# BASEMENT IMPACT ASSESSMENT

FOR

# PROPOSED DEVELOPMENT

AT

# No 10a Belmont Street
# Camden
# London NW1

Date: May 2015

Revision: Rev B

Pringuer-James
Consulting Engineers

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## 1.0 Introduction

Pringuer-James Consulting Engineers (PJCE) were appointed by Risetall Ltd. as the structural engineers for the proposed development at No.10a Belmont Street, Camden.

As part of the project brief PJCE are required to provide assistance on the structural engineering aspects of the proposed project including the preparation of a Basement Impact Assessment (BIA) to be submitted with the planning submission package.

The BIA has been prepared in accordance with the current format set-out by London Borough of Camden Planning Department (LB Camden) in the document, Camden Planning Guidance - Basements and Lightwells (CPG4). The guidance document is based on the specially commissioned study prepared by Ove Arup & Partners Ltd, Camden Geological, Hydrogeological and Hydrological Study (CGH&H). This document is a detailed study of the geotechnical, hydrogeological and hydrological characteristics of soil strata found in the borough of Camden.

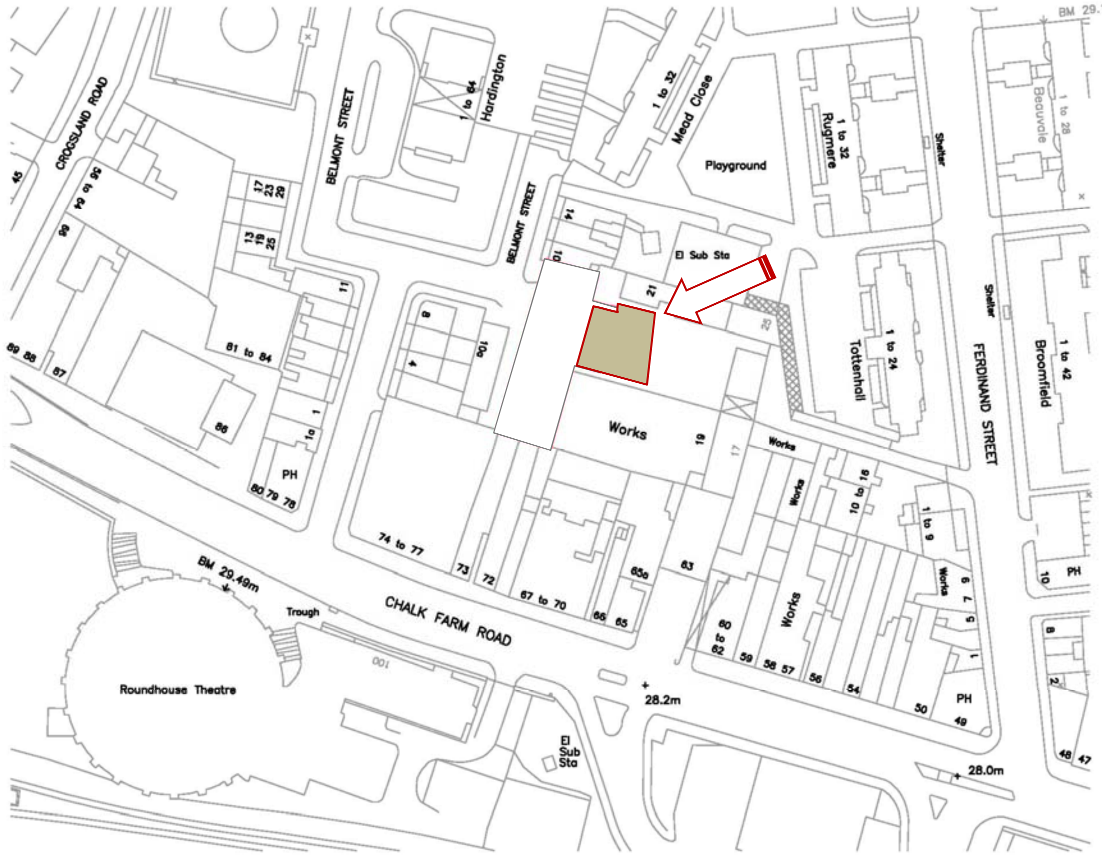
There are three critical criteria identified in the CGH&H study which must be considered and dealt with in each assessment carried out for a proposed basement development. The defining criteria are as follows:-

I) Subterranean Flow
II) Land Stability
III) Surface Flow & Flooding

This BIA document is set out with four stages indicated. Firstly, the initial screening process which leads to stage two, the scoping process, whereby relevant issues are identified for the site and their subsequent potential impacts. The third stage of the process involves gathering of site specific data by various means of a desk study and site investigation. From this the relevant information is obtained to enable an accurate assessment of the potential impacts of any issues identified in the first two stages.

Following the site investigation the fourth stage of the BIA involves an analysis of the information gathered and a site specific assessment is made on the potential impact of the proposed development. If the potential impacts identified are found to have an adverse risk to the existing site, the surrounding properties and/or the extended area, then a series of measures to mitigate against any negative impact are outlined for the project.

The assessment is then submitted as part of the planning package for the project to enable LB Camden make an informed decision on the overall planning submission.




EXISTING SITE LOCATION MAP

**Fig 1 – Existing Site Location Map**

## 2.0 Screening

### 2.1 Location of the Project

The site is located in Camden at number 10a Belmont Street. The proposed basement is partly under the rear extension to the main building and part under the rear yard beyond the main property which faces west on to Belmont Street and is bound by Chalk Farm Road to the south, Ferdinand Street to the east and Mead Close to the north.

Beyond the immediate boundaries outlined above, the site is also bounded by a number of railway lines. To the north and east by a north-south running line which is approximately 270m from the nearest boundary. To the south by a second national railway line, approximately 95m from the site outline. The railway line to the south runs in an east-west direction, and the train line to the north runs from an intersection 310m due east in a north-westerly direction. Euston Railway Station is located approximately 1.75km to the south-east of the site.

The Northern tube line is located below Chalk Farm Road running from Chalk Farm Tube Station, 300m to the West of the site, to Camden Town tube station, found 1.3km to the south-east of the site. The underground line between the two stations is found approximately 50m to the south of the site.

