GROUND INVESTIGATION AND BASEMENT IMPACT ASSESSMENT REPORT

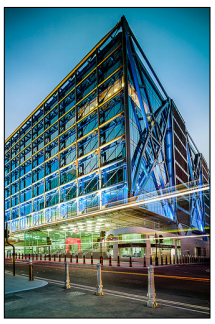
12 Keats Grove
London
NW3 2RN

Client: Private Clients

J19228

October 2019



GEA

Document Control

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	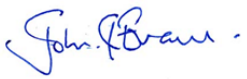		
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	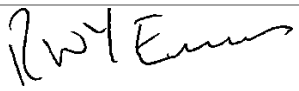		
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1	Preliminary		23 October 2019	
2	Final	Ground movement assessment added	25 October 2019	

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This report is intended as a Ground Investigation Report (GIR) as defined in BS EN1997-2, unless specifically noted otherwise. The report is not a Geotechnical Design Report (GDR) as defined in EN1997-2 and recommendations made within this report are for guidance only.

CONTENTS

Part 3: GROUND MOVEMENT ASSESSMENT

Part 4: BASEMENT IMPACT ASSESSMENT

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 Chris Dyson Architects, on behalf of Private Clients, with respect to the extension of the existing lower ground floor level across the entire footprint of the existing property. The purpose of the investigation has been to determine the ground conditions and hydrogeology, 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).

DESK STUDY FINDINGS

The desk study findings indicate that the site does not have a potentially contaminative history as it has apparently only been developed with the existing house, which is thought to have been built in 1818.

There is, therefore, assessed to be a VERY LOW RISK of contamination at this site.

GROUND CONDITIONS

The investigation has confirmed the expected ground conditions in that, beneath a nominal thickness of made ground and a localised layer of head deposits, London Clay was encountered and proved to the full depth of the investigation. The made ground comprised dark brown clayey gravelly sand with fragments of extraneous material and extended to depths of between 0.40 m and 0.80 m. The head deposits were only encountered in Borehole Nos 1 and 2 and comprised soft becoming firm orange-brown silty sandy slightly gravelly clay with rootlets, selenite crystals and sandy pockets to depths of 2.60 m and 4.00 m. The London Clay comprised high becoming very high strength firm becoming stiff fissured brown becoming greyish brown silty clay with selenite crystals and selenite crystals to the full depth investigated, of 15.00 m.

Groundwater was not encountered during the fieldwork. Standpipes were installed in Borehole Nos 1 and 2 and have been monitored on two occasions to date, measuring groundwater at depths of between 0.40 m and 5.45 m, probably reflecting the accumulation of perched water.

Contamination testing has revealed a single elevated concentration of lead within made ground recovered from the existing rear garden.

RECOMMENDATIONS

Formation level for the proposed basement is likely to be within the firm sandy gravelly clay of the head deposits or the firm to stiff clay of the London Clay, either of which should provide an eminently suitable bearing stratum for spread foundations. Excavations for the proposed basement structure will require temporary support to maintain stability and to prevent any excessive ground movements. Perched water is likely to be encountered towards the base of the made ground or within the head deposits, but significant groundwater inflows are not anticipated.

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 and an assessment of the ground movements associated with the basement excavation are included in Part 3.

1.0 INTRODUCTION

Geotechnical and Environmental Associates Limited (GEA) has been commissioned by Chris Dyson Architects, on behalf of Private Clients, to carry out a desk study, ground investigation and ground movement assessment at 12 Keats Grove, London NW3 2RN.

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 demolish the eastern and western wings of the existing building and subsequently construct a new single-storey wing on each side, each with an underlying basement floor level. The basement levels are proposed to extend to approximately 2.0 m below existing ground floor level.

This report is specific to the proposed development and the advice herein should be reviewed if the 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 associated with Unexploded Ordnance (UXO) risk;
- to determine the ground conditions and their engineering properties;
- to provide advice and information 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;
- commissioning of 1st Line Defence to undertake a preliminary UXO risk assessment;

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

- a single borehole advanced to a depth of 15000 m using a cable percussion rig;
- three boreholes advanced to depths of between 2.50 m and 3.70 m using window sampling equipment;
- installation of two groundwater monitoring standpipes, to a maximum depth of 6.00 m, and two subsequent monitoring visits;
- two hand excavated trial pits to a maximum depth of approximately 0.60 m;
- testing of selected soil samples for contamination and geotechnical purposes;
- provision of a report presenting and interpreting the above data, together with our advice and recommendations with respect to the proposed development.

The report includes a contaminated land assessment which has been undertaken in accordance with the methodology presented in Contaminated Land Report (CLR) 11[1] and 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. The risk assessment is thus divided into three stages comprising Preliminary Risk Assessment, Generic Quantitative Risk Assessment, and Site-Specific Risk Assessment.

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

1 *Model Procedures for the Management of Land Contamination* issued jointly by the Environment Agency and the Department for Environment, Food and Rural Affairs (DEFRA) Sept 2004
2 London Borough of Camden Planning Guidance CPG (March 2018) *Basements*

"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 John Evans, 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.

1.4 Limitations

The conclusions and recommendations made in this report are limited to those that can be made on the basis of the investigation. The results of the work should be viewed in the context of the range of data sources consulted, the number of locations where the ground was sampled and the number of soil, gas or groundwater samples tested; no liability can be accepted for information in other data sources or conditions not revealed by the sampling or testing. Any comments made on the basis of information obtained from the client or other third parties are given in good faith on the assumption that the information is accurate; no independent validation of such information has been made by GEA.

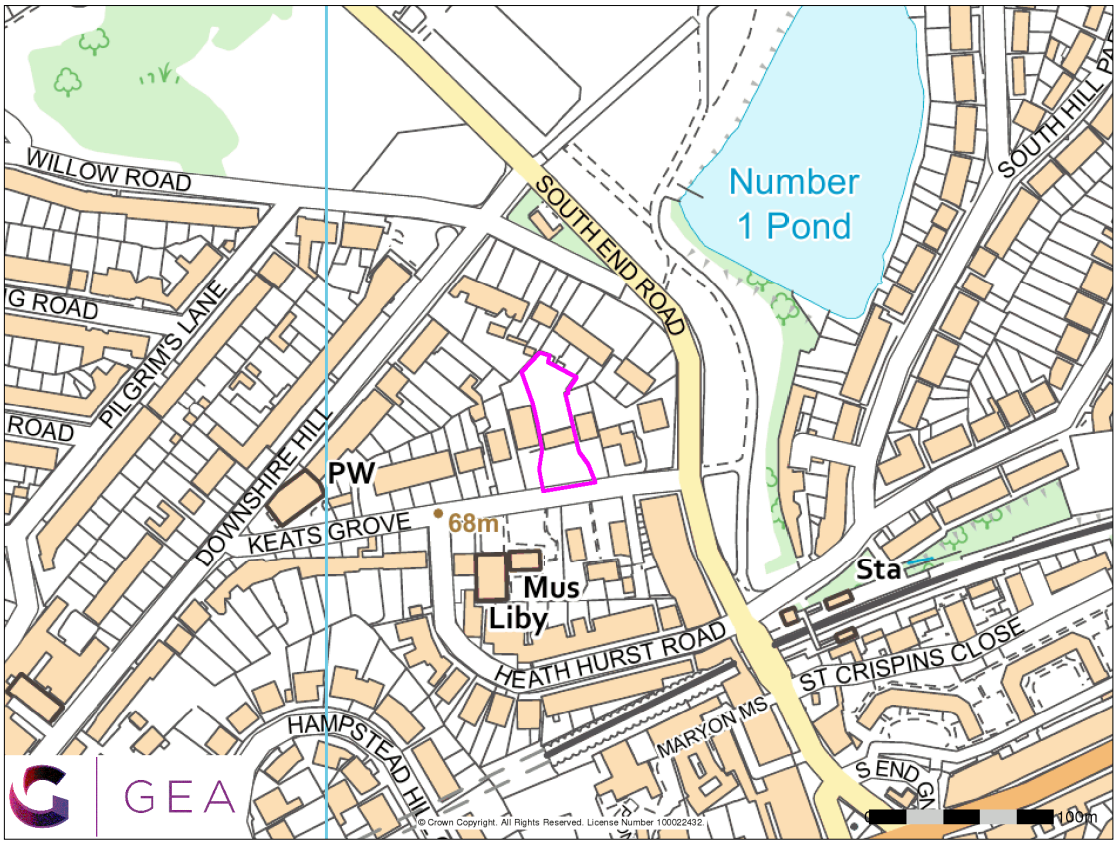
2.0 THE SITE

2.1 Site Description

The site is located in the London Borough of Camden, roughly 130 m northwest of Hampstead Heath Railway Station and 730 m to the east of Hampstead London Underground Station. It is irregular in shape, measuring approximately 60 m by 30 m in maximum extent.

The site fronts onto Keats Grove to the south and is bounded by similar three-storey properties to the north, east and west. The site may additionally be located by National Grid Reference 527120, 185740 and is shown on the map extract overleaf.

3 Ove Arup & Partners (2010) *Camden geological, hydrogeological and hydrological study. Guidance for Subterranean Development.* For London Borough of Camden November 2010



The site is occupied by 12 Keats Grove, a Grade II listed detached villa constructed in around 1818[4]. The house is stucco rendered with slated pitched roof with dormers, comprising three storeys, attic and semi-basement. It occupies roughly the centre of the site, with a large garden to the rear (north) and a driveway and small garden at the front of the house. The lower ground floor level covers the majority of the footprint of the building and two single-storey to two-storey wings are located on either side. The driveway is covered in tarmac which appeared to be in relatively good condition.

The site slopes gently down to the southeast, in keeping with the surrounding area. A number of mature deciduous trees are present within the front and rear garden of the property, including an approximately 15 m tall tree to the north of the eastern wing and an approximately 8 m tall tree to the southwest of the western wing.

2.1.1 Adjoining Structures

It is not believed that either of the adjoining properties along Keats Grove, to the east and west of the site have basements.

2.2 Site History

The history of the site and surrounding area has been researched by reference to archive historical maps and Ordnance Survey (OS) maps sourced from the Envirocheck database.

The earliest map studied, dated 1850, shows that the existing road network around the site had been established, although Keats Grove was then known as John Street. The next map, dated 1871, shows the existing property in the centre of the site, with a garden to the rear and a driveway at the front. The majority of the surrounding area was predominantly residential,

4 https://britishlistedbuildings.co.uk/101379222-12-keats-grove-hampstead-town-ward#.XaeVVPlKiUk

much as it is today, with Hampstead Heath Railway Station 120 m to the southeast and two of the Hampstead Ponds approximately 80 m to the east and 100 m to the northeast.

At some time between 1879 and 1895, the closer of the two ponds was drained and infilled, and by 1915, was occupied by an orchard and various footpaths, while John Street had been renamed as Keats Grove.

By 1934, the property immediately to the west of the site had been demolished while opposite the site to the south, the Keats Museum and later, Keats Library had been established. The site and surrounding area remained essentially unchanged until some time between 1991 and 1996, when a new property was constructed on the adjacent plot to the west.

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 search has revealed that there are no landfills, waste management, transfer, treatment or disposal sites within 1 km of the site. There have been no pollution incidents to controlled waters within 250 m of the site.

There is a single area of infilled land recorded within 100 m of the site, the former pond, located 80 m to the east of the site on Hampstead Heath and infilled between 1879 and 1895.

There are four contemporary trade industries within 100 m of the site, of which only one is still active, a scaffolding contractor 63 m to the east.

The search has indicated that the site is located in an area where less than 1% of homes are affected by radon emissions; which is the lowest classification given by the Health Protection Agency (HPA) and therefore no radon protective measures will be necessary.

The site is not located within a nitrate vulnerable zone or any other sensitive land use.

2.4 Geology

The British Geological Survey (BGS) map of the area (Sheet 256) indicates the site is directly underlain by the London Clay. It is however, also in an area of head propensity such that head deposits may also be present over 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.

A search of the BGS records has identified records of a deep borehole that was drilled roughly 100 m to the northeast of the site, which confirms that the London Clay is likely to extend to a depth of at least 80 m, below which mottled clay of the Lambeth Group is likely to be present.

2.5 Hydrology and Hydrogeology

The London Clay is classified by the Environment Agency (EA) as an Unproductive Stratum, referring to rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

The London Clay is not capable of supporting a groundwater table, although isolated pockets of perched groundwater do occur within fissures and silt and sand partings. Published data for the permeability of the London Clay indicates the horizontal permeability to generally range between 1 x 10^{-11} m/s and 1 x 10^{-9} m/s, with an even lower vertical permeability.

If head deposits are present on site, they are likely to be of higher permeability and to contain layers of coarser grained soils that could hold water but are unlikely to contain continuous layers capable of transmitting groundwater due to the clay dominated matrix.

The site is not indicated as being at risk from flooding, nor is it located within a Groundwater Source Protection Zone as defined by the Environment Agency. It is not listed within the London Borough of Camden report[5] as having suffered from surface water flooding in the 1975 or 2002 flooding events and is not shown on Figure 15 of the Arup report[6], or the EA surface water flood maps, as being in an area with a potential risk from surface water flooding.

Figure 11 of the Arup report and reference to the Lost Rivers of London[7] indicates that the nearest lost river is a tributary of the River Fleet, flowing 84 m to the east of the site. The source of the River Fleet is in Hampstead Heath, from which point it flows in a generally southeasterly direction, through the Hampstead Ponds, towards its mouth on the River Thames, next to Blackfriars Bridge. The nearest surface water feature is the Hampstead No 1 Pond, 120 m to the northeast of the site.

The existing rear garden is almost entirely covered by grass and as such, infiltration of rainwater is largely unimpeded. 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 largely covered by tarmac hardstanding, such that infiltration of rainwater is therefore generally restricted to surface water drains, such that the majority of surface runoff currently drains into combined sewers in the road.

As the development does not result in a change to the present conditions, for example through the loss of any soft covered areas, there will not be an 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.

Mitigation measures are unlikely to be feasible in any case, due to a lack of available space and little opportunity to reduce runoff rates from the site via attenuation or rainwater harvesting. However, alternative SUDS measures could be considered, which could temporarily retain surface water flows, if a requirement to reduce the rate and amount of flow into the existing sewer system from present levels is identified.

2.6 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.

5 London Borough of Camden (2003) *Floods in Camden, Report of the Floods Scrutiny Panel*
6 Ove Arup & Partners (2010) *Camden geological, hydrogeological and hydrological study. Guidance for Subterranean Development.* For London Borough of Camden November 2010
7 Nicholas Barton and Stephen Myers (2016) *London's Lost Rivers. Revised Edition.* Historical Publications Ltd

2.6.1 Source

The desk study research has indicated that the site has had a residential end use for its entire developed history and is therefore not considered to have had a contaminative history.

The nearby infilled pond is not thought likely to represent a potential source of soil gas as it was infilled between 1879 and 1895, and therefore any sources of gas in the infill material would by now have fully broken down.

2.6.2 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 or head deposits, 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.

2.6.3 Pathway

Within the site, end users will be isolated from direct contact with any contaminants present within the made ground by the building 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.

2.6.4 Preliminary Risk Appraisal

On the basis of the above it is considered that there is a VERY 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.

2.7 UXO Risk Assessment

A Preliminary UXO Risk Assessment has been completed by 1st Line Defence (report ref EP9454-00, dated August 2019), and a copy of the report is included in the appendix.

The risk assessment has been carried out in accordance with the guidelines provided by CIRIA[8], 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.

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

During World War II (WWII) the site was located within the Metropolitan Borough of Hampstead which sustained a very high bombing density according to official statistics. London Bomb Census mapping indicates no bombs landed on the site directly, although a high explosive bomb impacted adjacent to the eastern boundary and an incendiary shower was recorded over the area. The building on site was labelled as having 'general blast damage' while the adjacent site to the east was labelled as 'damage requiring demolition'. Further research is required in order to determine the risk posed by unexploded ordnance. In lieu of further research, UXO risk mitigation measures including magnetometer scanning should be carried out for all intrusive works.

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 12 Keats Grove
1a. Is the site located directly above an aquifer?	No. The site is directly underlain by the London Clay, which is classified as an Unproductive stratum.
1b. Will the proposed basement extend beneath the water table surface?	No. The London Clay cannot support a water table and is classified as an unproductive stratum. However, if an upper weathered layer or head deposits are present, this may have a higher permeability and could have the potential to collect groundwater if the stratum has a predominantly granular matrix, which is unlikely in this setting.
2. Is the site within 100 m of a watercourse, well (used/ disused) or potential spring line?	*Yes. The River Fleet previously flowed 84 m to the east of the site. The Envirocheck report and Figure 11 of the Arup report confirm this.*
3. Is the site within the catchment of the pond chains on Hampstead Heath?	No. Figure 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?	No. The proposed basement will extend beneath the existing building and will not therefore result in a significant change in the proportion of hard surfaced / paved areas.
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. It is not considered feasible that the ground would be sufficiently permeable to allow for a soakaway discharge design, nor do the details of the proposed development 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?	*Yes. Topographical maps acquired as part of the desk study and Figures 11 and 12 of the Arup report confirm the lowest point of the excavation is approximately 10 m below the mean water level of the nearest pond.*

The above assessment has not identified any potential issues that need to be further assessed:

Q2 The River Fleet previously flowed 84 m to the east of the site.

