SITE INVESTIGATION & BASEMENT IMPACT ASSESSMENT REPORT

62a Haverstock Hill/
201 Prince of Wales Road
London
NW3 2BH

Client: E. Sharon Group (Management) Limited

Engineer: Price & Myers

J14334

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GEA Geotechnical & Environmental Associates

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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 Price and Myers, on behalf of E. Sharon Group (Management) Ltd, with respect to the proposed demolition of the existing two-storey building and subsequent construction of a three-storey residential building with a single level basement beneath the entire footprint of the site. The purpose of the investigation has been to research the history of the site with respect to possible contaminative uses, to determine the ground conditions and hydrogeology, to assess the extent of any contamination and to provide information to assist with the design of suitable foundations and retaining walls. The report also includes information required to comply with the London Borough of Camden (LBC) Planning Guidance CPG4, relating to the requirement for a Basement Impact Assessment (BIA) including a ground movement assessment.

SITE HISTORY

The earliest map studied, dated 1875, shows the site to be developed with what appears to be the existing two buildings, fronting onto Haverstock Hill to the southwest and Prince of Wales Road to the north. The surrounding area was mostly developed with terraced and semi-detached housing. The site and surrounding area have essentially remained unchanged to the present day.

GROUND CONDITIONS

The investigation has generally confirmed the expected ground conditions in that, below a moderate thickness of made ground, London Clay was encountered and proved to the full depth investigated. Beneath a suspended wooden floor, a void was encountered, which extended to depths of between 0.29 m and 0.44 m, overlying made ground, generally comprised of brown silty clay with flint gravel with fragments of brick, burnt coal and concrete, which extended to depths of between 1.50 m and 1.80 m, where proved. The underlying London Clay comprised typical weathered firm becoming stiff brown mottled grey silty fissured clay with occasional partings of orange-brown fine sand and silt, proved to the maximum depth investigated of 4.00 m.

Groundwater was not encountered during drilling; however perched water was encountered around the base of the existing foundations in Trial Pit Nos 5 and 6 at depths of 0.87 m and 1.40 m respectively.

Contamination testing has revealed an elevated concentration of lead within one of the samples tested.

RECOMMENDATIONS

Based on the observations to date, significant groundwater inflows are not anticipated, subject to the results of further groundwater monitoring and ideally trial excavations to the full depth of the proposed basement, once access becomes available.

Assuming that groundwater inflows do not affect the excavation, spread foundations excavated from basement level to bear within the London Clay may be designed to provide an allowable bearing pressure of 150 kN/m^2, or alternatively piles could also be used for the support of the structural loads. Excavations for the proposed basement structure will require support to maintain stability and prevent any excessive ground movements. The stability of neighbouring structures will need to be ensured at all times and the retaining walls will need to be designed to accommodate the loads from these foundations unless they are underpinned.

The made ground will be removed by the basement construction and there will therefore be no contamination risk to end users.

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. An assessment of ground movements is included in this report.

Part 1: INVESTIGATION REPORT

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

1.0 INTRODUCTION

Geotechnical and Environmental Associates (GEA) has been commissioned by Price and Myers, on behalf of E. Sharon Group (Management) Ltd, to carry out a desk study and ground investigation at 62a Haverstock Hill / 201 Prince of Wales Road, London, NW3 2BH. This report also includes a Basement Impact Assessment (BIA), which has been carried out in support of a planning application.

A ground movement analysis is included as part of this report.

1.1 Proposed Development

It is proposed to demolish the existing two-storey building and to subsequently construct a three-storey residential building with a single level basement, to depths of between about 4.6 m to 5.2 m, beneath the entire footprint of the site.

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 and surrounding areas with respect to previous contaminative uses;
- to determine the ground conditions and their engineering properties;
- to assess the possible impact of the proposed development on the local hydrogeology;
- to provide advice with respect to the design of suitable foundations and retaining walls;
- 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 readily available geological and hydrogeological maps;
- a review of historical Ordnance Survey (OS) maps and environmental searches sourced from the Envirocheck database; and

- a walkover survey of the site carried out in conjunction with the fieldwork.

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

- three drive-in window sampler boreholes advanced to depths of up to 4.00 m;
- installation of three groundwater monitoring standpipes, to depths of between 3.21 m and 3.40 m and a single subsequent groundwater monitoring visit. A second monitoring visit is planned and will be reported as an addendum;
- in addition, a total of six hand dug trial pits were excavated to depths of between 0.72 m and 1.90 m, to determine the configuration of existing foundations;
- laboratory testing of selected soil samples for geotechnical purposes and for the presence of contamination; and
- 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.

1.3.1 Basement Impact Assessment

The work carried out also includes a Hydrological and Hydrogeological Assessment and Land Stability Assessment (also referred to as Slope Stability Assessment), all of which form part of the BIA procedure specified in the London Borough of Camden (LBC) Planning Guidance CPG4[2] and their Guidance for Subterranean Development[3] prepared by Arup. The aim of the work is to provide information on surface water, land stability and groundwater 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.

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 CPG4 *Basements and lightwells*
3 Ove Arup & Partners (2010) *Camden geological, hydrogeological and hydrological study. Guidance for Subterranean Development.* For London Borough of Camden November 2010

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 over 25 years' experience in geotechnical engineering and engineering geology.

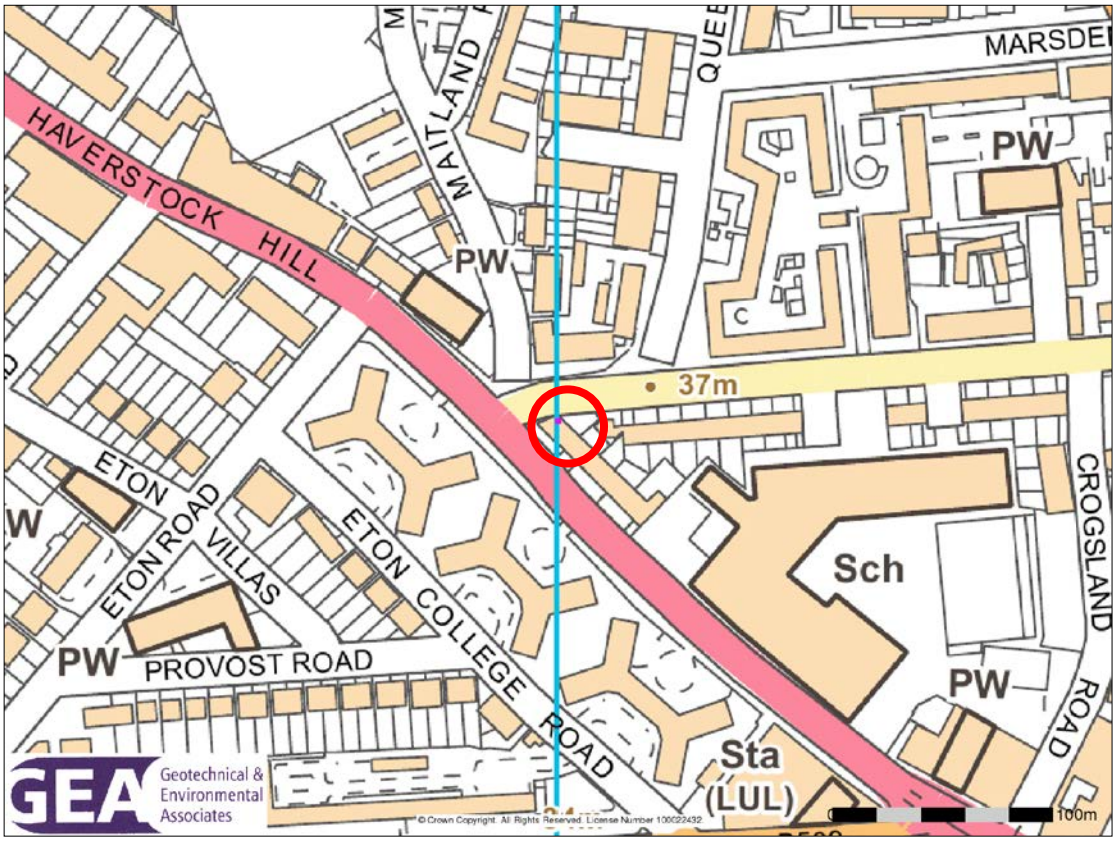
All assessors meet the qualification requirements of the Council guidance.

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 and the number of locations where the ground was sampled. 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 a mainly residential area in the London Borough of Camden, approximately 225 m to the northwest of Chalk Farm London Underground Station. It is located on a corner plot, such that it fronts onto Haverstock Hill to the southwest and Prince of Wales Road to the north. It is bounded to the northeast by No 200 Prince of Wales Road; a single storey building with semi-basement and to the southeast by a row of terraced houses

with semi-basements fronting onto Haverstock Hill. The site may additionally be located by National Grid Reference 528000, 184590 and is shown on the map extract above.

A walkover of the site was carried out by a geotechnical engineer from GEA at the time of the fieldwork. The site is roughly triangular in shape, measuring approximately 20 m northeast-southwest by 10 m northwest-southeast and is currently occupied by a disused two-storey building, comprised of No 62a Haverstock Hill and No 201 Prince of Wales Road.

It is understood that a paved garden area is present in the centre of the site, to the south of Prince of Wales Road, but this was not accessible. The site appears to be devoid of significant vegetation and is sensibly level, although Haverstock Hill slopes down towards the south.

Both buildings were in poor condition with ceiling damage in No 62a Haverstock Hill, thought to be the result of a leak along with rotten floorboards locally. It is understood that the buildings have been squatted for the last few years.

2.2 Site History

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

The earliest map studied, dated 1875, shows the site to be developed with what appears to be the existing two buildings, fronting onto Haverstock Hill to the southwest and Prince of Wales Road to the north. The surrounding area was mostly developed with terraced and semi-detached housing. The site and surrounding area have essentially remained unchanged to the present day.

2.3 Other Information

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

The Envirocheck report has indicated no landfill sites, waste management or waste transfer sites located within 800 m of the site. In addition there have been no pollution incidents within 1 km of the site.

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

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

The London Underground (LUL) Northern Line tunnel is located to the southwest of the site, at approximately 4.0 m at its closest passing to the site, and the tunnel crown is located at 24.50 m above OD, about 14.10 m below site level.

2.4 Geology

The British Geological Survey (BGS) map of the area (Sheet 256) indicates that the site is underlain by London Clay.

According to the British Geological Society memoir, the London Clay Formation is homogenous, slightly calcareous silty clay to very silty clay, with some beds of clayey silt grading to silty fine grained sand.
A nearby investigation carried out by GEA, approximately 125 m to the east of the site on Prince of Wales Road, indicated the made ground to be generally encountered to a maximum depth of 2.6 m, comprising brown sandy gravelly clay or clayey sand with fragments of brick, ash and clinker and large concrete obstructions. The London Clay typically comprised firm brown mottled grey fissured silty clay with occasional partings of silty sand, becoming stiff from depths of between 3.5 m and 3.7 m, and was proved to the maximum depth investigated of 6.45 m.

2.5 Hydrology and Hydrogeology

The London Clay is classified by the Environment Agency as unproductive strata, which refers to deposits that have low permeability and negligible significance for water supply or river base flow.

There are no Environment Agency designated Groundwater Source Protection Zones (SPZs) on the site and there are no listed water abstraction points within 450 m of the site.

The nearest surface water feature is Regents Canal, located 702 m south of the site.

In the aforementioned GEA investigation, groundwater was generally encountered within the made ground at depths of between 2.3 m and 2.8 m.

Due to the predominantly cohesive nature of the soils, the groundwater flow rate is likely to be negligible. Published data for the permeability of the London Clay indicates the horizontal permeability to generally range between 1 x 10^{-10} m/s and 1 x 10^{-8} m/s, with an even lower vertical permeability.

The site is not at risk of flooding from rivers or sea, as defined by the Environment Agency; Haverstock Hill has not been identified as a street at risk of surface water flooding, specified in the London Borough of Camden (LBC) Planning Guidance CPG4, but Prince of Wales Road has, and therefore a flood risk assessment may be required.

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.

2.6.1 Source

The desk study findings indicate the site not to have had a contaminative history as the site has been developed with the existing buildings for its entire developed history, since the first map studied. The site and immediate surrounding areas are not considered to have had a contaminative history. In addition, there are no historical or existing landfill sites within 250 m and a risk of soil gas has not been identified. A fuel station is located 204 m southeast, but is labelled as obsolete, is located downslope and the site is underlain by unproductive strata, and so there is a low risk of contamination leakage on site.

2.6.2 Receptor

The site will continue to have a residential end use following the excavation of the basement and no new receptors will result. However, the residential end use is considered a high sensitivity end-use. 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 direct contact with any contaminants present in the soil and through inhalation of vapours during basement excavation and construction.

2.6.3 Pathway

The proposed development comprises construction of a basement beneath the entire site. As such, end users will be isolated from direct contact with any contaminants present within the near surface soils by the presence of the building. The presence of negligibly permeable London Clay beneath the site will limit the potential for groundwater percolation into the underlying chalk, and thus a pathway is not considered likely to exist to the principal aquifer. There will be limited potential for contaminants to move on or off the site, except horizontally within any made ground in association with perched groundwater movements, although this pathway is also already in existence. A pathway for ground workers to come into contact with any contamination will exist during demolition and 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 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: there should thus be no need to consider landfill gas exclusion systems.

3.0 SCREENING

The London Borough of Camden guidance suggests that any development proposal that includes a subterranean basement should be screened to determine whether or not a full Basement Impact Assessment (BIA) 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 Appendix E which includes a series of questions within a screening flowchart for three categories; groundwater flow; land stability; and surface water flow. Responses to the questions are tabulated on the following pages.

3.1.1 Subterranean (groundwater) Screening Assessment

Question	Response for 62a Haverstock Hill / 201 Prince of Wales Road
1a. Is the site located directly above an aquifer?	No. The Site is underlain by the London Clay which is designated as Unproductive Strata by the Environment Agency and cannot store and transmit water in sufficient quantities to support groundwater abstractions or watercourses.

Question	Response for 62a Haverstock Hill / 201 Prince of Wales Road
1b. Will the proposed basement extend beneath the water table surface?	Unlikely. The London Clay cannot conduct groundwater flow and therefore does not have a water table.
2. Is the site within 100 m of a watercourse, well (used/ disused) or potential spring line?	No. The nearest surface water is located approximately 702 m south of the site and there are no historic rivers located within 250 m of the site.
3. Is the site within the catchment of the pond chains on Hampstead Heath?	No
4. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	No
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)?	Unlikely, given that the site is underlain by clay soils and is unlikely to be suitable for a soakaway or similar SUDS based system and therefore site drainage will be directed to public sewer, as is currently the case.
6. Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to or lower than, the mean water level in any local pond or spring line?	No

The above assessment has identified no potential issues that need to be assessed.

Any potential issues that need to be assessed, along with the possible effects of the basement construction on the local hydrology and hydrogeology and are discussed further in Part 2 of this report.

3.1.2 Stability Screening Assessment

Question	Response for 62a Haverstock Hill / 201 Prince of Wales Road
1. Does the existing site include slopes, natural or manmade, greater than 7°?	No
2. Will the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7°?	No
3. Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?	No
4. Is the site within a wider hillside setting in which the general slope is greater than 7°?	No
5. Is the London Clay the shallowest strata at the site?	*Yes*
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?	No
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 clay soils, such as London Clay.*
8. Is the site within 100 m of a watercourse or potential spring line?	No. The nearest surface water is located approximately 702 m south of the site and there are no historic rivers located within 250 m of the site.
9. Is the site within an area of previously worked ground?	No
10a. Is the site within an aquifer?	No. The site is underlain by the London Clay which is designated as Unproductive Strata by the Environment Agency and cannot store and transmit usable amounts of water.
10b. Will the proposed basement extend beneath the water table such that dewatering may be required during construction?	Unlikely.

Question	Response for 62a Haverstock Hill / 201 Prince of Wales Road
11. Is the site within 50 m of Hampstead Heath ponds?	No
12. Is the site within 5 m of a highway or pedestrian right of way?	*Yes - the site fronts onto Haverstock Hill to the southwest and Prince of Wales Road to the north.*
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	*Possibly. The neighbouring properties appear to have single level basements.*
14. Is the site over (or within the exclusion zone of) any tunnels, eg railway lines?	*Yes. The Northern Line Tunnel is located approximately 4.0 m from site at a level of 24.50 m above OD level, equating to about 14.10 m below site level.*

The above assessment has identified the following potential issues that need to be assessed:
Q5. London Clay is the shallowest strata at the site.
Q7. The site is within an area of seasonal shrink-swell.
Q12. The site is within 5 m of a public highway.
Q13 The development will increase the foundation depths relative to the neighbouring properties.
Q14. The site is located within an exclusion zone of a tunnel.

The potential issues that need to be assessed, along with the possible effects of the basement construction on the local hydrology and hydrogeology and are discussed further in Part 2 of this report.