### 2.2 Characteristics of the Project

The building in question has been used for general purpose office space in recent years. Historically the building was used for more light industrial purposes. The existing building was originally five storeys high, with a further two storeys having been added in recent times over the main building. An additional five storey balcony extension has been constructed to the side of the main building. Behind the building is a car parking area which is accessed from Ferdinand Street.

The main block of the building consists of loadbearing brickwork walls to the perimeter with timber floor plates supported at mid-span by a series of cast iron columns and timber beams. Above the original five storey building the two storey extension is constructed from a combination of brickwork along the perimeter with steel beams and columns supporting a timber floor plate. The proposed basement extension has been designed to support the car parking space above, through a series of beams and RC slab.

The proposed basement development involves the construction of a 2.7m deep basement below the existing car park. The basement will be formed by a series of contiguous piles with a facing wall which will be constructed and detailed to transfer the building loads to the substrata.

The existing ground level in the car park slopes upwards to approximately +50.000m and the proposed basement floor level will be 3.55m below this. This will entail an excavation of approximately 4.0m to construct the basement floor area.

Preliminary structural details are attached as part of the appendices which outline the proposed construction details to facilitate the installation of the new basement structure.

### 2.3 Physical Form of the Development

The proposed basement will be approximately 5.5m below existing ground floor level over the footprint of the extension. This is an area of approximately 185m$^2$. It is proposed to form the lower ground floor using contiguous piles and RC facing walls. It is proposed to create all the slabs using RC. The slab above the proposed basement will be supported on steel beams which will bear on RC column and on the contiguous walls. These will transfer the building loads through to the substrata via ground beams and pile caps supported on RC piles. The slabs within the proposed basements will be designed for the various loads due to gravity, soil movements and hydrostatic forces, and will transfer the loads to the contiguous piled walls and ground beams, which in turn will transfer the loads to the substrata.

An initial inspection of the site boundaries together with the available trial pit information suggests this is feasible along the full extent of the basement perimeter.

To the northern boundary of the main property, No10 Belmont Street is found. This property is an existing three storey terraced house with load bearing brickwork, timber floor plates and cut roof.

Along the eastern perimeter the proposed basement will be bounded by hard-standing areas which form the parking area to the square linked onto Ferdinand Street. Around this square are a number of 1-2 storey warehouse structures, No19 & No21 Ferdinand Street, that are of mixed use.

To the southern boundary the commercial buildings which line Chalk Farm Road extend back to the proposed development boundary. The properties directly abutting No10a Belmont Street are single storey brickwork with lightweight roof and it is anticipated that a concrete floor slab will be found within these properties at ground floor level.

To the western side of the proposed basement is the main building for 10a Belmont Street, whose western face forms the front elevation of the property on Belmont Street.

### 2.4 Mitigation Measures Being Considered

As with any development involving the construction of a basement, the proposed construction methods and programme of works must be chosen once appropriate levels of consideration are given to the inherent risks associated with excavation, and more specifically in this case, excavation in close proximity to existing buildings and their foundations.

Given the close proximity of the adjacent buildings along the north and south boundaries, the proposed development has been designed to limit the risk of adverse impact to the adjacent properties. This has been achieved by proposing the use of a series of contiguous piles with a facing wall. The piles will provide support to the excavation in the temporary condition, whereas the in-situ walls and slabs will form the permanent structure. The facing walls will be designed to act as propped cantilever retaining walls and the piles will be constructed and detailed to transfer the building loads to the substrata.