Q6 The lowest point of the proposed excavation is approximately 10 m below the mean water level in Hampstead Pond No 1.

3.1.2 Stability Screening Assessment

Question	Response for 12 Keats Grove
1. Does the existing site include slopes, natural or manmade, greater than 7°?	No. Survey levels across the site vary by approximately 1 m.
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°?	*Yes. 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. The proposed basement on the eastern side of the house is within a tree protection zone of a retained tree.*
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?	*Yes. The River Fleet flows underground, 84 m to the east of the site. The Envirocheck report and Figure 11 of the Arup report confirm this.*
9. Is the site within an area of previously worked ground?	No. Not according to Figure 3 of the Arup report.
10a. Is the site within an aquifer?	No. The site is located above an unproductive stratum.
10b. Will the proposed basement extend beneath the water table such that dewatering may be required during construction?	No. The London Clay cannot support a water table and is classified as an unproductive stratum.
11. Is the site within 50 m of Hampstead Heath ponds?	No. Figure 14 of the Arup report confirms that the site is not located within this catchment area.
12. Is the site within 5 m of a highway or pedestrian right of way?	*Yes, the site fronts onto Keats Grove. However, the proposed basement extension is set back on the rear part of the site at a distance more than 10 m from the front of the site.*
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	No. One of the neighbouring properties (No 12A) is understood to be founded on piles, such that the development is unlikely to increase the foundation depths relative to the neighbouring properties.
14. Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?	No. Not according to Figure 18 of the Arup report and information provided by London Underground.

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

Q4 The site is within a wider hillside setting in which the general slope is greater than 7°.
Q5 The London Clay is the shallowest stratum at the site.
Q6 The proposed basement on the eastern side of the house is within an tree protection zone of a retained tree.
Q7 The site is in an area likely to be affected by seasonal shrink-swell.
Q8 The River Fleet flows underground, 84 m to the east of the site.
Q12 The site is within 5 m of a highway.

3.1.3 Surface Flow and Flooding Screening Assessment

Question	Response for 12 Keats Grove
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. There will not be an increase in impermeable area across the site, so the surface water flow regime will be unchanged. The basement will entirely be beneath the footprint of the building, and the 1m distance between the roof of the basement and ground surface as recommended by section 3.2 of the CPG Basements 2018 does not apply.
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	No. There will not be a change in impermeable area across the ground surface above the basement.
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. There will not be an increase in impermeable area across the site, so the surface water flow regime will be unchanged. The basement will entirely be beneath the footprint of the building, and the 1m distance between the roof of the basement and ground surface as recommended by section 3.2 of the CPG Basements 2018 does not apply.
5. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No. The proposed basement is very unlikely to 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?	No. The findings of this BIA together with the Camden Flood Risk Management Strategy dated 2013 and Figures 3iii, 4e, 5a and 5b of the SFRA dated 2014, in addition to the Environment Agency online flood maps show that the site has a very low flooding risk from surface water, sewers, reservoirs (and other artificial sources), groundwater and fluvial/tidal watercourses. 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 no potential issues that need to be assessed.

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
The River Fleet flows underground, 84 m to the east of the site.	The River Fleet is culverted and does not derive any flow from the London Clay so will not affect the site.
The lowest point of the proposed excavation is 10 m below the mean water level in Hampstead Pond No 1.	As the pond is constructed within London Clay but derives its flow from Bagshot Formation springs, the proposed basement excavation could not impact on the water levels of

Potential Impact	Consequence
	Pond No.1.
The site is within a wider hillside setting in which the general slope is greater than 7°.	The slope stability will need to be ensured during temporary works.
London Clay is the shallowest stratum at the site.	The London Clay is prone to seasonal shrink-swell (subsidence and heave).
The proposed basement on the eastern side of the house is within a tree root protection zone of a retained tree.	Foundations will need to ensure the roots of the tree are not disturbed.
Seasonal shrink-swell can result in foundation movements.	Multiple potential impacts depending on the specific setting of the basement development. For example, in terraced properties, the implications of a deepened basement/foundation system on neighbouring properties should be considered.
The site is within 5 m of a highway.	The site fronts onto Keats Grove, but the proposed basement extension is set back on the rear part of the site at a distance more than 10 m from the front of the site.

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 15.00 m using a cable percussion rig. Additionally, three boreholes were advanced using a drive-in window sampler, to depths of between 2.50 m and 3.70 m. Two trial pits were manually excavated to depths of 0.40 m and 0.60 m to expose the foundations of the existing eastern wing and site boundary wall.

During boring, disturbed and undisturbed 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.

Groundwater monitoring standpipes were installed into two of the boreholes, to depths of 3.70 m and 6.00 m, and have been subsequently monitored on two occasions to date, at approximately two-week intervals.

A selection of disturbed and undisturbed samples recovered from the boreholes was submitted to a soil mechanics laboratory for a programme of geotechnical testing and an analytical laboratory for a programme of 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 the results of the laboratory testing and a site plan indicating the borehole locations.

4.3 Sampling Strategy

The boreholes and trial pits were positioned on site by an engineer from GEA in accessible areas, with due regard to the proposed development and the locations of known buried services.

Three samples of the shallow soil were subjected to analysis for a range of common industrial contaminants and contamination indicative parameters. For this investigation the analytical suite for the soil included a range of metals, total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH), total cyanide and monohydric phenols. The samples were also screened for 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 has confirmed the expected ground conditions in that, beneath a nominal thickness of made ground and a localised layer of head deposits, London Clay was encountered and proved to the full depth of the investigation.

5.1 Made Ground

The made ground comprised dark brown clayey gravelly sand with fragments of extraneous material and extended to depths of between 0.40 m and 0.80 m.

No evidence of significant contamination was identified during the fieldwork. As a precaution, three samples of the made ground were tested for the presence of contamination and the results are presented in Section 6.4.

5.2 Head Deposits

The head deposits were only encountered in the eastern half of the site, in Borehole Nos 1 and 2, and comprised soft becoming firm orange-brown silty sandy slightly gravelly clay with rootlets, selenite crystals and sandy pockets to depths of 2.60 m and 4.00 m.

This stratum was also noted as being stiff and desiccated to a depth of 1.50 m in Borehole No 2, presumably associated with the large tree in the vicinity.

Laboratory plasticity index tests indicate this layer to be of moderate volume change potential.

5.3 London Clay

The London Clay comprised firm becoming stiff fissured brown becoming greyish brown silty clay with selenite crystals and selenite crystals to the full depth investigated, of 15.00 m.

Laboratory plasticity index tests indicate this layer to be of high volume change potential. The results of the quick undrained triaxial tests indicate the clay to be of high becoming very high strength.

5.4 Groundwater

Groundwater was not encountered during the fieldwork.

The standpipes installed in Borehole Nos 1 and 2 have been monitored on two occasions since installation, the results of which are shown in the table below.

Date	Borehole No	Depth to water (m) below existing garden level
23/09/2019	1	5.45 m
	2	Unable to open standpipe
15/10/2019	1	0.40 m
	2	1.45 m

The groundwater levels measured are thought to be as a result of seepages from sandy pockets within the head deposits or the collection of rainwater infiltration through the made ground and are not representative of a continuous groundwater table.

5.5 Soil Contamination

The table below sets out the values measured within three samples of made ground; all concentrations are in mg/kg unless otherwise stated.

Determinant	BH1 – 0.30 m	BH2 – 0.40 m	BH3 – 0.30 m
Asbestos	Not detected	Not detected	Not detected
pH	8.9	10.1	9.4
Arsenic	10	14	13
Cadmium	<0.2	<0.2	2.0
Chromium	15	16	20
Copper	70	75	29
Mercury	<0.3	0.4	<0.3
Nickel	11	12	14
Lead	180	**250**	130
Selenium	<1.0	<1.0	<1.0
Zinc	87	81	90
Total Cyanide	<1.0	<1.0	<1.0
Total Phenols	<1.0	<1.0	<1.0
Sulphide	<1.0	<1.0	<1.0
Total TPH	28	19	81
Naphthalene	<0.05	<0.05	<0.05
Benzo(a)pyrene	0.56	0.50	0.83
Total PAH	5.61	5.19	8.33
Total organic carbon %	0.8	0.6	0.7

Note: Figures in bold indicate values in excess of the generic guideline screening values.

The results of the contamination testing have revealed an elevated concentration of lead within a single sample of made ground tested from Borehole No 2. All other contaminants were found to be below their respective generic guideline value.

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 a value in excess of a generic human health risk-based guideline values, which is either the CLEA Soil Guideline Value where available, a Generic Screening Value calculated using the CLEA UK Version 1.06 software assuming a residential end use or is based on the DEFRA Category 4 Screening values. 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 a young female child aged 0 to 6 years old;
- that young children will not have prolonged exposure to the site;
- that the exposure duration will be six years;
- that the critical exposure pathways will be direct soil and indoor dust ingestion, skin contact with soils and dust, and inhalation of dust and vapours; and
- that the building type equates to a two-storey small terraced house.

It is considered that these assumptions are suitable for this generic first 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 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.

This assessment is based upon the potential for risk to human health, which at this site is considered to be the critical risk receptor.

The results are discussed in detail in Section 2 of this report.

5.6 Existing Foundations

The trial pit findings are summarised in the table below and the trial pit photographs and sketches are appended.

Trial Pit No	Structure	Foundation detail	Bearing Stratum
1	Eastern wing of existing house	Concrete strip Top 0.04 m bgl Base 0.60 m bgl Lateral projection 300 mm	MADE GROUND (dark brown gravelly sand with fragments of brick, concrete and rootlets)
2	Eastern boundary wall	No observed footing Base of wall 0.40 m bgl	MADE GROUND (dark brown clayey sand with roots and rootlets)

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 foundation options and contamination issues.

6.0 INTRODUCTION

It is understood that it is proposed to demolish the eastern and western wings of the existing building and subsequently construct a new single-storey wing on each side, each with an underlying basement floor level. The basement levels are proposed to extend to approximately 2.0 m below existing ground floor level. Anticipated line loads are understood to be in the region of 60 kN/m.

7.0 GROUND MODEL

The desk study research has indicated that the site has not had a potentially contaminative history, having had a residential use for its entire developed history. On the basis of the fieldwork, the ground conditions at this site can be characterised as follows:

- below a nominal thickness of made ground and a localised layer of head deposits, London Clay is present to the full depth of the investigation;
- the made ground comprises dark brown clayey gravelly sand with fragments of extraneous material and extends to depths of between 0.40 m and 0.80 m;
- the head deposits were only encountered in Borehole Nos 1 and 2 and comprise soft becoming firm orange-brown silty sandy slightly gravelly clay with rootlets, selenite crystals and sandy pockets to depths of 2.60 m and 4.00 m;
- the underlying London Clay comprises firm becoming stiff fissured brown becoming greyish brown silty clay with selenite crystals and selenite crystals to the full depth investigated, of 15.00 m;
- groundwater was not encountered during the field work but subsequent monitoring measured groundwater at depths of between 0.40 m and 5.45 m, associated with seepages from granular pockets within the head deposits; and
- the contamination testing has measured a single elevated concentration of lead within the samples of made ground tested.

8.0 ADVICE AND RECOMMENDATIONS

Excavations for the proposed basement structure will require temporary support to maintain stability and to prevent any excessive ground movements. It should be feasible to construct the basement without the requirement for groundwater protection measures, although provision will need to be made to control perched water inflows from the base of the made ground.

Formation level for the proposed development is likely to be within the head deposits or London Clay, which should provide an eminently suitable bearing stratum for spread foundations excavated from basement level.

8.1 Basement Excavation

8.1.1 Basement Construction

It is understood that the proposed basement will extend to a depth of approximately 2.0 m below existing ground level, such that formation level is likely to be within the firm head deposits or the firm to stiff London Clay.

The investigation has indicated that groundwater is unlikely to be encountered within the head deposits or London Clay. Shallow inflows of perched water should be anticipated from within the made ground, particularly in the vicinity of existing structures. 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.

There are a number of methods by which the sides of the basement excavation could be supported in the temporary and permanent conditions. The choice of wall will be governed, to a large extent, by whether it is to be incorporated into the permanent works and have a load bearing function. The final choice will depend on a number of factors, including the need to protect nearby structures from movements, the required overall stiffness of the support system and the potential need to control groundwater movement through the wall in the temporary condition. In this respect the stability of the adjacent buildings will be paramount.

It is understood that the preferred method of retaining wall construction is through traditional mass concrete underpinning of the existing walls, which will have the benefit of minimising the plant required and maximising usable space in the new basement construction.

Whilst the proposed construction will not result in foundation depths being increased relative to the neighbouring properties, careful workmanship will still be required to ensure that movement of the surrounding structures does not arise. The contractor should also 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. The stability of the adjacent foundations will need to be ensured at all times and the existing foundations will need to be underpinned prior to construction of the proposed new basements or will need to be supported by new retaining walls. A Ground Movement Analysis has been carried out in accordance with the requirements of CPG and is presented in Part 3 below.

8.1.2 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
Head Deposits	1900	Zero	25
London Clay	1950	Zero	24

Significant inflows of groundwater are unlikely to be encountered within the basement excavation, although monitoring of the standpipes should be continued to confirm this.

Consideration should, however, be given to the risk of surface water building up behind the retaining walls and unless adequate drainage can be incorporated to prevent such build-up, it is recommended that the basement is designed with a water level assumed to be 1.0 m below ground level.

Reference should be made to BS8102:2009[9] regarding requirements for waterproofing.

8.1.3 Basement Heave

The approximately 2.0 m deep excavations to form the proposed basements will result in a net unloading of up to approximately 40 kN/m².

This unloading will result in elastic heave and long term swelling of the underlying clay soils, although these movements will to a certain extent be counteracted by the applied loads from the proposed development.

Further consideration is given to heave movements in Part 3.0 of this report.

8.2 Spread Foundations

Spread foundations, including underpinned foundations, bearing beneath basement formation level in the firm to stiff silty clay of the London Clay may be designed to apply a net allowable bearing pressure of 100 kN/m² at a depth of 3.00 m. This value incorporates an adequate factor of safety against bearing capacity failure and should ensure that settlement remains within normal tolerable limits.

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, with the survey drawing showing former and existing trees. 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.

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

8.3 Basement Floor Slabs

Following the excavation of the single level basements, it is likely that the floor slab for the proposed basement will need to be suspended over a void or layer of compressible material to accommodate the anticipated heave unless the slab can be suitably reinforced to cope with these movements.

8.4 Shallow Excavations

On the basis of the borehole findings it is considered that shallow excavations for foundations and services that extend through the made ground should remain generally stable in the short term, although some instability may occur. 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.

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

8.5 Effect of Sulphates

Chemical analyses carried out on selected samples for water soluble sulphate have been compared with of Table C2 of BRE Special Digest 1: SD1 Third Edition (2005) in order to determine the sulphate class and are summarised in the table below. The assessment has been based on static groundwater conditions and the guidelines contained in the above digest should be followed in the design of foundation concrete.

Stratum	No of samples	pH	SO_4 (mg/l)	Design Sulphate Class	ACEC Class
Made Ground	3	8.9 to 10.1	62 to 180	DS-1	AC-1s
Head Deposits	1	7.9	20	DS-1	AC-1s
London Clay	2	7.7 to 8.0	200 to 580	DS-2	AC-1s

8.6 Site Specific Risk Assessment

The desk study has indicated that the site has not had a contaminative history, having had a residential use throughout its developed history, in an area dominated by residential streets. However, the results of the contamination testing have identified a single elevated concentration of lead within one of the samples of made ground tested, taken from the existing rear garden.

The exact source of the contamination is unknown. However, the made ground was noted as containing variable amounts of extraneous material, including ash, and it is therefore likely that a fragment of such material was present within the samples tested, accounting for the elevated concentration. Information on Urban Soil Chemistry provided by the BGS also indicates that background concentrations for lead in the vicinity of the site are between 478.5 mg/kg and 660.40 mg/kg, such that a significant proportion of the measured concentrations could be the result of residual airborne sources.

Lead compounds are relatively immobile and 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, classified as Unproductive Strata, a risk to groundwater has not been identified.

8.6.1 End Users

End users will be effectively isolated from any potential contamination within the extent of the existing and proposed structures, 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[10]. 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.

8.6.2 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[11] and CIRIA[12] 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.

8.6.3 Protection of Buried Services

It is unlikely that services are at risk from the contamination noted in the made ground. However, details of any 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.

8.7 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[13] states that landfill WAC analysis, specifically leaching test results, must not be used for waste classification purposes.