3.1.3 Surface Flow and Flooding Screening Assessment

Question	Response for 62a Haverstock Hill / 201 Prince of Wales Road
1. Is the site within the catchment of the pond chains on Hampstead Heath?	No. Figure 14 of the Camden geological, hydrogeological and hydrological study – Guidance for subterranean development dated 2010, 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 ground surface above the basement. There will be no surface expression of the basement development, so the surface water flow regime will be unchanged. The basement will be completely beneath the footprint of the dwelling therefore the 1m distance between the roof of the basement and ground surface as recommended by the *Camden geological, hydrogeological and hydrological study – Guidance for subterranean development* dated 2010, 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 an increase in impermeable area across the ground surface above the basement. There will be no surface expression of the basement development.
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 ground surface above the basement. There will be no surface expression of the basement development, so the surface water flow regime will be unchanged. The basement will be completely beneath the footprint of the dwelling therefore the 1m distance between the roof of the basement and ground surface as recommended by the Camden geological, hydrogeological and hydrological study – Guidance for subterranean development dated 2010, does not apply.

5. Will the proposed basement result in changes to the quantity of surface water being received by adjacent properties or downstream watercourses?	No. There will be no surface expression of the basement development, so the surface water flow regime will be unchanged. There will not be an increase in impermeable area and therefore no increased quantity of surface water being discharged from the site. Additionally, off-site discharge will be via the sewer and so there will be no impact on adjacent properties or off-site 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?	No. The Camden Flood Risk Management Strategy dated 2013, North London Strategic Flood Risk Assessment dated 2008, and Environment Agency online flood maps show that the site has a low flooding risk from surface water, sewers, reservoirs (and other artificial sources), groundwater and fluvial/tidal watercourses. However, Prince of Wales Road is identified on Figure 15 of *Camden geological, hydrogeological and hydrological study – Guidance for subterranean development dated 2010,* to have flooded in the past. The site is located within the Critical Drainage Area number GROUP3-003 as identified in the Camden SWMP.

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

Q6. Prince of Wales Street is shown to have flooded in 2008 from surface water.

The potential issues that need to be assessed, along with the possible effects of the basement construction on the local hydrology and hydrogeology and are discussed further in Part 2 of this report.

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.

The potential impacts of the proposed development on surface flow and flooding and subterranean flow will need to be dealt with in separate assessments, such that the following section focuses on the potential impacts that may have an impact on slope stability.

4.1 Potential Impacts

The following potential impacts have been identified.

Potential Impact	Consequence
London Clay is the shallowest stratum on the site.	The London Clay is prone to seasonal shrink-swell and can cause structural damage.
Seasonal shrink-swell can result in foundation movements.	If a new basement is not dug to below the depth likely to be affected by tree roots this could lead to damaging differential movement between the subject site and adjoining properties.
Site within 5 m of a highway or pedestrian right of way.	Excavation of a basement may result in structural damage to the road or footway.
Founding depths relative to neighbours.	If not designed and constructed appropriately, the excavation of a basement may result in structural damage to neighbouring buildings and structures.
The site is within an area known to be at risk of surface water flooding.	If not designed appropriately, the basement and ground floor of the development could be liable to surface water flooding.
The location of the Northern Line Underground tunnel	If not designed and constructed appropriately, the basement may affect the tunnel structure.

These potential impacts have been investigated through the site investigation, as detailed in Section 9.0.

4.2 Exploratory Work

Access was severely limited by the presence of the existing buildings. Therefore, in order to meet the objectives described in Section 1.2, as far as possible within the constraints presented by the restricted access and poor condition of the building, three hand-held window-sampler boreholes were advanced to a depth of 4.00 m through the base of three of the trial pits, excavated to examine the configuration of the existing foundations. In total six trial pits were hand dug to depths of 0.72 m and 1.90 m.

A total of three groundwater monitoring standpipes were installed to depths of between 3.21 m and 3.40 m, and have been monitored on a single occasion to date, roughly four weeks after installation. A further monitoring visit is planned and will be reported as an addendum.

A selection of the disturbed samples recovered from the trial pits and boreholes were 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 full time supervision of a geotechnical engineer from GEA.

The borehole records and results of the laboratory testing are appended, together with a site plan indicating the exploratory positions.

4.3 Sampling Strategy

The scope of the works was determined by the limited access and agreed with the consulting engineers and was designed to provide information to assist with the planning application.

The trial pits and boreholes were agreed on site between the structural engineers and GEA, in accessible locations, whilst avoiding areas of buried services.

Four samples of made ground 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, speciation of total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH), total cyanide and monohydric phenols. The soil samples were selected to provide a general view of the chemical conditions of the soils that are likely to be involved in a human exposure or groundwater pathway and to provide advice in respect of re-use or for waste disposal classification.

The contamination analyses were carried out at a MCERTs accredited laboratory with the majority of the testing suite accredited to MCERTS standards. Details of the MCERTs accreditation and test methods are included in the Appendix together with the analytical results.

5.0 GROUND CONDITIONS

The investigation has confirmed the expected ground conditions in that, below a moderate thickness of made ground, London Clay was encountered to the full depth investigated.

5.1 Made Ground

Beneath a suspended wooden floor, a void was encountered, which extended to depths of 0.29 m and 0.44 m, overlying made ground, generally comprised of brown silty clay with flint gravel with fragments of brick, burnt coal and concrete, which extended to depths of between 1.5 m and 1.8 m, where proved. The base of the made ground was not proved in Trial Pits 1, 3, 5 and 6.

Apart from the presence of fragments of extraneous material noted above, no visual or olfactory evidence of contamination was observed during the fieldwork. Four samples of the made ground have been sent for contamination testing as a precautionary measure and the results are presented in Section 5.5.

5.2 London Clay

The London Clay comprised weathered firm becoming stiff brown mottled grey silty fissured clay with occasional partings of orange-brown fine sand and silt, and was proved to the maximum depth investigated of 4.00 m.

Laboratory plasticity index test results indicate the clay to be of high volume change potential.

No evidence of contamination was noted in these soils.

5.3 Groundwater

Groundwater was not encountered during drilling; however perched water was encountered around the base of the existing foundations in Trial Pit Nos 5 and 6 at depths of 0.87 m and 1.40 m respectively.

The results of the monitoring visit are shown in the table below.

Borehole No	Standpipe depth (m)	Depth to groundwater (m)
		10/12/14
1	3.21	1.69
2	3.22	2.76
3	3.40	3.28

5.4 Soil Contamination

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

Determinant	TP2 – 1.00 m	TP3 - 0.50 m	TP4 - 1.00 m	TP6 - 0.70 m
pH	8.1	7.8	7.7	7.9
Arsenic	17	13	13	8.7
Cadmium	0.10	0.11	<0.10	<0.10
Chromium	34	35	46	12
Copper	58	29	24	22
Mercury	0.71	0.58	0.15	0.68
Nickel	16	30	39	8.7
Lead	**400**	130	71	120
Selenium	<0.20	<0.20	<0.20	<0.20
Zinc	100	68	64	920
Total Cyanide	<0.50	<0.50	<0.50	<0.50
Total Phenols	<0.30	<0.30	<0.30	<0.30
Sulphide	<0.50	<0.50	<0.50	<0.50
Total PAH	<2.0	<2.0	<2.0	<2.0
Benzo(a)pyrene	<0.10	<0.10	<0.10	<0.10
Naphthalene	<0.10	<0.10	<0.10	<0.10
TPH	<10	<10	<10	<10
Total organic carbon %	1.0	0.58	0.46	1.3

Notes: Figure in **bold** indicates concentration in excess of risk-based soil guideline values, as discussed in Part 2 of this report

5.4.1 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. To this end the table below indicates those contaminants of concern that have values in excess of a generic human health risk based guideline values which are either that of the CLEA[4] Soil Guideline Value where available, or is a Generic Screening Value calculated using the CLEA UK Version 1.06[5] software assuming a residential end use, or is based on the DEFRA Category 4 Screening values[6]. The key generic assumptions for this end use are as follows:

- that groundwater will not be a critical risk receptor;
- that the critical receptor for human health will be young female children aged zero to six years old;

4 *Updated Technical Background to the CLEA Model (Science Report SC050021/SR3) Jan 2009* and Soil Guideline Value reports for specific contaminants; all DEFRA and Environment Agency.
5 Contaminated Land Exposure Assessment (CL|EA) Software Version 1.06 Environment Agency 2009
6 CL:AIRE (2013) *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination* Final Project Report SP1010 and DEFRA (2014) *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination* Policy Companion Document SP1010

- 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 indoor dust, and inhalation of indoor and outdoor dust and vapours; and
- that the building type equates to a two-storey small terraced house.

It is considered that these assumptions are acceptable for this generic assessment of this site, albeit conservative as the proposed new building will cover the entire footprint of the site, with the made ground excavated for the basement excavation and no proposed soft landscaped or garden areas. The tables of generic screening values derived by GEA and an explanation of how each value has been derived are included in the Appendix.

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

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

A single elevated concentration of lead was measured within the made ground from Trial Pit No 2 at a depth of 1.00 m.

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

Part 2: DESIGN BASIS REPORT

This section of the report provides an interpretation of the findings detailed in Part 1, in the form of a ground model, and then provides advice and recommendations with respect to the basement excavation, contamination and foundation issues.

6.0 INTRODUCTION

It is proposed to construct a single level basement beneath the entire site. The proposed new basement will extend to depths of between about 4.6 m to 5.2 m.

7.0 GROUND MODEL

The desk study has revealed that the site has not had a potentially contaminative historical use as it has been developed with the existing buildings for its entire developed history, and on the basis of the fieldwork, the ground conditions at this site can be characterised as follows:

- the investigation encountered a moderate thickness of made ground, overlying the London Clay, which was proved to the full depth investigated of 4.00 m;
- beneath suspended wooden floor, a void was encountered to between 0.29 m and 0.44 m;
- below which, made ground was encountered, comprising brown silty clay with flint gravel, brick, burnt coal and concrete fragments extending to between 1.50 m and 1.80 m;
- the London Clay generally comprised firm becoming stiff brown mottled grey silty fissured clay with occasional orange-brown partings of fine sand and silt, extended to the maximum depth investigated of 4.00 m;
- groundwater was encountered in Trial Pit No 5 at 0.87 m and in Trial Pit No 6 at 1.40 m, both after the pits had been excavated;
- subsequent monitoring on one occasion to date has measured groundwater at depths of between 1.69 m and 3.28 m; and
- contamination testing has revealed a single elevated concentration of lead within the made ground.

8.0 ADVICE AND RECOMMENDATIONS

It is proposed to construct a basement beneath the entire site footprint. The basement will extend to depths of between about 4.60 m and 5.20 m, below existing ground floor level within the London Clay.

The results of the groundwater monitoring to date indicate that it may not be possible to construct the basement without some form of groundwater control. Shallow monitored groundwater levels within standpipes is a common feature of low permeability clay strata and is not necessarily indicative of a consistent water table as would be the case within a

permeable water bearing strata. Thus, although the basement may extend below the monitored water levels in standpipes it is not the case that it extends below a general groundwater table.

Excavations for the proposed basement structure will require temporary support to maintain stability of the excavation and surrounding structures at all times. It will be necessary to underpin the foundations of the adjoining neighbouring structures or to design the new retaining walls to accommodate the load from the existing structures.

8.1 Basement Construction

8.1.1 Basement Excavations

It is understood that it is proposed to demolish the existing building and construct a new three-storey building plus a single level basement extending to depths of about 4.60 m to 5.20 m, beneath the entire footprint of the site. Formation level for the basement is likely to be within the London Clay.

Perched water was encountered at the base of the foundations in Trial Pit Nos 5 and 6 at depths of 0.87 m and 1.40 m respectively. Subsequent monitoring to date measured water in the standpipes at depths of between 1.69 m and 3.28 m. This indicates that groundwater is likely to be encountered within the basement excavation but it is not clear to what extent the water in the pipes is indicative of perched groundwater within the made ground. In any case, inflows could conceivably occur from perched water tables, particularly in the vicinity of existing foundations but should be adequately dealt with through sump pumping. Continued monitoring of the standpipes is an essential requirement. It would be prudent to pump out the standpipes and monitor the rate at which groundwater levels in the standpipes recover to establish the rate of rise in groundwater and permeability of the London Clay.

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 may be governed to a large extent by access constraints, the requirement to prevent ground water inflows and whether it is to be incorporated into the permanent works and have a load bearing function.

It should be possible to form the retaining walls by underpinning of the existing foundations with the boundary walls, using a traditional ‘hit and miss’ approach, subject to further monitoring or trial excavations. Careful workmanship will be required to ensure that movement of the surrounding structures does not arise during underpinning of the existing foundations, but this method will have the benefit of minimising the plant required and maximising usable space in the new basement. The contractor should however have a contingency in place to deal with any groundwater inflows.

For the remainder of the basement it is understood that a sheet piled wall will be installed where there is no party wall. Consideration will need to be given to the noise and vibrations associated with this method.

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.

8.1.2 Retaining Walls

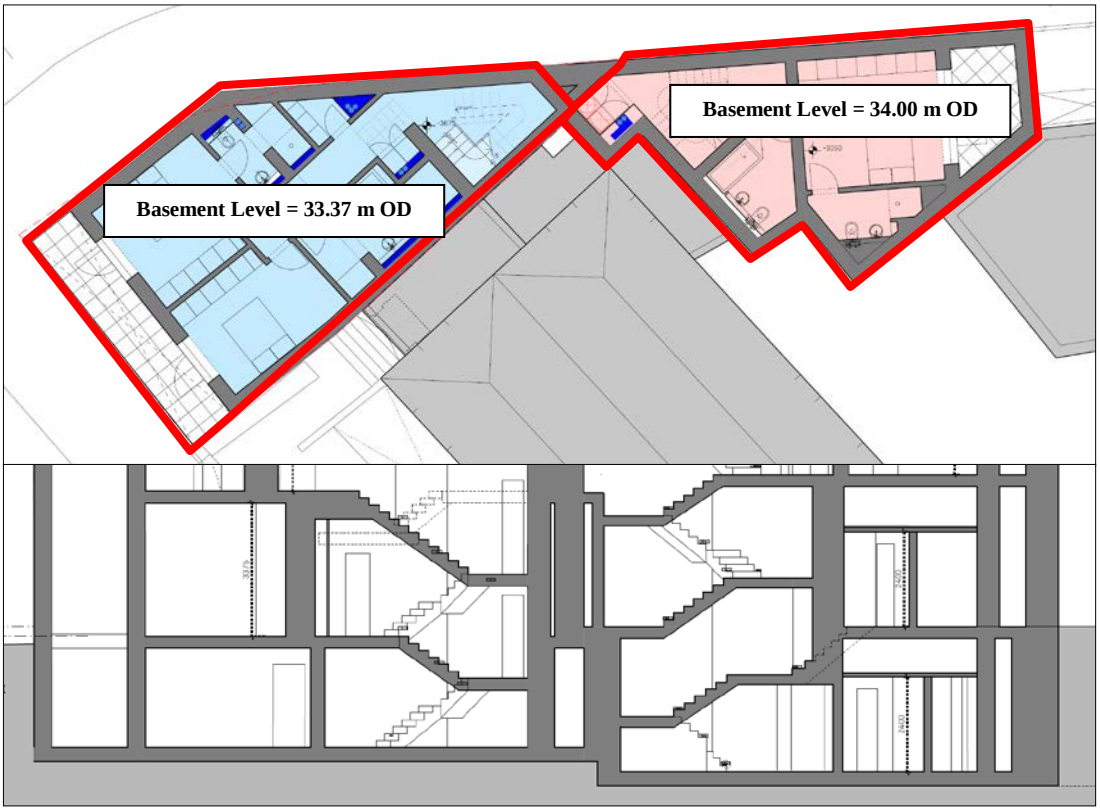
The following parameters are suggested for the design of the permanent basement retaining walls.

Stratum	Bulk Density (kg/m^3)	Effective Cohesion (c' – kN/m^2)	Effective Friction Angle (Φ' – degrees)
Made Ground	1700	Zero	20
London Clay	1950	Zero	25

Groundwater has been measured at depths of between 1.69 m and 3.28 m, with a further monitoring visit planned, and further monitoring should be continued in order to establish a design water level. On this basis, groundwater might be anticipated to be encountered in the 4.60 m to 5.20 m deep basement and further monitoring should be undertaken as detailed in Section 8.1.1. Reference should be made to BS8102:2009[7] with regard to requirements for waterproofing and design with respect to groundwater pressures.

8.2 Ground Movement Analysis

8.2.1 Proposed Basement



Section of Proposed Basement

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

Adopted model assumptions are as follows.

