12 of the Arup report.
3. Is the site within the catchment of the pond chains on Hampstead Heath?	Figures 12 and 14 of the Arup report
4. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	A site walkover and existing plans of the site have confirmed the proportions of hardstanding and soft landscaping, which have been compared to the proposed drawings to determine the changes in the proportions.
5. As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	The details of the proposed development do not indicate the use of soakaway drainage.
6. Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to or lower than, the mean water level in any local pond or spring line?	Topographical maps acquired as part of the desk study and Figures 11 and 12 of the Arup report.
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	development, including reference to the FRA for the site.
4. Will the proposed basement development result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?	
5. Will the proposed basement result in changes to the quantity of surface water being received by adjacent properties or downstream watercourses?	
6. Is the site in an area known to be at risk from surface water flooding such as South Hampstead, West Hampstead, Gospel Oak and Kings Cross, or is it at risk of flooding because the proposed basement is below the static water level of a nearby surface water feature?	Flood risk maps acquired from the Environment Agency as part of the desk study, Figure 15 of the Arup report, the Camden Flood Risk Management Strategy dated 2013 and the North London Strategic Flood Risk Assessment dated 2008, and reference to the site specific FRA.

12.3.2 Scoping and Site Investigation

The questions in the screening stage that there were answered 'yes', were taken forward to a scoping stage and the potential impacts discussed in Section 4.0 of this report, with reference to the possible impacts outlined in the Arup report.

A ground investigation has been carried out, which has allowed an assessment of the potential impacts of the basement development on the various receptors identified from the screening and scoping stages. Principally the investigation aimed to establish the ground conditions, including the groundwater level, the engineering properties of the underlying soils to enable suitable design of the basement development and the configuration of existing party wall foundations. The findings of the investigation are discussed in Section 5.0 of this report and summarized in both Section 7.0 and the Executive Summary.

12.3.3 Impact Assessment

Section 14.0 of this report summarises whether, on the basis of the findings of the investigation, the potential impacts still need to be given consideration and identifies

ongoing risks that will require suitable engineering mitigation. Section 9.0 of this report also provides recommendations for the design of the proposed development.

A ground movement analysis and building damage assessment has been carried out and its findings are presented in Part 3.

13.0 Outstanding Risks & Issues

This section of the report aims to highlight areas where further work is required as a result of limitations on the scope of this investigation, or where issues have been identified by this investigation that warrant further consideration. The scope of risks and issues discussed in this section is by no means exhaustive, but covers the main areas where additional work may be required.

The ground is a heterogeneous natural material and variations will inevitably arise between the locations at which it is investigated. This report provides an assessment of the ground conditions based on the discrete points at which the ground was sampled, but the ground conditions should be subject to review as the work proceeds to ensure that any variations from the Ground Model are properly assessed by a suitably qualified person.

The investigation has not identified the presence of any significant contamination and as the some of the made ground will be removed from this site through the excavation of the proposed basement and large areas are covered by hardstanding, remedial measures should not be required, other than in areas of soft landscaping. However, as with any site there is a potential for further areas of contamination to be present within the made ground beneath parts of the site not covered by the investigation it is recommended that a watching brief is maintained during any groundworks for the proposed new foundations and that if any suspicious soils are encountered that they are inspected by a geoenvironmental engineer and further assessment may be required.

If during ground works any visual or olfactory evidence of contamination is identified it is recommended that further investigation be carried out and that the risk assessment is reviewed.

These areas of doubt should be drawn to the attention of prospective contractors and further investigation will be required or sufficient contingency should be provided to cover the outstanding risk.

Appendix

a. Field Work

Site Plan
Borehole Records

b. Lab Testing

Geotechnical Test Results
SPT & Cohesion/Depth Graph
Chemical Test Results
Generic Risk Based Screening Values

c. Desk Study

Risk Assessment Tables
Envirocheck Extracts
Historical Maps
UXO Preliminary Risk Assessment

d. Ground Movement Analysis

PDisp Analysis – Short Term Movements
PDisp Analysis – Total Movements
XDisp Analysis – All Input Data
XDisp Analysis – Installation Movements
XDisp Analysis – Installation & Excavation Movements
XDisp Analysis – Building Damage Assessment Results

appendix a

Field Work

Site Plan
Borehole Records

GEA

Geotechnical & Environmental Associates

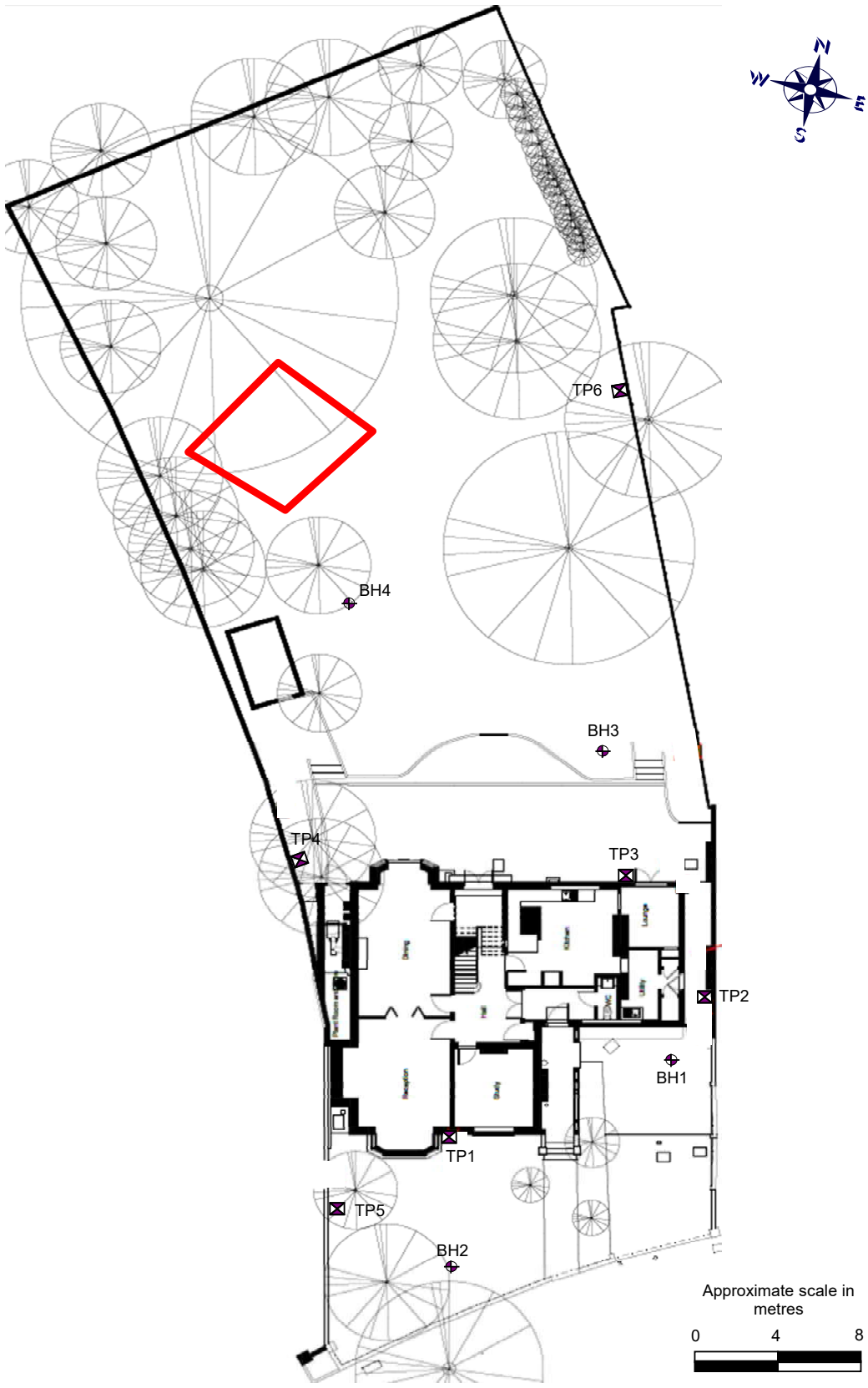
www.gea-ltd.co.uk

Site Plan

Site	68 Elsworthy Road, London NW3 3BP
Client	Mrs S Freeman
Engineer	Form Structural Design

Job Number J23332

Sheet 1 / 1



GEA

Geotechnical & Environmental Associates

Project				BOREHOLE No
68 Elsworthy Road, London NW3 3BP				**BH1**
Job No	Date	Ground Level (m OD)	Co-Ordinates ()	
J23332	21-12-23 21-12-23			
Client		Engineer		Sheet
Mrs S Freeman		Form Structural Design		1 of 1

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
						0.30	Tarmac over Concrete	
0.30	D1					(0.50)	Made Ground (brown slightly sandy clay with gravel, brick and concrete fragments and occasional ash fragments)	
						0.80		
						(1.00)	Soft becoming firm slightly fissured brown CLAY	
1.50	D2					1.80		
						(2.00)	Stiff fissured brown CLAY with bluish grey veins, selenite crystals and occasional partings of orange-brown fine sand	
2.50	D3							
3.50	D4					3.80		
						(3.65)	Stiff fissured brown CLAY with occasional bluish grey veins and occasional selenite crystals	
4.50	D5							
5.50	D6							
6.50	D7					7.45	7.40 - 7.45 Claystone encountered at 7.40 m	

Boring Progress and Water Observations					
Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth

GENERAL REMARKS

Groundwater not encountered.
Groundwater monitoring standpipe installed to a depth of 5.00 m.