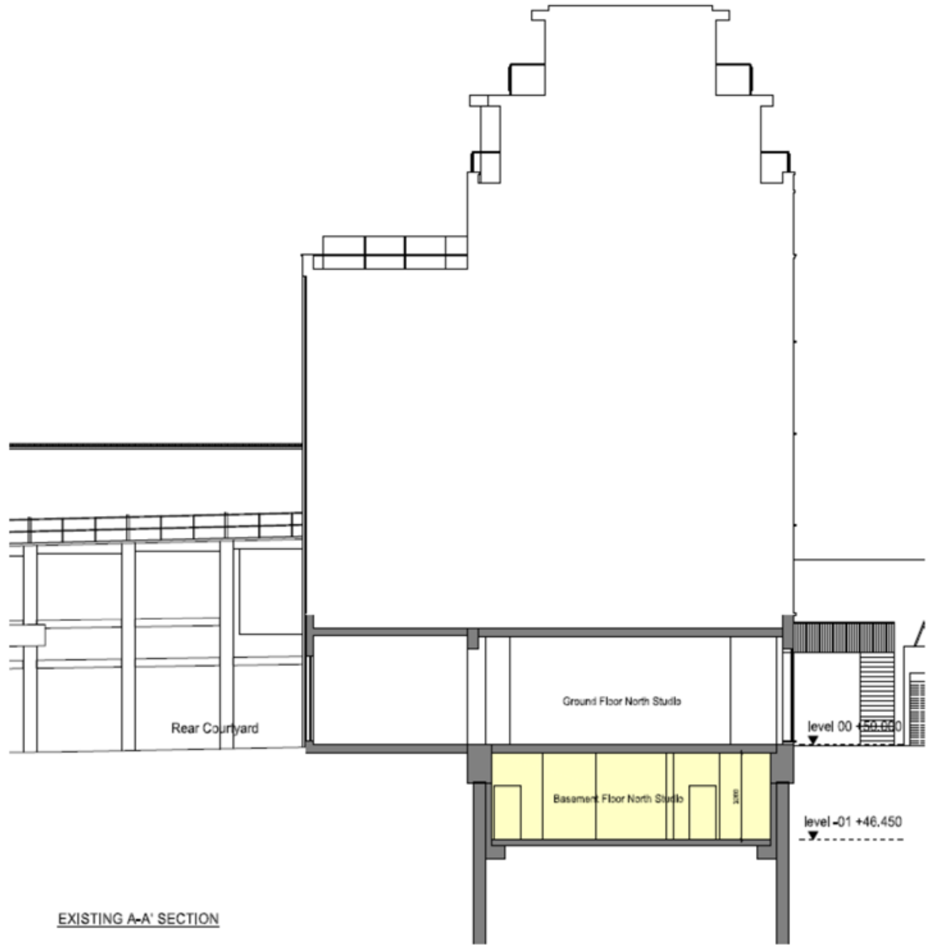



**Fig 1 - Existing Section**

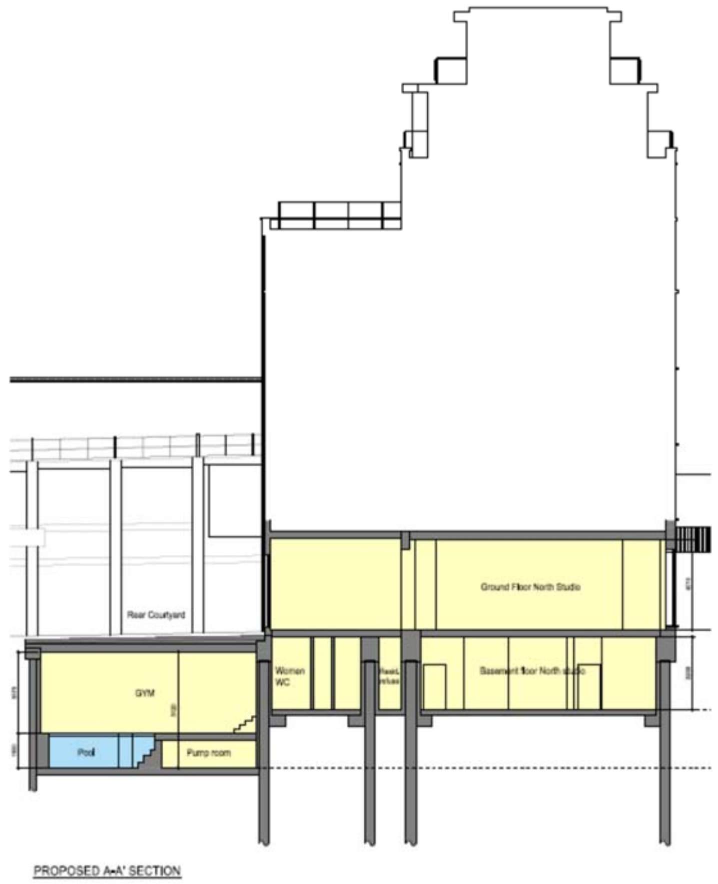



**Fig 2 - Proposed Section**

## 2.5 Characteristics of Potential Impacts

### 2.5.1 Subterranean (Groundwater Flow)

The prevalent geological characteristics of the Camden area consist of a stiff London Clay with a depth varying from 80m to 120m overlying a Chalk bedrock formation.

Over the extended Camden Borough region the upper levels of the clay layer contain relatively small regions of River Terrace Deposits defined by outcrops of Claygate Formation and Bagshot Sands. In these areas of permeable material it is not uncommon to come across a raised groundwater table due to the presence of a perched aquifer or historic river channel. The attributes of the groundwater in these areas varies, sometimes found to be static if not connected to additional groundwater features.

Where a high groundwater table is found the possible effects of excavating for a basement include altering the water table levels and/or diverting the existing flow paths. The effect of these changes needs to be taken into consideration in the early planning stages of a development to ensure that adverse effects are accounted for and wherever possible designed out of the proposed development.

These adverse effects may include:-

- Forming alternative flow paths for the groundwater which may conflict with existing basements that have not been adequately protected against moisture.
- Altering existing groundwater levels locally and as a result possibly altering the soil properties of the local area. The altered soil properties may influence among other things, the existing slope stability and the soil bearing capacity.

### 2.5.2 Slope Stability

Generally:
Slope instability is affected by a number of contributory factors ranging from soil properties, land use, topography, landscape and human activities (e.g.: mining or drainage etc.)The excavation and construction of a basement can affect the slope stability of a site and the adjoining land or properties in a number of ways including:-

- Altering the soil properties such as, the moisture content, pore water pressure, consolidation and compaction levels, shear strength and bearing capacity of the soil.
- Requiring an element of pumping or dewatering of the site which can in some instances lead to the removal of “fines” in the existing soil, thus affecting the soil properties and interaction of the particles.
- Requiring the removal of existing vegetation, plants and/or trees from the site which are part of the system of groundwater extraction. This in turn may alter the groundwater levels which can affect the soil properties.
- Altering the natural state of the landscape or possibly involving works to previously disturbed or “worked” soil which could have an historic element of instability.

Beyond the Confines of the Site:
Possible effects of any basement construction must take into account the adjoining structures and their existing foundations, and any infrastructure in the area. The scale of proposed works will dictate the potential zone of influence of any works to be undertaken below ground.

During the construction stage of a project the local bearing capacity of the soil in the zone of influence for the works can be temporarily reduced. This is due to the removal of existing overburden pressures. Any project must allow for this reduction in pressure and undertake proper planning, design and execution of the excavation and any temporary works which would be required.

Additional effects which must be considered in the planning and design of a project are the inevitable ground movements which will be experienced. With any excavation there is a degree of ground movement which must be allowed for and this is generally done by specifying agreed design parameters for any soil retaining element of the works and incorporating in the construction sequence a suitable scheme for temporary works.
Once the construction stage of a project is complete possible effects which should be considered include the increased stiffness of the new foundations and also the possible increase in the loads transmitted to the bearing strata.

As part of the project any existing foundations within a site or adjoining the site may require upgrading to support the new building. Upgrading foundations along party wall lines can give rise to a variation in stiffness between old and new foundations which should be considered as part of the planning and design process.

In addition to the variation in stiffness of the foundations, a new or redeveloped building can lead to increased or redirected pressures on soil bearing strata. The effects of this should be catered for in any design with particular attention paid in areas where the primary soil is a clay-based material. This is due to the susceptibility of clay to experience swelling and contraction as moisture content varies. The issue of swelling and contraction can be minimized by excavating below the upper layers of soil which would be more sensitive to weather and moisture conditions.

### 2.5.3 Surface Flow & Flooding

Potential impacts on the surface flow and flooding characteristics in an area as a result of excavation for a basement can vary dependent on a site location and the existing drainage infrastructure which is required to cater for any runoff from a site.

Excavating for a basement directly affects the volume of soil below ground and depending on the type of material can affect the natural groundwater storage capacity of the soil. If this is reduced significantly it can cause an increase in the proportion of surface water runoff which needs to be catered for by the local drainage network.

Following on from the point above, with an increase in the volume of surface water runoff, there is an increased risk of overwhelming the local drainage network which may not have sufficient capacity to deal with the increased volumes. This in turn may raise the possibility of flooding properties down-gradient. As part of the planning and design of a project careful consideration should be given to the need to cater for any runoff generated by the development and if possible deal with it within the confines of the development site before finally letting any excess which cannot be catered for flow into the drainage network.