- Ground level is assumed to be 38.60 m OD across the site.
- Proposed basement depth assumed to be at a depth of between 5.23 m in the west and 4.60 m in the east.
- A sheet piled wall is modelled in the short term only and will be constructed adjacent to Haverstock Hill, Prince of Wales Road, the front garden of No 62 Haverstock Hill and the front and rear gardens of No 200 Prince of Wales Road;
- Sheet piled wall will be multi-propped and is assumed to be high stiffness to be able to resist the resultant bending moments. It is assumed to be left in the ground in the long term and as such is likely to reduce wall movements to a degree. Sheet piles are assumed to be installed to a depth of 8.60 m (30.00 m OD).
- An adjacent London Underground (LU) tunnel is present approximately 4.00 m from the southwestern boundary of site and the crown of the tunnel is assumed to be at a depth of 14.10 m (24.50 m OD).
    - No 62 Haverstock Hill is assumed to be 7.50 m in height, while No 200 Prince of Wales Road is assumed to be 2.50 m. The adjacent Haverstock Hill and Prince of Wales Road are assumed to be a nominal 0.10 m above ground level.
    - Underpins will be constructed beneath the existing party walls at No 62 Haverstock Hill in the short and long term, while the remainder basement perimeter will be formed with reinforced concrete retaining walls in the long term.
- Applied loads acting on new raft foundation and underpins are assumed to be mobilised in the long term only.
- All loads applied at assumed basement level.

The proposed construction of the new basement will result in a net unloading of roughly 100 kN/m^2 in the west and 90 kN/m^2 in the east.

Applied loadings to the new underpins will be 367 kN/m^2, while the basement raft will have an applied loading of 11.1 kN/m^2.

A rigid boundary for the analysis has been set at a depth of about -15 m OD.

8.2.2 Construction Sequence

On the basis of the ground investigation, the basement will have a formation level within the London Clay. Groundwater inflows are expected within the proposed basement and an underpinning specialist should be consulted to control the groundwater during construction, although it should be possible to adopt traditional reinforced concrete underpins beneath the existing house.

The construction method statement indicates the basement under the building will be generally constructed by underpinning the existing external and internal loadbearing structural walls. Where existing load bearing lines are not being carried through to the proposed basement level then new beams will support the structure over.

A sheet piled wall will be constructed to enable basement construction at the interface with Haverstock Hill, Prince of Wales Road and the adjacent gardens to No 62 Haverstock Hill and No 200 Prince of Wales Road in the short term. It is understood that this wall will be sacrificial and will ultimately form part of the permanent reinforced concrete retaining walls; it is likely that this will provide additional stiffness and rigidity in the long term.

The existing foundations of No 62 and party walls will be underpinned prior to basement excavation.

8.2.3 Basis of analysis

The analysis of potential ground movements has been carried out based on the assumption that the soils behave elastically, which provides a reasonable approximation to soil behaviour at small strains.

The table below summarises the assumed soil profile used in the analysis. The soil profile is based on a 25 m deep cable percussion borehole carried out a site approximately 180 m to the west.

Soil Profile	Depth of base of Stratum (m) [level (m)]	Young's Modulus (E' - kN/m2)	Young's Modulus (E_u - kN/m2)	Unit Weight (γ- kN/m3)
Made Ground	1.50 [37.1]	3000	5000	1,700
London Clay	53.00 [-15.0]	18,000 to 75,000	30,000 to 125,000	1,950

* Strengths interpolated based upon an assumed linear strength profile.

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 drained and undrained stiffness respectively, to values of undrained cohesion, as described by Padfield and Sharrock[8], Butler[9] and more recently O'Brien and Sharp[10]. For the purpose of this analysis, the following relationship has been adopted:

$Eu = 500\ c_u$ $E' = 300\ c_u$

On the basis of the above we have determined values of stiffness from the undrained cohesion profiles described above. Drained and undrained parameters have been used throughout, to provide an estimate of the total 'long term' and 'short term' movement. More recent published data[11] suggests higher values, but it is considered that the use of the lower values is a reasonable approach for a first analysis.

A rigid lower boundary for the analysis has been set within the London Clay at a level of about 53 m (-15.00 m OD).

[8] Padfield CJ and Sharrock MJ (1983) *Settlement of structures on clay soils.* CIRIA Special Publication 27
[9] Butler FG (1974) *Heavily overconsolidated clays: a state of the art review.* Proc Conf Settlement of Structures, Cambridge, 531-578, Pentech Press, Lond
[10] 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
[11] 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

8.2.4 Ground Movements Arising from Basement Excavation

An analysis of the resulting ground movements has been carried out using the Oasys PDisp (Version 19.2 – Build 12) software package based on the assumption that the soils behave elastically, which provides a reasonable approximation to soil behaviour at small strains.

The results of the heave analysis are included in the table presented below and contour plots are enclosed. Full tabular results can be provided upon request.

Location	Movement (mm)		
	Short-term heave (excavation phase)	Total heave	Total heave
5.2 m deep basement (west)			
Centre of excavation	9	6	15
Edge of excavation	5	0	5
Above LUL Tunnel	2	0	1

Short Term heave due to excavation (undrained condition)

At the centre of the excavations, up to 9 mm of heave has been estimated at the centre of the excavation in the short term, reducing to about 6 mm at the edges of the excavation and 2 mm at the approximate crown of the LU tunnel.

Long term heave due to excavation (drained condition)

Following completion of the basement construction, 10 mm of total heave is likely to have taken place in the centre of the excavation with a reduction to a total of 5 mm of heave predicted at the edges. The long term movement on the edges of the excavation will be resisted by the applied loads.

A void should be incorporated into the design of the basement floor slab to accommodate these potential long term movements. 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 50 % to 60 % of the total unloading pressure.

8.2.5 Ground Movements Induced by Sheet Piling and Underpinning

An analysis of the resulting ground movements has been carried out using the Oasys XDisp software package to calculate the horizontal and vertical displacements, including Building Damage Category, as a result of the proposed wall and basement excavations.

It is expected that settlement will occur at the proposed basement level as a result of the new underpins transferring the existing load from the building above to the London Clay at a greater depth than has hitherto been the case.

The lateral movement of material behind the new underpinned basement walls is unlikely to exceed 2 mm to 5 mm due to the construction process and anticipated stiffness of the walls, although this will depend on the workmanship and quality of the wall during construction.

The settlement will comprise an “immediate” component that may be expected to occur following loading of the soils, together with long term settlement due to consolidation of the clay that would theoretically occur over a period of many years. The excavation of the proposed basement will however result in heave of the underlying London Clay which is likely to reduce the estimated settlements.

8.2.6 Damage to Neighbouring Structures

The combined movements resulting from the basement excavation have been used to carry out an assessment of the likely damage to adjacent properties of Nos 62 Haverstock Hill and No 200 Prince of Wales Road and the results are summarised in the table below.

Building Damage Assessment			
Sensitive Structure	**Horizontal movements (mm)**	**Vertical Displacements outside of excavation (mm)**	**Burland Scale**
No 62 Haverstock Hill	21	14	Category 1 (Very Slight)
No 200 Prince of Wales Road	18	12	Category 0 (Negligible)

The building damage assessment for the sensitive structures identified in the above table predicts that the effect on the adjacent No 62 and No 200 Prince of Wales Road will be 'very slight' and negligible' respectively, as defined in the Burland damage categories. Settlements noted above are likely to be off-set to a certain degree by heave movements associated with the basement excavation.

8.2.7 Conclusions

On the basis of these results for the total movements, the building damage assessments for the adjacent structures of No 62 Haverstock Hill and No 200 Prince of Wales Road fall within Category 1 of the Building Damage Assessment, indicating a very slight class of damage which could include, for example, cracks up to 1 mm in width. All estimates of movement may be expected to have a tolerance of + / - 20 %, but this would still fall within Category 1.

Regular monitoring of the underpins should be undertaken during construction and compared with the predicted values. Good quality workmanship and propping in the short term and long term is essential to control ground movements.

8.3 Spread Foundations

The excavation to form the single level basement beneath the site will result in a formation level in the London Clay.

Groundwater inflows are likely to be encountered within the basement excavation, but inflows should be relatively slow, given the low permeability of the London Clay, but it may not be possible to form spread foundations, although this will depend on the basement support system and the extent to which a water-tight excavation is maintained at formation level, although some form of pumping will be required in any case to deal with water within the excavation. The volume of groundwater anticipated in the basement excavation should be further investigated, as discussed in Section 8.1.1.

If a dry excavation can be maintained, moderate width pad or strip foundations, bearing within firm London Clay, may be designed to apply a net allowable bearing pressure of 150 kN/m^2 below the formation level of the proposed 4.60 m to 5.20 m deep basement. This value incorporates an adequate factor of safety against bearing capacity failure and should ensure that settlement remains within normal tolerable limits.

8.4 Basement Raft Foundation

The suitability of a raft foundation will be governed by the net load of the new development, taking into consideration the weight of soil removed by the basement excavation. On this site, in view of the depth of the proposed excavation and the estimated heave it is anticipated that the gross load on the raft will not be sufficient to balance the weight of soil removed and the raft may need to be anchored into the ground by piles to resist movements. The raft could be constructed so that it forms a rigid box with the retaining walls such that differential movements are minimised. Further analyses should be carried out once the proposed uniform distributed load is known.

8.5 Shallow Excavations

On the basis of the borehole a trial pit findings it is considered likely that it will be feasible to form relatively shallow excavations for services terminating within the made ground without the requirement for lateral support, although localised instabilities may occur.

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

8.6 Basement Floor Slab

Following the excavation of the basement, 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. This should be reviewed once the levels and loads are known.

8.7 Effect of Sulphates

Chemical analyses carried out on four samples of made ground have revealed concentrations of soluble sulphate and pH in accordance with Class DS-2 conditions of Table C2 of BRE Special Digest 1 Part C (2005). The measured pH value of the samples shows that an ACEC class of AC-2s would be appropriate for the site. This assumes a static water condition at the site. The guidelines contained in the above digest should be followed in the design of foundation concrete.

8.8 Site Specific Risk Assessment

The desk study research has indicated that the site has not had a potentially contaminative history, having been occupied by the existing house throughout its developed history.

The chemical analyses revealed a single elevated concentration of lead at 400 mg/kg above the screening value of 200 mg/kg in a sample of the made ground tested from Trial Pit No 2 at a depth of 1.00 m. The results do not indicate widespread contamination of lead and the source of the lead is likely to be from an extraneous fragment of burnt coal noted within the sample.

The lead is considered to be non-volatile or of a low volatility and does not thus present a significant vapour risk. In addition the compounds are considered likely to be of low solubility and a risk to groundwater has not been identified.

The made ground will be removed by the basement construction and there will therefore be no risk to end users.

Site workers will be protected from the contamination through adherence to normal high standards of site safety.

8.8.1 Site Workers

Site workers should be made aware of the 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 and CIRIA[12] and the requirements of the Local Authority Environmental Health Officer.

8.9 Waste Disposal

Any spoil arising from excavations or landscaping works, which is not to be re-used in accordance with the CL:AIRE guidance[13], will need to be disposed of to a licensed tip. 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 going to landfill is subject to landfill tax at either the standard rate of £64 per tonne (about £120 per m^3) or at the lower rate of £2.50 per tonne (roughly £5 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 rocks and soils, which are accurately described as such in terms of the 2011 Order[14], would qualify for the 'lower rate' of landfill tax.

Based upon on the technical guidance provided by the Environment Agency[15] it is considered likely that the made ground from this site, as represented by four chemical analyses carried out, would be classified as NON-HAZARDOUS waste under the waste code 17 05 04 (soils and stones not containing dangerous substances) and would be taxable at the standard rate. It is likely that the natural soils, if separated out, could be classified as an INERT waste also under the waste code 17 05 04. This material would be taxable at the lower rate, if accurately described as naturally occurring clay in terms of the 2011 Order on the waste transfer note. This would however need to be confirmed by the receiving landfill site.

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[16] 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 by sufficiently characterising the soils in-situ prior to excavation.

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

13 CL:AIRE (2011) *The Definition of Waste: Development Industry Code of Practice* Version 2, March 2011

14 *Landfill Tax (Qualifying Material) Order 2011*

15 Environment Agency (2008) *Hazardous Waste: Interpretation of the definition and classification of hazardous waste. Technical Guidance* WM2 Second Edition Version 2.2, May 2008

16 Regulatory Position Statement (2007) *Treating non-hazardous waste for landfill - Enforcing the new requirement* Environment Agency 23 Oct 2007

The above opinion with regard to the classification of the excavated soils and its likely landfill taxable rate 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.

If consideration were to be given to the re-use of the soil as a structural fill on this or another site, in accordance with the Code of Practice for the definition of waste, it would be necessary to confirm its suitability for use, its certainty of use and to confirm that only as much material is to be used as is required for the specific purpose for which it was being used. A materials management plan could then be formulated and a tracking system put in place such that once placed the material would no longer be regarded as being a waste and thus waste management licensing and landfill tax would not apply.

9.0 BASEMENT IMPACT ASSESSMENT

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

It is proposed to construct a new three-storey building plus a single level basement, extending to a depth of between 4.6 m to 5.2 m. Formation level is likely to be within the London Clay.

The London Clay extends to a depth of 4.00 m, the full depth of the investigation. Monitoring of the standpipes has measured water at depths of between 1.69 m and 3.28 m.

The proposed 4.60 m to 5.20 m deep basement will be wholly within the London Clay. On the basis of the results of the ground investigation, it is not considered that the proposed basement would result in a significant change to the groundwater flow regime in the vicinity of the proposal or on the amount of annual recharge into the London Clay. This is due to its very low permeability and its inability to conduct groundwater flow.

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

Potential Impact	Site Investigation Conclusions
Seasonal shrink-swell can result in foundation movements	Plasticity index tests indicate the London Clay to be of high volume change potential.
Site within 5 m of a highway or pedestrian right of way	The site fronts onto Haverstock Hill and Prince of Wales Road. A retention system will need to be adopted that maintains the stability of the excavation at all times.
Founding depths relative to neighbours	The house bounded by two houses and the existing foundations will need to be underpinned to ensure the stability of the house and neighbouring adjoining house. The retention system will ensure the stability of the excavation and neighbouring properties at all times.
The proposed basement may extend beneath the water table	Monitored water levels in the standpipes have been measured between 2.28 m and 3.77 m and groundwater inflows are likely to be encountered within the 4.6 m to 5.2 m deep basement excavation. This will be allowed for within the design. The 4.6 m to 5.2 m, deep basement is wholly within the London Clay. The measured water levels are not reflective of groundwater flow or a water table.

Potential Impact	Site Investigation Conclusions
Location of the Northern Line Underground tunnel	The ground movement analysis has not indicaed that movements will affect the tunnel but consultation will be required with LUL prior to commencement.

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

Proposed basement *structure may extend below groundwater table*

The ground investigation has confirmed the presence of London Clay beneath the site extending to a depth of 4.00 m. The London Clay is classified by the Environment Agency as Unproductive Strata; not capable of storing and transmitting groundwater in sufficient quantities to support baseflow to watercourses or private supplies.

Groundwater has been measured within the standpipes at depths of between 1.69 m and 3.28 m, however these are not necessarily representative of a water table. Shallow groundwater levels monitored within standpipes are a common feature of low permeability clay strata, and is not indicative of a consistent water table within a permeable water bearing strata.

Shallow monitored groundwater levels within standpipes is a common feature of low permeability clay strata and is not necessarily indicative of a consistent water table as would be the case within a permeable water bearing strata. Thus, although the basement may extend below the monitored water levels in standpipes it is not the case that it extends below a general groundwater table.

Shrink / swell potential of London Clay

Shrinkable London Clay is present below the site.

Location of public highway

A retention system will be adopted that maintains the stability of the excavation at all times.

The proposed basement will significantly increase the differential depth of foundations relative to neighbouring properties

The stability of neighbouring properties and structures will be ensured at all times, through a suitable retention system. There is nothing unusual or exceptional in the proposed development or the findings of the investigation that give rise to any concerns with regard to stability over and above any development of this nature.

A ground movement analysis should be carried out once the basement designs have been finalised in order to assess the damage to nearby neighbouring structures. The Northern Line London Underground tunnel is located close to site and London Underground Limited should be consulted in this case.

9.1 BIA Conclusion

A Basement Impact Assessment has been carried out following the information and guidance published by the London Borough of Camden. Information from a Site Investigation has been used to assess potential impacts identified by the screening process.

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

10.0 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 is considered to 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, groundwater inflows are likely to be encountered during the basement excavation although groundwater monitoring should be continued to further assess groundwater levels.

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

The depth of investigation has been limited by the access to the site and deeper investigation is likely to be required once access becomes available to provide parameters for foundation design.