All dimensions in metres Scale 1:62.5	Method/ Plant Used	Logged By

Report ID: CABLE PERCUSSION || Project: J23332 - 68 ELSWORTHY ROAD.GPJ || Library: GEA LIBRARY.GLB || Date: 05 January 2024

GEA

Geotechnical & Environmental Associates

Project				BOREHOLE No
68 Elsworthy Road, London NW3 3BP				**BH2**
Job No	Date	Ground Level (m OD)	Co-Ordinates ()	
J23332	21-12-23 21-12-23			
Client	Engineer			Sheet
Mrs S Freeman	Form Structural Design			1 of 1

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
0.20	D1					0.30	Made Ground (brown sandy sliughtly silty clay with rootlets, occaisonal gravel, rare ash fragments and brick fragments becoming more abundant with depth)	
						(0.50)		
						0.80	Soft to firm brown mottled pale grey CLAY	
1.00	D2					(0.80)	Firm to stiff fissured brown CLAY with bluish grey veins and occasional selenite crystals	
						1.60		

Boring Progress and Water Observations					
Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth

GENERAL REMARKS

Groundwater not encountered.
Groundwater monitoring standpipe installed to a depth of 1.50 m.
Borehole terminated due to the stiffness of the clay at a depth of 1.50 m.

All dimensions in metres Scale 1:62.5	Method/ Plant Used	Logged By

Report ID: CABLE PERCUSSION || Project: J23332 - 68 ELSWORTHY ROAD.GPJ || Library: GEA LIBRARY.GLB || Date: 05 January 2024

GEA

Geotechnical & Environmental Associates

Project				BOREHOLE No
68 Elsworthy Road, London NW3 3BP				**BH3**
Job No	Date	Ground Level (m OD)	Co-Ordinates ()	
J23332	21-12-23 21-12-23			
Client		Engineer		Sheet
Mrs S Freeman		Form Structural Design		1 of 1

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
						0.40	Made Ground (dark brown occasionally mottled orange-brown very clayey sand with occasional gravel, rootlets and brick fragments)	
0.60	D1					0.80	Soft orange-brown occasionally mottled grey silty CLAY with occasional rootlets	
1.30	D2					(1.20)	Firm becoming stiff slightly fissured brown slightly sandy CLAY with occasional bluish grey veins and rare fine to coarse subrounded gravel	
						2.00		
						2.40	Stiff brown slightly fissured CLAY with bluish grey veins, occasional fine selenite crystals and occasional fine rounded black gravel	

Boring Progress and Water Observations					
Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth

GENERAL REMARKS

Groundwater not encountered.
Borehole terminated due to the stiffness of the clay at a depth of 2.40 m.

All dimensions in metres Scale 1:62.5	Method/ Plant Used	Logged By

Report ID: CABLE PERCUSSION || Project: J23332 - 68 ELSWORTHY ROAD.GPJ || Library: GEA LIBRARY.GLB || Date: 05 January 2024

GEA

Geotechnical & Environmental Associates

Project				BOREHOLE No
68 Elsworthy Road, London NW3 3BP				**BH4**
Job No	Date	Ground Level (m OD)	Co-Ordinates ()	
J23332	21-12-23 21-12-23			
Client		Engineer		Sheet
Mrs S Freeman		Form Structural Design		1 of 1

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
0.50	D1					(1.00) 1.00	Made Ground (brown sandy sliughtly silty clay with rootlets, occaisonal gravel, rare ash fragments and brick fragments becoming more abundant with depth)	
1.50	D2					(0.80) 1.80	Soft to firm slightly silty slightly sandy orange-brown mottled brown or pale grey CLAY with with occasional fine to medium subrounded gravel	
2.30	D3					(0.80) 2.60	Firm becoming stiff occasionally mottled grey slighlty silty slightly sandy CLAY with occasional black speckling and rare fine subroudned gravel	

Boring Progress and Water Observations

Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth

GENERAL REMARKS

Groundwater not encountered.
Groundwater monitoring standpipe installed to a depth of 2.50 m.
Borehole terminated due to the stiffness of the clay at a depth of 2.50 m.

All dimensions in metres Scale 1:62.5	Method/ Plant Used	Logged By

Report ID: CABLE PERCUSSION || Project: J23332 - 68 ELSWORTHY ROAD.GPJ || Library: GEA LIBRARY.GLB || Date: 05 January 2024

GEA

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Herts | 01727 824666 Notts | 01509 674888

Trial Pit No

1

Site 68 Elsworthy Road, London NW3 3BP

Client Mrs S Freeman

Engineer Form Structural Design

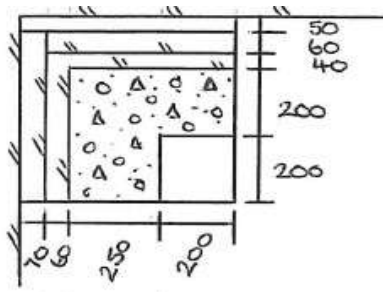
Job Number J23332

Sheet 1/6

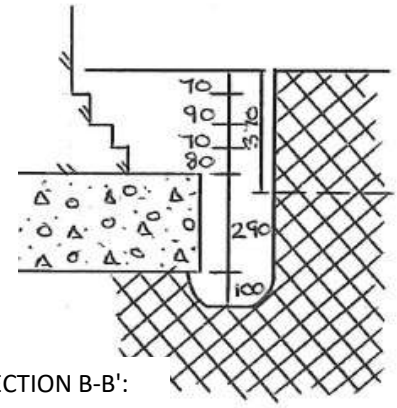
Dates

Excavation Method	Dimensions	Ground Level (mOD)	Location
Manual	580 x 550 x 400		

PLAN:



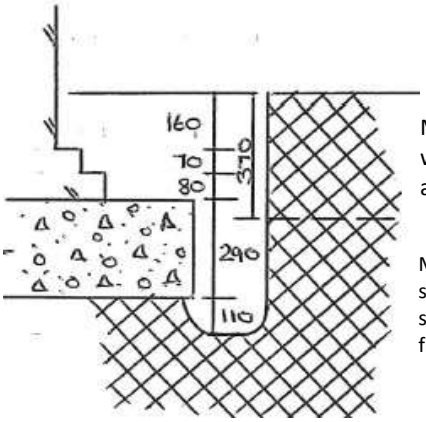
SECTION A-A':



Made Ground (dark brown clayey sand with rootlets, gravel and occasional ash and brick fragments)

Made Ground (brown slightly silty slightly sandy clay with occasional fine to medium subrounded gravel and occasional brick fragments)

SECTION B-B':



Made Ground (dark brown clayey sand with rootlets, gravel and occasional ash and brick fragments)

Made Ground (brown slightly silty slightly sandy clay with occasional fine to medium subrounded gravel and occasional brick fragments)

Remarks:

All dimensions in millimetres

Sides of trial pit remained stable during excavation

Groundwater not encountered

Scale: 01:20

Logged by: AT

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Site 68 Elsworthy Road, London NW3 3BP

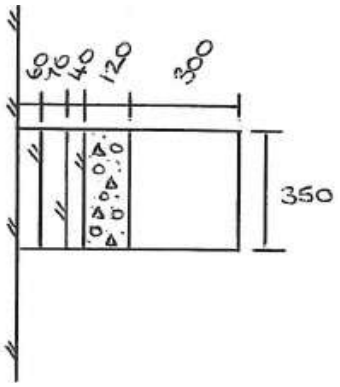
Client Mrs S Freeman

Engineer Form Structural Design

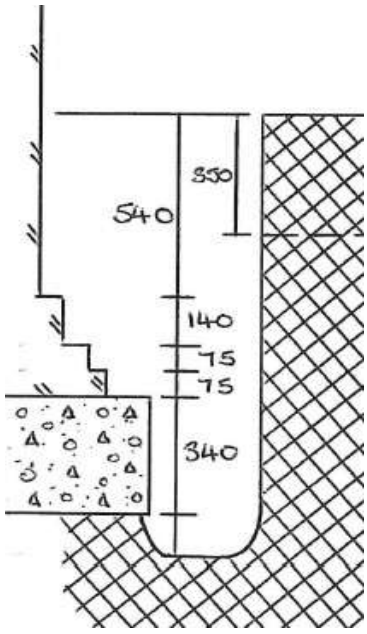
Job Number
J23332
Sheet
3/6
Dates

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Location**
Manual	590 x 350 x 1270		