If a project causes an increase in the levels of runoff produced, and the increased volumes are not catered for, the possibility and frequency of flooding is increased. In areas which are already prone to flooding the effects of this must be examined and further analysis may need to be undertaken.

## 2.6 Screening Process

### 2.6.1 Subterranean Flow

***Q1a: Is the site located directly above an aquifer?*** ***→ NO***
Referring to Figure 8 of the CGH&HS (see Appendix A.11) indicates that the underlying soil has been classified as "Unproductive Strata" and thus would not be expected to contain any groundwater.

The site investigation carried out in the adjacent site shows that the predominant soil condition is found to be a stiff London Clay to a minimum depth of 25m underlying a 3.0m depth of made ground. There are no indications of a high water table or outcrops of permeable material in the immediate area.

***Q1b: Will the proposed basement extend beneath the water table surface?*** ***→ NO***
The proposed basement depth is expected to be a maximum of 3.55m. Borehole results and trial pits carried out for the site do not indicate the presence of a high groundwater table and thus it is expected that the proposed basement excavation will not extend beneath the water table.

***Q2: Is the site within 100m of a watercourse, well (used/disused), or potential spring line?*** ***→ NO***
The latest available information relating to watercourses in the area would suggest that the site is not within 100m of any existing natural water feature. Initial inspection of available mapping in the area (see Appendix A.13) shows a watercourse approximately 200m to the east of the site.

Historic records from the Lost Rivers of London (see Appendix A.12) suggest that the upper course of the River Fleet may have previously run its course approximately 500m to the north. Preliminary site investigation carried out on the site has not come across any form of dried water channel. On this basis it is assumed that the site will not contain any river channel material.

From available information on the British Geological Survey (BGS) website, the nearest water borehole has been identified approximately 700metres to the east of the site. Available BGS information shows that this well is approximately 195m deep. (Reg No: TQ28SE1491/BJ).
Additional wells in the area are found approximately 500m to the north, 750m to the west, and 800m to the south.

The site is located over an extensive area of London Clay material (see Appendix A.8) with no evidence of an outcrop of claygate formation or bagshot sands in the nearby area. This would suggest that the potential for a spring is minimal.

***Q3: Is the site within the catchment of the pond chains on Hampstead Heath?*** ***→ NO***
Referring to the Fig 14 of the CHG&HS (see Appendix A.14), the catchment areas for the Hampstead Heath pond chains do not coincide with the site location and are approximately 2km to the Hampstead Chain catchment.

***Q4: Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?*** ***→ NO***
At present the existing site is fully developed by existing buildings and hard-standing areas. It is envisaged that this situation will be maintained once the site is redeveloped and the basement installed.

***Q5: As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?*** ***→ NO***
The existing site is fully developed and this situation is not anticipated to change.

The existing drainage system for the site is assumed to drain freely into the local authority drainage network. It is not anticipated that the proposed development will increase the levels discharged to the ground.

***Q6: 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 (not the pond chains on Hampstead Heath) or spring line?*** ***→ NO***
The lowest point of the proposed excavation will be approximately 4.0metres below ground level. The site is not in close proximity to any local ponds, the nearest pond being 1.5 kilometres to the south in Regents Park.

### 2.6.2 Slope Stability

***Q1: Does the existing site include slopes, natural or manmade, greater than 7 degrees (approximately 1 in 8)?*** ***→ NO***
The existing site has no significant gradient or falls. Topographical data available from existing site surveys suggests the site is relatively flat across the plan area. Over the extended region the site is located in an area which is not noted as vulnerable to landslides or significant soil movements. The elevation of the extended area is found to be approximately 28m AOD

***Q2: Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 7 degrees (approximately 1 in 8)?*** ***→ NO***
The site is not anticipated to require any re-profiling to landscaping and is intended to be built upon over its entire plan area.

***Q3: Does the development neighbour land including railway cuttings and the like, with a slope greater than 7 degrees (approximately 1 in 8)?*** ***→ NO***
While the site is located approximately 100m to an existing railway line, initial site inspection and geotechnical investigations do not suggest the presence of any railway cuttings or indeed a slope in excess of 1in8.

***Q4: Is the site within a wider hillside setting in which the general slope is greater than 7 degrees (approximately 1 in 8)?*** ***→ NO***
The site is set in a region with a relatively flat slope. Approximate site levels are in the region of 28.5m with variance at a maximum of +/-0.3m.

***Q5: Is the London clay the shallowest strata at the site?*** ***→ NO***
The London Clay is the only definable strata at the site and is expected to go as far down as the underlying bedrock. Elements of the surrounding site have previously been used as parking areas and were found to have approximately 1.5-3.0m of made ground.

***Q6: Will any tree/s be felled as part of the proposed development and/or any works proposed within any tree protection zones where trees are to be retained?*** ***→NO***
There are no trees found within the curtilage of the site. It can be expected that the works will not encroach into the potential root protection zones.

***Q7: Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site?*** ***→ UNKNOWN***
With the limited information available (no pre condition survey has been carried out to date on the existing buildings either within or adjacent to the site) the effects of seasonal shrink-swell subsidence cannot be accurately established.

***Q8: Is the site within 100m of a watercourse or a potential spring line?*** ***→ NO***
Refer to Q2 of section 2.6.1 Subterranean Flow.

***Q9: Is the site within an area of previously worked ground?*** ***→ NO***
The site is not considered to be within an area of previously worked ground. Referring to the historic geological mapping available for the 1920's there is no indication that the area contains any worked ground.

***Q10: Is the site within an aquifer? If so, will the proposed basement extend beneath the water table such that dewatering may be required during construction?*** ***→ NO***
The site is located in an area designated as unproductive strata. Thus it is not expected to be within an aquifer. (See Appendices A.1; A.2; A.11)
Site investigation shows some signs of water ingress into the borehole. This is consistent with the depth of made ground in the area. Following the recent construction of the side extension close by it is anticipated that there will be no requirement for any dewatering during the construction of the proposed basement.