10 BRE (2004) *Cover systems for land regeneration. Thickness of cover systems for contaminated land.* BRE pub 465
11 HSE (1992) HS(G)66 *Protection of workers and the general public during the development of contaminated land* HMSO
12 CIRIA (1996) *A guide for safe working on contaminated sites* Report 132, Construction Industry Research and Information Association
13 Environment Agency 2015. *Guidance on the classification and assessment of waste.* Technical Guidance WM3 First Edition

Any spoil arising from excavations or landscaping works, which is not to be re-used in accordance with the CL:AIRE[14] 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 £91.35 per tonne (about £219 per m^3) or at the lower rate of £2.90 per tonne (roughly £6.95 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 upon 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	Non-hazardous (17 05 04)	No	£91.35/tonne (Standard rate)
Natural soils	Inert (17 05 04)	No	£2.90 / 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[15] 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.

14 CL:AIRE March 2011. *The Definition of Waste: Development Industry Code of Practice* Version 2
15 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.

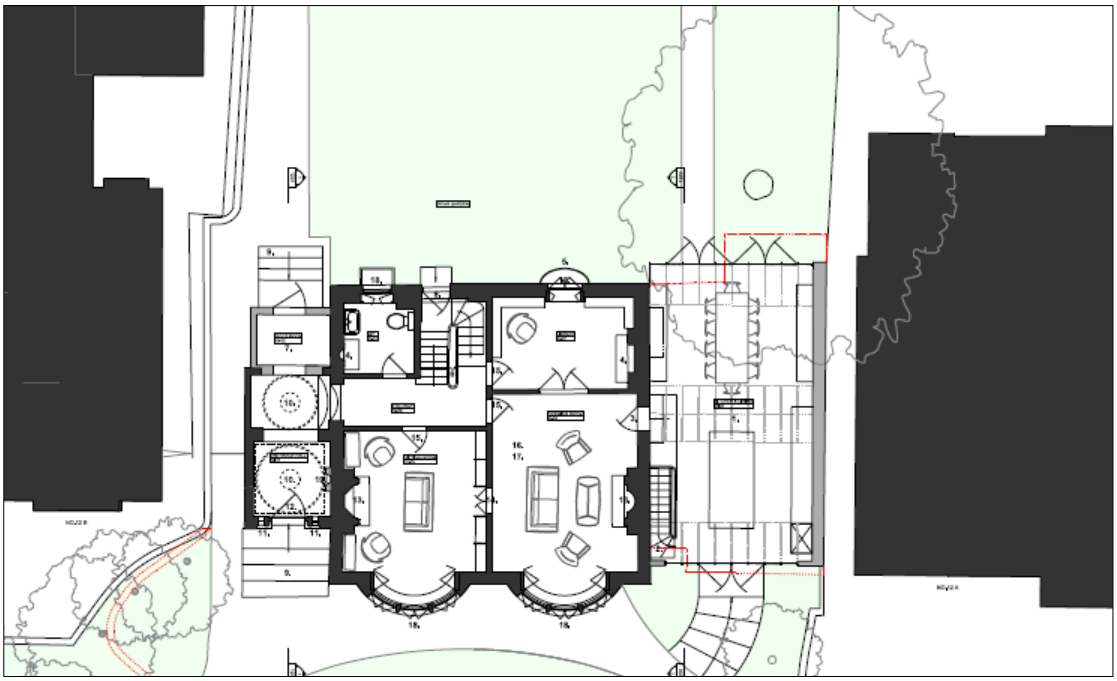
9.0 INTRODUCTION

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 during underpinning 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.

9.1 Basis of Ground Movement Assessment

A plan showing the nearby sensitive structures is shown below.



A section through the proposed basements shows levels relative to upper ground floor level of 0.00 m. These levels have been adopted in this assessment, and are referenced as “m SD”.

Sensitive structures relevant to this assessment include Nos 12A and 12B Keats Grove, to the east and west of No 12 respectively. Price and Myers Drawing No 28750 SK03 Ver 1, dated October 2019, shows that No 12A Keats Grove is supported on piled foundations so will not be affected structurally by the proposed basement works.

The nature of the foundations of No 12B are not known and a cautious approach has therefore been adopted with the assumption that the building is supported on relatively shallow spread foundations at a depth of 1.0 m and at a level of -1.5 m SD.

The adjoining boundary wall with No 12B Keats Grove is noted to be within the site and is understood to be part of the client's property. As such, it has not been included as part of the ground movement assessment as any damage could be repaired during the course of the construction.

9.2 Construction Sequence

It is understood that it is proposed to construct two single storey extensions, each with a single level basement, one to the east and one to the west of the existing structure. The western basement will have a finished floor level of -3.16 m SD and the Price and Myers calculations show a 300 mm thick basement slab. Allowing for 100 mm for finishes and 100 mm for blinding, a formation level of -3.66 m SD has been adopted. For the larger eastern basement extension the finished floor level is -3.59 m SD and the formation will, therefore, be at -4.09 m SD.

The same drawing as noted above shows the basement construction methodology where the walls to the new basements are to be formed by underpinning the existing walls to No 12 Keats Grove and using the same underpinning techniques for the other walls but in an open excavation.

In general, the sequence of works for excavation and construction, will comprise the following stages, which are also summarised in the drawing below.

1. install concrete retaining walls to form section of new basement walls;

2. excavate ground to basement level with props installed mid height;

3. construct basement floor raft slab to connect with the underpinned foundations; and

4. construct ground floor slab to complete the basement 'box' and remove temporary propping.

It is noted that some preparatory excavation will be required but will not extend below the depth of the adjoining retaining structures. Care should be taken to protect the sides of such excavations during periods of rainfall and any run-off from construction operations until the retaining walls have been installed. Movement of plant at the top of any open cut should be prevented and daily inspections of the cut faces should be carried out to check stability.

10.0 GROUND MOVEMENTS

The assessment of ground movements within the basement and associated with the excavation and raft mobilisation has been undertaken using the P-Disp (Version 20.0 – Build 1) package licensed from the OASYS suite of geotechnical modelling software from Arup. The X-Disp (Version 20.0 – Build 14) modelling software has been used to predict ground movements surrounding the basement that are likely to arise from the installation of the underpins and subsequent excavation of the proposed basement. The ground movements include settlement of the ground (vertical) and lateral movement of the soil (horizontal) behind the proposed retaining walls.

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 Keats Grove, whilst the y-direction is perpendicular to it. Vertical movement is in the z-direction.

The full outputs of all the analyses are included within the appendix.

10.1 Ground Movements – Surrounding the Basement

10.1.1 Model Used

For the X-Disp analysis, the soil movement relationship used for the walls installed by underpinning techniques, the installation curves for the panel-like planar diaphragm wall have been adopted as most appropriate for underpinning. The excavation phase has not, however, been modelled in this part of the assessment since the stress relief that takes place during excavation in front of an embedded wall will have already taken place during underpin installation. Following dry-packing, the pin is subject to vertical loading from the structure above and will be fully propped on exposure until the basement and ground floor slabs are cast.

The behaviour of the underpin under vertical load when connected to the basement raft is considered later in this assessment.

10.1.2 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 to be illustrated, but may not reflect the anticipated accuracy of the predictions.

Phase of Works	Maximum Wall Movement (mm)	
	Vertical Settlement	Horizontal Movement
Underpin Installation	1.5	1.5

The analysis has predicted that the maximum vertical and horizontal displacement that will result from the installation of the piled retaining wall is around 1.5 mm.

10.2 Ground Movements – Resulting from Excavation

10.2.1 Model Used

Unloading of the underlying soils, particularly the clay soils 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 and we have used a well-established method to provide our estimates. This relates values of E_u and E', the undrained and drained stiffness respectively, to values of undrained cohesion

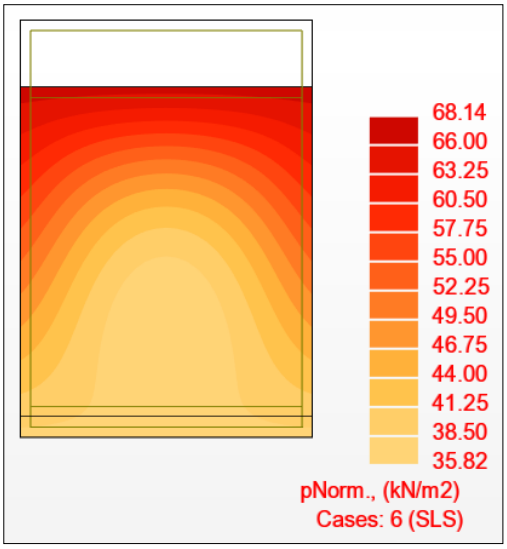
(Cu), as described by Padfield and Sharrock[16] and Butler[17] and more recently by O'Brien and Sharp[18]. Relationships of E_u = 500 C_u and E' = 300 C_u for the cohesive soils have previously been used to obtain values of Young's modulus. More recent published data[19] indicates stiffness values of 750 x Cu for the London Clay and a ratio of E' to Cu of 0.75, and it is considered appropriate to use these values for this assessment where the basements bear into the London Clay.

The excavation of approximately 2.2 m and 3.0 m thickness of soil for the proposed eastern and western basements respectively will result in a net unloading of 44 kN/m^2 and 51 kN/m^2.

The intensity of the reloading of the soils in the western basement has been taken from the Price and Myers raft analysis output and is shown opposite. This includes the load from the underpins and these loads have been rationalised and modelled as a series of six loaded polygons.

No such arrangement has been supplied for the western basement and a uniformly distributed raft loading of 15 kN/m^2 has been adopted.

The short term analysis has therefore considered unloading only whilst the total movement calculations include the reloading.



The soil parameters used in this analysis are tabulated below.

Stratum	Depth Range (m) (m OS)	Eu (MPa)	E'(MPa)
Made Ground / Head Deposits	GL to 3.0 (-0.6 to -3.6)	17.50	10.50
London Clay	3.0 to 7.0 (-3.6 to -7.6)	26.25 to 60.00	19.69 to 45.00
London Clay	7.0 to 13.0 (-7.6 to -13.6)	60.00 to 112.50	45.00 to 84.40

A rigid boundary for the analysis has been set at the base of the London Clay at a depth of 100.0 m below ground level.

10.2.2 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.

16 Padfield CJ and Sharrock MJ (1983) *Settlement of structures on clay soils*. CIRIA Special Publication 27
17 Butler FG (1974) *Heavily overconsolidated clays: a state of the art review*. Proc Conf Settlement of Structures, Cambridge, 531-578, Pentech Press, Lond
18 O'Brien AS and Sharp P (2001) *Settlement and heave of overconsolidated clays - a simplified non-linear method.* Part Two, Ground Engineering, Nov 2001, 48-53
19 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

Location	Movements (mm) Heave is -ve and Settlement +ve)	
	Short-term (Post excavation Phase)	Total (post construction)
Eastern Basement	-4.0	-3.0 to + 1.0
Western Basement	-4.0	-5.0

The P-Disp analysis indicates that, by the time the basement construction is complete, up to 5 mm of heave is likely to have taken place at the centre of the proposed western excavation whilst the unloaded area of the eastern basement would heave by around 2.0 mm and the loaded area exhibit settlement of up to 1.0 mm.

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.

11.0 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[20].

The sensitive structure at No 12B Keats Grove has been modelled as a series of displacement lines in the analysis along which the damage assessment has been undertaken.

For the analyses, a foundation depth of approximately 1.0 m below existing garden level has been assumed.

11.1 Damage to Neighbouring Structures

The ground movements calculated using the P-Disp modelling software have been imported into X-Disp to carry out an assessment of the likely damage to adjacent properties, whereby the vertical heave and settlement movements along each sensitive structure have been used to estimate the deflection ratio of the nearby sensitive structures.

The building damage reports for sensitive structures highlighted above are included in the appendix and indicate that the damage to the adjoining and nearby structures due to short and total movements would not exceed Category 0 (negligible) with a single structure, the front wall to No 12B Keats Grove predicted to suffer damage marginally into Category 1 (very slight).

11.2 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

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

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.

12.0 GMA CONCLUSIONS

The analysis has concluded that the predicted damage to the neighbouring properties from the construction of the proposed basements would be largely 'Negligible' with one exception at '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.

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.

13.0 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.

13.1 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	Site Investigation Conclusions
The River Fleet flows underground, 84 m to the east of the site.	The River Fleet is culverted and does not derive any flow from the London Clay so will not affect the site.
The lowest point of the proposed excavation is 10 m below the mean water level in Hampstead Pond No 1.	As the pond is constructed within London Clay but derives its flow from Bagshot Formation springs, the proposed basement excavation could not impact on the water levels of Pond No.1.
The site within a wider hillside setting in which the general slope is greater than 7°.	The slope stability will need to be ensured during temporary works.
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.	The London Clay is prone to seasonal shrink-swell and can cause structural damage. Desiccation was noted during the fieldwork in the vicinity of one of the trees to the rear of the house.
The proposed basement on the eastern side of the house is within a tree root protection zone of a retained tree.	Foundations will need to ensure the roots of the tree are not disturbed.
The site is within 5 m of a highway.	The site fronts onto Keats Grove however, the proposed basement extension is set back on the rear part of the site at a distance more than 10 m from the front of the site.

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.

The River Fleet flows underground, 84 m to the east of the site.

The River Fleet has been culverted, but prior to this it flowed perched on the London Clay. The distance of the former River Fleet from the site make it highly unlikely that any excavation would encounter permeable alluvial materials.

The lowest point of the proposed excavation is 10 m below the mean water level in Hampstead Pond No 1.

Both Hampstead Pond No.1 and the proposed basement excavation are within London Clay which is cohesive Unproductive Strata. The proposed basement excavation would therefore not be in hydraulic continuity with the pond and could not impact on the pond's water levels.

The site is within a wider hillside setting in which the general slope is greater than 7°

As the site is not at an angle greater than 7°, neither are any of the slopes bordering the site, it will not significantly impact that development. Even so, the stability of the slopes will need to be ensured during temporary works.

London Clay is the shallowest stratum / Seasonal Shrink-Swell

The proposed basement will extend to a depth such that new foundations will be expected to bypass any desiccated soils.

Subject to inspection of foundation excavations in the normal way to ensure that there is not significant unexpectedly deep root growth, it is not considered that the occurrence of shrink-swell issues in the local area has any bearing on the proposed development.

The proposed basement on the eastern side of the house is within a tree root protection zone of a retained tree.

The arboriculturalist report must be referred to where appropriate, to ensure the root protection zone is maintained.

The site is within 5 m of a highway.

The site fronts onto Keats Grove however, the proposed basement extension is set back on the rear part of the site at a distance more than 10 m from the front of the site so the road will not be affected.

13.2 BIA Conclusion

A Basement Impact Assessment has been carried out following the information and guidance published by the London Borough of Camden.

It is concluded that the proposed development is unlikely to result in any specific land or slope stability issues.

13.3 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.

13.3.1 Screening

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, 13 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 and existing plans of the site have confirmed that the proposed basement scheme will not increase the amount of hardstanding.
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	
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?	As above.
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 SFRA dated 2014.

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

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 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, Figures 11 and 12 of the Arup report and the Lost Rivers of London book.
3. 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, 13 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 that the basement development will only replace existing hardstanding areas.
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 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.

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 and confirmed during a site walkover.
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 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?	Trees were observed during the site walkover.
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, Figures 11 and 12 of the Arup report and the Lost Rivers of London book.
9. Is the site within an area of previously worked ground?	Geological maps and Figures 3 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 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, 13 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.

13.3.2 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 and the engineering properties of the underlying soils to enable suitable design of the basement development.

The findings of the investigation are discussed in Part 2 of this report and summarised in the Executive Summary.

13.3.3 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.

14.0 OUTSTANDING RISKS AND 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.

As discussed throughout the report, perched water is likely to be encountered during the basement excavation, although the finding of the investigation indicate that potential inflows are unlikely to be significant and should be adequately dealt with through sump pumping. However, groundwater monitoring should be continued, and trial excavations should be considered to assess the extent of inflows to be expected within the proposed basement excavations.

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 where areas of soft landscaping are to be formed. 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.

The findings of the ground movement analysis and damage assessment should be reviewed once the design proposals have been finalised, particularly if any changes are made to the proposed basement construction.