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

APPENDIX

Borehole Records

Trial Pit Records

Laboratory Geotechnical Test Results

Chemical Analyses (soil)

Risk-based Generic Guideline Values

Envirocheck Extracts

Historical Maps

Ground Movement Analysis

Site Plan

GEA Geotechnical & Environmental Associates Tyttenhanger House Coursers Road St Albans AL4 0PG	**Site** 62a Haverstock Hill / 201 Prince of Wales Road, London NW3 2BH	**Number** **BH1**	
Excavation Method Drive-in Window Sampler	**Dimensions**	**Ground Level (mOD)** 38.60	**Client** E. Sharon Group (Management) Ltd	**Job Number** J14334
	Location	**Dates** 11/11/2014	**Engineer** Price and Myers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				38.50	(0.10) 0.10	Wooden floor 25 mm over 80 mm wooden joist		
					(0.34)	Void		
				38.16	0.44	MADE GROUND (brown clay with flint gravel, brick, burnt coal and concrete fragments)		
1.00	D1				(1.06)			
				37.10	1.50	Firm orange-brown mottled grey CLAY with decaying rootlets		
					(0.50)			
2.00	D2			36.60	2.00	Firm brown mottled grey silty fissured CLAY with occasional orange-brown partings of fine sand and silt and rare selenite crystals. Decaying roots and rare carbonaceous material noted to a depth of 2.50 m		
2.50	D3				(1.50)			
3.00	D4							
3.50	D5			35.10	3.50	Stiff brown mottled grey silty fissured CLAY with occassional orange-brown partings of fine sand and silt		
					(0.50)			
4.00	D6			34.60	4.00	Terminated at 4.00m		

Remarks
Borehole carried out through base of Trial Pit No 2
Groundwater not encountered during drilling
Standpipe installed to a depth of 3.30 m - response zone from 1.30 m to 3.30 m

Scale (approx)	Logged By
1:50	HD

Figure No.
J14334.BH1

Geotechnical & Environmental Associates	Tyttenhanger House Coursers Road St Albans AL4 0PG	**Site** 62a Haverstock Hill / 201 Prince of Wales Road, London NW3 2BH	**Number** **BH2**

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Window Sampler		38.60	E. Sharon Group (Management) Ltd	J14334
	Location	**Dates** 11/11/2014	**Engineer** Price and Myers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				38.48	(0.12) 0.12	Wooden floor 20 mm thick over 100 mm thick wooden joist		
				38.31	(0.17) 0.29	Void		
0.45 0.65	D1 D2			38.08	(0.23) 0.52	MADE GROUND (brown sandy clay with flint gravel and occasional fragments of brick and concrete)		
					(0.68)	MADE GROUND (brown slightly clayey gravelly sand with rare fine brick fragments)		
1.10	D3			37.40	1.20			
1.40	D4				(0.30)	MADE GROUND (brown mottled orange-brown silty sandy clay with flint gravel, fine brick fragments, burnt coal and roots)		
1.60	D5			37.10 36.95	1.50 (0.15) 1.65			
2.00	D6					Firm light brown silty CLAY with occasional orange-brown partings of fine sand and silt and fine to medium subangular to subrounded flint gravel		
					(1.05)			
2.50	D7					Firm brown mottled grey silty fissured CLAY with occasional partings of orange-brown fine sand and silt. Decaying wood at a depth of 1.78 m		
				35.90	2.70			
3.00	D8				(0.50)	Stiff brown mottled grey silty fissured CLAY with occasional partings of orange-brown fine sand and silt and rare selenite crystals		
				35.40	3.20			
						Terminated at 3.20m		

Remarks
Borehole carried out through base of Trial Pit No 3
Groundwater not encountered during drilling
Standpipe installled to a depth of 3.20 m - response zone from 1.20 m to 3.20 m

Scale (approx)	**Logged By**
1:50	HD

Figure No.
J14334.BH2

GEA Geotechnical & Environmental Associates Tyttenhanger House Coursers Road St Albans AL4 0PG	**Site** 62a Haverstock Hill / 201 Prince of Wales Road, London NW3 2BH	**Number** **BH3**	
Excavation Method Drive-in Window Sampler	**Dimensions**	**Ground Level (mOD)** 38.60	**Client** E. Sharon Group (Management) Ltd	**Job Number** J14334
	Location	**Dates** 11/11/2014	**Engineer** Price and Myers	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				38.44	(0.16)	Wooden floor 20 mm thick over 140 mm thick wooden joist		
					0.16	Void		
				38.24	(0.20)			
					0.36	MADE GROUND (brown silty clay with occasional slate and brick fragments)		
					(1.44)			
1.60	D1			36.80	1.80	Firm brown mottled grey silty fissured CLAY with occasional partings of orange-brown fine sand and silt and rare carbonaceous material. Fine claystones at a depth of 2.00 m		
2.00	D2				(0.90)			
2.50	D3			35.90	2.70	Stiff brown mottled grey silty fissured CLAY with occasional partings of orange-brown fine sand and silt. Decaying plant remains at a depth of 2.50 m		
3.00	D4				(0.50)			
				35.40	3.20	Terminated at 3.20m		

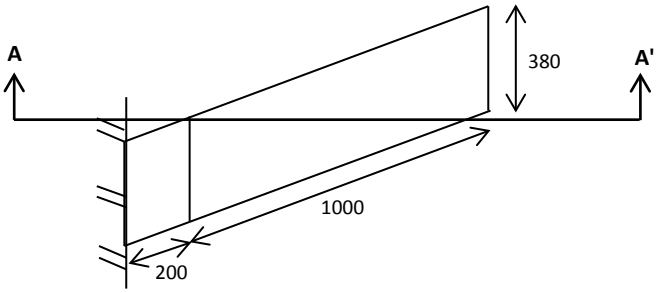
Remarks
Borehole carried out through base of Trial Pit No 4
Groundwater not encountered during drilling
Standpipe installed to a depth of 3.20 m - reponse zone from 1.20 m to 3.20 m

Scale (approx)	**Logged By**
1:50	HD

Figure No.
J14334.BH3

GEA Geotechnical & Environmental Associates Tyttenhanger House Coursers Road St Albans Herts AL4 0PG			**Site** 62a Haverstock Hill / 201 Prince of Wales Road, London, NW3 2BH	**Trial Pit Number** 1
Excavation Method Manual	**Dimensions** 1200 x 380 x 720	**Ground Level (mOD)**	**Client** E. Sharon Group (Management) Ltd	**Job Number** J14334
	Location	**Dates** 10/11/2014	**Engineer** Price and Myers	**Sheet** 1 / 1

Plan: -



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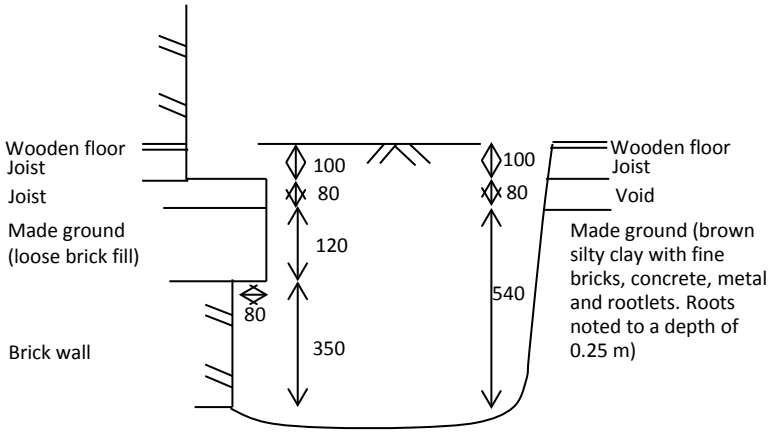


Remarks: All dimensions in millimetres Sides of trial pit remained stable during excavation Ground water not encountered	Scale: 1:20 Logged by: HD

GEA Geotechnical & Environmental Associates

Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Trial Pit No 1

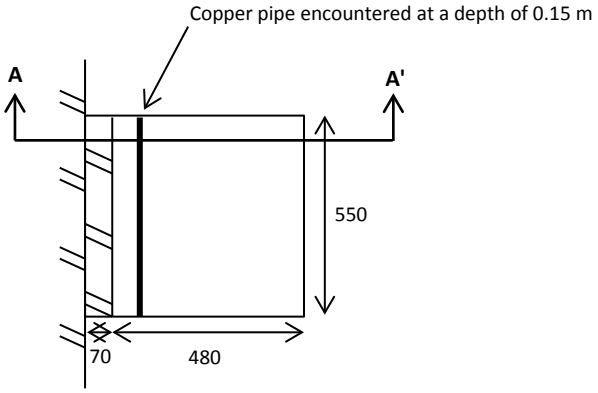
Site	62A Haverstock Hill / 201 Prince of Wales Road, London, NW3 2BH
Client	E. Sharon Group (Management) Ltd
Engineer	Price and Myers

Job Number J14334

Sheet

Geotechnical & Environmental Associates	Tyttenhanger House Coursers Road St Albans Herts AL4 0PG	**Site** 62a Haverstock Hill / 201 Prince of Wales Road, London, NW3 2BH	**Trial Pit Number** **2**
Excavation Method Manual	**Dimensions** 550 x 540 x 1600	**Ground Level (mOD)**	**Client** E. Sharon Group (Management) Ltd	**Job Number** J14334
	Location	**Dates** 10/11/2014	**Engineer** Price and Myers	**Sheet** 1 / 1

Plan: -



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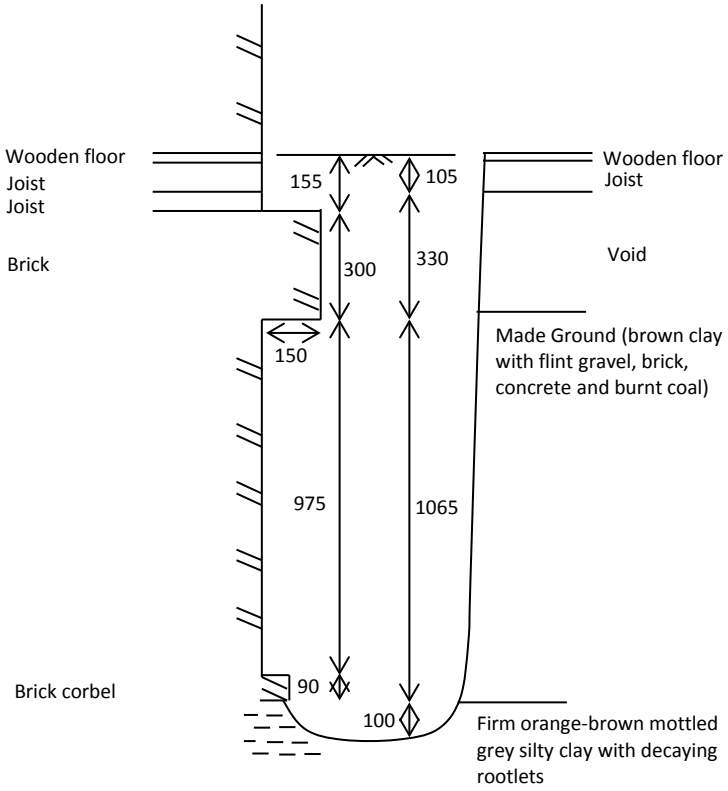


Remarks:	Scale:
All dimensions in millimetres	1:20
Sides of trial pit remained stable during excavation	Logged by:
Ground water not encountered	HD

GEA Geotechnical & Environmental Associates

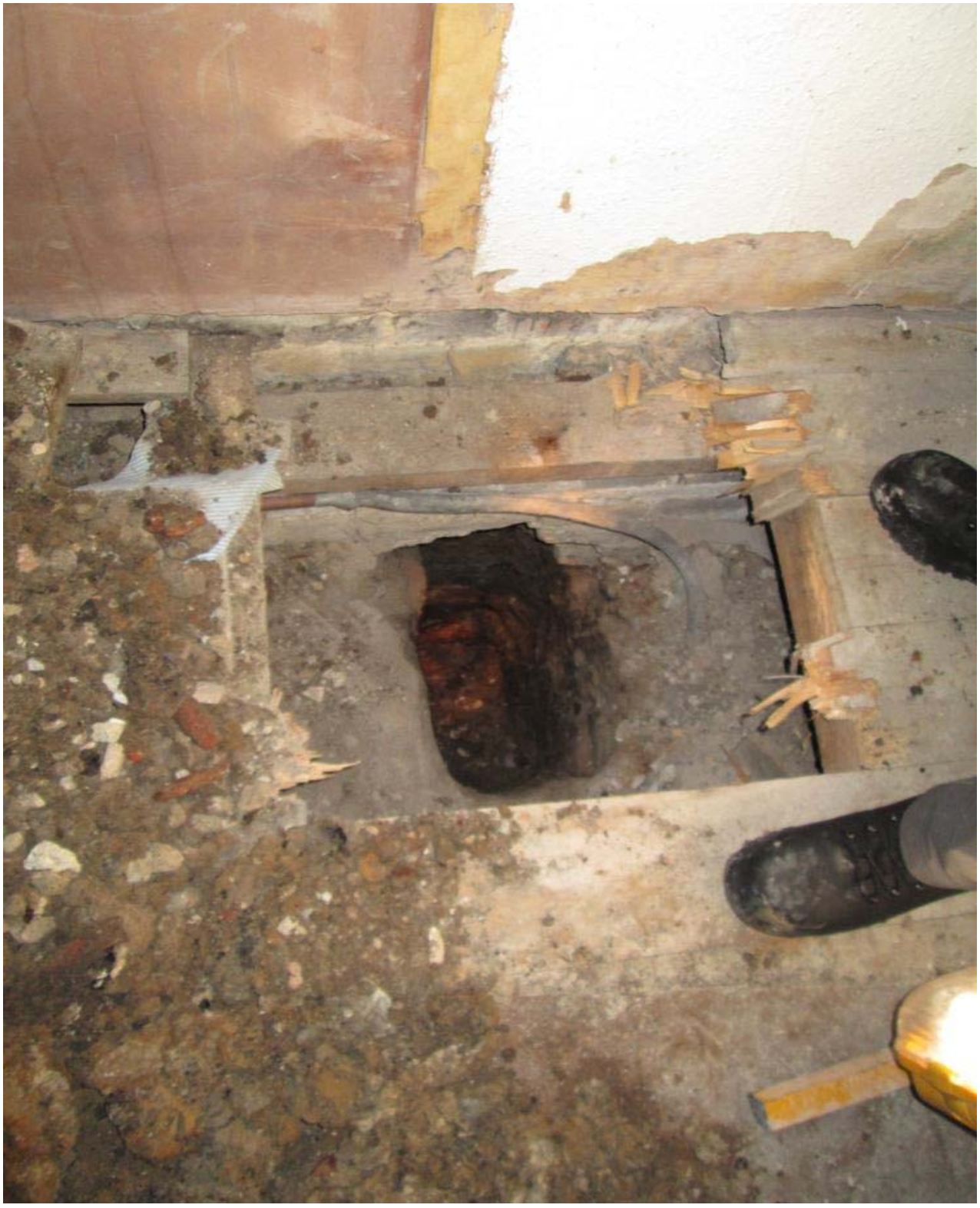
Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Trial Pit No 2

Site	62A Haverstock Hill / 201 Prince of Wales Road, London, NW3 2BH
Client	E. Sharon Group (Management) Ltd
Engineer	Price and Myers

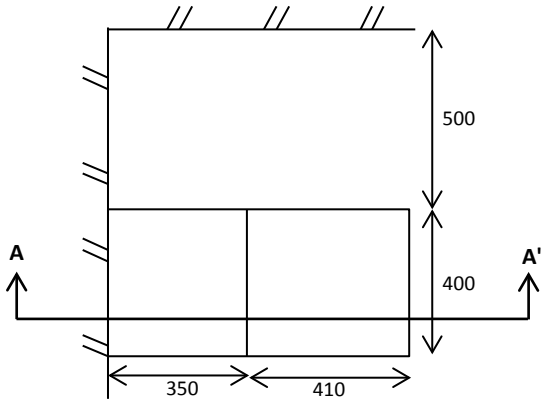
Job Number J14334

Sheet



GEA Geotechnical & Environmental Associates Tyttenhanger House Coursers Road St Albans Herts AL4 0PG			**Site** 62a Haverstock Hill / 201 Prince of Wales Road, London, NW3 2BH	**Trial Pit Number** 3
Excavation Method Manual	**Dimensions** 760 x 400 x 950	**Ground Level (mOD)**	**Client** E. Sharon Group (Management) Ltd	**Job Number** J14334
	Location	**Dates** 10/11/2014	**Engineer** Price and Myers	**Sheet** 1 / 1

Plan: -



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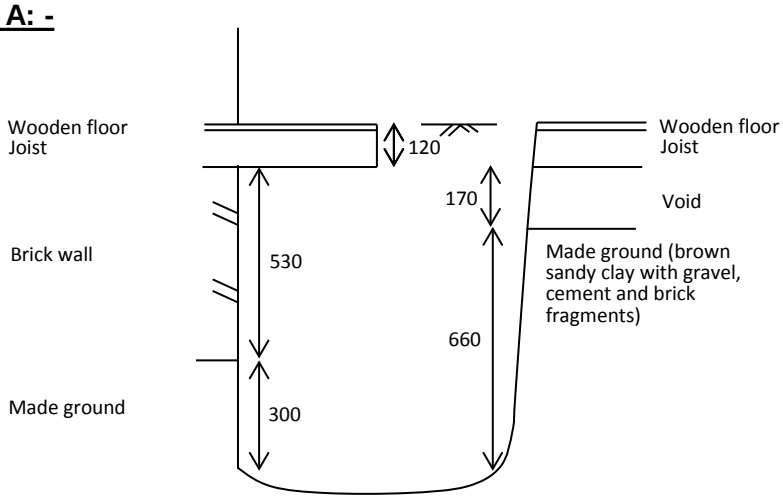