***Q11: Is the site within 50m of the Hampstead Heath ponds?*** ***→NO***
The site is located approximately 1.5kilometres away from the nearest pond in the Hampstead Heath Ponds. (See Appendix A.14)

***Q12: Is the site within 5m of a highway or pedestrian right of way?*** ***→ NO***
The proposed basement is set back more than 10 metres from the nearest roadway and/or pedestrian right of way which is Belmont Street. The proposed basement development is sitting directly underneath the existing car parking area, which will remain usable after all works have been carried out.

***Q13: Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?*** ***→YES***
To the north and south along the boundaries with the adjacent property it is anticipated that the differential depth of foundations will be approximately 3.0m assuming no basement/cellar is found below the neighbouring properties.

***Q14: Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?*** ***→ NO***
The site is located a minimum of 80m from the surrounding railway lines, and 100m from the neighbouring Northern tube line along the south elevation. Thus it is not expected that that the site is over or within any exclusion zones for rail or underground infrastructure.

### 2.6.3 Surface Flow & Flooding

***Q1: Is the site within the catchment of the pond chains on Hampstead Heath? → NO***

The site is approximately 1.5kilometers from the Hampstead Pond Chain and is not within the catchment of any of the pond chains on Hampstead Heath.

***Q2: 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***

The site is completely covered by impermeable elements and the proposed development will be similar in proportion to the extent of site covered. The use of any existing local authority drainage systems will be maintained and so the proposed development will not materially change the surface water flows.

***Q3: Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas? → NO***

It is not anticipated that the proposed basement will result in a change in surface water generated since the existing site is completely covered in hard-standing surfaces.

***Q4: Will the proposed basement result in changes to the profile of the inflows (instantaneous and long-term) of surface water being received by adjacent properties or downstream watercourses? → NO***

The existing site is serviced by a series of drainage sewers and channels which restrict the flow of surface water from the site to adjacent properties. This also ensures that all surface water generated is directed into the gravity fed drainage systems locally. The proposed basement is not expected to generate any additional surface water and so is not expected to change the profile of inflows of surface water to adjacent properties or downstream watercourses.

***Q5: Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses? → NO***

As per Q4, the proposed basement will not have any effect on the surface water which will be generated and so will have no subsequent effect on the quality of the surface water received by adjacent properties or downstream watercourses.

***Q6: Is the site in an area known to be at risk from surface water flooding, such as South Hampstead, West Hampstead, Gospel Oak and King's Cross, or is it at risk from flooding, for example because the proposed basement is below the static water level of a nearby surface water feature? → NO***

The site is located along Belmont Street. Examination of the available flooding data suggests that the site is not at risk of flooding of any nature. (see Appendix A.16)

## 2.7 Summary

### 2.7.1 Subterranean (Groundwater) Flow

The screening process has not identified any issues of concern to be investigated further as part of this BIA.

### 2.7.2 Slope Stability

The screening process has identified three issues which are of initial concern as part of the planning process and should be examined further as part of the scoping process

1. History of seasonal shrink-swell subsidence in the local area.
2. Possible differential depth between foundations of adjacent structures

### 2.7.3 Surface Flow & Flooding

The screening process has not identified any issues of concern to be investigated further as part of this BIA.

# 3.0 Scoping

## 3.1 Potential Impacts of the Proposed Scheme

### 3.1.1 Subterranean Flow

Not applicable

### 3.1.2 Slope Stability

#### 3.1.2.1 Seasonal Shrink-Swell Subsidence

The history of the seasonal shrink-swell ground movements in the local area is not readily known, although the clay-based nature of the underlying soil does point to the need to consider the cause and effects of shrink-swell movement in the proposed structural design.

There are a number of methods for dealing with possible ground movements which occur in clay soils. For areas of deep basement excavation, these can include the use of tension piles to counteract the anticipated hydrostatic pressures and/or the use of compressible material (e.g. Cordek) to reduce the build-up of hydrostatic pressure acting on the slab. In situations where a raft basement slab is used it is necessary to design the slab to resist the anticipated hydrostatic pressures.

In ground bearing RC strip foundation systems it is generally accepted that increasing the depth of a foundation below ground minimizes its susceptibility to the problems associated with the more frequent shrink-swell movement of clay soils due to freezing. A minimum depth of 1000mm is typically used for ground bearing foundations and is normally assumed to be below the level at which soil is susceptible to freezing and thawing.

The form of the foundations underlying the existing buildings adjacent to the excavation perimeter (typically stepped brickwork corbels to a depth of approximately 1.45m below existing ground level) allows us to presume that the problems that are inherent with shrink/swell of clay soils in shallow foundations are not applicable to the existing buildings on the site and would lead to the assumption that shrink-swell movements in the local area are currently not causing any undue deterioration in the buildings or boundaries.

For the proposed development, the building foundations are expected to comprise a suitably designed RC slab, with an underlying layer of compressible material. A suitably designed scheme of contiguous piling with RC facing walls is proposed to the perimeter of the new basement excavation.

#### 3.1.2.2 Differential Depth Between Foundations

The proposed excavation levels for the project will encounter varying levels of foundation between adjacent properties and a maximum differential level of 3.0m is expected between parts of the boundary which will be excavated for the basement floor. The slope stability and soil condition within neighbouring sites and adjacent areas may be subject to various potential impacts as a result of the proposed development. These can be categorised relative to their scale and an appropriate risk factor assigned to each case.

**Northern Boundary (No.21 Ferdinand Street)**

The property at No.21 Ferdinand Street is a 2-storey brickwork building with foundations expected to consist of corbelled brickwork down to level of approximately 1.0m below existing ground level. On this basis, the expected differential depth between the existing foundations and the excavated depth of the proposed lower basement will be in the order of 2.5-3.0m. Along this boundary it is proposed to construct a series of contiguous piles with a reinforced concrete facing wall.

The various impacts associated with the proposed works and a differential depth of foundation of 3.0m may include:

Small scale: Risk – Average
A nominal degree of horizontal deflection in the temporary works scheme proposed would possibly result in a reduction in the passive pressure exerted by the temporary works on the retained material facilitating a reduction in shear pressure between the soil particles and a settlement of the soil material immediately beyond the line of excavation. This in turn would possibly lead to some settlement of the more heavily loaded foundations. The result of this would be some minor cracking of brittle elements in the adjacent building (i.e.: plastered blockwork and plasterboard clad timber partitions). The frequency and magnitude of expected cracking to the adjacent building would not be expected to compromise the overall stability of the building in any way or indeed the capacity of the structural elements which could be affected.