These items 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 – PART 1

Site Plan

Borehole Records

Trial Pit Records

Geotechnical Laboratory Test Results

Chemical Analyses (Soil)

Generic Risk Based Screening Values

Envirocheck Report Summary

Historical Maps

Preliminary UXO Assessment

GEA

Geotechnical & Environmental Associates

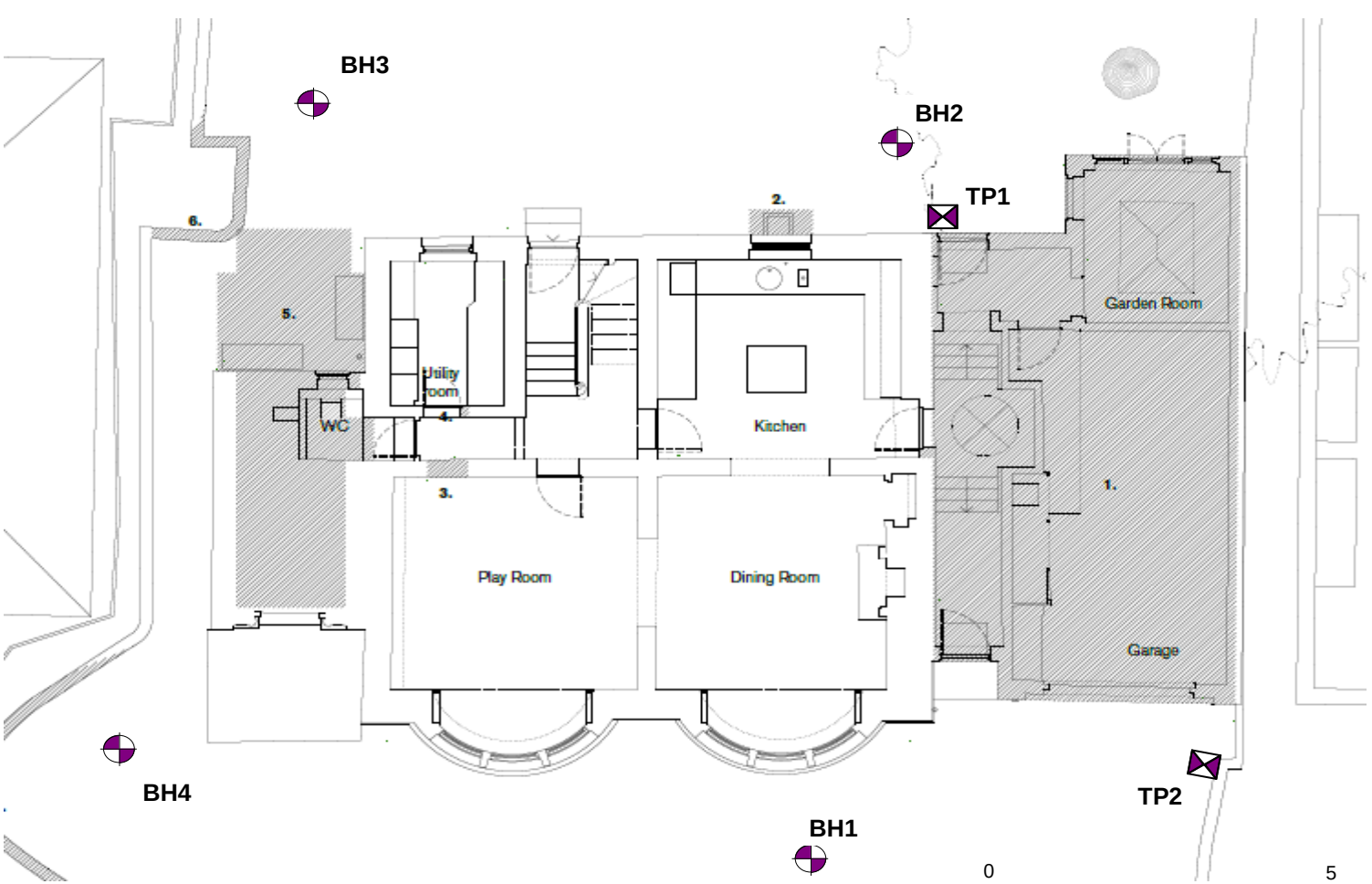
www.gea-ltd.co.uk

Site Plan

Site	12 Keats Grove, London NW3 2RN
Client	Private Clients
Engineer	Price and Myers

Job Number J19228

Sheet 1 / 1



Position of Borehole

Position of Trial Pit

Approximate Scale in metres

GEA

Geotechnical & Environmental Associates

Project				BOREHOLE No
12 Keats Grove, London NW3 2RN				**BH1**
Job No	Date	Ground Level (m OD)	Co-Ordinates ()	
J19228	29-08-19 29-08-19			
Client				Sheet
Private Clients				1 of 2

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
						0.10	Tarmac	
0.30	D					0.40	MADE GROUND (dark reddish brown brick rubble)	
0.50	B						Soft becoming firm brown silty sandy slightly gravelly CLAY with selenite crystals, occasional rootlets and silty lenses	
1.20-1.65	SDS	1,2/1,2,2,2 N60 = 6						
1.75	D							
2.00-2.50	B					(3.60)		
2.50-3.00	B							
3.00-3.45	SDS	1,2/2,2,2,2 N60 = 7						
3.75	D					4.00		
4.00-4.45	U	25 blows					High becoming very high strength firm becoming stiff fissured brown becoming brownish grey silty CLAY with selenite crystals and occasional dark grey sandy pockets	
4.75	D							
5.00	SDS	1,2/3,3,3,3 N60 = 11						
6.00	D							
6.50-6.95	U	30 blows						
7.50	D							

Boring Progress and Water Observations						Chiselling			Water Added	
Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To
3.00	29-08-19	11.00	3.00	150	DRY					

GENERAL REMARKS

Inspection pit dug to 1.20 m.
Borehole advanced under UXO supervision.
Groundwater not encountered.
Standpipe installed to 6.00 m.

All dimensions in metres Scale 1:50	Method/ Plant Used Cable Percussion Rig	Logged By GC

Report ID: CABLE PERCUSSION || Project: J19228 - 12 KEATS GROVE.GPJ || Library: GEA LIBRARY.GLB || Date: 14 October 2019

GEA

Geotechnical & Environmental Associates

Project				BOREHOLE No
12 Keats Grove, London NW3 2RN				**BH1**
Job No	Date	Ground Level (m OD)	Co-Ordinates ()	
J19228	29-08-19 29-08-19			
Client				Sheet
Private Clients				2 of 2

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
8.00-8.45	SDS	2,3/5,5,6,6 N60 = 20					High becoming very high strength firm becoming stiff fissured brown becoming brownish grey silty CLAY with selenite crystals and occasional dark grey sandy pockets *(continued)*	
9.00	D							
9.50-9.95	U	30 blows				(11.00)		
10.50	D							
11.00-11.45	SDS	3,6/6,6,6,8 N60 = 24						
12.00	D							
12.50-12.95	U	35 blows						
13.50	D							
14.55-15.00	SDS	4,6/7,8,9,9 N60 = 30				15.00		

Boring Progress and Water Observations						Chiselling			Water Added	
Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To
15.00	29-08-19	16.00	3.00	150	DRY					

GENERAL REMARKS

Inspection pit dug to 1.20 m.
Borehole advanced under UXO supervision.
Groundwater not encountered.
Standpipe installed to 6.00 m.

All dimensions in metres Scale 1:50	Method/ Plant Used Cable Percussion Rig	Logged By GC

Report ID: CABLE PERCUSSION || Project: J19228 - 12 KEATS GROVE.GPJ || Library: GEA LIBRARY.GLB || Date: 14 October 2019

GEA

Geotechnical & Environmental Associates

Project				BOREHOLE No
12 Keats Grove, London NW3 2RN				**BH2**
Job No	Date	Ground Level (m OD)	Co-Ordinates ()	
J19228	29-08-19 29-08-19			
Client				Sheet
Private Clients				1 of 1

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
						0.02	Slate slabs	
						0.05	MADE GROUND (yellowish brown sand)	
0.40	D					0.20	MADE GROUND (brown clayey sand with fragments of concrete and rootlets)	
						(0.55) 0.25		
						0.80	MADE GROUND (concrete rubble)	
1.00	D						MADE GROUND (dark brown clayey sand with fragments of brick, concrete, tarmac and rootlets)	
1.50	D						Stiff orange-brown silty sandy slightly gravelly CLAY with rootlets and occasional sandy pockets. Slightly dessicated and very friable to 1.50 m	
2.00	D					(1.80)		
2.50	D					2.60		
							Stiff fissured greyish brown silty CLAY with grey lenses and selenite crystals	
3.00	D					(1.10)		
3.50	D					3.70		

Boring Progress and Water Observations						Chiselling			Water Added	
Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To

GENERAL REMARKS

Inspection pit dug to 1.20 m. Borehole advanced under UXO support. Borehole terminated at 3.70 m due to refusal in stiff clay. Groundwater not encountered. Standpipe installed to 3.70 m.

All dimensions in metres Scale 1:50	Method/ Plant Used Window sampling	Logged By GC

Report ID: CABLE PERCUSSION || Project: J19228 - 12 KEATS GROVE.GPJ || Library: GEA LIBRARY.GLB || Date: 14 October 2019

GEA

Geotechnical & Environmental Associates

Project				BOREHOLE No
12 Keats Grove, London NW3 2RN				**BH3**
Job No: J19228	Date: 29-08-19 29-08-19	Ground Level (m OD)	Co-Ordinates ()	
Client: Private Clients				Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
						0.08	MADE GROUND (yellowish brown sandy gravel)	
						0.12	CONCRETE	
0.30	D					(0.48)		
						0.60	MADE GROUND (dark brown clayey gravelly sand with rare flint gravel and fragments of concrete and brick)	
1.00	D						Firm fissured orange-brown silty CLAY with selenite crystals and occasional orange-brown sandy pockets and grey lenses. Rootlets present and dessicated from 0.60 m to 0.90 m.	
1.50	D					(2.00)		
2.00	D							
2.50	D					2.60		

Boring Progress and Water Observations						Chiselling			Water Added	
Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To

GENERAL REMARKS

Inspection pit dug to 1.20 m.
Borehole advanced under UXO support.
Borehole terminated at 2.60 m due to refusal in stiff clay.
Groundwater not encountered.

All dimensions in metres Scale 1:50	Method/ Plant Used: Window sampling	Logged By: GC

Report ID: CABLE PERCUSSION || Project: J19228 - 12 KEATS GROVE.GPJ || Library: GEA LIBRARY.GLB || Date: 14 October 2019

GEA

Geotechnical & Environmental Associates

Project				BOREHOLE No
12 Keats Grove, London NW3 2RN				**BH4**
Job No	Date	Ground Level (m OD)	Co-Ordinates ()	
J19228	29-08-19 29-08-19			
Client				Sheet
Private Clients				1 of 1

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
						0.08	Tarmac	
						(0.42)	MADE GROUND (concrete and brick rubble with rootlets)	
						0.50	Firm fissured silty CLAY with selenite crystals, roots, rootlets and occasional orange-brown sandy pockets. Becoming stiff at 1.50 m.	
1.00	D							
1.50	D					(2.00)		
2.00	D							
						2.50		

Boring Progress and Water Observations						Chiselling			Water Added	
Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To

GENERAL REMARKS

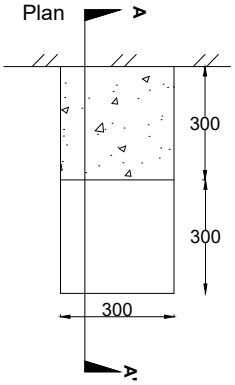
Inspection pit dug to 1.20 m.
Borehole advanced under UXO support.
Borehole terminated at 2.50 m due to refusal in stiff clay.
Groundwater not encountered.

All dimensions in metres Scale 1:50	Method/ Plant Used Window sampling	Logged By GC

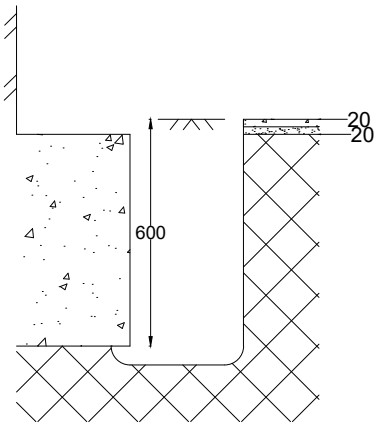
Report ID: CABLE PERCUSSION || Project: J19228 - 12 KEATS GROVE.GPJ || Library: GEA LIBRARY.GLB || Date: 14 October 2019

GEA	Widbury Barn Widbury Hill Ware Herts SG12 7QE	**Site** 12 Keats Grove, London, NW3 2RN		**Trial Pit Number** **TP1**
Excavation Method Manual	**Dimensions** 300 x 600 x 600 mm	**Ground Level (m TBM)**	**Client** Private Clients	**Job Number** J19228
	Location As per attached plan	**Date** 29/08/2019	**Engineer** Price and Myers	**Sheet Number** 1 of 2

Plan



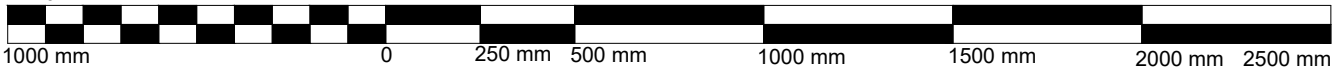
Section A - A'



Slate slabs
Sand

Made ground (dark brown gravelly sand with bricks, concrete and rootlets)

1 : 20

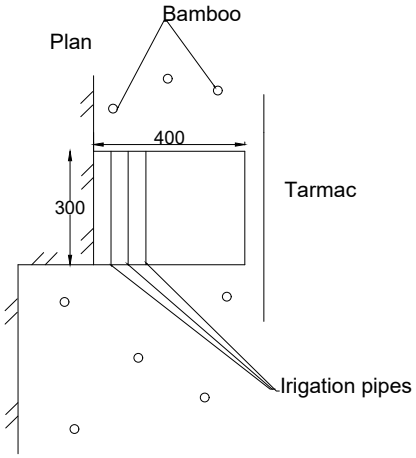


Notes:
All dimensions in millimetres
Groundwater not encountered; trial pit dry on completion

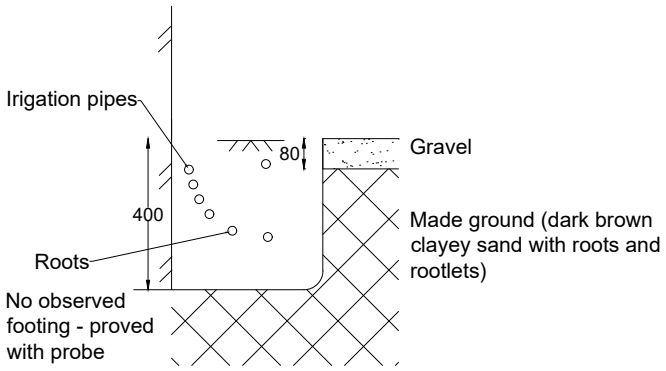
Scale 1 : 20

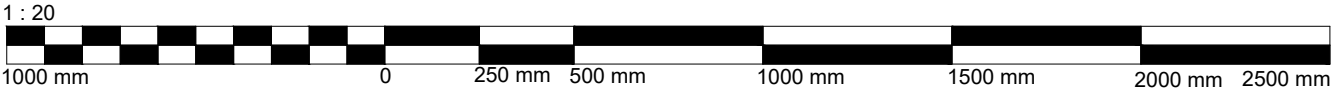
Logged By GC

GEA	Widbury Barn Widbury Hill Ware Herts SG12 7QE	**Site** 12 Keats Grove, London, NW3 2RN		**Trial Pit Number** **TP2**
Excavation Method Manual	**Dimensions** 300 x 400 x 400 mm	**Ground Level (m TBM)**	**Client** Private Clients	**Job Number** J19228
	Location As per attached plan	**Date** 29/08/2019	**Engineer** Price and Myers	**Sheet Number** 2 of 2



Section A - A'





Notes:
All dimensions in millimetres
Groundwater not encountered; trial pit dry on completion

Scale 1 : 20

Logged By GC

George Clifton
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Analytical Report Number : 19-57549

Project / Site name:	12 Keats Grove	**Samples received on:**	02/09/2019
Your job number:		**Samples instructed on:**	03/09/2019
Your order number:		**Analysis completed by:**	10/09/2019
Report Issue Number:	1	**Report issued on:**	10/09/2019
Samples Analysed:	3 soil samples		

Signed: K. Lewicka

Katarzyna Lewicka
Head of Reporting Section
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

Excel copies of reports are only valid when accompanied by this PDF certificate.