Remarks: All dimensions in millimetres Sides of trial pit remained stable during excavation Ground water not encountered	Scale: 1:20 Logged by: HD

GEA Geotechnical & Environmental Associates

Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Trial Pit No 3

Site	62A Haverstock Hill / 201 Prince of Wales Road, London, NW3 2BH
Client	E. Sharon Group (Management) Ltd
Engineer	Price and Myers

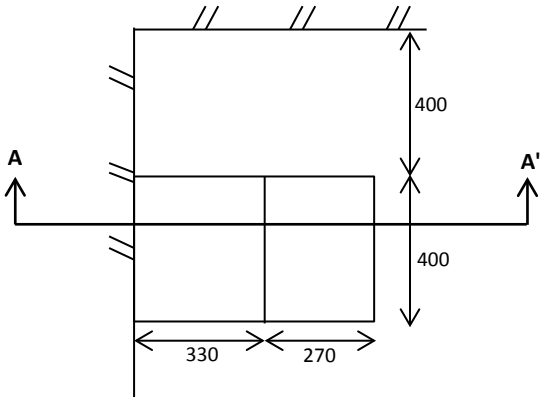
Job Number J14334

Sheet

GEA Geotechnical & Environmental Associates	Tyttenhanger House Coursers Road St Albans Herts AL4 0PG	**Site** 62a Haverstock Hill / 201 Prince of Wales Road, London, NW3 2BH	**Trial Pit Number** 4

Excavation Method Manual	**Dimensions** 400 x 700 x 1900	**Ground Level (mOD)**	**Client** E. Sharon Group (Management) Ltd	**Job Number** J14334
	Location	**Dates** 11/11/2014	**Engineer** Price and Myers	**Sheet** 1 / 1

Plan: -



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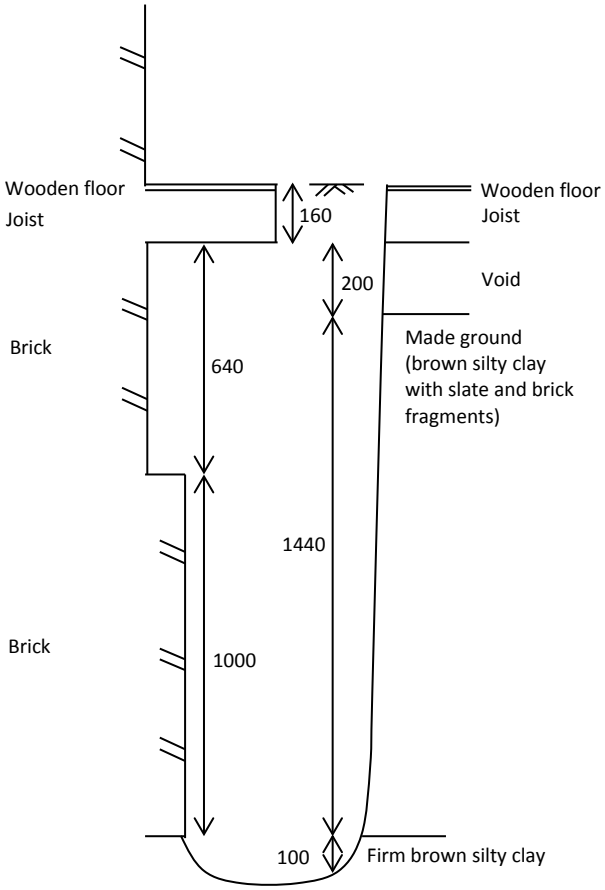


Remarks: All dimensions in millimetres Sides of trial pit remained stable during excavation Ground water not encountered	Scale: 1:20 Logged by: HD

Geotechnical & Environmental Associates

Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Trial Pit No 4

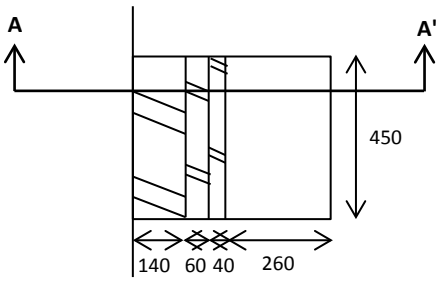
Site	62A Haverstock Hill / 201 Prince of Wales Road, London, NW3 2BH
Client	E. Sharon Group (Management) Ltd
Engineer	Price and Myers

Job Number J14334

Sheet

GEA Geotechnical & Environmental Associates	Tyttenhanger House Coursers Road St Albans Herts AL4 0PG		**Site** 62a Haverstock Hill / 201 Prince of Wales Road, London, NW3 2BH	**Trial Pit Number** 5
Excavation Method Manual	**Dimensions** 500 x 450 x 1260	**Ground Level (mOD)**	**Client** E. Sharon Group (Management) Ltd	**Job Number** J14334
	Location	**Dates** 11/11/2014	**Engineer** Price and Myers	**Sheet** 1 / 1

Plan: -



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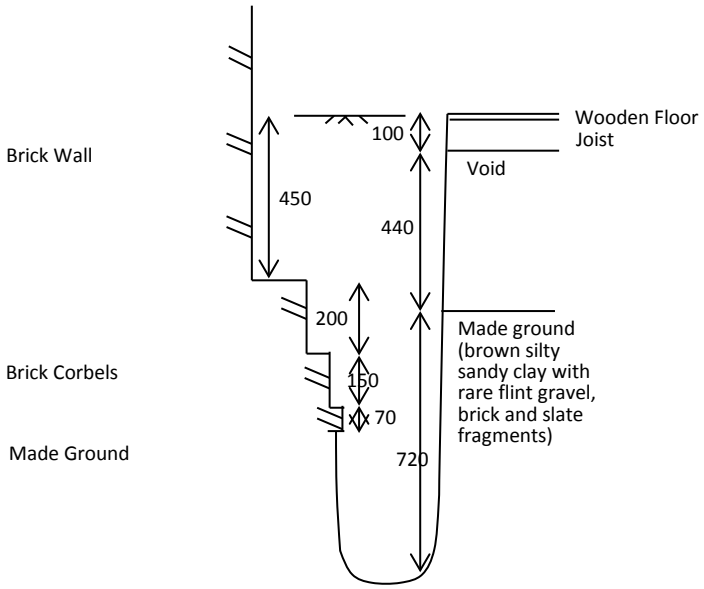


Remarks: All dimensions in millimetres Sides of trial pit remained stable during excavation Ground water encountered at 1.26 m	Scale: 1:20 Logged by: HD

Geotechnical & Environmental Associates

Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Trial Pit No 5

Site	62A Haverstock Hill / 201 Prince of Wales Road, London, NW3 2BH
Client	E. Sharon Group (Management) Ltd
Engineer	Price and Myers

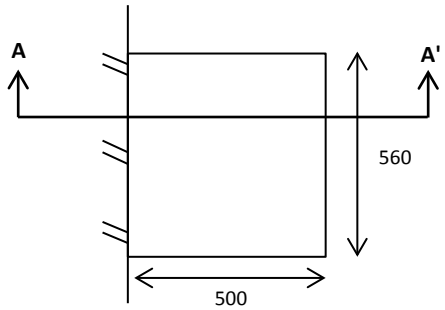
Job Number J14334

Sheet

GEA Geotechnical & Environmental Associates	Tyttenhanger House Coursers Road St Albans Herts AL4 0PG	**Site** 62a Haverstock Hill / 201 Prince of Wales Road, London, NW3 2BH	**Trial Pit Number** **6**

Excavation Method Manual	**Dimensions** 500 x 560 x 1400	**Ground Level (mOD)**	**Client** E. Sharon Group (Management) Ltd	**Job Number** J14334
	Location	**Dates** 11/11/2014	**Engineer** Price and Myers	**Sheet** 1 / 1

Plan: -



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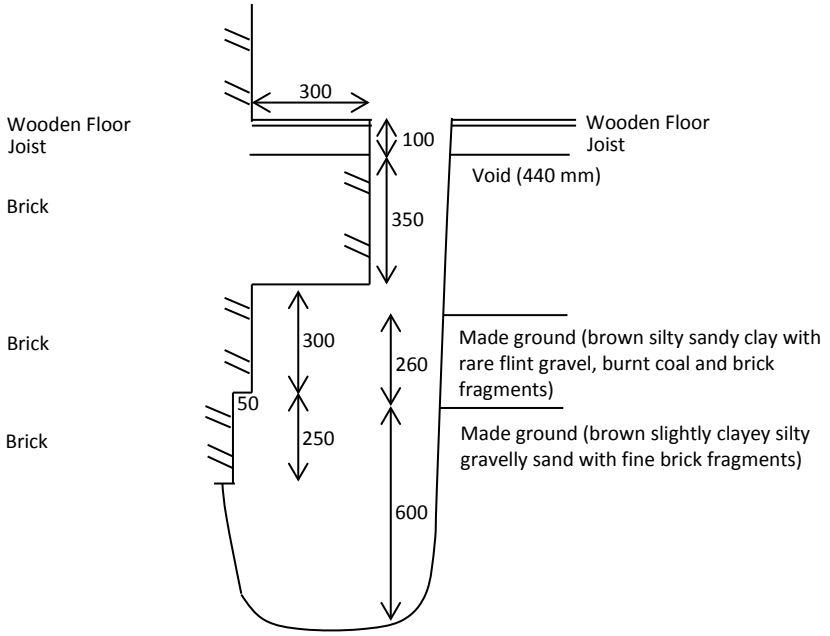


Remarks:	Scale:
All dimensions in millimetres	1:20
Sides of trial pit remained stable during excavation	Logged by:
Ground water encountered at 1.40 m	HD

GEA Geotechnical & Environmental Associates

Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Trial Pit No 6

Site	62A Haverstock Hill / 201 Prince of Wales Road, London, NW3 2BH
Client	E. Sharon Group (Management) Ltd
Engineer	Price and Myers

Job Number J14334

Sheet

Project Name:	62 Haverstock Hill and 201 Prince of Wales Road, London, NW5 3QB	**Samples Received:**	13/11/2014
		Project Started:	18/11/2014
Client:	GEA	**Testing Started:**	26/11/2014
Project No:	J14334 **Our job/report no:** 17838	**Date Reported:**	27/11/2014

K4 SOILS

Borehole No:	Sample No:	Depth (m)	Description	Moisture content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425 mm (%)	Remarks
BH1	D2	2.00	Brown silty CLAY	28	72	25	47	100	
BH1	D3	2.50	Orange brown slightly mottled blue grey silty CLAY	28					
BH1	D4	3.00	Orange brown slightly mottled blue grey silty CLAY	29					
BH1	D5	3.50	Brown and occasional pale grey silty CLAY	31	73	27	46	100	
BH1	D6	4.00	Orange brown silty CLAY	31					
BH2	D5	1.60	Brown gravelly silty CLAY (gravel is fmc and angular to rounded)	22	53	22	31	34	
BH2	D6	2.00	Orange brown and occasional grey silty CLAY with rare fine gravel	31					
BH2	D7	2.50	Orange brown slightly mottled blue grey silty CLAY	32					
BH2	D8	3.00	Brown and occasional pale grey silty CLAY with traces of decomposed selenite crystals	29	73	26	47	100	
BH3	D3	2.50	Brown and occasional pale grey silty CLAY	28	74	26	48	100	

UKAS TESTING 2519

Summary of Test Results

BS 1377 : Part 2 : Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method.
BS 1377 : Part 2 : Clause 5 : 1990 Determination of the plastic limit and plasticity index.
BS 1377 : Part 2 : Clause 3.2 : 1990 Determination of the moisture content by the oven-drying method.

Checked and Approved
Initials: K.P
Date: 27/11/2014

Project Name:	62 Haverstock Hill and 201 Prince of Wales Road, London, NW5 3QB			K4 SOILS
Client:	GEA	Project no:	J14334	
		Our job no:	17838	

Borehole No:	Sample No:	Depth m	Description	pH	Sulphate content (g/l)
BH1	D5	3.50	Brown and occasional pale grey silty CLAY	8.0	1.07
TP3	-	0.65	Grey slightly gravelly clayey SAND (gravel is fm and sub-angular to angular)	7.9	0.14
TP6	-	1.00	Brown gravelly clayey SAND (gravel is fmc and sub-rounded to angular)	7.9	1.74

Date 27/11/2014

Summary of Test Results

BS 1377 : Part 3 :Clause 5 : 1990

Determination of sulphate content of soil and ground water : gravimetric method

Checked and Approved

Initials : kp

Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

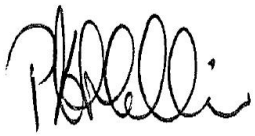
Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.co.uk

Final Report

Report Number:	14-14254 Issue-1
Initial Date of Issue:	18-Nov-14
Client:	GEA
Client Address:	Tyttenhanger House Coursers Road Saint Albans Hertfordshire AL4 0PG
Contact(s):	Juliette Forgham
Project:	J14334 62A Haverstock Hill / 201 Prince of Wales Road, London NW3 2BH

Quotation No.:		**Date Received:**	14-Nov-14
Order No.:	J14334	**Date Instructed:**	14-Nov-14
No. of Samples:	6	**Results Due:**	18-Nov-14
Turnaround: (Weekdays)	3		
Date Approved:	18-Nov-14		

Approved By:



Details: Phil Hellier, Project Director

Results Summary - Soil

Project: J14334 62A Haverstock Hill / 201 Prince of Wales Road, London NW3 2BH

Client: GEA					Chemtest Job No.:	14-14254	14-14254	14-14254	14-14254
Quotation No.:					Chemtest Sample ID.:	69642	69643	69644	69645
Order No.: J14334					Client Sample Ref.:				
					Client Sample ID.:	TP2	TP3	TP4	TP6
					Sample Type:	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	1.00	0.50	1.00	0.70
					Bottom Depth(m):				
					Date Sampled:	10-Nov-14	10-Nov-14	10-Nov-14	10-Nov-14
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Moisture	N	2030	%	0.02		19	21	19	19
Stones	N	2030	%	0.02		< 0.020	< 0.020	< 0.020	< 0.020
Soil Colour	N					brown	brown	brown	brown
Other Material	N					none	none	none	none
Soil Texture	N					clay	clay	clay	clay
pH	M	2010				8.1	7.8	7.7	7.9
Chloride (Extractable)	U	2220	g/l	0.01		0.023	0.16	0.28	0.022
Cyanide (Total)	M	2300	mg/kg	0.5		< 0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	M	2325	mg/kg	0.5		< 0.50	< 0.50	< 0.50	< 0.50
Sulphate (Total)	M	2430	mg/kg	100		1600	490	1000	780
Arsenic	M	2450	mg/kg	1		17	13	13	8.7
Cadmium	M	2450	mg/kg	0.1		0.10	0.11	< 0.10	< 0.10
Chromium	M	2450	mg/kg	1		34	35	46	12
Copper	M	2450	mg/kg	0.5		58	29	24	22
Mercury	M	2450	mg/kg	0.1		0.71	0.58	0.15	0.68
Nickel	M	2450	mg/kg	0.5		16	30	39	8.7
Lead	M	2450	mg/kg	0.5		400	130	71	120
Selenium	M	2450	mg/kg	0.2		< 0.20	< 0.20	< 0.20	< 0.20
Zinc	M	2450	mg/kg	0.5		100	68	64	920
Total Organic Carbon	M	2625	%	0.2		1.0	0.58	0.46	1.3
TPH >C5-C6	N	2670	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0
TPH >C6-C7	N	2670	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0
TPH >C7-C8	N	2670	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0
TPH >C8-C10	N	2670	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0
TPH >C10-C12	N	2670	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0
TPH >C12-C16	N	2670	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0
TPH >C16-C21	N	2670	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0
TPH >C21-C35	N	2670	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0
Total TPH >C5-C35	N	2670	mg/kg	10		< 10	< 10	< 10	< 10
Naphthalene	M	2700	mg/kg	0.1		< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	M	2700	mg/kg	0.1		< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	M	2700	mg/kg	0.1		< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	M	2700	mg/kg	0.1		< 0.10	< 0.10	< 0.10	< 0.10