PLAN:



SECTION:



Paving over Sand

Made Ground (orange-brown sandy clay with gravel and brick and ash fragments)

Remarks:

All dimensions in millimetres

Sides of trial pit remained stable during excavation

Groundwater not encountered

Scale:
01:20
Logged by:
AT

GEA	www.gea-ltd.co.uk Herts | 01727 824666 Notts | 01509 674888	**Trial Pit No** 4

Site 68 Elsworthy Road, London NW3 3BP

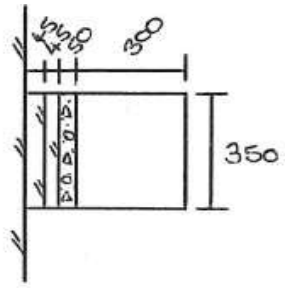
Client Mrs S Freeman

Engineer Form Structural Design

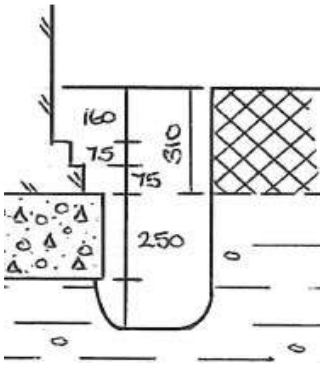
Job Number
J23332
Sheet
4/6
Dates

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Location**
Manual	440 x 350 x 710		

PLAN:



SECTION:



Made Ground (dark brown clayey sand with rootlets, gravel and occasional ash and brick fragments)

Firm brown slightly fissured CLAY with black flecks and fine to coarse subrounded gravel

Remarks:

All dimensions in millimetres

Sides of trial pit remained stable during excavation

Groundwater not encountered

Scale:
01:20
Logged by:
AT

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Trial Pit No 5

Site 68 Elsworthy Road, London NW3 3BP

Client Mrs S Freeman

Engineer Form Structural Design

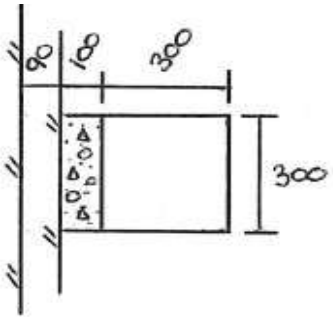
Job Number J23332

Sheet 5/6

Dates

Excavation Method	Dimensions	Ground Level (mOD)	Location
Manual	490 x 300 x 770		

PLAN:



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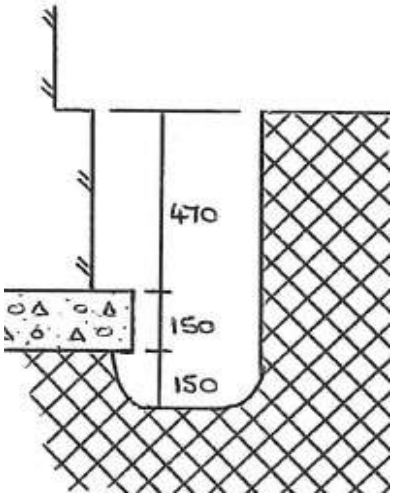

Made Ground (dark brown clayey sand with rootlets, gravel and occasional ash and brick fragments)

Remarks:

All dimensions in millimetres

Sides of trial pit remained stable during excavation

Groundwater not encountered

Scale: 01:20

Logged by: AT

appendix b

Lab Testing

Geotechnical Test Results
SPT & Cohesion/Depth Graph
Chemical Test Results
Generic Risk Based Screening Values

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Geotechnical & Environmental Associates Limited
Widbury Barn
Widbury Hill
Ware
Hertfordshire
SG12 7QE

07 February 2024
Report No : GEO/39760/01

For the attention of Mr A Taylor

Date samples received	22/12/2023
Date written instructions received	25/01/2024
Date testing commenced	26/01/2024
Date of sample disposal	**06/03/2024**

Our ref **GEO / 39760**
Your Ref **J23332**

Project **68 ELSWORTHY ROAD**

Further to your instructions we have pleasure in enclosing the results of the tests you requested in the attached figures.

LABORATORY TEST REPORT

Item No	Test Quantity	Description
1	~	Geotechnical Test Summary
~	7	Water Content
~	7	Liquid & Plastic Limits
~	2	pH Value & Water Soluble Sulphate Content as SO4

Any opinions or interpretations expressed herein are outside the scope of UKAS accreditation. All results contained in this report are provisional unless signed by an approved signatory. The results contained in this report relate only to samples received in the laboratory and are tested 'as received' unless otherwise stated. This report should not be reproduced, except in full, without the written approval of the laboratory. The results reported are applicable only to the test items received by the laboratory.

All the necessary data required by the documented test procedures has been recorded and will be stored for a period of not less than 6 years. This data will be issued to yourselves at your request. All samples will be disposed of after the date shown above. Written confirmation will be required to retain the samples beyond this period and a storage charge may be applied.

We trust that the above meets your requirements and should you require any further information or assistance, please do not hesitate to contact us.

Yours faithfully
on behalf of **GEOLABS Limited**

S Burke
Senior Technician

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression				Chemical Tests			Other tests and comments
Location	Depth (m)	Sample Ref	Type	Description	WC %	LL %	PL %	PI %	<425 µm %	Bulk Mg/m³	Dry Mg/m³	Condition	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	pH	2:1 W/S SO4 g/L	W/S Mg mg/L	
BH1	1.50		D	Brown mottled grey CLAY.	27.5	64	23	41	100										
BH1	3.50		D	Brown mottled grey CLAY with occasional gypsum.	28.1	71	23	48	100							5.9	0.12		
BH1	5.50		D	Brown CLAY with rare gypsum.	25.2	66	27	39	100										
BH2	1.00		D	Brown CLAY.	25.4	69	24	45	100										
BH3	1.30		D	Orangish brown mottled grey gravelly CLAY.	25.1	54	21	33	87										
BH4	1.50		D	Orangish brown mottled grey silty CLAY.	34.9	65	26	39	100							10.2	0.16		
BH4	2.30		D	Brown mottled grey gravelly CLAY. Gravel is fine to medium.	21.7	58	22	36	97										

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Checked and Approved by

S Burke

S Burke - Senior Technician
07/02/2024

Project Number:

GEO / 39760

Project Name:

68 ELSWORTHY ROAD
J23332

GEOLABS®

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t: 01923 225404
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e: reception@i2analytical.com

Analytical Report Number : 23-76387

Project / Site name:	68 Elsworthy Road	**Samples received on:**	21/12/2023
Your job number:	J23332	**Samples instructed on/ Analysis started on:**	21/12/2023
Your order number:		**Analysis completed by:**	03/01/2024
Report Issue Number:	1	**Report issued on:**	03/01/2024
Samples Analysed:	5 soil samples		

Signed:

Joanna Szwagrzak
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 23-76387
Project / Site name: 68 Elsworthy Road

Lab Sample Number				2919215	2919216	2919217	2919218	2919219
Sample Reference				BH2	TP3	BH4	BH1	BH3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.50	0.50	0.30	0.60
Date Sampled				20/12/2023	20/12/2023	20/12/2023	20/12/2023	20/12/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	19	19	18	20	20
Total mass of sample received	kg	0.001	NONE	0.8	0.9	0.9	0.9	0.8
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSO	DSO	DSO	DSO	DSO

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.6	7.9	7.3	9	7.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	490	340	330	1500	200
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0213	0.0356	0.0227	0.862	0.033
Sulphide	mg/kg	1	MCERTS	9.7	2.1	1.6	2.5	4.6
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	4	3	4.3	66	9.1
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2.6	0.4	1.4	0.6	0.6

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.13	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.1	0.07	0.09	0.13	0.22
Anthracene	mg/kg	0.05	MCERTS	0.21	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	4.4	0.09	0.13	0.36	0.41
Pyrene	mg/kg	0.05	MCERTS	4	0.09	0.14	0.37	0.35
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.4	0.06	0.13	0.23	0.19
Chrysene	mg/kg	0.05	MCERTS	3	0.06	0.14	0.27	0.19
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	3.8	< 0.05	0.17	0.3	0.24
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1.8	< 0.05	< 0.05	0.16	0.13
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.2	< 0.05	0.13	0.26	0.21
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.6	< 0.05	0.08	0.16	0.11
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.41	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.8	< 0.05	0.09	0.2	0.13

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	27.9	< 0.80	1.1	2.44	2.18

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	23	18	19	15	13
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	1.9	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	39	53	41	54	49
Copper (aqua regia extractable)	mg/kg	1	MCERTS	77	34	47	29	22
Lead (aqua regia extractable)	mg/kg	1	MCERTS	380	54	260	62	40
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.8	< 0.3	1	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	44	26	23	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.1	< 1.0	< 1.0	< 1.0	1.3
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	150	79	110	80	130

Analytical Report Number: 23-76387
Project / Site name: 68 Elsworthy Road

Lab Sample Number				2919215	2919216	2919217	2919218	2919219
Sample Reference				BH2	TP3	BH4	BH1	BH3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.50	0.50	0.30	0.60
Date Sampled				20/12/2023	20/12/2023	20/12/2023	20/12/2023	20/12/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH C10 - C40 EH_CU_1D_TOTAL	mg/kg	10	MCERTS	39	< 10	< 10	< 10	14
TPH (C8 - C10) HS_1D_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH (C21 - C35) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	30	< 10	< 10	< 10	< 10
TPH Total C8 - C35 EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	30	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 23-76387
Project / Site name: 68 Elsworthy Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2919215	BH2	None Supplied	0.2	Brown loam and clay with gravel and vegetation.
2919216	TP3	None Supplied	0.5	Brown clay and sand with brick and vegetation.
2919217	BH4	None Supplied	0.5	Brown clay and sand with brick and vegetation.
2919218	BH1	None Supplied	0.3	Brown clay and sand with brick.
2919219	BH3	None Supplied	0.6	Brown clay with gravel.