Medium scale: Risk - Low
Should the temporary works along the boundary be subject to an increased level of horizontal deflection it is expected that the potential impact would be somewhat similar to those outlined above in terms of cracking but would be more frequent and more prevalent in the adjacent boundary wall and its connecting elements.

Large Scale: Risk – Very Low
In the event of a more severe situation such as the complete or partial failure of the temporary works and therefore the excavated faces, it is possible that the bearing capacity of the underlying soil below No.21 Ferdinand Street would be reduced significantly. It is possible that a situation of this magnitude would result in

- Major cracking to primary structural elements bearing on the foundations with similar effects propagating throughout the secondary supported elements.
- Excessive subsidence below the foundation to the existing building. The consequences of this would be a reduction in the integrity of the building and/or foundations to unacceptable levels requiring large scale repair works or demolition.

**Southern Boundary (No.19 Ferdinand Street)**

The property at No.19 Ferdinand Street is a 2-storey brickwork building with foundations expected to consist of corbelled brickwork down to level of approximately 1.0m below existing ground level. On this basis, the expected differential depth between the existing foundations and the excavated depth of the proposed lower basement will be in the order of 2.5-3.0m. Along this boundary it is proposed to install a series of reinforced concrete walls founded on a mass concrete underpin.

The various impacts associated with the proposed works and a differential depth of foundation of 3.0m may include:

Small scale: Risk – Average
A nominal degree of horizontal deflection in the temporary works scheme proposed would possibly result in a reduction in the passive pressure exerted by the temporary works on the retained material facilitating a reduction in shear pressure between the soil particles and a settlement of the soil material immediately beyond the line of excavation. This in turn would possibly lead to some settlement of the more heavily loaded foundations. The result of this would be some minor cracking of brittle elements in the adjacent building (ie: plastered blockwork and plasterboard clad timber partitions). The frequency and magnitude of expected cracking to the adjacent building would not be expected to compromise the overall stability of the building in any way or indeed the capacity of the structural elements which could be affected.

Medium scale: Risk - Low
Should the temporary works along the boundary be subject to an increased level of horizontal deflection it is expected that the potential impact would be somewhat similar to those outlined above in terms of cracking but would be more frequent and more prevalent in the adjacent boundary wall and its connecting elements.

Large Scale: Risk – Very Low
In the event of a more severe situation such as the complete or partial failure of the temporary works and therefore the excavated faces, it is possible that the bearing capacity of the underlying soil below No.10 Belmont Street would be reduced significantly. It is possible that a situation of this magnitude would result in

- Major cracking to primary structural elements bearing on the foundations with similar effects propagating throughout the secondary supported elements.
- Excessive subsidence below the foundation to the existing building. The consequences of this would be a reduction in the integrity of the building and/or foundations to unacceptable levels requiring large scale repair works or demolition.

#### 3.1.3 Surface Flow & Flooding

Not applicable

### 3.2 Summary

The proposed development is located in a region underlain by London Clay throughout. The potential impacts of the basement excavation have been assessed in relation to the three screening flowcharts provided by LB Camden.

The scoping process has examined the particular areas which pose the highest risk for potential impact on the adjacent properties. Given the relatively shallow depth of the excavation and the proposed structure it is not expected that the works will present significant risk to any of the boundaries affected provided the works are carried out in the appropriate manner.

# 4.0 Site Investigation & Study

A geotechnical site investigation has been carried out by Soil Consultants Ltd. This has been used to interpret the soil conditions found in the proposed development site. The borehole log and trial pit details are attached in Appendix C of this document.

The findings of the borehole investigation confirm the assumptions made in relation to clay-based subsoil in the vicinity and serve to back up the points made as part of this BIA.

A brief summary of the findings from the site investigation reveals that the proposed excavation will be carried out in an area of soil containing predominantly stiff London Clay below a depth of fill of up to 1.50m depth. The subsoil has also been defined as unproductive in terms of groundwater and no evidence of water ingress was found during the site investigation.

# 5.0 Impact Assessment & Conclusion

## 5.1 Existing vs Proposed

The existing site is currently un-developed below ground level. To the north and south the adjacent properties have not made use of the potential provided by construction of a basement. The existing foundation and slab arrangements for both properties consist of a stepped brickwork corbel to a depth of approximately 1.0m.

## 5.2 Site Attributes & Features Affected

### 5.2.1 Subterranean Flow

An analysis of preliminary site investigation results and an initial interpretation of the information obtained from various additional sources (British Geological Service, Environment Agency, Camden Geological Hydrogeological and Hydrological Study) would indicate that the presence of groundwater in the area is minimal and thus the potential impacts to the groundwater as a result of the development would safely be considered negligible.

### 5.2.2 Slope Stability

The scope of the proposed works and the extent of existing foundations in the area facilitate the reduction for the proposed basement floor over the existing building footprint with a relatively low level of risk to the slope stability of the adjacent properties.

### 5.2.3 Surface Flow & Flooding

The existing site has been fully developed in terms of impermeable surfaces and thus the construction of a basement is anticipated to have negligible effects on the volume and quality of surface water generated by the redeveloped site.

Analysis of the available material in relation to flooding has indicated that the site is not historically prone to flooding and is not in an area which is required to consider flooding as part of the basement construction.

## 5.3 Conclusion

The basement impact assessment for No.10a Belmont Street has been carried out in accordance with current guidelines provided by London Borough of Camden Planning Department.

The three principle criteria identified by the department and which must be dealt with in each assessment include, subterranean (groundwater) flow, slope stability, and surface runoff and flooding.

At each stage of this assessment these three criteria have been considered and any requirements for each category have been incorporated into the projects proposed development scheme.

As a result of this assessment it is reasonable to conclude that the proposed basement will not be detrimental to the region in terms of groundwater, slope stability and surface flow and flooding.