Chemtest
The right chemistry to deliver results

Results Summary - Soil

Project: J14334 62A Haverstock Hill / 201 Prince of Wales Road, London NW3 2BH

Client: GEA					Chemtest Job No.:	14-14254	14-14254	14-14254	14-14254
Quotation No.:					Chemtest Sample ID.:	69642	69643	69644	69645
Order No.: J14334					Client Sample Ref.:				
					Client Sample ID.:	TP2	TP3	TP4	TP6
					Sample Type:	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	1.00	0.50	1.00	0.70
					Bottom Depth(m):				
					Date Sampled:	10-Nov-14	10-Nov-14	10-Nov-14	10-Nov-14
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Phenanthrene	M	2700	mg/kg	0.1		< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	M	2700	mg/kg	0.1		< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	M	2700	mg/kg	0.1		< 0.10	0.29	< 0.10	< 0.10
Pyrene	M	2700	mg/kg	0.1		< 0.10	0.32	< 0.10	< 0.10
Benzo[a]anthracene	M	2700	mg/kg	0.1		< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	M	2700	mg/kg	0.1		< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.1		< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.1		< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.1		< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.1		< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.1		< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.1		< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2		< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols	M	2920	mg/kg	0.3		< 0.30	< 0.30	< 0.30	< 0.30

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVCOs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at our Coventry laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container

Sample Retention and Disposal

All soil samples will be retained for a period of 60 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

GEA Geotechnical & Environmental Associates

Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Generic Risk-Based Soil Screening Values

Site	62a Haverstock Hill / 201 Prince of Wales Road, London, NW3 2BH	**Job Number** J14334
Client	E. Sharon Group (Management) Ltd	**Sheet** 1 / 1
Engineer	Price and Myers	

Proposed End Use Residential with plant uptake

Soil pH 8

Soil Organic Matter content % 2.5

Contaminant	Screening Value mg/kg	Data Source
Metals		
Arsenic	37	C4SL
Cadmium	26	C4SL
Chromium (III)	3000	LQM/CIEH
Chromium (VI)	21	C4SL
Copper	2,330	LQM/CIEH
Lead	200	C4SL
Elemental Mercury	1	SGV
Inorganic Mercury	170	SGV
Nickel	130	LQM/CIEH
Selenium	350	SGV
Zinc	3,750	LQM/CIEH
Hydrocarbons		
Benzene	0.34	C4SL
Toluene	320	SGV
Ethyl Benzene	180	SGV
Xylene	120	SGV
Aliphatic C5-C6	55	LQM/CIEH
Aliphatic C6-C8	160	LQM/CIEH
Aliphatic C8-C10	46	LQM/CIEH
Aliphatic C10-C12	230	LQM/CIEH
Aliphatic C12-C16	1700	LQM/CIEH
Aliphatic C16-C35	64,000	LQM/CIEH
Aromatic C6-C7	See Benzene	LQM/CIEH
Aromatic C7-C8	See Toluene	LQM/CIEH
Aromatic C8-C10	65	LQM/CIEH
Aromatic C10-C12	160	LQM/CIEH
Aromatic C12-C16	310	LQM/CIEH
Aromatic C16-C21	480	LQM/CIEH
Aromatic C21-C35	1100	LQM/CIEH
PRO (C_5 –C_{10})	646	Calc
DRO (C_{12} –C_{28})	66,490	Calc
Lube Oil (C_{28} –C_{44})	65,100	Calc
TPH	**1000**	Trigger for speciated testing

Contaminant	Screening Value mg/kg	Data Source
Anions		
Soluble Sulphate	0.5 g/l	Structures
Sulphide	50	Structures
Chloride	400	Structures
Others		
Organic Carbon (%)	6	Methanogenic potential
Total Cyanide	140	WRAS
Total Mono Phenols	290	SGV
PAH		
Naphthalene	5.30	Rev. LQM/CIEH
Acenaphthylene	400	LQM/CIEH
Acenaphthene	480	LQM/CIEH
Fluorene	380	LQM/CIEH
Phenanthrene	200	LQM/CIEH
Anthracene	4,900	LQM/CIEH
Fluoranthene	460	LQM/CIEH
Pyrene	1,000	LQM/CIEH
Benzo(a) Anthracene	6.7	Rev. LQM/CIEH
Chrysene	11	Rev. LQM/CIEH
Benzo(b) Fluoranthene	9.5	Rev. LQM/CIEH
Benzo(k) Fluoranthene	14.1	Rev. LQM/CIEH
Benzo(a) pyrene	4.40	C4SL
Indeno(1 2 3 cd) Pyrene	5.6	Rev. LQM/CIEH
Dibenzo(a h) Anthracene	1.27	Rev. LQM/CIEH
Benzo (g h i) Perylene	69	Rev. LQM/CIEH
Screening value for PAH	**62.9**	B(a)P / 0.15
Chlorinated Solvents		
1,1,1 trichloroethane (TCA)	12.9	LQM/CIEH
tetrachloroethane (PCA)	2.1	LQM/CIEH
tetrachloroethene (PCE)	2.1	LQM/CIEH
trichloroethene (TCE)	0.22	LQM/CIEH
1,2-dichloroethane (DCA)	0.008	LQM/CIEH
vinyl chloride (Chloroethene)	0.00064	LQM/CIEH
tetrachloromethane (Carbon tetra	0.039	LQM/CIEH
trichloromethane (Chloroform)	1.3	LQM/CIEH

Notes

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

SGV - Soil Guideline Value, derived from the CLEA model and published by Environment Agency 2009

LQM/CIEH - Generic Assessment Criteria for Human Health Risk Assessment 2nd edition (2009)derived using CLEA 1.04 model 2009

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

Rev LQM/CIEH calculated using C4SL revisions to exposure assessment but LQM/CIEH health croiteria values

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

B(a)P / 0.15 - GEA experince indicates that Benzo(a) pyrene (one of the most common and most carcenogenic of the PAHs) rarely exceeds 15% of the total PAH concentration, hence this Total PAH threshold is regarded as being conservative

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
61843249_1_1

Customer Reference:
J14334

National Grid Reference:
528000, 184590

Slice:
A

Site Area (Ha):
0.01

Search Buffer (m):
1000

Site Details:

62A Haverstock Hill / 201 Prince of Wales Road,
LONDON
NW3 2BH

Client Details:

Mr S Branch
GEA Ltd
Tyttenhanger House
Coursers Road
St Albans
Herts
AL4 0PG

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 the attached datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Ove Arup Copyright Notice

Peter Brett Associates Copyright Notice

Radon Potential dataset Copyright Notice

Report Version v49.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 1				3
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		1	4	14
Local Authority Pollution Prevention and Control Enforcements	pg 4				1
Nearest Surface Water Feature	pg 4				Yes
Pollution Incidents to Controlled Waters	pg 4				2
Prosecutions Relating to Authorised Processes	pg 4				1
Prosecutions Relating to Controlled Waters					
Registered Radioactive Substances	pg 5				2
River Quality	pg 5				1
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register	pg 5				1
Water Abstractions	pg 5				13 (*8)
Water Industry Act Referrals					
Groundwater Vulnerability	pg 10	Yes	n/a	n/a	n/a
Bedrock Aquifer Designations	pg 10	Yes	n/a	n/a	n/a
Superficial Aquifer Designations			n/a	n/a	n/a
Source Protection Zones	pg 10			1	2
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
Detailed River Network Lines					n/a
Detailed River Network Offline Drainage					n/a

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites					
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)	pg 12				2
Local Authority Recorded Landfill Sites					
Registered Landfill Sites					
Registered Waste Transfer Sites	pg 12				3
Registered Waste Treatment or Disposal Sites	pg 13				1
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					
Geological					
BGS 1:625,000 Solid Geology	pg 14	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry	pg 14	Yes	Yes	Yes	Yes
BGS Recorded Mineral Sites					
BGS Urban Soil Chemistry	pg 15			Yes	Yes
BGS Urban Soil Chemistry Averages	pg 17	Yes			
Brine Compensation Area			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 18	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 18	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards				n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 18	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

Geotechnical & Environmental Associates

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Industrial Land Use					
Contemporary Trade Directory Entries	pg 19		10	49	185
Fuel Station Entries	pg 39		1		4
Sensitive Land Use					
Areas of Adopted Green Belt					
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves	pg 40				1
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones					
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: National Grid Company Plc. Property Type: Production & Distribution Of Electricity Location: Fitzroy Bridge Outlet, Primrosehill, Camden, London Authority: Environment Agency, Thames Region Catchment Area: Not Given Reference: CTMR.0387 Permit Version: 1 Effective Date: 28th March 1980 Issued Date: 28th March 1980 Revocation Date: Not Supplied Discharge Type: Trade Discharges - Cooling Water Discharge Environment: Canal Receiving Water: Grand Unioncanal **Status: Transferred from Rivers (Prevention of Pollution) Act 1951-1961** Positional Accuracy: Located by supplier to within 100m	A9NW (SE)	758	3	528360 183920
2	**Discharge Consents** Operator: The Jim Henson Studio Property Type: Recreational & Cultural Location: 30 Oval Road, Camden Town, London, Nw1 7de Authority: Environment Agency, Thames Region Catchment Area: Not Given Reference: CATM.2853 Permit Version: 1 Effective Date: 1st April 1997 Issued Date: 1st April 1997 Revocation Date: 30th September 2005 Discharge Type: Trade Discharges - Cooling Water Discharge Environment: Canal Receiving Water: Guc - Paddington Arm **Status: Revoked (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A9NW (SE)	805	3	528600 184050
2	**Discharge Consents** Operator: Rushes Motion Control Property Type: Recreational & Cultural Location: 30 Oval Road, Camden Town, London, Nw1 7de Authority: Environment Agency, Thames Region Catchment Area: Not Given Reference: Cntm.1566 Permit Version: 1 Effective Date: 1st September 1994 Issued Date: 1st September 1994 Revocation Date: 1st October 1996 Discharge Type: Trade Discharges - Cooling Water Discharge Environment: Freshwater Stream/River Receiving Water: Guc - Paddington Arm **Status: Lapsed (under Environment Act 1995, Schedule 23)** Positional Accuracy: Located by supplier to within 100m	A9NW (SE)	805	3	528600 184050
3	**Local Authority Pollution Prevention and Controls** Name: The Dry Cleaners Of Hampstead Location: 80 Haverstock Hill, London, Nw3 2be Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC41 Dated: 25th June 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A13NW (NW)	159	4	527875 184684
4	**Local Authority Pollution Prevention and Controls** Name: Texaco Location: 81-85 Chalk Farm Road, LONDON, NW1 8AR Authority: London Borough of Camden, Pollution Projects Team Permit Reference: NOT GIVEN Dated: 24th December 1998 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station **Status: Site Closed** Positional Accuracy: Manually positioned to the address or location	A13SE (SE)	339	4	528269 184381

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
5	**Local Authority Pollution Prevention and Controls** Name: Primrose Valet Location: 91 Regent'S Park Road, London, Nw1 8ur Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC53 Dated: 28th January 2009 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A8NW (S)	441	4	527917 184155
6	**Local Authority Pollution Prevention and Controls** Name: Moderna Dry Cleaners Location: 70 Queens Crescent, London, Nw5 4ee Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC16 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	A18SE (NE)	471	4	528216 185005
7	**Local Authority Pollution Prevention and Controls** Name: Lex Volvo Location: 1 Dumpton Place, Gloucester Avenue, Chalk Farm, LONDON, NW1 8JB Authority: London Borough of Camden, Pollution Projects Team Permit Reference: Not Given Dated: 7th January 1994 Process Type: Local Authority Air Pollution Control Description: PG6/34 Respraying of road vehicles **Status: Authorised** Positional Accuracy: Manually positioned to the address or location	A8NE (S)	479	4	528165 184138
8	**Local Authority Pollution Prevention and Controls** Name: Chequers Textile Care Ltd Location: 48 Englands Lane, London, Nw3 4ue Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC47 Dated: 5th December 2006 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A12SE (W)	503	4	527498 184580
9	**Local Authority Pollution Prevention and Controls** Name: Wm Morrisons Supermarkets Plc Location: Chalk Farm Road, LONDON, NW1 8AA Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC19 Dated: 22nd December 1998 Process Type: Local Authority Pollution Prevention and Control Description: PG1/14 Petrol filling station **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A14SW (SE)	514	4	528426 184300
10	**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	A18SW (N)	558	4	527961 185143
11	**Local Authority Pollution Prevention and Controls** Name: J T Coachworks Location: 52A Prince Wales Road, LONDON, NW5 3LR Authority: London Borough of Camden, Pollution Projects Team Permit Reference: Not Given Dated: 30th April 1993 Process Type: Local Authority Air Pollution Control Description: PG6/34 Respraying of road vehicles **Status: Authorisation revokedRevoked** Positional Accuracy: Automatically positioned to the address	A14NW (E)	604	4	528594 184700

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Hanson Quarry Products Europe Ltd Licence Number: Th/039/0039/027 Permit Version: 2 Location: Kings Cross Concrete Plant-Borehole Authority: Environment Agency, Thames Region Abstraction: Mineral Products: General use relating to Secondary Category (High Loss) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Kings Cross Concrete Plant, Off York Way, London. Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 13th August 2012 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(E)	1996	3	529920 184040
	Water Abstractions Operator: Hanson Quarry Products Europe Ltd Licence Number: Th/039/0039/027 Permit Version: 1 Location: Kings Cross Concrete Plant-Borehole Authority: Environment Agency, Thames Region Abstraction: Mineral Products: General use relating to Secondary Category (High Loss) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Kings Cross Concrete Plant, Off York Way, London. Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 21st April 2010 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(E)	1996	3	529920 184040
	Water Abstractions Operator: Hanson Quarry Products Europe Ltd Licence Number: 28/39/39/0222 Permit Version: 1 Location: Kings Cross Concrete Plant-Borehole Authority: Environment Agency, Thames Region Abstraction: Mineral Products: General use relating to Secondary Category (High Loss) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Kings Cross Concrete Plant, Off York Way, London. Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 31st August 2006 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(E)	1996	3	529920 184040
	Groundwater Vulnerability Soil Classification: Not classified Map Sheet: Sheet 39 West London Scale: 1:100,000	A13NE (N)	0	3	528001 184587
	Drift Deposits None				
	Bedrock Aquifer Designations Aquifer Designation: Unproductive Strata	A13NE (N)	0	2	528001 184587
	Superficial Aquifer Designations No Data Available				
29	**Source Protection Zones** Name: Barrow Hill Source: Environment Agency, Head Office Reference: Th405 Type: Zone II (Outer Protection Zone): Either 25% of the source area or a 400 day travel time whichever is greater.	A12SE (SW)	454	3	527655 184293
30	**Source Protection Zones** Name: Barrow Hill Source: Environment Agency, Head Office Reference: Th405 Type: Zone I (Inner Protection Zone): Travel time of 50 days or less to the groundwater source.	A8NW (SW)	722	3	527686 183938

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
32	**Licensed Waste Management Facilities (Locations)** Licence Number: 80482 Location: 28 Jamestown Road, London, NW1 7BY Operator Name: Camden London Borough Council Operator Location: Not Supplied Authority: Environment Agency - Thames Region, North East Area Site Category: Household Waste Amenity Sites **Licence Status: Surrendered** Issued: 15th October 1994 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: 25th July 1997 IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A9NW (SE)	866	3	528667 184035
33	**Licensed Waste Management Facilities (Locations)** Licence Number: 80349 Location: Recycling Centre, Regis Road, Kentish Town, London, NW5 3EP Operator Name: LondonWaste Ltd Operator Location: Not Supplied Authority: Environment Agency - Thames Region, North East Area Site Category: Household Waste Amenity Sites **Licence Status: Transferred** Issued: 10th December 1996 Last Modified: 25th January 2002 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	923	3	528740 185138
	Local Authority Landfill Coverage Name: London Borough of Camden - Has no landfill data to supply		0	7	528001 184587
	Local Authority Landfill Coverage Name: Westminster City Council - Has supplied landfill data		927	8	528171 183676
34	**Registered Waste Transfer Sites** Licence Holder: L.B. of Camden Licence Reference: DL251 Site Location: Jamestown Road Recycling Centre, 28 Jamestown Road, CAMDEN, London, NW1 Operator Location: Old Town Hall, Haverstock Hill, CAMDEN, London, NW3 4QP Authority: Environment Agency - Thames Region, North East Area Site Category: Transfer Max Input Rate: Small (Equal to or greater than 10,000 and less than 25,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Licence has completion certificateSurrendered Dated: 5th October 1994 Preceded By Licence: DL251 Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Lead/Acid Batteries Lwra Cat. A = Inert Wastes Lwra Cat. Bi Gen.Non-Putresc Mineral Oils Mostlwra Cat. C 'Putresc' Some Lwra Cat Bii Gen. Scrap Metal W. W.For Recyling (Cats A, Bi, C) Prohibited Waste: Clinical - As In Coll/Disp.Regs Of '88 Special Wastes N.O.S. Waste N.O.S.	A9NE (SE)	893	3	528690 184020