Analytical Report Number : 23-76387
Project / Site name: 68 Elsworthy Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards. Refer to CoA for analyte specific accreditation.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

Analytical Report Number : 23-76387
Project / Site name: 68 Elsworthy Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

GEA

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Generic Risk-Based Soil Screening Values

Site	68 Elsworthy Road, London NW3 3BP	**Job Number** J23332
Client	Mrs S Freeman	**Sheet** 1 / 2
Engineer	Form Structural Design	

Proposed End Use Residential with plant uptake

Soil Organic Matter content % 1.0

Contaminant	Screening Value mg/kg	Data Source
Metals		
Arsenic	37	C4SL
Cadmium	26	C4SL
Chromium (III)	910	S4UL
Chromium (VI)	21	C4SL
Copper	2,400	S4UL
Lead	200	C4SL
Elemental Mercury	1.2	S4UL
Inorganic Mercury	40	S4UL
Nickel	180	S4UL
Selenium	350	SGV
Zinc	3,700	S4UL
Anions		
Soluble Sulphate	500 mg/l	Structures
Sulphide	50	Structures
Chloride	400	Structures
Others		
Organic Carbon (%)	6	Methanogenic potential
Total Cyanide	140	WRAS
Total Mono Phenols	184	SGV
PAH		
Naphthalene	2.30	S4UL
Acenaphthylene	170	S4UL
Acenaphthene	210	S4UL
Fluorene	170	S4UL
Phenanthrene	95	S4UL
Anthracene	2,400	S4UL
Fluoranthene	280	S4UL
Pyrene	620	S4UL
Benzo(a)anthracene	7.2	S4UL
Chrysene	15	S4UL
Benzo(b)fluoranthene	2.6	S4UL
Benzo(k)fluoranthene	77.0	S4UL
Benzo(a)pyrene	4.35	C4SL
Indeno(1 2 3 cd)pyrene	27.0	S4UL
Dibenz(a h)anthracene	0.24	S4UL
Benzo (g h i)perylene	320	S4UL
Total PAH Screen	**62.1**	B(a)P / 0.15

Contaminant	Screening Value mg/kg	Data Source
Hydrocarbons		
Banded TPH (8-10)	52	Calc1
Banded TPH (10-12)	114	Calc1
Banded TPH (12-16)	215	Calc1
Banded TPH (16-21)	400	Calc1
Banded TPH (21-35)	1692	Calc1
Benzene	0.2	C4SL
Toluene	120	SGV
Ethyl Benzene	65	SGV
Xylene	42	SGV
Aliphatic C5-C6	42	S4UL
Aliphatic C6-C8	100	S4UL
Aliphatic C8-C10	27	S4UL
Aliphatic C10-C12	130	S4UL
Aliphatic C12-C16	1100	S4UL
Aliphatic C16-C35	65,000	S4UL
Aromatic C6-C7	See Benzene	S4UL
Aromatic C7-C8	See Toluene	S4UL
Aromatic C8-C10	34	S4UL
Aromatic C10-C12	74	S4UL
Aromatic C12-C16	140	S4UL
Aromatic C16-C21	260	S4UL
Aromatic C21-C35	1100	S4UL
PRO (C_5 –C_{10})	323	Calc2
DRO (C_{12} –C_{28})	66,500	Calc2
Lube Oil (C_{28} –C_{44})	66,100	Calc2
TPH	**500**	Trigger to consider speciated testing
Chlorinated Solvents		
1,1,1 trichloroethane (TCA)	8.8	S4UL
tetrachloroethane (PCA)	1.2	S4UL
tetrachloroethene (PCE)	0.31	C4SL
trichloroethene (TCE)	0.0093	C4SL
1,2-dichloroethane (DCA)	0.11	C4SL
vinyl chloride (Chloroethene)	0.0064	C4SL
tetrachloromethane (Carbon tetra	0.026	S4UL
trichloromethane (Chloroform)	0.91	S4UL

Notes

Concentrations measured below these screening values may be considered to represent 'uncontaminated conditions' which pose a 'LOW' risk to human health. Concentrations measured in excess of these values indicate a potential risk which require further, site specific risk assessment.

C4SL - Defra Category 4 Screening value based on Low Level of Toxicological Risk

SGV - Soil Guideline Value, derived from the CLEA model and published by Environment Agency 2009 - where not superseded by C4SL

S4UL - LQM/CIEH Suitable for use Level (2015) based on 'minimal' level of risk

Calc1 - sum of thresholds for Ali & Aro fractions - assuming a 35% Aro:65% Ali ratio as is commonly encountered in the soil

Calc2 - sum of nearest available carbon range specified including BTEX for PRO fraction

Total PAH based on B(a)P / 0.15 - GEA experience indicates that Benzo(a) pyrene rarely exceeds 15% of the total PAH concentration

appendix c

Desk Study

Risk Assessment Tables
Envirocheck Extracts
Historical Maps
UXO Preliminary Risk Assessment

appendix c

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
328185318_1_1

Customer Reference:
J23332

National Grid Reference:
527010, 183940

Slice:
A

Site Area (Ha):
0.14

Search Buffer (m):
1000

Site Details:

68 Elsworthy Road
LONDON
NW3 3BP

Client Details:

Mr S Branch
GEA Ltd
Widbury Barn
Widbury Hill
Ware
Herts
SG12 7QE

GEA

Contents

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination.
For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client.
In this datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

Report Version v53.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility					n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 1				1
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control					
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls	pg 1			2	17
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 3			Yes	
Pollution Incidents to Controlled Waters	pg 3				3
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances	pg 4				7
River Quality	pg 5				1
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register					
Water Abstractions	pg 5			6	3 (*28)
Water Industry Act Referrals					
Groundwater Vulnerability Map	pg 14	Yes	n/a	n/a	n/a
Groundwater Vulnerability - Soluble Rock Risk			n/a	n/a	n/a
Groundwater Vulnerability - Local Information			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 15	Yes	n/a	n/a	n/a
Superficial Aquifer Designations			n/a	n/a	n/a
Source Protection Zones	pg 15	1		1	
Extreme Flooding from Rivers or Sea without Defences				n/a	n/a
Flooding from Rivers or Sea without Defences				n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
OS Water Network Lines	pg 15		1		1

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites					
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)	pg 16				1
Local Authority Landfill Coverage		1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Potentially Infilled Land (Non-Water)	pg 16				1
Potentially Infilled Land (Water)					
Registered Landfill Sites					
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites					
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)					
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Geological					
BGS 1:625,000 Solid Geology	pg 17	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry					
BGS Recorded Mineral Sites					
BGS Urban Soil Chemistry	pg 17		Yes	Yes	Yes
BGS Urban Soil Chemistry Averages	pg 20	Yes			
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas			n/a	n/a	n/a
Mining Instability			n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain				n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 20	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards				n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 20	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 20	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 20	Yes		n/a	n/a
Radon Potential - Radon Affected Areas			n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a
Industrial Land Use					
Contemporary Trade Directory Entries	pg 21			18	176
Fuel Station Entries	pg 37				4
Points of Interest - Commercial Services	pg 37			3	47
Points of Interest - Education and Health	pg 41				8
Points of Interest - Manufacturing and Production	pg 42		1		17
Points of Interest - Public Infrastructure	pg 44				19
Points of Interest - Recreational and Environmental	pg 45			9	25
Gas Pipelines					
Underground Electrical Cables	pg 48		6	10	30