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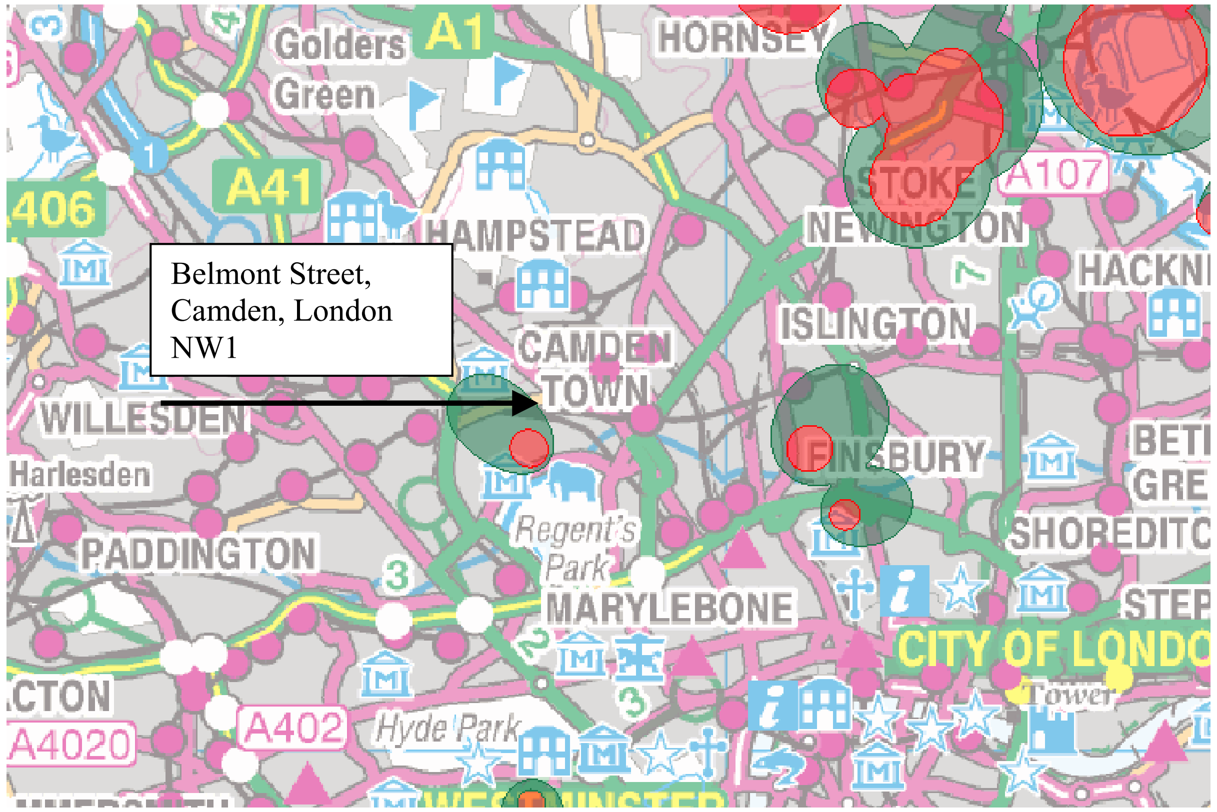
| | | |
|---|---|---|
| Date | : | 28th May 2015 |
| Revision | : | B |

**Appendix A**

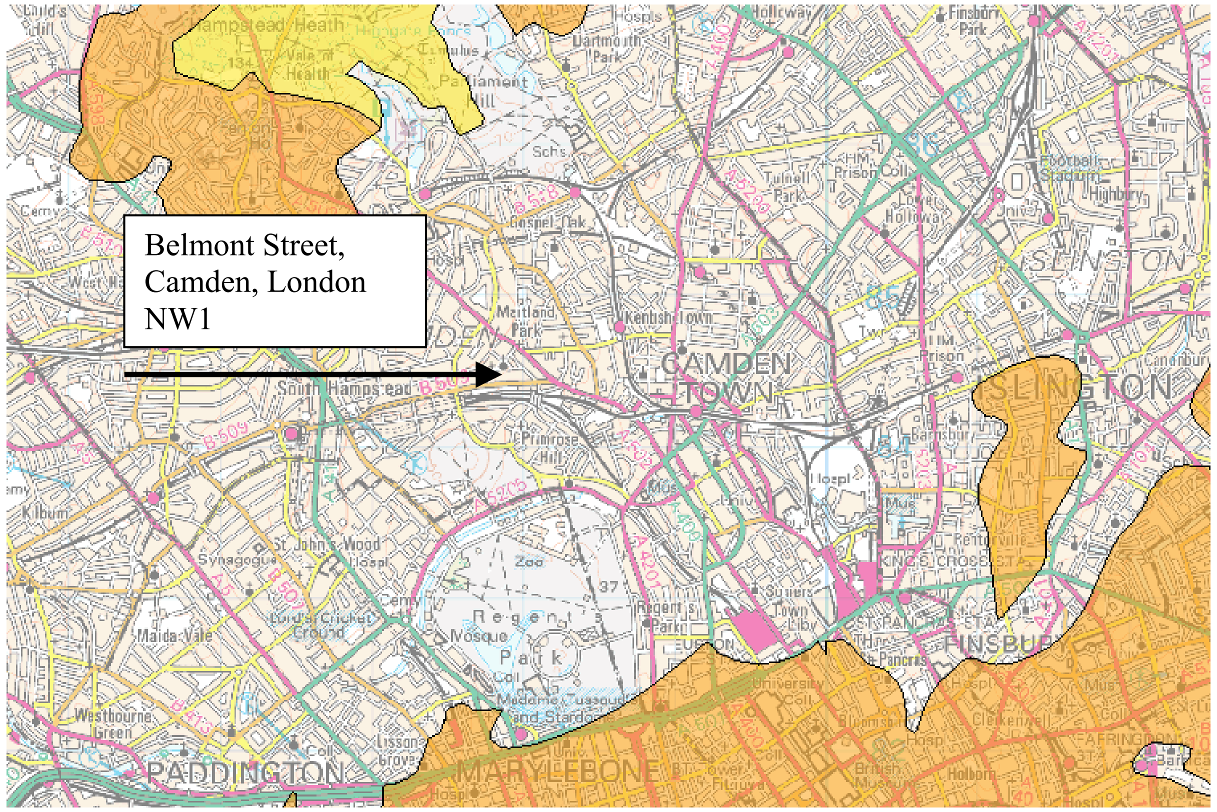
**Pringuer-James Consulting Engineers**
**Basement Impact Assessment**