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: 19-57549

Project / Site name: 12 Keats Grove

Lab Sample Number				1306227	1306228	1306229		
Sample Reference				BH3	BH2	BH1		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.30	0.40	0.30		
Date Sampled				29/08/2019	29/08/2019	29/08/2019		
Time Taken				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		
Moisture Content	%	N/A	NONE	10	5.5	6.4		
Total mass of sample received	kg	0.001	NONE	1.1	1.2	1.3		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	9.4	10.1	8.9		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Total Sulphate as SO_4	mg/kg	50	MCERTS	1300	920	740		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.17	0.18	0.062		
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	8.6	12	12		
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.7	0.6	0.8		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	1.0	0.60	0.63		
Anthracene	mg/kg	0.05	MCERTS	0.19	0.11	0.12		
Fluoranthene	mg/kg	0.05	MCERTS	1.3	0.84	0.97		
Pyrene	mg/kg	0.05	MCERTS	1.1	0.71	0.80		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.0	0.60	0.56		
Chrysene	mg/kg	0.05	MCERTS	0.69	0.44	0.50		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.97	0.60	0.65		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.41	0.27	0.26		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.83	0.50	0.56		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.38	0.22	0.24		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.46	0.30	0.32		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	8.33	5.19	5.61		
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	14	10		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	16	15		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	29	75	70		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	130	250	180		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.4	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14	12	11		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	90	81	87		
Petroleum Hydrocarbons								
TPH C10 - C40	mg/kg	10	MCERTS	81	19	28		
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		

Analytical Report Number: 19-57549

Project / Site name: 12 Keats Grove

Lab Sample Number				1306227	1306228	1306229		
Sample Reference				BH3	BH2	BH1		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.30	0.40	0.30		
Date Sampled				29/08/2019	29/08/2019	29/08/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
TPH (C16 - C21)	mg/kg	1	MCERTS	20	5.7	9.8		
TPH (C21 - C35)	mg/kg	1	MCERTS	61	13	18		

Analytical Report Number : 19-57549

Project / Site name: 12 Keats Grove

* 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 *
1306227	BH3	None Supplied	0.30	Brown loam and clay with gravel and rubble.
1306228	BH2	None Supplied	0.40	Brown loam and clay with gravel and rubble.
1306229	BH1	None Supplied	0.30	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 19-57549

Project / Site name: 12 Keats Grove

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion 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 based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests. 2:1 extraction.	L082-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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.	In-house method based on USEPA 8270	L064-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
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 based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-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 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 based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-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 based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-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	W	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

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' 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.

GEA
Widbury Barn
Widbury Hill
Ware
SG12 7QE

Generic Risk-Based Soil Screening Values

Site	12 Keats Grove, London NW3 2RN	**Job Number** J19228
Client	Private Clients	**Sheet** 1 / 2
Engineer	Price and Myers	

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	22	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	130	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	**750**	Trigger to consider speciated testing
Chlorinated Solvents		
1,1,1 trichloroethane (TCA)	8.8	S4UL
tetrachloroethane (PCA)	1.2	S4UL
tetrachloroethene (PCE)	0.18	S4UL
trichloroethene (TCE)	0.016	S4UL
1,2-dichloroethane (DCA)	0.0071	S4UL
vinyl chloride (Chloroethene)	0.00064	S4UL
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

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
215322376_1_1

Customer Reference:
J19228

National Grid Reference:
527120, 185740

Slice:
A

Site Area (Ha):
0.16

Search Buffer (m):
1000

Site Details:

12, Keats Grove
LONDON
NW3 2RN

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	pg 1		Yes		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			3	5
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 2		Yes		
Pollution Incidents to Controlled Waters					
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances	pg 2			40	
River Quality					
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register	pg 9			1	
Water Abstractions	pg 9				(*10)
Water Industry Act Referrals					
Groundwater Vulnerability Map	pg 11	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 11	Yes	n/a	n/a	n/a
Superficial Aquifer Designations			n/a	n/a	n/a
Source Protection Zones					
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 12		3	4	19

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)					
Local Authority Landfill Coverage	pg 15	1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Potentially Infilled Land (Non-Water)	pg 15			2	5
Potentially Infilled Land (Water)	pg 15		1	1	
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 16	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry					
BGS Recorded Mineral Sites					
BGS Urban Soil Chemistry	pg 16		Yes	Yes	Yes
BGS Urban Soil Chemistry Averages	pg 19	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 19	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 19	Yes	Yes	n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 19	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 19	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		10	24	76
Fuel Station Entries	pg 30			1	
Points of Interest - Commercial Services	pg 30			3	13
Points of Interest - Education and Health	pg 31			5	2
Points of Interest - Manufacturing and Production	pg 32		2		3
Points of Interest - Public Infrastructure	pg 32		3	7	6
Points of Interest - Recreational and Environmental	pg 34		2		11
Gas Pipelines					
Underground Electrical Cables	pg 35			6	6

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 37				1
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones					
Ramsar Sites					
Sites of Special Scientific Interest	pg 37				1
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NW (NW)	207	1	527000 185950
1	**Discharge Consents** Operator: Thames Water Utilities Ltd Property Type: WTW/WATER COLLECTION/TREATMENT/SUPPLY Location: Hampstead Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Temp.0140 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	A17SW (W)	965	2	526200 186100
2	**Local Authority Pollution Prevention and Controls** Name: The Royal Free Hospital Location: Pond Street, LONDON, NW3 2QG Authority: London Borough of Camden, Pollution Projects Team Permit Reference: Not Given Dated: 24th July 1992 Process Type: Local Authority Air Pollution Control Description: PG5/1Clinical waste incineration processes under 1 tonne an hour **Status:** **Authorisation revoked** Positional Accuracy: Manually positioned to the address or location	A13SE (SE)	334	3	527296 185410
3	**Local Authority Pollution Prevention and Controls** Name: Top Choice Dry Cleaners Location: 96 Fleet Road, London, Nw3 2qx Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC13 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	A14SW (SE)	451	3	527529 185471
4	**Local Authority Pollution Prevention and Controls** Name: Belsize Park Service Station Location: 215 Haverstock Hill, LONDON, NW3 4RE Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC21 Dated: 2nd January 1999 Process Type: Local Authority Pollution Prevention and Control Description: PG1/14 Petrol filling station **Status:** **Permitted** Positional Accuracy: Automatically positioned to the address	A8NE (S)	482	3	527187 185227
5	**Local Authority Pollution Prevention and Controls** Name: Perkins Dry Cleaners Location: 171 Haverstock Hill, London, Nw3 4qs Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC7 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	A8SE (S)	683	3	527342 185055
5	**Local Authority Pollution Prevention and Controls** Name: Swan Dry Cleaners Location: 163 Haverstock Hill, London, Nw3 4qt Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC42 Dated: 24th 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	A8SE (S)	713	3	527371 185032

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
6	**Local Authority Pollution Prevention and Controls** Name: Perkins Dry Cleaners Location: 40 Heath Street, London, Nw3 6te Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC9 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	A12SW (W)	733	3	526374 185724
7	**Local Authority Pollution Prevention and Controls** Name: Pyramid Cleaners Location: 52 Besize Lane, London, Nw3 5ar Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC8 Dated: 1st 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	A8SW (S)	760	3	526872 184985
8	**Local Authority Pollution Prevention and Controls** Name: Visage Location: 171 Malden Road, London, Nw5 4ht Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC50 Dated: 1st February 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	A9NE (SE)	993	3	527961 185143
	Nearest Surface Water Feature	A13NE (NE)	100	-	527206 185836
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital, Pond Street, Hampstead, LONDON, Greater London, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: AR0446 Dated: 12th July 1995 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Substantial variation to authorisation under RSA **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	332	2	527292 185410
9	**Registered Radioactive Substances** Name: Anthony Nolan Trust (Ant) Location: Royal Free Hospital, Pond Street, Hampstead, London, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: Bz0777 Dated: 14th July 2005 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Minor variation to authorisation under RSA **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	334	2	527297 185411
9	**Registered Radioactive Substances** Name: Anthony Nolan Trust (Ant) Location: Royal Free Hospital, Pond Street, Hampstead, London, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: Bw7643 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: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	334	2	527297 185411

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	**Registered Radioactive Substances** Name: Anthony Nolan Trust (Ant) Location: Royal Free Hospital, Pond Street, Hampstead, London, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: Bj5716 Dated: 14th February 2001 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	A13SE (SE)	334	2	527297 185411
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital,Pond Street,Hampstead, LONDON, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: CD3170 Dated: 13th July 2009 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Substantial variation to authorisation under RSA **Status: Application has been authorised and any conditions apply to the operator** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital,Pond Street,Hampstead, LONDON, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: CB2954 Dated: 20th July 2007 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Substantial variation to an authorisation under S13 or S14 RSA in respect of a registration under S7 when Technetium 99M is used being =< 10 gigabecquerels **Status: Authorisation either revoked or cancelled** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital,Pond Street,Hampstead, LONDON, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: Ca2592 Dated: 13th April 2006 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Minor variation to authorisation under RSA **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital, Pond Street, LONDON, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: Bz9162 Dated: 9th December 2005 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Minor variation to authorisation under RSA **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital, Pond Street, HAMPSTEAD, LONDON, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: Bz1617 Dated: 9th September 2005 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Substantial variation to authorisation under RSA **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	2	527297 185410

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	**Registered Radioactive Substances** Name: Anthony Nolan Trust (Ant) Location: Medical Physics Department Royal Free Hospital, Pond Street, Hampstead, London, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: Bz0831 Dated: 14th July 2005 Process Type: Registration under S7 RSA for the keeping and use of Radioactive materials (was RSA60 S1) Description: Minor variation to a registration under the Act of an open source which is also the subject of an authorisation **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Manually positioned to the address or location	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital, Pond Street, HAMPSTEAD, LONDON, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: By5714 Dated: 6th December 2004 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Substantial variation to authorisation under RSA **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital, Pond Street, HAMPSTEAD, LONDON, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: By5706 Dated: 22nd November 2004 Process Type: Registration under S7 RSA for the keeping and use of Radioactive materials (was RSA60 S1) Description: Discretionary 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	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital, Pond Street, HAMPSTEAD, LONDON, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: Bw6841 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: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital,Pond Street,Hampstead, LONDON, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: Bt8759 Dated: 12th May 2003 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Substantial variation to authorisation under RSA **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital, Pond Street, HAMPSTEAD, LONDON, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: Bs4863 Dated: 25th July 2002 Process Type: Registration under S7 RSA for the keeping and use of Radioactive materials (was RSA60 S1) Description: Minor variation to a registration under the Act of an open source which is also the subject of an authorisation **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	2	527297 185410

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	**Registered Radioactive Substances** Name: Anthony Nolan Trust (Ant) Location: Royal Free Hospital, Pond Street, HAMPSTEAD, LONDON, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: Br6392 Dated: 29th April 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: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital, Pond Street, HAMPSTEAD, LONDON, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: Br6406 Dated: 29th April 2002 Process Type: Registration under S7 RSA for the keeping and use of Radioactive materials (was RSA60 S1) Description: Substantial variation to a registration under the Act of an open source which is also the subject of an authorisation **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free And University College Medical School Of University College London Location: Medical Physics Department, Royal Free Hospital, Pond Street, London, Greater London, NW3 2PF Authority: Environment Agency, Thames Region Permit Reference: Bm0214 Dated: 28th November 2001 Process Type: Registration under S7 RSA for the keeping and use of Radioactive materials (was RSA60 S1) Description: Substantial variation to a registration under the Act of an open source which is also the subject of an authorisation **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital, Pond Street, London, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: Bj5708 Dated: 14th February 2001 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Substantial variation to authorisation under RSA **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Polymasc Pharmaceuticals Plc Location: Royal Free Hospital, Pond Street, Hampstead, LONDON, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: Bj5678 Dated: 14th February 2001 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	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free And University College Medical School Of University College London Location: Medical Physics Department, Royal Free Hospital, Pond Street, London, Greater London, NW3 2PF Authority: Environment Agency, Thames Region Permit Reference: BB6254 Dated: 27th October 1998 Process Type: Registration under S7 RSA for the keeping and use of Radioactive materials (was RSA60 S1) Description: Minor variation to a registration under the Act of an open source which is also the subject of an authorisation **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	2	527297 185410

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital,Pond Street,Hampstead, LONDON, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: AV1327 Dated: 11th August 1997 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Substantial variation to authorisation under RSA **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free And University College Medical School Of University College London Location: Medical Physics Department, Royal Free Hospital, Pond Street, London, Greater London, NW3 2PF Authority: Environment Agency, Thames Region Permit Reference: AR0403 Dated: 12th July 1995 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: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital,Pond Street,Hampstead, LONDON, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: AH9987 Dated: 21st June 1994 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	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital, Pond Street, LONDON, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: AB4095 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 superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free London Nhs Foundation Trust Location: The Royal Free Hospital, Pond Street, Hampstead, Nw3 2qg Authority: Environment Agency, Thames Region Permit Reference: UB3935DG 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	A13SE (SE)	335	2	527297 185410
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital, Pond Street, Hampstead, LONDON, Greater London, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: AT8398 Dated: 17th January 1996 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Minor variation to authorisation under RSA **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	337	2	527292 185405

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	**Registered Radioactive Substances** Name: Royal Free Hampstead NHS Trust Location: Royal Free Hospital, Pond Street, Hampstead, LONDON, Greater London, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: AR0373 Dated: 11th July 1995 Process Type: Registration under S7 RSA for the keeping and use of Radioactive materials (was RSA60 S1) Description: Minor variation to a registration under the Act of an open source which is also the subject of an authorisation **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	337	2	527302 185410
9	**Registered Radioactive Substances** Name: Royal Free Hampstead Nhs Trust Location: Royal Free Hospital, Pond Street, Hampstead, LONDON, Greater London, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: AE8658 Dated: 24th March 1992 Process Type: Registration under S7 RSA for the keeping and use of Radioactive materials (was RSA60 S1) Description: Registration under the Act of multiple open sources which are also the subject of authorisations **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	341	2	527302 185405
10	**Registered Radioactive Substances** Name: Royal Free Hampstead NHS Trust Location: Royal Free Hospital, Pond Street, Hampstead, LONDON, Greater London, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: AV8011 Dated: 25th October 1996 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Substantial variation to authorisation under RSA **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A8NE (SE)	341	2	527292 185400
10	**Registered Radioactive Substances** Name: University College London Location: Royal Free Campus, Rowland Hill Street, London, Nw3 2pf Authority: Environment Agency, Thames Region Permit Reference: By6001 Dated: 7th May 2015 Process Type: Not Supplied Description: Not Supplied **Status: Replaced** Positional Accuracy: Located by supplier to within 100m	A8NE (SE)	345	2	527300 185400
10	**Registered Radioactive Substances** Name: University College London Location: Royal Free Campus, Rowland Hill Street, London, Nw3 2pf Authority: Environment Agency, Thames Region Permit Reference: Bz9758 Dated: 7th May 2015 Process Type: Not Supplied Description: Not Supplied **Status: Replaced** Positional Accuracy: Located by supplier to within 100m	A8NE (SE)	345	2	527300 185400
10	**Registered Radioactive Substances** Name: University College London Location: Royal Free Campus, Rowland Hill Street, London, Nw3 2pf Authority: Environment Agency, Thames Region Permit Reference: SB3598DT Dated: Not Supplied Process Type: Not Supplied Description: Not Supplied **Status: Application has been determined by the EA** Positional Accuracy: Located by supplier to within 100m	A8NE (SE)	345	2	527300 185400

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
10	**Registered Radioactive Substances** Name: Royal Free And University College Medical School Of University College London Location: Royal Free Hospital, Pond Street, London, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: By6010 Dated: 3rd August 2005 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Substantial variation to authorisation under RSA **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Manually positioned to the address or location	A8NE (SE)	346	2	527299 185399
10	**Registered Radioactive Substances** Name: Royal Free And University College Medical School Of University College London Location: Royal Free Hospital, Pond Street, London, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: Bw7635 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: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Manually positioned to the address or location	A8NE (SE)	346	2	527299 185399
10	**Registered Radioactive Substances** Name: Royal Free And University College Medical School Of University College London Location: Royal Free Hospital, Pond Street, London, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: Bj5694 Dated: 14th February 2001 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: Manually positioned to the address or location	A8NE (SE)	346	2	527299 185399
11	**Registered Radioactive Substances** Name: Polymasc Pharmaceuticals Plc Location: Anthony Nolan Building, Royal Free Hospital Site, Fleet Road; Hampstead, LONDON, Greater London, NW3 2EZ Authority: Environment Agency, Thames Region Permit Reference: AU4924 Dated: 20th February 1996 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: Authorisation either revoked or cancelled** Positional Accuracy: Manually positioned to the address or location	A14SW (SE)	414	2	527500 185495
12	**Registered Radioactive Substances** Name: Anthony Nolan Trust Location: Anthony Nolan Histocompatibility Laboratories, 77b Fleet Road, Hampstead, London, Nw3 2qr Authority: Environment Agency, Thames Region Permit Reference: CB1915 Dated: 21st January 2016 Process Type: Not Supplied Description: Not Supplied **Status: Replaced** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	425	2	527442 185404
12	**Registered Radioactive Substances** Name: Anthony Nolan Trust Location: Anthony Nolan Histocompatibility Laboratories, 77b Fleet Road, Hampstead, London, Nw3 2qr Authority: Environment Agency, Thames Region Permit Reference: CB5171 Dated: 21st January 2016 Process Type: Not Supplied Description: Not Supplied **Status: Replaced** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	425	2	527442 185404