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Use					
Ancient Woodland					
Areas of Adopted Green Belt					
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves	pg 54				2
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones					
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: Thames Water Utilities Ltd Property Type: WTW/WATER COLLECTION/TREATMENT/SUPPLY Location: Barrow Hill Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Temp.0018 Permit Version: 1 Effective Date: 15th September 1989 Issued Date: 15th September 1989 Revocation Date: 5th October 2000 Discharge Type: Trade Effluent Discharge Environment: Freshwater Stream/River Receiving Water: River Thames **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 100m	A9NW (SE)	652	2	527600 183600
2	**Local Authority Pollution Prevention and Controls** Name: Kings Dry Cleaners Location: 25 Winchester Road, London, E4 Authority: London Borough of Waltham Forest, Environmental Health Department Permit Reference: DC05 Dated: 6th July 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A18SW (NW)	387	3	526812 184310
3	**Local Authority Pollution Prevention and Controls** Name: Swiss Cottage Dry Cleaners Location: 121 Finchley Road, London, Nw3 6hy Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC10 Dated: 12th January 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A12NE (NW)	475	4	526626 184270
4	**Local Authority Pollution Prevention and Controls** Name: Ivy Dry Cleaner Location: 4 Queens Terrace, London, Nw8 6dx Authority: Westminster City Council, Environmental Health Department Permit Reference: 06/40583/EE1EP Dated: 14th September 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A8NW (SW)	502	5	526672 183539
5	**Local Authority Pollution Prevention and Controls** Name: St John'S Wood Dry Cleaners Location: 47 Charlbert Street, London, NW8 6JN Authority: Westminster City Council, Environmental Health Department Permit Reference: 09/53345/EE1EP Dated: 10th November 2009 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A8NE (S)	587	5	527114 183327
6	**Local Authority Pollution Prevention and Controls** Name: Masterclean Dry Cleaners Location: 6 Langtry Walk, London, Nw8 0du Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC38 Dated: 12th January 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A12NE (W)	633	4	526352 184004
7	**Local Authority Pollution Prevention and Controls** Name: Johnsons Cleaners Location: 69 St Johns Wood High Street, London, Nw8 7nl Authority: Westminster City Council, Environmental Health Department Permit Reference: 06/40583/EE1EP Dated: 7th September 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Site Closed** Positional Accuracy: Manually positioned to the address or location	A8SW (S)	680	5	526938 183230

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
7	**Local Authority Pollution Prevention and Controls** Name: Madame George Location: 9 Circus Road, London, Nw8 6nx Authority: Westminster City Council, Environmental Health Department Permit Reference: 06/39117/EE1EP Dated: 7th September 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A8SW (S)	688	5	526902 183227
8	**Local Authority Pollution Prevention and Controls** Name: Tempo Dry Cleaners Location: 98 St Johns Wood High Street, London, Nw8 7sh Authority: Westminster City Council, Environmental Health Department Permit Reference: 06/38279/EE1EP Dated: 7th September 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Site Closed** Positional Accuracy: Manually positioned to the address or location	A8SE (S)	722	5	527019 183184
9	**Local Authority Pollution Prevention and Controls** Name: Connoisseur Dry Cleaners Location: 3-5 Fairhazel Gardens, London, Nw6 3qe Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC11 Dated: 12th January 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A12NW (W)	739	4	526262 184119
9	**Local Authority Pollution Prevention and Controls** Name: Sqweaky Clean Professional Dry Cleaners Location: 13 Fairhazel Gardens, London, Nw6 3qe Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC37 Dated: 12th January 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A12NW (W)	767	4	526237 184134
10	**Local Authority Pollution Prevention and Controls** Name: Chequers Textile Care Ltd Location: 48 Englands Lane, London, Nw3 4ue Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC47 Dated: 5th December 2006 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A19SW (NE)	784	4	527498 184580
11	**Local Authority Pollution Prevention and Controls** Name: B P Harmony Location: 104a Finchley Road, London, NW3 5EY Authority: London Borough of Camden, Pollution Projects Team Permit Reference: Not Given Dated: 1st July 1999 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station **Status: Authorised** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	786	4	526471 184554
11	**Local Authority Pollution Prevention and Controls** Name: Bp Harmony Location: 104a Finchley Road, LONDON, NW3 5EY Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC18 Dated: 1st July 1999 Process Type: Local Authority Pollution Prevention and Control Description: PG1/14 Petrol filling station **Status: Permitted** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	786	4	526471 184554

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
12	**Local Authority Pollution Prevention and Controls** Name: Elias Dry Cleaners Location: 68 St Johns Wood High Street, London, Nw8 7sh Authority: Westminster City Council, Environmental Health Department Permit Reference: 08/15232/EE1EP Dated: 6th March 2008 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A8SE (S)	798	5	527077 183110
13	**Local Authority Pollution Prevention and Controls** Name: Bp Filling Station Location: 21-41 Wellington Road, St John's Wood, LONDON, NW8 9SP Authority: Westminster City Council, Environmental Health Department Permit Reference: VR 8 Dated: 7th May 1999 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station **Status: Authorised** Positional Accuracy: Manually positioned to the address or location	A8SW (S)	839	5	526864 183080
14	**Local Authority Pollution Prevention and Controls** Name: Abbey Dry Cleaners Location: 11 Blenheim Terrace, London, Nw8 0eh Authority: Westminster City Council, Environmental Health Department Permit Reference: 07/71922/EE1EP Dated: 25th September 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Site Closed** Positional Accuracy: Manually positioned to the address or location	A7NW (SW)	900	5	526303 183355
15	**Local Authority Pollution Prevention and Controls** Name: Primrose Valet Location: 91 Regent'S Park Road, London, Nw1 8ur Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC53 Dated: 28th January 2009 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A14NE (E)	918	4	527917 184155
16	**Local Authority Pollution Prevention and Controls** Name: Siciliana Location: 6 Blenheim Terrace, London, Nw8 0eb Authority: Westminster City Council, Environmental Health Department Permit Reference: 06/48997/EE1EP Dated: 25th September 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A7NW (SW)	963	5	526198 183395
17	**Local Authority Pollution Prevention and Controls** Name: Perfect Dry Cleaners Location: 55 Abbey Road, London, NW8 0AD Authority: Westminster City Council, Environmental Health Department Permit Reference: 09/74394/EE1EP Dated: 23rd March 2010 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A7NW (W)	988	5	526069 183582
	Nearest Surface Water Feature	A18SW (NW)	386	-	526776 184286
18	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: LONDON, NW8 Authority: Environment Agency, Thames Region Pollutant: Oils - Unknown Note: Not Supplied Incident Date: 2nd February 1996 Incident Reference: SE960054 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A8SW (S)	738	2	526800 183200

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
19	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: LONDON, NW8 Authority: Environment Agency, Thames Region Pollutant: Miscellaneous - Natural Note: Not Supplied Incident Date: 10th September 1996 Incident Reference: SE960481 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A8SE (S)	761	2	527300 183200
20	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Hampstead Road Lock, CAMDEN TOWN Authority: Environment Agency, Thames Region Pollutant: Oils - Unknown Note: Not Supplied Incident Date: 17th December 1998 Incident Reference: THNE1998041401 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A14NE (E)	973	2	528000 184000
21	**Registered Radioactive Substances** Name: Wellington Hospital Location: 8a Wellington Place, LONDON, NW8 9LE Authority: Environment Agency, Thames Region Permit Reference: Bw7716 Dated: 1st December 2003 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Minor variation to authorisation under RSA **Status: Application has been authorised and any conditions apply to the operator** Positional Accuracy: Automatically positioned to the address	A8SW (S)	804	2	526814 183127
21	**Registered Radioactive Substances** Name: Wellington Hospital Location: 8a Wellington Place, LONDON, NW8 9LE Authority: Environment Agency, Thames Region Permit Reference: Br5558 Dated: 28th March 2002 Process Type: Registration under S7 RSA for the keeping and use of Radioactive materials (was RSA60 S1) Description: Registration under the Act of an open source which is also the subject of an authorisation **Status: Application has been authorised and any conditions apply to the operator** Positional Accuracy: Automatically positioned to the address	A8SW (S)	804	2	526814 183127
21	**Registered Radioactive Substances** Name: Wellington Hospital Location: 8a Wellington Place, LONDON, NW8 9LE Authority: Environment Agency, Thames Region Permit Reference: Br5531 Dated: 28th March 2002 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Authorisation under RSA **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A8SW (S)	804	2	526814 183127
21	**Registered Radioactive Substances** Name: Humana Hospital Wellington Location: 27 Circus Road, LONDON, Greater London, NW8 9JG Authority: Environment Agency, Thames Region Permit Reference: AB8520 Dated: 31st March 1991 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Authorisation under RSA in respect of a registration under S7 when Technetium 99M is used being =< 10 gigabecquerels **Status: Authorisation either revoked or cancelled** Positional Accuracy: Unknown	A8SW (S)	804	2	526794 183133