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: London Clay	A13NE (N)	0	2	528001 184587
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: London Arsenic Concentration: no data Cadmium Concentration: no data Chromium Concentration: no data Lead Concentration: no data Nickel Concentration: no data	A13NE (N)	0	5	528001 184587
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: London Arsenic Concentration: no data Cadmium Concentration: no data Chromium Concentration: no data Lead Concentration: no data Nickel Concentration: no data	A13NW (W)	1	5	528000 184587
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: London Arsenic Concentration: no data Cadmium Concentration: no data Chromium Concentration: no data Lead Concentration: no data Nickel Concentration: no data	A18SW (N)	413	5	528000 185000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: London Arsenic Concentration: no data Cadmium Concentration: no data Chromium Concentration: no data Lead Concentration: no data Nickel Concentration: no data	A18SE (N)	413	5	528001 185000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: London Arsenic Concentration: no data Cadmium Concentration: no data Chromium Concentration: no data Lead Concentration: no data Nickel Concentration: no data	A8NW (S)	588	5	528000 184000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: London Arsenic Concentration: no data Cadmium Concentration: no data Chromium Concentration: no data Lead Concentration: no data Nickel Concentration: no data	A8NE (S)	588	5	528001 184000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: London Arsenic Concentration: no data Cadmium Concentration: no data Chromium Concentration: no data Lead Concentration: no data Nickel Concentration: no data	A14NE (E)	1000	5	529000 184587
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 528240, 184781 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 17.00 mg/kg Cadmium Measured Concentration: 0.30 mg/kg Chromium Measured Concentration: 74.00 mg/kg Lead Measured Concentration: 994.00 mg/kg Nickel Measured Concentration: 26.00 mg/kg	A13NE (NE)	309	2	528240 184781
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 528324, 184426 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 14.00 mg/kg Cadmium Measured Concentration: 1.00 mg/kg Chromium Measured Concentration: 71.00 mg/kg Lead Measured Concentration: 1103.00 mg/kg Nickel Measured Concentration: 29.00 mg/kg	A13SE (SE)	362	2	528324 184426
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527678, 184753 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 19.00 mg/kg Cadmium Measured Concentration: 0.70 mg/kg Chromium Measured Concentration: 90.00 mg/kg Lead Measured Concentration: 1533.00 mg/kg Nickel Measured Concentration: 31.00 mg/kg	A13NW (NW)	363	2	527678 184753
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527717, 184227 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 21.00 mg/kg Cadmium Measured Concentration: 0.60 mg/kg Chromium Measured Concentration: 77.00 mg/kg Lead Measured Concentration: 2046.00 mg/kg Nickel Measured Concentration: 34.00 mg/kg	A8NW (SW)	459	2	527717 184227

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: 527169, 184808 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 21.00 mg/kg Cadmium Measured Concentration: 0.60 mg/kg Chromium Measured Concentration: 83.00 mg/kg Lead Measured Concentration: 2154.00 mg/kg Nickel Measured Concentration: 35.00 mg/kg	A12NW (W)	861	2	527169 184808
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 528869, 184298 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 14.00 mg/kg Cadmium Measured Concentration: 0.30 mg/kg Chromium Measured Concentration: 88.00 mg/kg Lead Measured Concentration: 1420.00 mg/kg Nickel Measured Concentration: 28.00 mg/kg	A14SE (E)	916	2	528869 184298
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 528234, 183700 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 32.00 mg/kg Cadmium Measured Concentration: 1.80 mg/kg Chromium Measured Concentration: 81.00 mg/kg Lead Measured Concentration: 1498.00 mg/kg Nickel Measured Concentration: 46.00 mg/kg	A8SE (S)	918	2	528234 183700
	BGS Urban Soil Chemistry Averages Source: British Geological Survey, National Geoscience Information Service Sample Area: London Count Id: 7189 Arsenic Minimum Concentration: 1.00 mg/kg Arsenic Average Concentration: 17.00 mg/kg Arsenic Maximum Concentration: 161.00 mg/kg Cadmium Minimum Concentration: 0.30 mg/kg Cadmium Average Concentration: 0.90 mg/kg Cadmium Maximum Concentration: 165.20 mg/kg Chromium Minimum Concentration: 13.00 mg/kg Chromium Average Concentration: 79.00 mg/kg Chromium Maximum Concentration: 2094.00 mg/kg Lead Minimum Concentration: 11.00 mg/kg Lead Average Concentration: 280.00 mg/kg Lead Maximum Concentration: 10000.00 mg/kg Nickel Minimum Concentration: 2.00 mg/kg Nickel Average Concentration: 28.00 mg/kg Nickel Maximum Concentration: 506.00 mg/kg	A13NE (N)	0	2	528001 184587

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Coal Mining Affected Areas In an area that might not be affected by coal mining				
	Non Coal Mining Areas of Great Britain No Hazard				
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	0	2	528001 184587
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	0	2	528001 184587
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	0	2	528001 184587
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	0	2	528001 184587
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	0	2	528001 184587
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	0	2	528001 184587
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	0	2	528001 184587
	Radon Potential - Radon Affected Areas Affected Area: The property is in a lower probability radon area, as less than 1% of homes are above the action level Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	0	2	528001 184587

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
37	**Contemporary Trade Directory Entries** Name: Ariel Medical Ltd Location: 4, Maitland Park Road, London, NW3 2ES Classification: Medical Equipment Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (N)	90	-	527991 184676
38	**Contemporary Trade Directory Entries** Name: The Dry Cleaners Of Hampstead Location: 80, Haverstock Hill, London, NW3 2BE Classification: Dry Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	159	-	527875 184684
38	**Contemporary Trade Directory Entries** Name: The Ranelagh Press Location: 84, Haverstock Hill, London, NW3 2BD Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	172	-	527864 184691
38	**Contemporary Trade Directory Entries** Name: Browns Industrial Group Ltd Location: 75, Haverstock Hill, London, NW3 4SL Classification: Sheet Metal Work **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A13NW (NW)	186	-	527831 184662
39	**Contemporary Trade Directory Entries** Name: American Dry Cleaners Location: 4, Chalk Farm Parade, Adelaide Road, London, NW3 2BN Classification: Dry Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	196	-	528085 184411
40	**Contemporary Trade Directory Entries** Name: Abbas Location: 85, Haverstock Hill, London, NW3 4RL Classification: Brass & Copper Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	232	-	527792 184687
41	**Contemporary Trade Directory Entries** Name: Hope & Piaget Location: Unit 12/13, Burmarsh Workshops, 71, Marsden Street, London, NW5 3JA Classification: Antiques - Repairing & Restoring **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NE (NE)	244	-	528192 184738
41	**Contemporary Trade Directory Entries** Name: Jayne Ormonde Ltd Location: Unit 14, Burmarsh Workshops, 71, Marsden Street, London, NW5 3JA Classification: Candle Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NE (NE)	244	-	528192 184738
41	**Contemporary Trade Directory Entries** Name: Stop The Press Location: Unit 2, Burmarsh Workshops, 71, Marsden Street, London, NW5 3JA Classification: Screen Process Printers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A13NE (NE)	244	-	528192 184738
42	**Contemporary Trade Directory Entries** Name: Stonegate Cleaning Location: Flat 4, Stonegate, St. Silas Place, London, NW5 3QP Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NE (E)	245	-	528235 184657
43	**Contemporary Trade Directory Entries** Name: Cleaners Chalk Farm Location: 8, Haverstock Hill, London, NW3 2BL Classification: Cleaning Services - Domestic **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	255	-	528197 184426
43	**Contemporary Trade Directory Entries** Name: Marine Ices Location: 8, Haverstock Hill, London, NW3 2BL Classification: Ice Cream Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	255	-	528197 184426

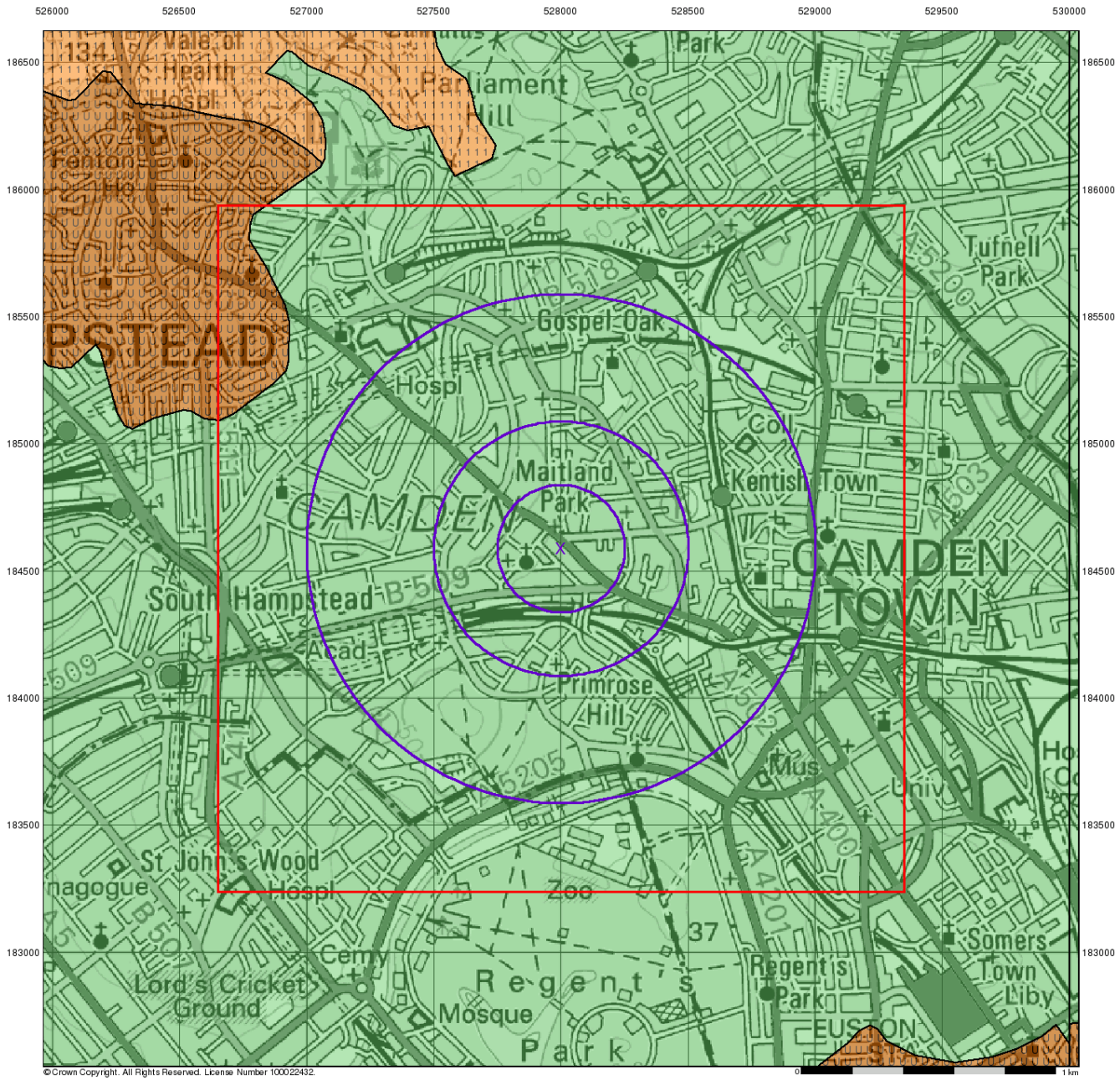
Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
145	**Contemporary Trade Directory Entries** Name: Pearl & Black Location: Interchange Studios,Hampstead Town Hall Centre,321 Haverstoc, London, NW3 4QP Classification: Greeting Card Publishers & Wholesalers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A17SW (NW)	973	-	527216 185161
146	**Contemporary Trade Directory Entries** Name: Uk Janitorial Supplies Ltd Location: 104, Mansfield Road, London, NW3 2HX Classification: Cleaning Materials & Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NE (N)	980	-	528101 185562
146	**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	A18NE (N)	980	-	528101 185562
147	**Contemporary Trade Directory Entries** Name: Oven Cleaning Belsize Park Location: 250 Haverstock Hill, London, NW3 2AE Classification: Oven cleaning **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A17SW (NW)	990	-	527249 185230
148	**Contemporary Trade Directory Entries** Name: North London Cleaners Location: 46, Rochester Road, London, NW1 9JJ Classification: Carpet, Curtain & Upholstery Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A14NE (E)	991	-	528991 184590
149	**Fuel Station Entries** Name: Star Chalk Farm Location: 81-85 Chalk Farm Road, Chalk Farm, LONDON, NW1 8AR Brand: Texaco Premises Type: Not Applicable **Status: Obsolete** Positional Accuracy: Approximate location provided by supplier	A13SE (SE)	204	-	528174 184481
150	**Fuel Station Entries** Name: Court Service Station Location: 160a Malden Road, Kentish Town, LONDON, NW5 4BT Brand: Obsolete Premises Type: Not Applicable **Status: Obsolete** Positional Accuracy: Located by supplier to within 100m	A18SE (N)	614	-	528033 185200
151	**Fuel Station Entries** Name: Chalk Farm Service Station Location: 32-33, Chalk Farm Road, London, NW1 8AJ Brand: ESSO Premises Type: Not Applicable **Status: Obsolete** Positional Accuracy: Manually positioned to the address or location	A14SW (SE)	640	-	528567 184291
152	**Fuel Station Entries** Name: Morrisons Camden Location: Chalk Farm Road, Chalk Farm, London, Greater London, NW1 8AA Brand: Morrisons Premises Type: Hypermarket **Status: Open** Positional Accuracy: Manually positioned to the address or location	A9NW (SE)	700	-	528547 184151
153	**Fuel Station Entries** Name: Parkway Filling Station Location: 120 Parkway, Camden Town, LONDON, NW1 7AN Brand: Obsolete Premises Type: Not Applicable **Status: Obsolete** Positional Accuracy: Approximate location provided by supplier	A9SW (SE)	909	-	528582 183889

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
154	**Local Nature Reserves** Name: Belsize Wood Multiple Area: N Area (m2): 2722.99 Source: Natural England Designation Date: 28th March 2012	A17SE (NW)	799	6	527528 185230

Useful Contacts

Contact	Name and Address	Contact Details
2	**British Geological Survey - Enquiry Service** British Geological Survey, Kingsley Dunham Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
3	**Environment Agency - National Customer Contact Centre (NCCC)** PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 08708 506 506 Email: enquiries@environment-agency.gov.uk
4	**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
5	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmark.co.uk Website: www.landmarkinfo.co.uk
6	**Natural England** Suite D, Unex House, Bourges Boulevard, Peterborough, Cambridgeshire, PE1 1NG	Telephone: 0845 600 3078 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
7	**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
8	**Westminster City Council - Environmental Health Department** Council House, Marylebone Road, London, NW1 5PT	Telephone: 020 7641 1317 Fax: 020 7641 1142 Website: www.westminster.gov.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.