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
12	**Registered Radioactive Substances** Name: Anthony Nolan Trust Location: Anthony Nolan Histocompatibility Laboratories, 77b Fleet Road, Hampstead, London, Nw3 2qr Authority: Environment Agency, Thames Region Permit Reference: AB3298DT 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	A13SE (SE)	425	2	527442 185404
13	**Substantiated Pollution Incident Register** Authority: Environment Agency - Thames Region, North East Area Incident Date: 23rd September 2003 Incident Reference: 191922 Water Impact: Category 2 - Significant Incident Air Impact: Category 4 - No Impact Land Impact: Category 4 - No Impact Positional Accuracy: Located by supplier to within 10m Pollutant: Pollutant Not Identified: Not Identified	A18SE (N)	351	2	527254 186101
	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	A3SW (S)	1459	2	526800 184280
	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	A2SE (S)	1489	2	526750 184261
	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	A2SE (S)	1489	2	526750 184261

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	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	A2SE (S)	1489	2	526750 184261
	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	A5NE (SE)	1938	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	A5NE (SE)	1938	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	A5NE (SE)	1938	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: 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	A5NE (SE)	1938	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: 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	A5NE (SE)	1938	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	A5NE (SE)	1938	2	528800 184700
	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	A13SW (N)	0	4	527124 185739
	Groundwater Vulnerability - Soluble Rock Risk None				
	Bedrock Aquifer Designations Aquifer Designation: Unproductive Strata	A13SW (N)	0	4	527124 185739
	Superficial Aquifer Designations No Data Available				
	Extreme Flooding from Rivers or Sea without Defences None				

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Flooding from Rivers or Sea without Defences None				
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
14	**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)	84	5	527230 185735
15	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 172.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Hampstead Ponds Catchment Name: Thames Primacy: 1	A13NE (NE)	113	5	527233 185821
16	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 13.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A13SE (E)	176	5	527315 185663
17	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 18.7 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Hampstead Ponds Catchment Name: Thames Primacy: 1	A13NE (NE)	268	5	527289 185984
18	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 118.5 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Hampstead Ponds Catchment Name: Thames Primacy: 1	A13NE (NE)	280	5	527285 186003
19	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A18SE (N)	363	5	527249 186116
20	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 178.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Hampstead Ponds Catchment Name: Thames Primacy: 1	A18SE (N)	372	5	527245 186127
21	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 71.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A18SE (N)	510	5	527163 186285

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
22	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 10.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A18SW (N)	568	5	527125 186345
23	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 40.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A18SW (N)	572	5	527116 186349
24	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 131.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A18SW (N)	592	5	527080 186369
25	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 214.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A18SW (N)	628	5	526954 186384
26	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 68.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A18SW (N)	628	5	526954 186384
27	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 132.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Hampstead Ponds Catchment Name: Thames Primacy: 1	A18NW (N)	696	5	526937 186451
28	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A19SW (NE)	714	5	527476 186396
29	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A19SW (NE)	731	5	527483 186411
30	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 184.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A19SW (NE)	731	5	527488 186408

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
31	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 124.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A17NE (NW)	752	5	526771 186446
32	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 62.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A17NE (NW)	752	5	526771 186446
33	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 164.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A18NW (N)	811	5	526922 186565
34	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A19NW (NE)	894	5	527635 186507
35	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 119.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A19NW (NE)	895	5	527638 186507
36	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 37.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A18NW (N)	940	5	526820 186671
37	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 9.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A18NW (N)	940	5	526820 186671
38	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A19NW (NE)	991	5	527748 186543
39	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 16.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A19NW (NE)	992	5	527752 186541

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Local Authority Landfill Coverage Name: London Borough of Camden - Has no landfill data to supply		0	6	527124 185739
40	**Potentially Infilled Land (Non-Water)** Bearing Ref: N Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1996	A18SE (N)	473	8	527250 186231
41	**Potentially Infilled Land (Non-Water)** Bearing Ref: S Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1996	A8NE (S)	500	8	527284 185228
42	**Potentially Infilled Land (Non-Water)** Bearing Ref: SE Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1996	A9NW (SE)	555	8	527473 185261
43	**Potentially Infilled Land (Non-Water)** Bearing Ref: S Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1996	A8NE (S)	558	8	527347 185189
44	**Potentially Infilled Land (Non-Water)** Bearing Ref: SW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1996	A7NE (SW)	646	8	526616 185296
45	**Potentially Infilled Land (Non-Water)** Bearing Ref: SW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1996	A7SE (SW)	762	8	526763 185029
46	**Potentially Infilled Land (Non-Water)** Bearing Ref: SW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1991	A7SE (SW)	959	8	526467 184999
47	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1873	A13SE (E)	84	8	527228 185721
48	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1873	A13NW (NW)	378	8	526813 186007

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Thames Group	A13SW (N)	0	1	527124 185739
	BGS Estimated Soil Chemistry No data available				
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527233, 185694 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 31.90 mg/kg Cadmium Measured Concentration: 0.60 mg/kg Chromium Measured Concentration: 126.40 mg/kg Lead Measured Concentration: 478.50 mg/kg Nickel Measured Concentration: 45.60 mg/kg	A13SE (SE)	89	1	527233 185694
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527216, 185357 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 19.70 mg/kg Cadmium Measured Concentration: 0.80 mg/kg Chromium Measured Concentration: 96.90 mg/kg Lead Measured Concentration: 626.10 mg/kg Nickel Measured Concentration: 27.60 mg/kg	A8NE (S)	359	1	527216 185357
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 526732, 185657 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 40.30 mg/kg Cadmium Measured Concentration: 0.60 mg/kg Chromium Measured Concentration: 97.40 mg/kg Lead Measured Concentration: 660.40 mg/kg Nickel Measured Concentration: 34.00 mg/kg	A12SE (W)	388	1	526732 185657
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527297, 186229 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 21.10 mg/kg Cadmium Measured Concentration: 0.30 mg/kg Chromium Measured Concentration: 115.30 mg/kg Lead Measured Concentration: 367.50 mg/kg Nickel Measured Concentration: 18.70 mg/kg	A18SE (N)	486	1	527297 186229

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: 526737, 186262 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 11.40 mg/kg Cadmium Measured Concentration: 0.50 mg/kg Chromium Measured Concentration: 155.00 mg/kg Lead Measured Concentration: 104.40 mg/kg Nickel Measured Concentration: 7.80 mg/kg	A17SE (NW)	615	1	526737 186262
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527766, 185717 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 14.80 mg/kg Cadmium Measured Concentration: 0.50 mg/kg Chromium Measured Concentration: 62.40 mg/kg Lead Measured Concentration: 150.60 mg/kg Nickel Measured Concentration: 19.50 mg/kg	A14SW (E)	621	1	527766 185717
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 526763, 185153 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 17.60 mg/kg Cadmium Measured Concentration: 0.60 mg/kg Chromium Measured Concentration: 55.10 mg/kg Lead Measured Concentration: 617.70 mg/kg Nickel Measured Concentration: 22.30 mg/kg	A7NE (SW)	655	1	526763 185153
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527669, 185211 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 18.20 mg/kg Cadmium Measured Concentration: 0.60 mg/kg Chromium Measured Concentration: 99.60 mg/kg Lead Measured Concentration: 936.90 mg/kg Nickel Measured Concentration: 25.60 mg/kg	A9NW (SE)	722	1	527669 185211
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527758, 186258 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 17.00 mg/kg Cadmium Measured Concentration: 0.30 mg/kg Chromium Measured Concentration: 103.40 mg/kg Lead Measured Concentration: 230.10 mg/kg Nickel Measured Concentration: 21.30 mg/kg	A19SW (NE)	795	1	527758 186258

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: 526223, 185630 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 19.70 mg/kg Cadmium Measured Concentration: 0.50 mg/kg Chromium Measured Concentration: 127.10 mg/kg Lead Measured Concentration: 514.80 mg/kg Nickel Measured Concentration: 23.20 mg/kg	A12SW (W)	894	1	526223 185630
	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	A8SE (S)	897	1	527169 184808
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 526278, 185352 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 25.30 mg/kg Cadmium Measured Concentration: 0.50 mg/kg Chromium Measured Concentration: 122.20 mg/kg Lead Measured Concentration: 273.70 mg/kg Nickel Measured Concentration: 19.50 mg/kg	A7NW (SW)	910	1	526278 185352
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527271, 186735 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 13.50 mg/kg Cadmium Measured Concentration: 0.40 mg/kg Chromium Measured Concentration: 104.50 mg/kg Lead Measured Concentration: 217.30 mg/kg Nickel Measured Concentration: 12.30 mg/kg	A18NE (N)	970	1	527271 186735

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	A13SW (N)	0	1	527124 185739
	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	A13SW (N)	0	1	527124 185739
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	527124 185739
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	527124 185739
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	527124 185739
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SW (W)	79	1	527037 185708
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	135	1	527179 185897
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	158	1	527015 185584
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	166	1	527313 185718
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	527124 185739
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	527124 185739

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	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	A13SW (N)	0	1	527124 185739
	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	A13SW (N)	0	1	527124 185739

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
49	**Contemporary Trade Directory Entries** Name: Bri-Clean Laundries Location: 57, South End Road, London, NW3 2QB Classification: Laundries & Launderettes **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	52	-	527188 185678
49	**Contemporary Trade Directory Entries** Name: Padma Location: Davu House, 2b, Heath Hurst Road, LONDON, NW3 2RX Classification: Textile Manufacturing **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	93	-	527204 185637
50	**Contemporary Trade Directory Entries** Name: Bevan Scaffolding Location: 14 Rutsea Lodge,South End Road, London, NW3 2QB Classification: Scaffolding & Work Platforms **Status: Active** Positional Accuracy: Manually positioned to the road within the address or location	A13NE (E)	63	-	527197 185753
51	**Contemporary Trade Directory Entries** Name: Oven Cleaning (Hampstead) Location: 32, Downshire Hill, London, NW3 1NT Classification: Oven cleaning **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	85	-	527034 185812
52	**Contemporary Trade Directory Entries** Name: Kronus (Uk) Ltd Location: 6, Park End, London, NW3 2SE Classification: Catering Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NE (E)	126	-	527263 185752
53	**Contemporary Trade Directory Entries** Name: American Dry Cleaning Location: 29, South End Road, London, NW3 2PT Classification: Dry Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	156	-	527235 185581
53	**Contemporary Trade Directory Entries** Name: House Of Mistry Location: 15, South End Road, LONDON, NW3 2PT Classification: Pharmaceutical Manufacturers & Distributors **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	193	-	527251 185547
54	**Contemporary Trade Directory Entries** Name: Interior Couture Location: 14a, Downshire Hill, LONDON, NW3 1NR Classification: Wallpapers & Wall Coverings **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (W)	162	-	526950 185723
55	**Contemporary Trade Directory Entries** Name: Metro Cleaning Cameden Location: 38, South End Close, London, NW3 2RB Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	210	-	527319 185590
56	**Contemporary Trade Directory Entries** Name: T5 Oil & Gas Location: 45 Pond Street, London, NW3 2PR Classification: Oil & Gas Exploration Supplies & Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A13SE (SE)	246	-	527270 185497
57	**Contemporary Trade Directory Entries** Name: The Royal Free Hospital & School Of Medicine Location: Royal Free Hospital, Pond Street, London, NW3 2QG Classification: Hospitals **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	335	-	527297 185410
57	**Contemporary Trade Directory Entries** Name: The Royal Free Hospital Location: Pond Street, London, NW3 2QG Classification: Hospitals **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A13SE (SE)	335	-	527297 185410

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
104	**Contemporary Trade Directory Entries** Name: Kilbey Cleaning Location: 104, Mansfield Road, London, NW3 2HX Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14SE (E)	967	-	528101 185562
105	**Contemporary Trade Directory Entries** Name: Chalcot House Services Location: Flat 1, 51, Belsize Park Gardens, London, NW3 4JL Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8SE (S)	971	-	527202 184737
106	**Contemporary Trade Directory Entries** Name: Visage Dry Cleaners Location: 171, Malden Road, London, NW5 4HT Classification: Dry Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A9NE (SE)	996	-	527961 185137
107	**Fuel Station Entries** Name: Belsize Park Service Station Location: 215, Haverstock Hill , Belsize Park , London, Inner London, NW3 4QE Brand: BP Premises Type: Petrol Station **Status: Open** Positional Accuracy: Automatically positioned to the address	A8NE (S)	482	-	527187 185227
108	**Points of Interest - Commercial Services** Name: A V Auto Locksmiths Location: 38 Willow Road, London, NW3 1TN Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A12NE (W)	396	7	526722 185864
109	**Points of Interest - Commercial Services** Name: B P Car Wash Location: 215 Haverstock Hill, London, NW3 4QE Category: Personal, Consumer and other Services Class Code: Vehicle Cleaning Services Positional Accuracy: Positioned to address or location	A8NE (S)	482	7	527188 185227
109	**Points of Interest - Commercial Services** Name: Car Wash Location: Belzier Park Service Station 215, Haverstock Hill, London, NW3 4QE Category: Personal, Consumer and other Services Class Code: Vehicle Cleaning Services Positional Accuracy: Positioned to address or location	A8NE (S)	482	7	527187 185227
110	**Points of Interest - Commercial Services** Name: Targus Seatrade Location: 201 Haverstock Hill, London, NW3 4QG Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A8NE (S)	601	7	527272 185121
111	**Points of Interest - Commercial Services** Name: Zapem Pest Control London Location: 26 Downside Crescent, London, NW3 2AS Category: Contract Services Class Code: Pest and Vermin Control Positional Accuracy: Positioned to address or location	A9NW (SE)	658	7	527536 185179
112	**Points of Interest - Commercial Services** Name: Comac Motors Location: 13 Daleham Mews, London, NW3 5DB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A7SE (SW)	841	7	526773 184937
112	**Points of Interest - Commercial Services** Name: Comac Motors Location: 19 Daleham Mews, London, NW3 5DB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A7SE (SW)	865	7	526770 184911
112	**Points of Interest - Commercial Services** Name: Continental Autos Location: 10 Daleham Mews, London, NW3 5DB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A7SE (SW)	869	7	526749 184917

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
112	**Points of Interest - Commercial Services** Name: Continental Autos Location: 10 Daleham Mews, London, NW3 5DB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A7SE (SW)	869	7	526749 184917
112	**Points of Interest - Commercial Services** Name: Daleham Garage Location: 14 Daleham Mews, London, NW3 5DB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A7SE (SW)	890	7	526749 184894
112	**Points of Interest - Commercial Services** Name: Daleham Garage Location: 14 Daleham Mews, London, NW3 5DB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A7SE (SW)	890	7	526749 184894
112	**Points of Interest - Commercial Services** Name: Auto Reliant Suspension Co Location: 25 Daleham Mews, London, NW3 5DB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A7SE (SW)	891	7	526768 184884
112	**Points of Interest - Commercial Services** Name: J R J Motors Location: 25 Daleham Mews, London, NW3 5DB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A7SE (SW)	891	7	526768 184884
113	**Points of Interest - Commercial Services** Name: Pest Control Camden Location: 196 Malden Road, London, NW5 4BS Category: Contract Services Class Code: Pest and Vermin Control Positional Accuracy: Positioned to address or location	A9NE (SE)	893	7	527897 185227
114	**Points of Interest - Commercial Services** Name: Urban Shield Ltd Location: 25 Savernake Road, London, NW3 2JT Category: Contract Services Class Code: Pest and Vermin Control Positional Accuracy: Positioned to address or location	A14SE (E)	944	7	528088 185666
114	**Points of Interest - Commercial Services** Name: Urban Shield Location: 25 Savernake Road, London, NW3 2JT Category: Contract Services Class Code: Pest and Vermin Control Positional Accuracy: Positioned to address or location	A14SE (E)	945	7	528089 185666
115	**Points of Interest - Education and Health** Name: Royal Free Hospital Location: Royal Free Hospital, Pond Street, London, NW3 2QG Category: Health Practitioners and Establishments Class Code: Accident & Emergency Department Positional Accuracy: Positioned to address or location	A13SE (S)	272	7	527240 185454
115	**Points of Interest - Education and Health** Name: Eating Disorders Intensive Service Location: Royal Free Hospital, Pond Street, London, NW3 2QG Category: Health Practitioners and Establishments Class Code: Hospitals Positional Accuracy: Positioned to address or location	A13SE (SE)	335	7	527297 185410
115	**Points of Interest - Education and Health** Name: Royal Free Hospital Location: Royal Free Hospital, Pond Street, London, NW3 2QG Category: Health Practitioners and Establishments Class Code: Hospitals Positional Accuracy: Positioned to address or location	A13SE (SE)	335	7	527297 185410
115	**Points of Interest - Education and Health** Name: Royal Free Hospital Location: Royal Free Hospital, Pond Street, London, NW3 2QG Category: Health Practitioners and Establishments Class Code: Hospitals Positional Accuracy: Positioned to address or location	A13SE (SE)	335	7	527297 185410