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
22	**Registered Radioactive Substances** Name: Wynn Institute For Metabolic Research Location: Flat 21, Cavendish House, 21 Wellington Road, LONDON, Greater London, NW8 9SQ Authority: Environment Agency, Thames Region Permit Reference: AC0591 Dated: 31st March 1991 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Authorisation under RSA **Status: Authorisation either revoked or cancelled** Positional Accuracy: Automatically positioned to the address	A8SW (S)	888	2	526898 183025
23	**Registered Radioactive Substances** Name: Hca International Limited Location: The Wellington Hospital, Wellington Place, St Johns Wood, Nw8 9le Authority: Environment Agency, Head Office Permit Reference: ZB3233DA Dated: Not Supplied Process Type: Not Supplied Description: Not Supplied **Status: Application has been determined by the EA** Positional Accuracy: Automatically positioned to the address	A8SW (S)	921	2	526931 182989
23	**Registered Radioactive Substances** Name: Humana Hospital Wellington Location: 8A Wellington Place, LONDON, Greater London, NW8 9LE Authority: Environment Agency, Thames Region Permit Reference: AB8511 Dated: 31st March 1991 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Authorisation under RSA **Status: Authorisation either revoked or cancelled** Positional Accuracy: Unknown	A8SW (S)	950	2	526918 182961
	River Quality Name: Guc (Paddington Arm) GQA Grade: River Quality E Reach: Canal Feeder - Camden Road Estimated Distance (km): 10.5 Flow Rate: Flow greater than 80 cumecs Flow Type: Canal Year: 2000	A9NW (SE)	753	2	527419 183270
24	**Water Abstractions** Operator: National Rail Licence Number: Th/039/0039/169 Permit Version: 1 Location: Shallow Deposits & London Clay In Camden, London - B Authority: Environment Agency, Thames Region Abstraction: Drainage Operations: Dewatering Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 13th September 2022 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13NW (NW)	319	2	526817 184233
25	**Water Abstractions** Operator: London Borough Of Camden Licence Number: 28/39/39/0219 Permit Version: 1 Location: Swiss Cottage Open Space- Borehole Authority: Environment Agency, Thames Region Abstraction: Municipal Grounds: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Swiss Cottage Open Space, Winchester Road, London. Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A18SW (NW)	367	2	526800 184280

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
26	**Water Abstractions** Operator: London Borough Of Camden Licence Number: Th/039/0039/087 Permit Version: 1 Location: Swiss Cottage Open Space- Borehole Authority: Environment Agency, Thames Region Abstraction: Municipal Grounds: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Swiss Cottage Open Space, Winchester Road, London Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 5th December 2013 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13NW (NW)	382	2	526750 184261
26	**Water Abstractions** Operator: London Borough Of Camden Licence Number: Th/039/0039/087 Permit Version: 1 Location: Swiss Cottage Open Space- Borehole Authority: Environment Agency, Thames Region Abstraction: Municipal Grounds: General Washing/Process Washing Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Swiss Cottage Open Space, Winchester Road, London Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 5th December 2013 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13NW (NW)	382	2	526750 184261
26	**Water Abstractions** Operator: London Borough Of Camden Licence Number: Th/039/0039/087 Permit Version: 1 Location: Swiss Cottage Open Space- Borehole Authority: Environment Agency, Thames Region Abstraction: Municipal Grounds: Lake And Pond Throughflow Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Swiss Cottage Open Space, Winchester Road, London Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 5th December 2013 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13NW (NW)	382	2	526750 184261
27	**Water Abstractions** Operator: National Rail Licence Number: Th/039/0039/169 Permit Version: 1 Location: Shallow Deposits & London Clay In Camden, London - C Authority: Environment Agency, Thames Region Abstraction: Drainage Operations: Dewatering Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 13th September 2022 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A12SE (W)	415	2	526574 183886

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
28	**Water Abstractions** Operator: Thames Water Utilities Ltd Licence Number: Th/039/0039/058 Permit Version: 1 Location: Borehole At Barrow Hill Authority: Environment Agency, Thames Region Abstraction: Public Water Supply: Potable Water Supply - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 1st April 2013 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14SW (E)	645	2	527636 183697
28	**Water Abstractions** Operator: Thames Water Utilities Ltd Licence Number: 28/39/39/0231 Permit Version: 1 Location: Barrow Hill Pumping Station - Borehole Authority: Environment Agency, Thames Region Abstraction: Public Water Supply: Potable Water Supply - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Barrow Hill Pumping Station Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 2007 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14SW (E)	651	2	527640 183690
28	**Water Abstractions** Operator: Thames Water Utilities Ltd Licence Number: 28/39/39/0202 Permit Version: 1 Location: Barrow Hill Pumping Station - Borehole Authority: Environment Agency, Thames Region Abstraction: Public Water Supply: Potable Water Supply - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Barrow Hill Pumping Station Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 26th September 2002 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14SW (E)	651	2	527640 183690
	Water Abstractions Operator: Marylebone Cricket Club Licence Number: Th/039/0039/116 Permit Version: 3 Location: Lords Cricket Ground, London. Authority: Environment Agency, Thames Region Abstraction: Other Industrial/Commercial/Public Services: Heat Pump Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 26th March 2021 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A3NW (S)	1040	2	526902 182872

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Marylebone Cricket Club Licence Number: Th/039/0039/116 Permit Version: 2 Location: Lords Cricket Ground, London. Authority: Environment Agency, Thames Region Abstraction: Other Industrial/Commercial/Public Services: Heat Pump Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 28th May 2020 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A3NW (S)	1040	2	526902 182872
	Water Abstractions Operator: Marylebone Cricket Club Licence Number: Th/039/0039/116 Permit Version: 1 Location: Lords Cricket Ground, London. Authority: Environment Agency, Thames Region Abstraction: Other Industrial/Commercial/Public Services: Heat Pump Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 17th May 2017 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A3NW (S)	1040	2	526902 182872
	Water Abstractions Operator: Zoological Society Of London Licence Number: 28/39/39/0035 Permit Version: 100 Location: Borehole At Regent'S Park, London Nw1 Authority: Environment Agency, Thames Region Abstraction: Zoos/Kennels/Stables: Animal Watering & General Use (Non Agricultural) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 59 Yearly Rate (m3): 681 Details: Regent'S Park, London Nw1 Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 4th April 1966 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A9NE (SE)	1099	2	528000 183400
	Water Abstractions Operator: The Royal Parks Limited Licence Number: Th/039/0039/142 Permit Version: 1 Location: Borehole A - Regents Park, London Authority: Environment Agency, Thames Region Abstraction: Crown and Government: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 October Permit Start Date: 18th October 2022 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A4NW (SE)	1249	2	527665 182839

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: The Royal Parks Limited Licence Number: Th/039/0039/142 Permit Version: 1 Location: Borehole A - Regents Park, London Authority: Environment Agency, Thames Region Abstraction: Crown And Government: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 18th October 2022 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A4NW (SE)	1249	2	527665 182839
	Water Abstractions Operator: The Royal Parks Limited Licence Number: Th/039/0039/142 Permit Version: 1 Location: Borehole A - Regents Park, London Authority: Environment Agency, Thames Region Abstraction: Crown and Government: Make-Up or Top Up Water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 18th October 2022 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A4NW (SE)	1249	2	527665 182839
	Water Abstractions Operator: Abbey Lodge Rtm Company Limited Licence Number: 28/39/39/0115 Permit Version: 101 Location: Abbey Lodge, Park Road, London Nw8-Two Boreholes Authority: Environment Agency, Thames Region Abstraction: Household Water Supply: Drinking; Cooking; Sanitary; Washing; (Small Garden) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Abbey Lodge, Park Road, London Nw8 Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st June 2006 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A4NW (S)	1348	2	527420 182620
	Water Abstractions Operator: Wood Management Trustees Ltd Licence Number: 28/39/39/0115 Permit Version: 100 Location: Two Boreholes At Abbey Lodge, Park Road, London Nw8 Authority: Environment Agency, Thames Region Abstraction: Household Water Supply: Drinking; Cooking; Sanitary; Washing; (Small Garden) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 100 Yearly Rate (m3): 28640 Details: Abbey Lodge, Park Road, London Nw8 Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 28th November 1991 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A4NW (S)	1348	2	527420 182620

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: National Rail Licence Number: Th/039/0039/169 Permit Version: 1 Location: Shallow Deposits & London Clay In Camden, London - A Authority: Environment Agency, Thames Region Abstraction: Drainage Operations: Dewatering Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 13th September 2022 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A15SE (E)	1373	2	528397 183788
	Water Abstractions Operator: Canal And River Trust Licence Number: 28/39/39/0164 Permit Version: 101 Location: St John'S Wood, London - Regents Canal Authority: Environment Agency, Thames Region Abstraction: Amenity: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Pipeline Alongside The Regents Canal, London Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 17th December 2007 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A3SE (S)	1446	2	527050 182460
	Water Abstractions Operator: British Waterways Board Licence Number: 28/39/39/0164 Permit Version: 100 Location: St John'S Wood, London - Regents Canal Authority: Environment Agency, Thames Region Abstraction: Amenity: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): 3840 Yearly Rate (m3): 1 Details: Pipeline Alongside The Regents Canal, London Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 25th April 1983 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A3SE (S)	1446	2	527050 182460
	Water Abstractions Operator: British Waterways Board Licence Number: 28/39/39/0173 Permit Version: 100 Location: Oval Road, Camden - Grand Union Regents Canal Authority: Environment Agency, Thames Region Abstraction: Other Industrial/Commercial/Public Services: Non-Evaporative Cooling Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): 20 Yearly Rate (m3): 7000 Details: Land At Oval Road, Camden, London Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 8th December 1994 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A15NE (E)	1464	2	528490 184020