GEA Geotechnical & Environmental Associates

Groundwater Vulnerability

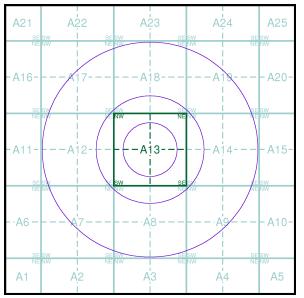
General

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

Agency and Hydrological

Geological Classes	Soil Classes
Major Aquifer (Highly Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Minor Aquifer (Variably Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Non Aquifer (Negligibly Permeable)	
Water or Sea	
Drift Deposit	

Site Sensitivity Context Map - Slice A



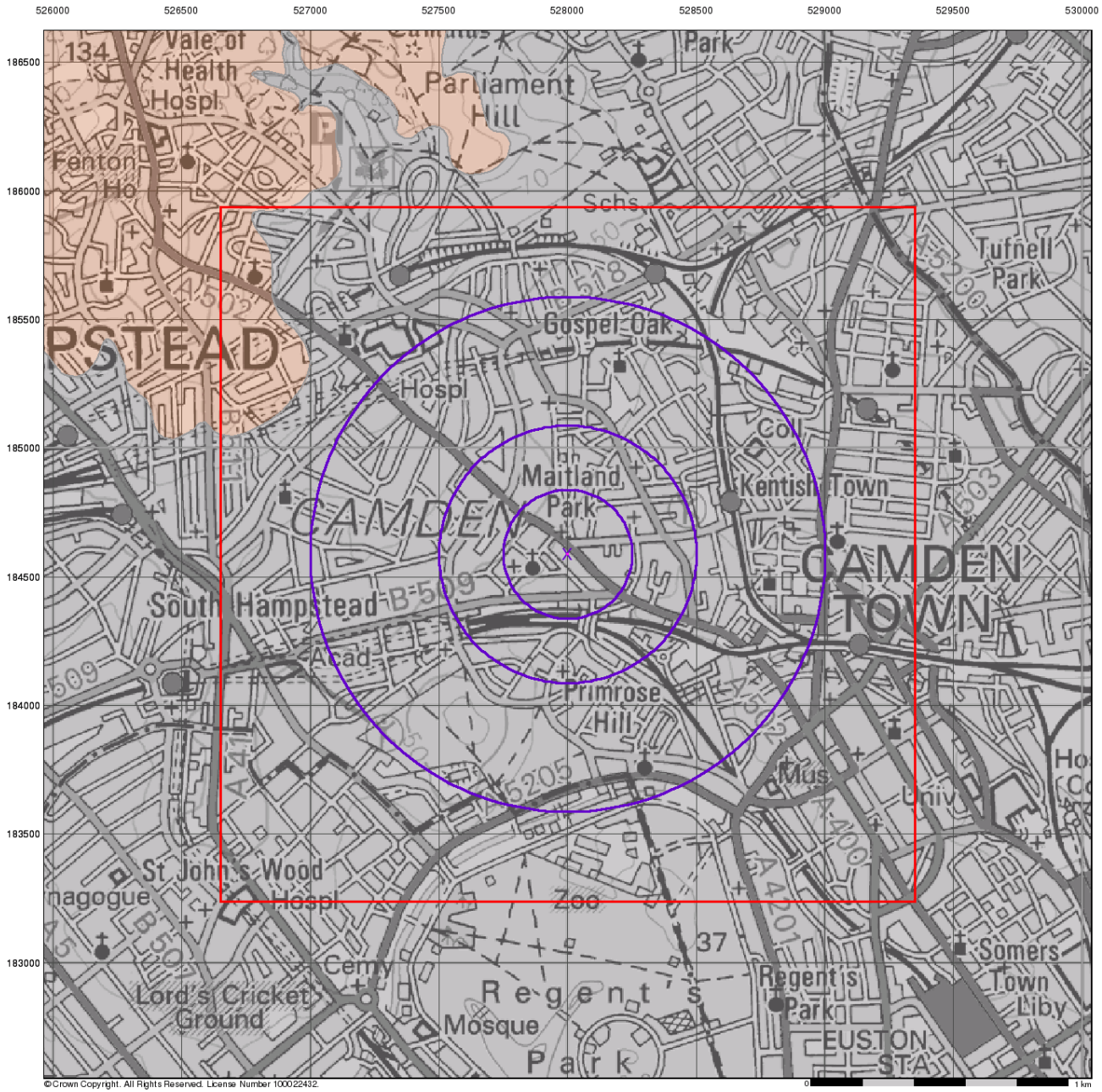
Order Details

Order Number:	61843249_1_1
Customer Ref:	J14334
National Grid Reference:	528000, 184590
Slice:	A
Site Area (Ha):	0.01
Search Buffer (m):	1000

Site Details

62A Haverstock Hill, LONDON, NW3 2BH

Landmark Information Group
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



GEA Geotechnical & Environmental Associates

Bedrock Aquifer Designation

General

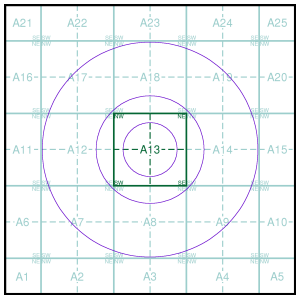
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown

Site Sensitivity Context Map - Slice A



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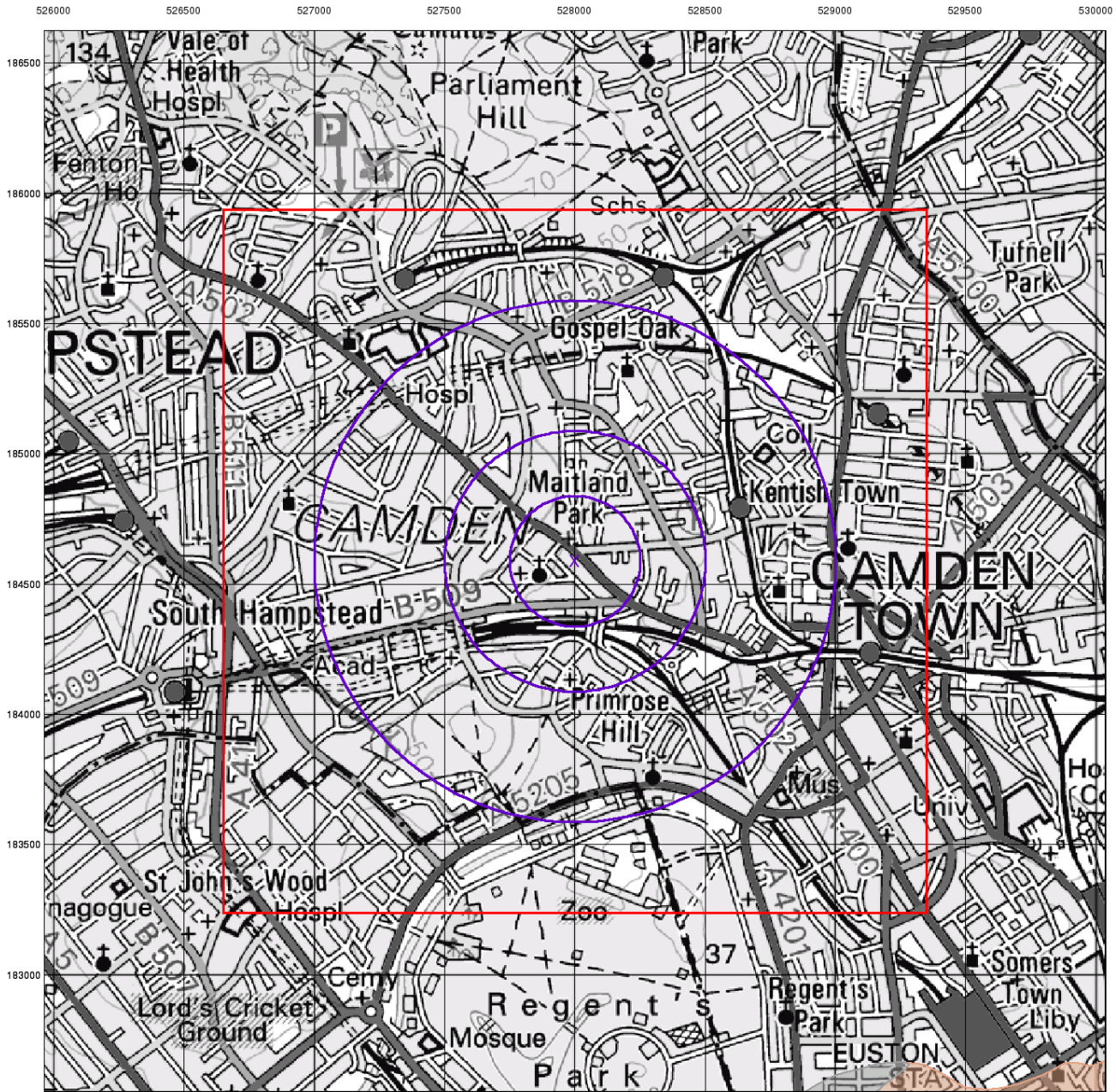


GEA Geotechnical & Environmental Associates

Superficial Aquifer Designation

General

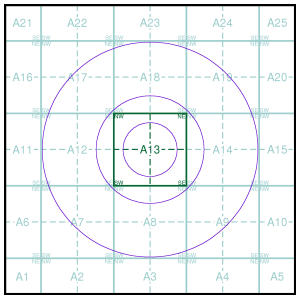
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown

Site Sensitivity Context Map - Slice A



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Slice:	A
Site Area (Ha):	0.01
Search Buffer (m):	1000

Site Details

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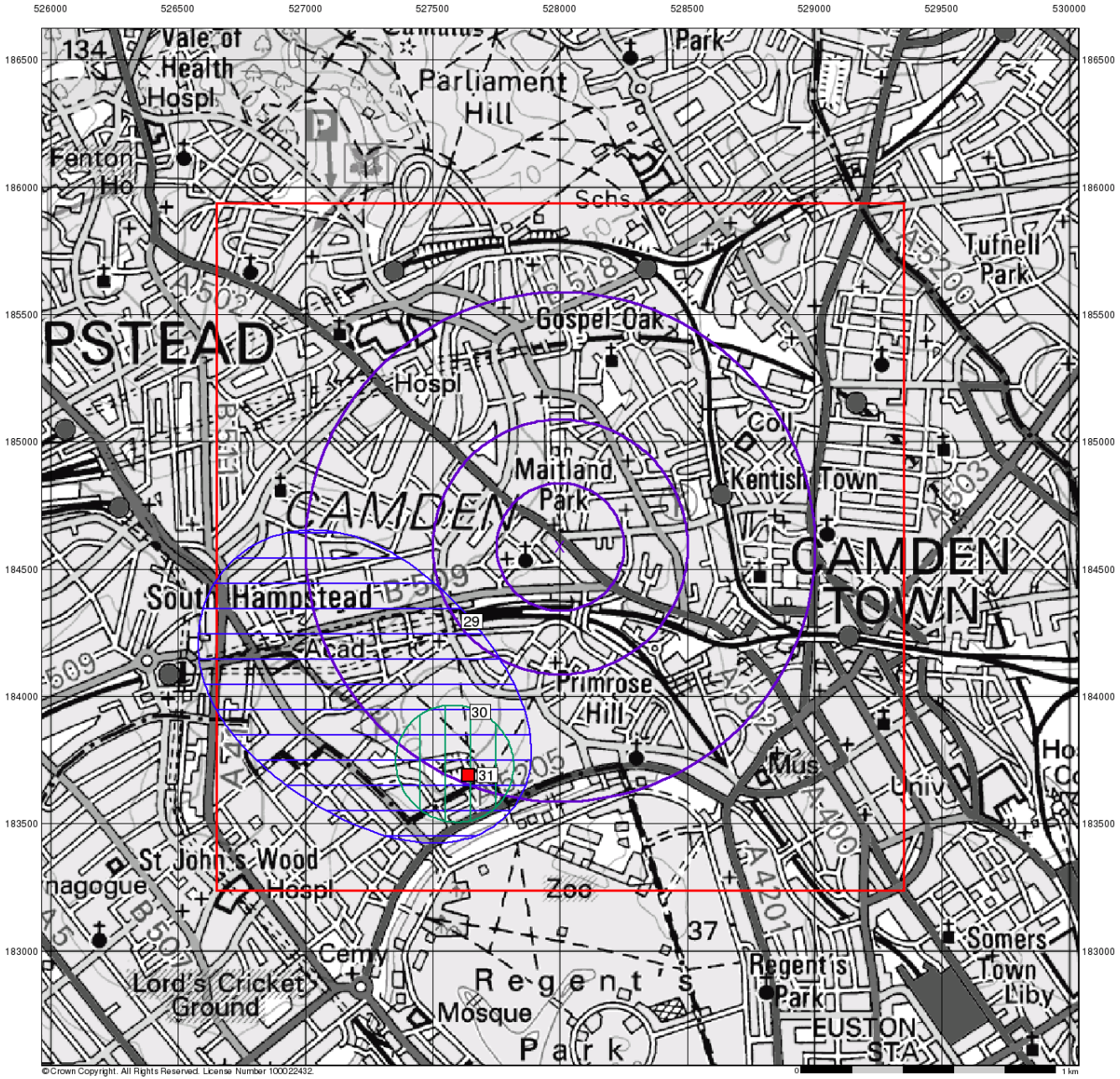


GEA Geotechnical & Environmental Associates

Source Protection Zones

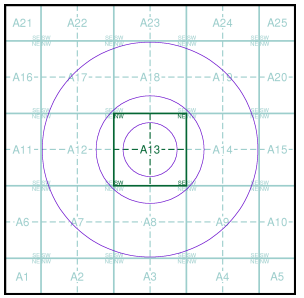
General

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

Agency and Hydrological

- Source Protection Zone I
- Source Protection Zone II
- Source Protection Zone III
- Zone of Special Interest
- Source Protection Zone Borehole

Site Sensitivity Context Map - Slice A



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Site Details

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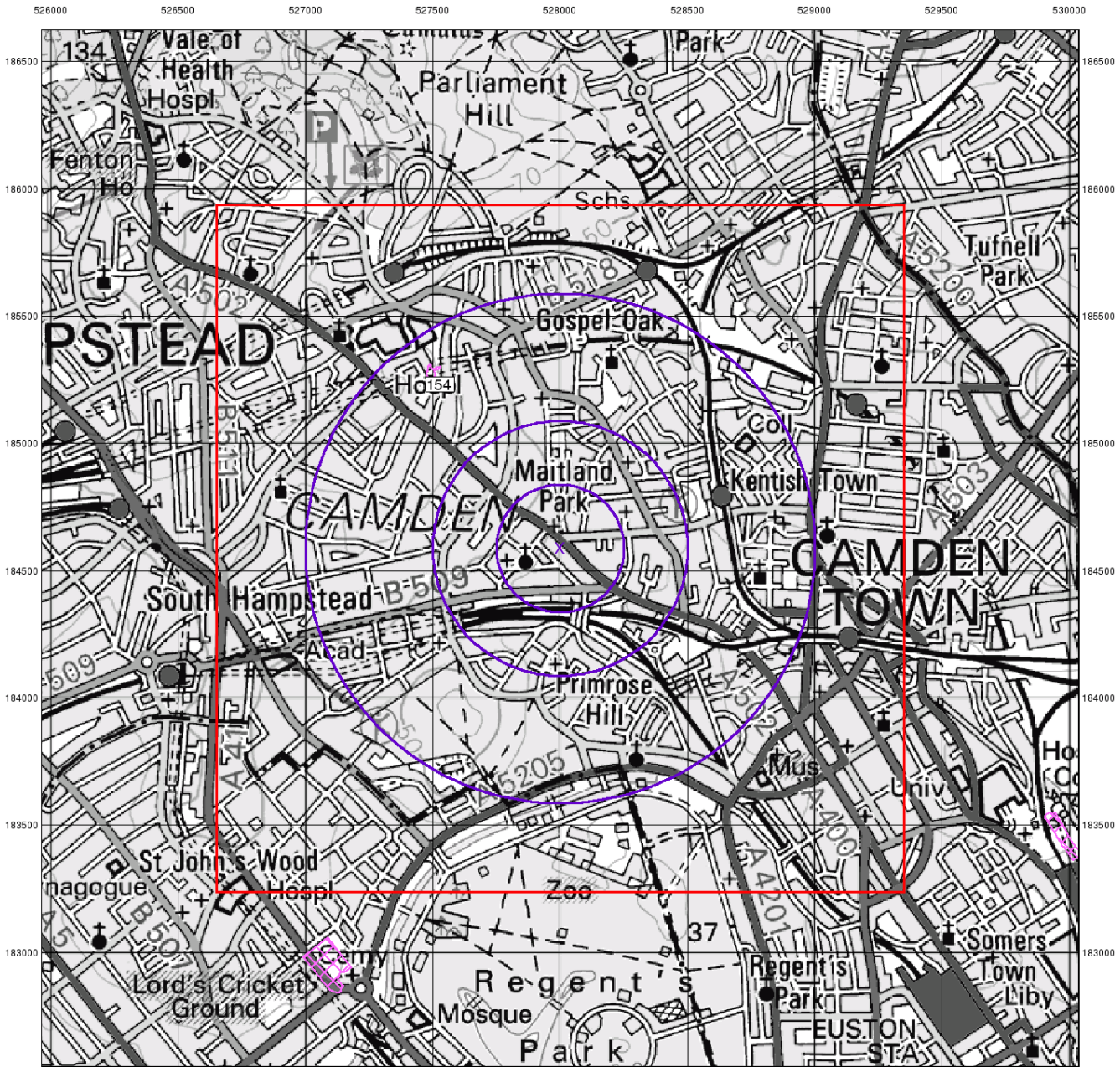


GEA Geotechnical & Environmental Associates

Sensitive Land Uses

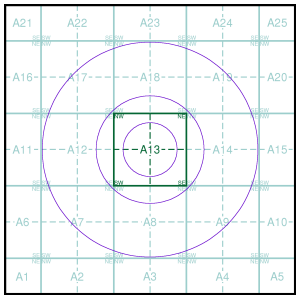
General

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

Sensitive Land Uses

- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area

Site Sensitivity Context Map - Slice A



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Slice:	A
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GEA Geotechnical & Environmental Associates

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Geological

- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

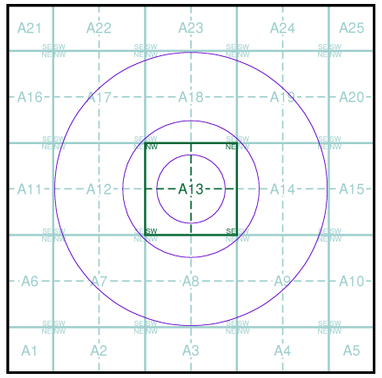
Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Site Sensitivity Map - Slice A



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GEA Geotechnical & Environmental Associates

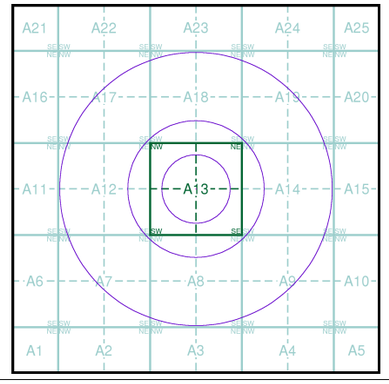
General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



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Search Buffer (m):	1000

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