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
115	**Points of Interest - Education and Health** Name: Royal Free Hospital Location: Royal Free Hospital, Pond Street, London, NW3 2QG Category: Health Practitioners and Establishments Class Code: Accident & Emergency Department Positional Accuracy: Positioned to address or location	A13SE (SE)	335	7	527297 185410
116	**Points of Interest - Education and Health** Name: Piercey Day Hospital Location: 23 East Heath Road, London, NW3 1DU Category: Health Practitioners and Establishments Class Code: Hospitals Positional Accuracy: Positioned to address or location	A17SW (NW)	857	7	526380 186224
116	**Points of Interest - Education and Health** Name: Queen Marys House Location: 23 East Heath Road, London, NW3 1DU Category: Health Practitioners and Establishments Class Code: Hospitals Positional Accuracy: Positioned to address or location	A17SW (NW)	881	7	526353 186225
117	**Points of Interest - Manufacturing and Production** Name: Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A13NE (E)	112	7	527251 185744
117	**Points of Interest - Manufacturing and Production** Name: Works Location: NW3 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A13NE (E)	113	7	527252 185744
118	**Points of Interest - Manufacturing and Production** Name: Sand Pit Location: NW3 Category: Extractive Industries Class Code: Sand, Gravel and Clay Extraction and Merchants Positional Accuracy: Positioned to an adjacent address or location	A14NE (E)	701	7	527840 185798
119	**Points of Interest - Manufacturing and Production** Name: Zarka Marble Ltd Location: 43 Belsize Lane, London, NW3 5AU Category: Extractive Industries Class Code: Stone Quarrying and Preparation Positional Accuracy: Positioned to address or location	A8SW (S)	827	7	526861 184917
119	**Points of Interest - Manufacturing and Production** Name: Zarka Marble Ltd Location: 43 Belsize Lane, London, NW3 5AU Category: Extractive Industries Class Code: Stone Quarrying and Preparation Positional Accuracy: Positioned to address or location	A8SW (S)	827	7	526861 184917
120	**Points of Interest - Public Infrastructure** Name: Hampstead Heath Rail Station Location: South End Road, NW3 Category: Public Transport, Stations and Infrastructure Class Code: Railway Stations, Junctions and Halts Positional Accuracy: Positioned to address or location	A13SE (SE)	129	7	527250 185634
120	**Points of Interest - Public Infrastructure** Name: Hampstead Heath Station Location: South End Road, NW3 Category: Public Transport, Stations and Infrastructure Class Code: Railway Stations, Junctions and Halts Positional Accuracy: Positioned to address or location	A13SE (SE)	129	7	527250 185634
121	**Points of Interest - Public Infrastructure** Name: Sluice Location: NW3 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A13NE (NE)	245	7	527235 185993
122	**Points of Interest - Public Infrastructure** Name: Hampstead Police Station Location: Hampstead Police Station 26, Rosslyn Hill, London, NW3 1PD Category: Central and Local Government Class Code: Police Stations Positional Accuracy: Positioned to address or location	A13SW (SW)	287	7	526883 185539

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
129	**Points of Interest - Recreational and Environmental** Name: Playground Location: St Crispins Close, NW3 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A13SE (SE)	229	7	527351 185608
129	**Points of Interest - Recreational and Environmental** Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A13SE (SE)	230	7	527351 185607
130	**Points of Interest - Recreational and Environmental** Name: Playground Location: Savernake Road, NW3 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location	A14NE (E)	704	7	527840 185823
130	**Points of Interest - Recreational and Environmental** Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A14NE (E)	705	7	527841 185818
131	**Points of Interest - Recreational and Environmental** Name: Playground Location: NW3 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A14NE (E)	829	7	527971 185781
131	**Points of Interest - Recreational and Environmental** Name: Adventure Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A14NE (E)	829	7	527971 185783
131	**Points of Interest - Recreational and Environmental** Name: Adventure Playground Location: NW3 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location	A14NE (E)	870	7	528011 185795
132	**Points of Interest - Recreational and Environmental** Name: Adventure Playground Location: NW3 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A9SW (SE)	881	7	527702 185026
132	**Points of Interest - Recreational and Environmental** Name: Adventure Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A9SW (SE)	923	7	527689 184963
132	**Points of Interest - Recreational and Environmental** Name: Adventure Playground Location: Fountain Mews, NW3 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A9SW (SE)	923	7	527689 184963
133	**Points of Interest - Recreational and Environmental** Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A14NE (E)	933	7	528075 185780
133	**Points of Interest - Recreational and Environmental** Name: Playground Location: Savernake Road, NW3 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A14NE (E)	933	7	528075 185779

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
147	**Local Nature Reserves** Name: Belsize Wood Multiple Area: N Area (m2): 2722.99 Source: Natural England Designation Date: 1st October 2004	A9NW (SE)	526	9	527487 185309
148	**Sites of Special Scientific Interest** Name: Hampstead Heath Woods Multiple Areas: Y Total Area (m2): 161715.26 Source: Natural England Reference: 1003451 Designation Details: Site Of Special Scientific Interest Designation Date: 18th April 1990 Date Type: Notified	A23SW (N)	999	9	526967 186766

Data Suppliers

A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
Environment Agency	
Scottish Environment Protection Agency	
The Coal Authority	
British Geological Survey	
Centre for Ecology and Hydrology	
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Peter Brett Associates	

Useful Contacts

Contact	Name and Address	Contact Details
1	**British Geological Survey - Enquiry Service** British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
2	**Environment Agency - National Customer Contact Centre (NCCC)** PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
3	**London Borough of Camden - Pollution Projects Team** Seventh Floor, Town Hall Extension, Argyle Street, London, WC1H 8EQ	Telephone: 020 7278 4444 Fax: 020 7860 5713 Website: www.camden.gov.uk
4	**Environment Agency - Head Office** Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD	Telephone: 01454 624400 Fax: 01454 624409
5	**Ordnance Survey** Adanac Drive, Southampton, Hampshire, SO16 0AS	Telephone: 03456 05 05 05 Email: customerservices@ordnancesurvey.co.uk Website: www.ordnancesurvey.gov.uk
6	**London Borough of Camden** Town Hall, Judd Street, London, WC1H 9JE	Telephone: 020 7974 4444 Fax: 020 7974 6866 Email: info@camden.gov.uk Website: www.camden.gov.uk
7	**PointX** 7 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY	Website: www.pointx.co.uk
8	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9966 Fax: 0844 844 9951 Email: helpdesk@landmark.co.uk Website: www.landmark.co.uk
9	**Natural England** County Hall, Spetchley Road, Worcester, WR5 2NP	Telephone: 0300 060 3900 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
-	**Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards** Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.

Geology 1:50,000 Maps Legends

Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	WGR	Worked Ground (Undivided)	Void	Not Supplied - Holocene

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	STGR	Stanmore Gravel Formation	Sand and Gravel	Not Supplied - Pleistocene

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	LC	London Clay Formation	Clay, Silt and Sand	Not Supplied - Ypresian
	CLGB	Claygate Member	Clay, Silt and Sand	Not Supplied - Ypresian
	BGS	Bagshot Formation	Sand	Not Supplied - Ypresian

GEA

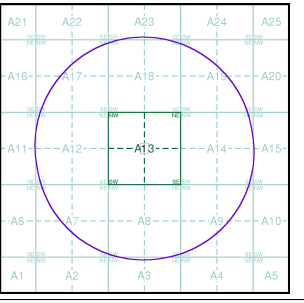
Geology 1:50,000 Maps

This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.
The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage

Map ID:	**1**
Map Sheet No:	**256**
Map Name:	**North London**
Map Date:	**2006**
Bedrock Geology:	**Available**
Superficial Geology:	**Available**
Artificial Geology:	**Available**
Faults:	**Not Supplied**
Landslip:	**Available**
Rock Segments:	**Not Supplied**

Geology 1:50,000 Maps - Slice A



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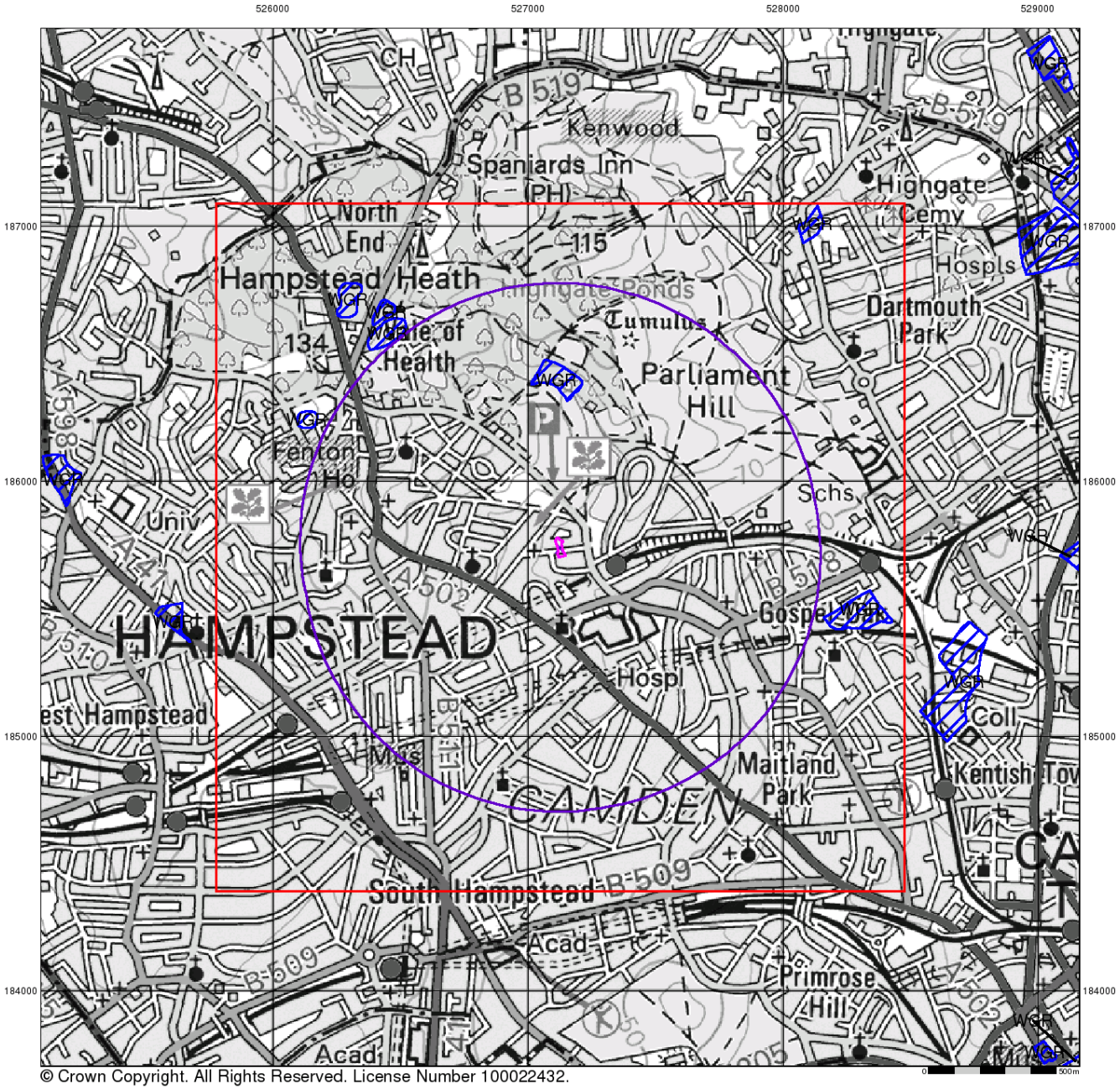
National Grid Reference:	527120, 185740
Slice:	A
Site Area (Ha):	0.16
Search Buffer (m):	1000

Site Details:

12, Keats Grove, LONDON, NW3 2RN



GEA

Artificial Ground and Landslip

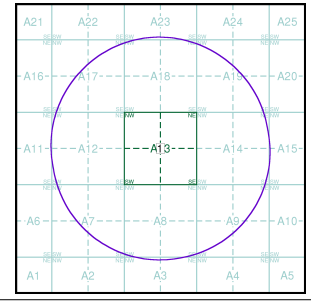
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes foundered strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



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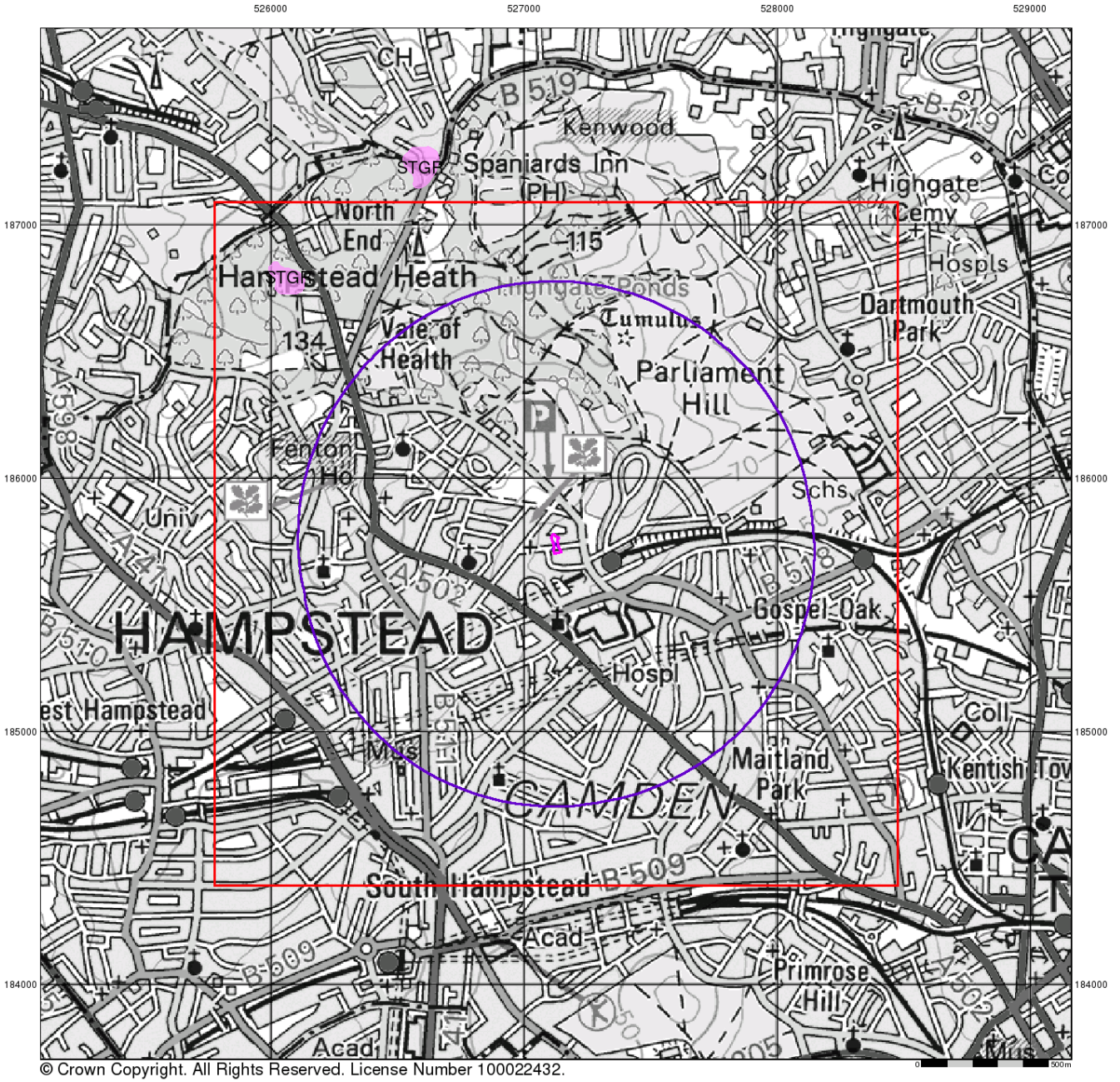
Web: www.envirocheck.co.uk



GEA

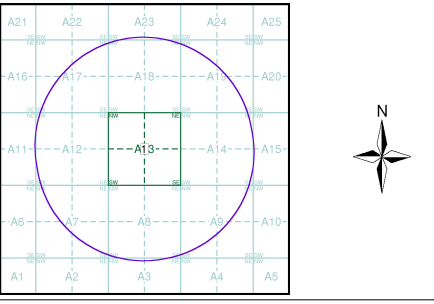
Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A