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: British Waterways Licence Number: 28/39/39/0164B Permit Version: Not Supplied Location: Southampton Bridge, LONDON, Nw8 Authority: Environment Agency, Thames Region Abstraction: Industrial Cooling (Cegb) Abstraction Type: Not Supplied Source: River Daily Rate (m3): 3840 Yearly Rate (m3): 1 Details: Annual Abstraction Total Aggregated To Another Licence For Quantity Purposes. Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A15NE (E)	1472	2	528500 184000
	Water Abstractions Operator: Canal And River Trust Licence Number: 28/39/39/0164 Permit Version: 101 Location: Southampton Bridge, London, Nw8 - Regents Canal Authority: Environment Agency, Thames Region Abstraction: Amenity: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Pipeline Alongside The Regents Canal, London Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 17th December 2007 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A15NE (E)	1473	2	528500 184020
	Water Abstractions Operator: British Waterways Board Licence Number: 28/39/39/0164 Permit Version: 100 Location: Southampton Bridge, London, Nw8 - Regents Canal Authority: Environment Agency, Thames Region Abstraction: Amenity: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): 3840 Yearly Rate (m3): 1 Details: Pipeline Alongside The Regents Canal, London Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 25th April 1983 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A15NE (E)	1473	2	528500 184020
	Water Abstractions Operator: British Waterways Licence Number: 28/39/39/0164A Permit Version: Not Supplied Location: St Johns Wood, LONDON, Nw1 Authority: Environment Agency, Thames Region Abstraction: Industrial Cooling (Cegb) Abstraction Type: Not Supplied Source: River Daily Rate (m3): 1920 Yearly Rate (m3): 1 Details: Annual Abstraction Total Aggregated To Another Licence For Quantity Purposes. Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A3SW (S)	1506	2	527000 182400

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Greenwich Leisure Limited Licence Number: 28/39/39/0091 Permit Version: 101 Location: Kentish Town Sports Centre, Prince Of Wales St Authority: Environment Agency, Thames Region Abstraction: Commercial/Industrial/Public Services: Drinking; Cooking; Sanitary; Washing; (Small Garden) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Kentish Town Sports Centre, Prince Of Wales Road, London Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 25th May 2012 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	(NE)	1933	2	528800 184700
	Water Abstractions Operator: Greenwich Leisure Limited Licence Number: 28/39/39/0091 Permit Version: 101 Location: Kentish Town Sports Centre, Prince Of Wales St Authority: Environment Agency, Thames Region Abstraction: Other Industrial/Commercial/Public Services: Process Water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: St. Pancras Public Baths, Prince Of Wales Road, London Nw1 Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 25th May 2012 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	(NE)	1933	2	528800 184700
	Water Abstractions Operator: Greenwich Leisure Ltd Licence Number: 28/39/39/0091 Permit Version: 101 Location: Two Bores At Kentish Town Sports Centre, Prince Of Wales St Authority: Environment Agency, Thames Region Abstraction: Other Industrial/Commercial/Public Services: Process Water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: St. Pancras Public Baths, Prince Of Wales Road, London Nw1 Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 5th April 2012 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	(NE)	1933	2	528800 184700
	Water Abstractions Operator: London Borough Of Camden Licence Number: 28/39/39/0091 Permit Version: 100 Location: Two Bores At Kentish Town Sports Centre, Prince Of Wales St Authority: Environment Agency, Thames Region Abstraction: Commercial/Industrial/Public Services: Drinking; Cooking; Sanitary; Washing; (Small Garden) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 605 Yearly Rate (m3): 76509 Details: Kentish Town Sports Centre, Prince Of Wales Road, London Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 13th June 1966 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	(NE)	1933	2	528800 184700

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: London Borough Of Camden Licence Number: 28/39/39/0091 Permit Version: 100 Location: Two Bores At Kentish Town Sports Centre, Prince Of Wales St Authority: Environment Agency, Thames Region Abstraction: Industrial; Commercial And Public Services: Laundry Use Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: St. Pancras Public Baths, Prince Of Wales Road, London Nw1 Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 13th June 1966 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(NE)	1933	2	528800 184700
	Water Abstractions Operator: London Borough Of Camden Licence Number: 28/39/39/0091 Permit Version: 100 Location: Two Bores At Kentish Town Sports Centre, Prince Of Wales St Authority: Environment Agency, Thames Region Abstraction: Other Industrial/Commercial/Public Services: Process Water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: St. Pancras Public Baths, Prince Of Wales Road, London Nw1 Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 13th June 1966 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(NE)	1933	2	528800 184700
	Water Abstractions Operator: Abbey National Plc Licence Number: 28/39/39/0070 Permit Version: 101 Location: Borehole At Abbey House, Baker Street, London Nw1 Authority: Environment Agency, Thames Region Abstraction: Commercial/Industrial/Public Services: Drinking; Cooking; Sanitary; Washing; (Small Garden) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 91 Yearly Rate (m3): 2273 Details: Abbey House, Baker Street, London Nw1 Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 2nd May 2000 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	(SE)	1969	2	527800 182100
	Water Abstractions Operator: Baskerville Estates (Gp) Limited Licence Number: 28/39/39/0070 Permit Version: 102 Location: Abbey House, Baker Street- Borehole Authority: Environment Agency, Thames Region Abstraction: Commercial/Industrial/Public Services: Drinking; Cooking; Sanitary; Washing; (Small Garden) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Abbey House, Baker Street, London Nw1 Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 19th December 2003 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(SE)	1989	2	527850 182100

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: The Royal Parks Limited Licence Number: Th/039/0039/142 Permit Version: 1 Location: Borehole B - Regents Park, London Authority: Environment Agency, Thames Region Abstraction: Crown And Government: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 18th October 2022 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A5SE (SE)	1998	2	528505 182570
	Water Abstractions Operator: The Royal Parks Limited Licence Number: Th/039/0039/142 Permit Version: 1 Location: Borehole B - Regents Park, London Authority: Environment Agency, Thames Region Abstraction: Crown and Government: Make-Up or Top Up Water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 18th October 2022 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A5SE (SE)	1998	2	528505 182570
	Water Abstractions Operator: The Royal Parks Limited Licence Number: Th/039/0039/142 Permit Version: 1 Location: Borehole B - Regents Park, London Authority: Environment Agency, Thames Region Abstraction: Crown and Government: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 October Permit Start Date: 18th October 2022 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A5SE (SE)	1998	2	528505 182570
	Groundwater Vulnerability Map Combined Classification: Unproductive Aquifer (may have productive aquifer beneath) Combined Vulnerability: Unproductive Combined Aquifer: Unproductive Bedrock Aquifer, No Superficial Aquifer Pollutant Speed: Low Bedrock Flow: Mixed Dilution: 300-550 mm/year Baseflow Index: 40-70% Superficial Patchiness: <90% Superficial Thickness: <3m Superficial Recharge: No Data	A13NW (W)	0	6	527000 183939

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Groundwater Vulnerability Map Combined Classification: Unproductive Aquifer (may have productive aquifer beneath) Combined Vulnerability: Unproductive Combined Aquifer: Unproductive Bedrock Aquifer, No Superficial Aquifer Pollutant Speed: Low Bedrock Flow: Mixed Dilution: 300-550 mm/year Baseflow Index: 40-70% Superficial Patchiness: <90% Superficial Thickness: <3m Superficial Recharge: No Data	A13NE (W)	0	6	527008 183939
	Groundwater Vulnerability - Soluble Rock Risk None				
	Bedrock Aquifer Designations Aquifer Designation: Unproductive Strata	A13NE (W)	0	6	527008 183939
	Superficial Aquifer Designations No Data Available				
29	**Source Protection Zones** Name: Not Supplied Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone II (Outer Protection Zone): Either 25% of the source area or a 400 day travel time whichever is greater.	A13NE (W)	0	2	527008 183939
30	**Source Protection Zones** Name: Not Supplied Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone I (Inner Protection Zone): Travel time of 50 days or less to the groundwater source.	A14SW (E)	353	2	527369 183815
	Extreme Flooding from Rivers or Sea without Defences None				
	Flooding from Rivers or Sea without Defences None				
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
31	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5204.1 Watercourse Level: Underground Permanent: True Watercourse Name: The Fountains Catchment Name: Thames Primacy: 1	A13SE (E)	135	7	527166 183934
32	**OS Water Network Lines** Watercourse Form: Canal Watercourse Length: 2236.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Grand Union Canal Catchment Name: Thames Primacy: 1	A9NW (SE)	739	7	527482 183333