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Site Area (Ha):	0.16
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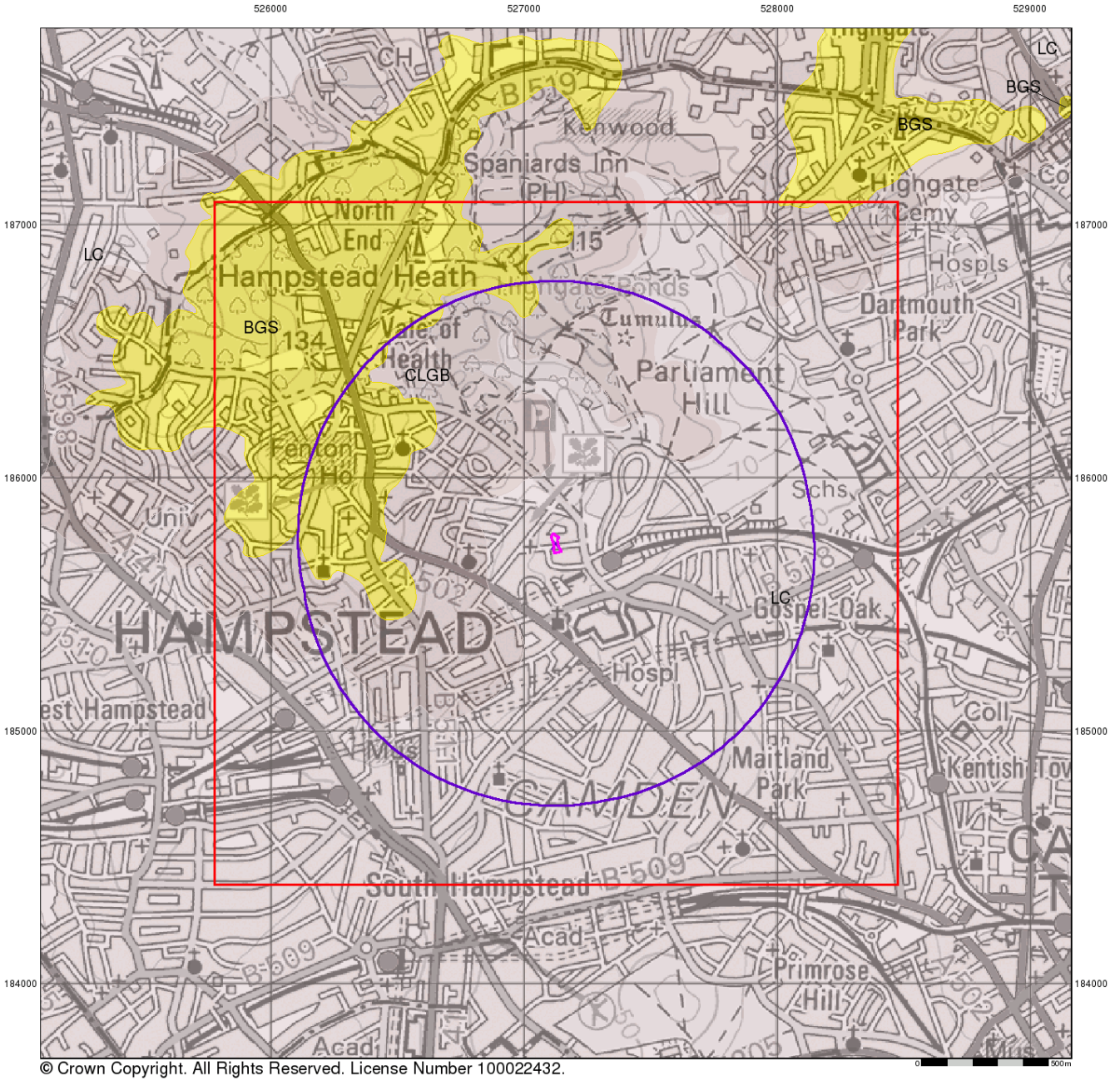


GEA

Bedrock and Faults

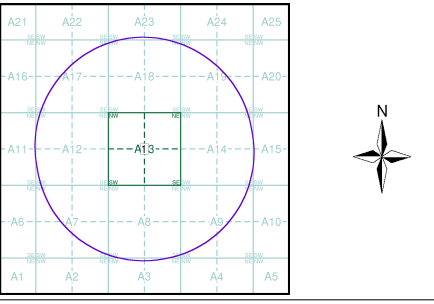
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

Bedrock and Faults Map - Slice A



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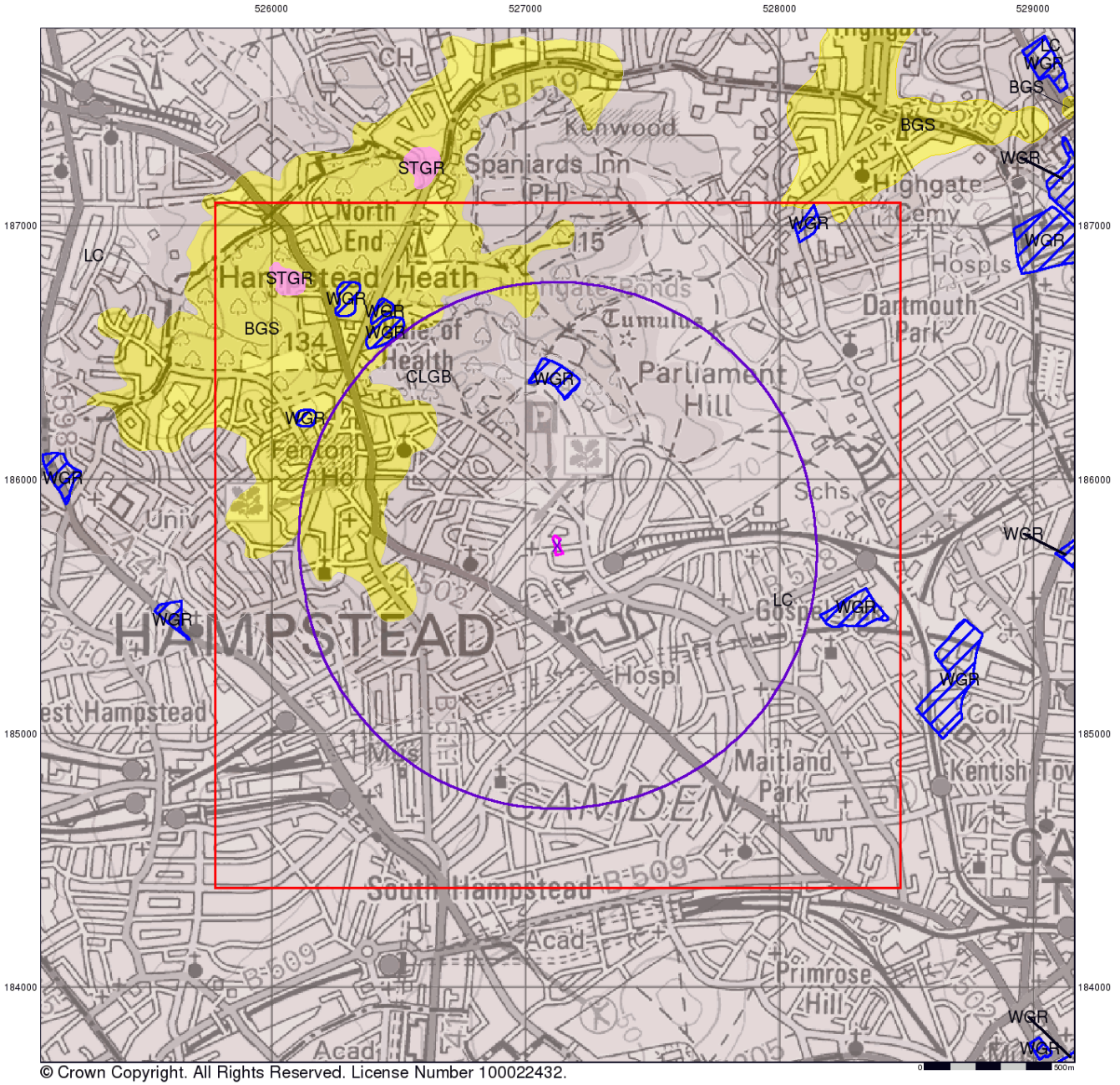


GEA

Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

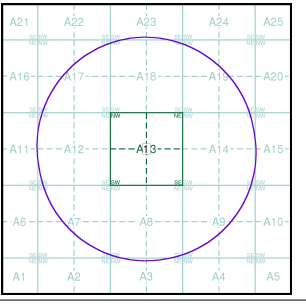
Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

Combined Geology Map - Slice A



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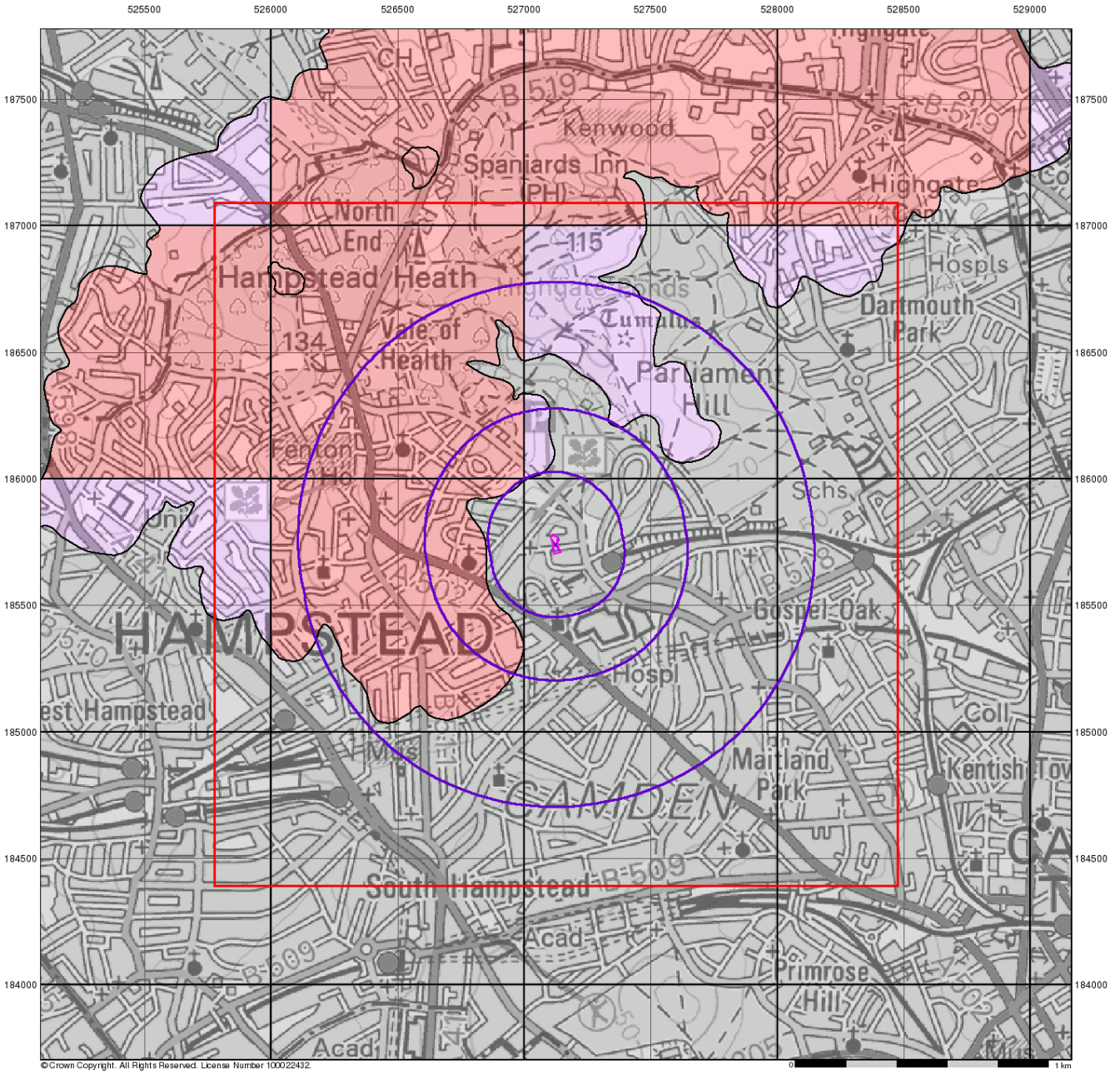


GEA

Groundwater Vulnerability

General

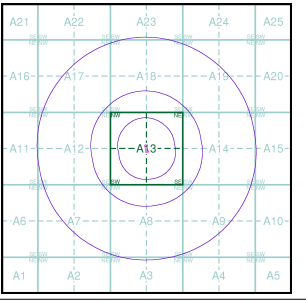
Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Agency and Hydrological

Bedrock Aquifers	Superficial Aquifers
High Vulnerability, Principal Aquifer	High Vulnerability, Principal Aquifer
High Vulnerability, Secondary Aquifer	High Vulnerability, Secondary Aquifer
Medium Vulnerability, Principal Aquifer	Medium Vulnerability, Principal Aquifer
Medium Vulnerability, Secondary Aquifer	Medium Vulnerability, Secondary Aquifer
Low Vulnerability, Principal Aquifer	Low Vulnerability, Principal Aquifer
Low Vulnerability, Secondary Aquifer	Low Vulnerability, Secondary Aquifer

Unproductive Aquifer
Soluble Rock

Site Sensitivity Context Map - Slice A



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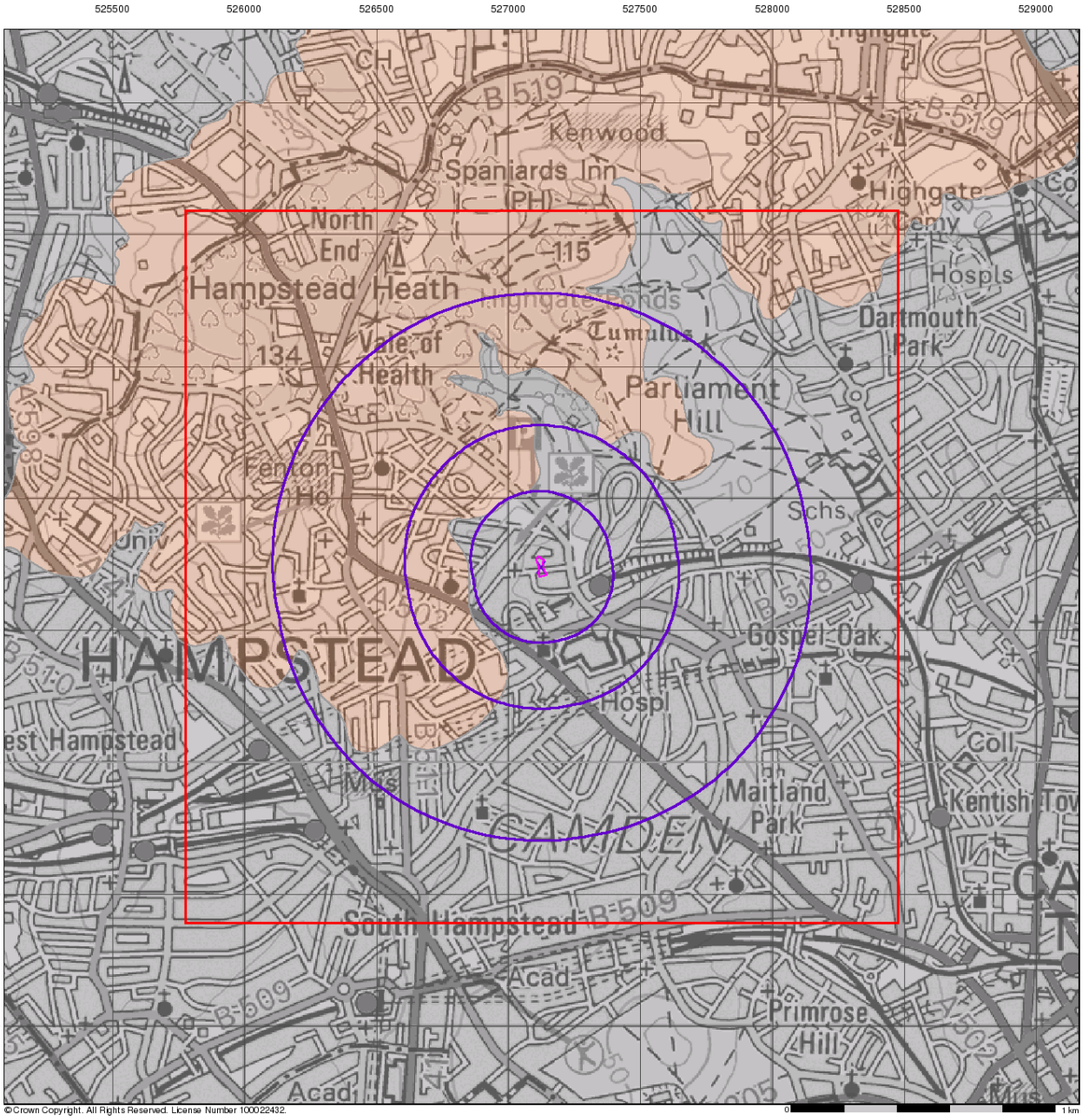


GEA

Bedrock Aquifer Designation

General

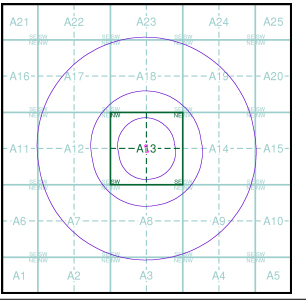
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



Order Details

Order Number:	215322376_1_1
Customer Ref:	J19228
National Grid Reference:	527120, 185740
Slice:	A
Site Area (Ha):	0.16
Search Buffer (m):	1000

Site Details

12, Keats Grove, LONDON, NW3 2RN