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
33	**Licensed Waste Management Facilities (Locations)** Licence Number: 401853 Location: Regents Park Office, The Store Yard, Inner Circle, Regents Park, London, NW1 4NR Operator Name: The Royal Parks Limited Operator Location: Not Supplied Authority: Environment Agency - Thames Region, North East Area Site Category: Composting **Licence Status: Transferred** Issued: Not Supplied Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A9SW (SE)	940	2	527538 183124
	Local Authority Landfill Coverage Name: London Borough of Camden - Has no landfill data to supply		0	8	527008 183939
	Local Authority Landfill Coverage Name: Westminster City Council - Has supplied landfill data		135	5	527050 183776
34	**Potentially Infilled Land (Non-Water)** Bearing Ref: SW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1991	A12SE (SW)	621	10	526436 183663

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Thames Group	A13NE (W)	0	1	527008 183939
	BGS Estimated Soil Chemistry No data available				
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 526761, 183848 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 23.60 mg/kg Cadmium Measured Concentration: 0.60 mg/kg Chromium Measured Concentration: 78.40 mg/kg Lead Measured Concentration: 572.40 mg/kg Nickel Measured Concentration: 37.60 mg/kg	A13SW (W)	248	1	526761 183848
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527263, 183792 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 15.40 mg/kg Cadmium Measured Concentration: 0.50 mg/kg Chromium Measured Concentration: 110.30 mg/kg Lead Measured Concentration: 2419.20 mg/kg Nickel Measured Concentration: 40.00 mg/kg	A13SE (SE)	264	1	527263 183792
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 526761, 184231 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 7.00 mg/kg Cadmium Measured Concentration: 0.30 mg/kg Chromium Measured Concentration: 20.70 mg/kg Lead Measured Concentration: 38.00 mg/kg Nickel Measured Concentration: 6.70 mg/kg	A13NW (NW)	352	1	526761 184231
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527207, 184291 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 13.10 mg/kg Cadmium Measured Concentration: 0.70 mg/kg Chromium Measured Concentration: 81.00 mg/kg Lead Measured Concentration: 714.00 mg/kg Nickel Measured Concentration: 26.50 mg/kg	A18SE (NE)	379	1	527207 184291

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527278, 183302 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 31.70 mg/kg Cadmium Measured Concentration: 0.90 mg/kg Chromium Measured Concentration: 91.20 mg/kg Lead Measured Concentration: 2587.50 mg/kg Nickel Measured Concentration: 46.40 mg/kg	A8NE (SE)	658	1	527278 183302
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 526820, 183228 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 12.00 mg/kg Cadmium Measured Concentration: 0.30 mg/kg Chromium Measured Concentration: 57.90 mg/kg Lead Measured Concentration: 221.30 mg/kg Nickel Measured Concentration: 19.00 mg/kg	A8SW (S)	705	1	526820 183228
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527717, 184227 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 21.20 mg/kg Cadmium Measured Concentration: 0.60 mg/kg Chromium Measured Concentration: 77.40 mg/kg Lead Measured Concentration: 2046.50 mg/kg Nickel Measured Concentration: 33.50 mg/kg	A14NE (E)	751	1	527717 184227
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527766, 183762 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 17.80 mg/kg Cadmium Measured Concentration: 0.50 mg/kg Chromium Measured Concentration: 86.20 mg/kg Lead Measured Concentration: 432.00 mg/kg Nickel Measured Concentration: 27.40 mg/kg	A14SE (E)	752	1	527766 183762
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 526218, 183841 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 18.90 mg/kg Cadmium Measured Concentration: 0.70 mg/kg Chromium Measured Concentration: 90.90 mg/kg Lead Measured Concentration: 937.50 mg/kg Nickel Measured Concentration: 30.50 mg/kg	A12SW (W)	774	1	526218 183841

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 526703, 184701 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 32.80 mg/kg Cadmium Measured Concentration: 0.70 mg/kg Chromium Measured Concentration: 79.00 mg/kg Lead Measured Concentration: 770.10 mg/kg Nickel Measured Concentration: 44.30 mg/kg	A18NW (N)	787	1	526703 184701
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 526268, 184340 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 30.40 mg/kg Cadmium Measured Concentration: 0.80 mg/kg Chromium Measured Concentration: 95.50 mg/kg Lead Measured Concentration: 688.90 mg/kg Nickel Measured Concentration: 45.30 mg/kg	A17SW (NW)	811	1	526268 184340
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527169, 184808 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 20.70 mg/kg Cadmium Measured Concentration: 0.60 mg/kg Chromium Measured Concentration: 83.40 mg/kg Lead Measured Concentration: 2153.80 mg/kg Nickel Measured Concentration: 34.90 mg/kg	A18NE (N)	852	1	527169 184808
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 526344, 184653 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 47.30 mg/kg Cadmium Measured Concentration: 2.00 mg/kg Chromium Measured Concentration: 111.00 mg/kg Lead Measured Concentration: 1462.80 mg/kg Nickel Measured Concentration: 71.20 mg/kg	A17NE (NW)	945	1	526344 184653

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Urban Soil Chemistry Averages Source: British Geological Survey, National Geoscience Information Service Sample Area: London Count Id: 7209 Arsenic Minimum Concentration: 1.00 mg/kg Arsenic Average Concentration: 17.00 mg/kg Arsenic Maximum Concentration: 161.00 mg/kg Cadmium Minimum Concentration: 0.10 mg/kg Cadmium Average Concentration: 0.90 mg/kg Cadmium Maximum Concentration: 165.20 mg/kg Chromium Minimum Concentration: 13.00 mg/kg Chromium Average Concentration: 79.00 mg/kg Chromium Maximum Concentration: 2094.00 mg/kg Lead Minimum Concentration: 11.00 mg/kg Lead Average Concentration: 280.00 mg/kg Lead Maximum Concentration: 10000.00 mg/kg Nickel Minimum Concentration: 2.00 mg/kg Nickel Average Concentration: 28.00 mg/kg Nickel Maximum Concentration: 506.00 mg/kg	A13NE (W)	0	1	527008 183939
	Coal Mining Affected Areas In an area that might not be affected by coal mining				
	Non Coal Mining Areas of Great Britain No Hazard				
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (W)	0	1	527008 183939
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (W)	0	1	527008 183939
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (W)	0	1	527008 183939
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (W)	0	1	527008 183939
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (W)	0	1	527008 183939
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NE (W)	0	1	527008 183939
	Radon Potential - Radon Affected Areas Affected Area: The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A13NE (W)	0	1	527008 183939
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13NE (W)	0	1	527008 183939

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
35	**Contemporary Trade Directory Entries** Name: Soap Opera The Location: 8, Winchester Road, London, NW3 3NT Classification: Laundries & Launderettes **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (N)	311	-	526882 184260
36	**Contemporary Trade Directory Entries** Name: Tyre Tigers Location: 97, AVENUE ROAD, LONDON, NW3 5EJ Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	341	-	526723 184178
36	**Contemporary Trade Directory Entries** Name: Tyre Tigers Location: 97, AVENUE ROAD, LONDON, NW3 5EJ Classification: Tyre Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	341	-	526723 184178
36	**Contemporary Trade Directory Entries** Name: Fairfax Engineering Location: 1, Regency Parade, Finchley Road, London, NW3 5EQ Classification: Catering Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	356	-	526694 184166
36	**Contemporary Trade Directory Entries** Name: Medoroux Medical Ltd Location: 11, Regency Parade, Finchley Road, London, NW3 5EG Classification: Medical Equipment Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	356	-	526694 184166
36	**Contemporary Trade Directory Entries** Name: Balco Ltd Location: 8, Regency Parade, Finchley Road, London, NW3 5EG Classification: Ventilators & Ventilation Systems **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	356	-	526694 184166
36	**Contemporary Trade Directory Entries** Name: Oxyvita Ltd Location: 11, Regency Parade, Finchley Road, London, NW3 5EG Classification: Medical Instruments - Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	356	-	526694 184166
36	**Contemporary Trade Directory Entries** Name: Golf Doktor Location: Former 8, Regency Parade, Finchley Road, London, NW3 5EG Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	356	-	526694 184166
36	**Contemporary Trade Directory Entries** Name: My 1st Call Locksmith Location: 4, Regency Parade, Finchley Road, London, NW3 5EG Classification: Lock Suppliers and Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	356	-	526694 184166
37	**Contemporary Trade Directory Entries** Name: Arrow Enterprises (Uk) Ltd Location: 13, Lower Merton Rise, London, NW3 3RA Classification: Chemicals & Allied Products **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NE (NE)	348	-	527235 184231
37	**Contemporary Trade Directory Entries** Name: Swan Dry Cleaners Location: 19, Lower Merton Rise, London, NW3 3RA Classification: Dry Cleaners **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NE (NE)	364	-	527226 184259
38	**Contemporary Trade Directory Entries** Name: Danico Location: 31-35, Winchester Road, London, NW3 3NR Classification: Hardware **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SW (NW)	404	-	526803 184325