**Mapping Data**

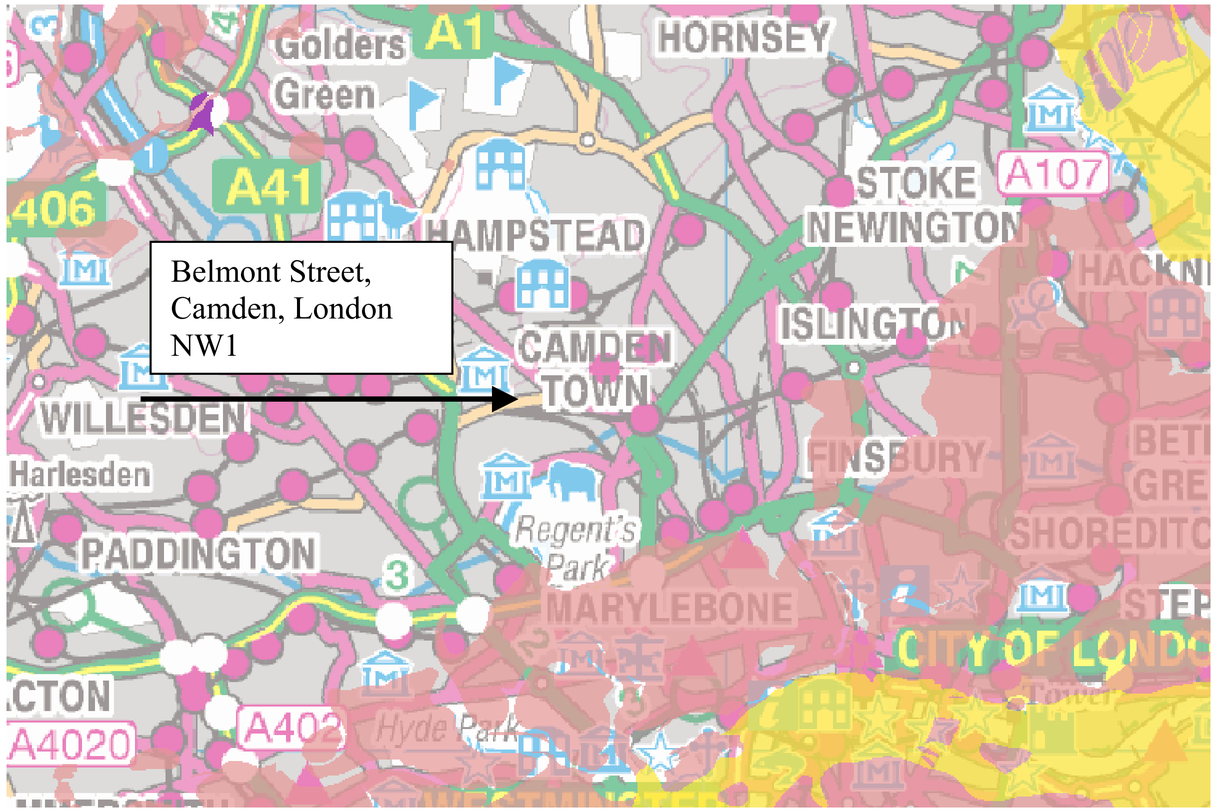

A1. AQUIFER – SOURCE PROTECTION ZONES (1:40,000)



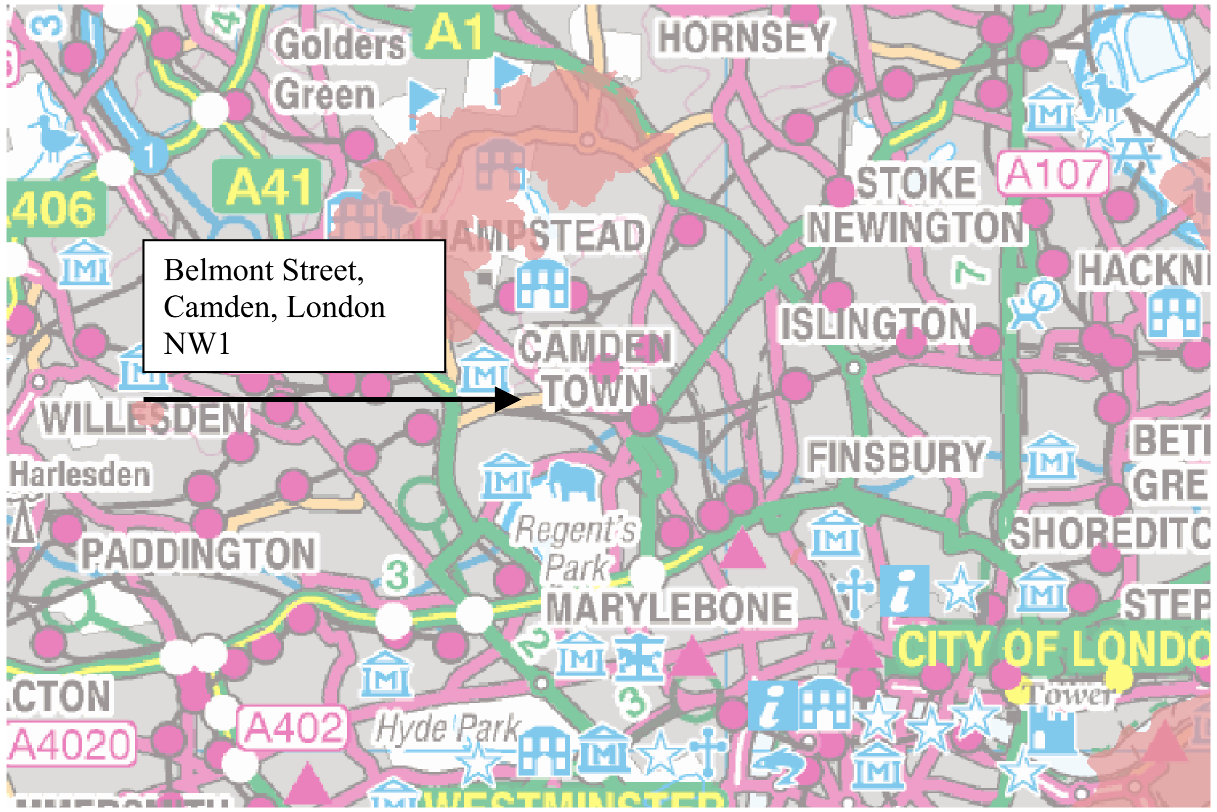

A3. AQUIFER – SOURCE PROTECTION ZONES (1:75,000)



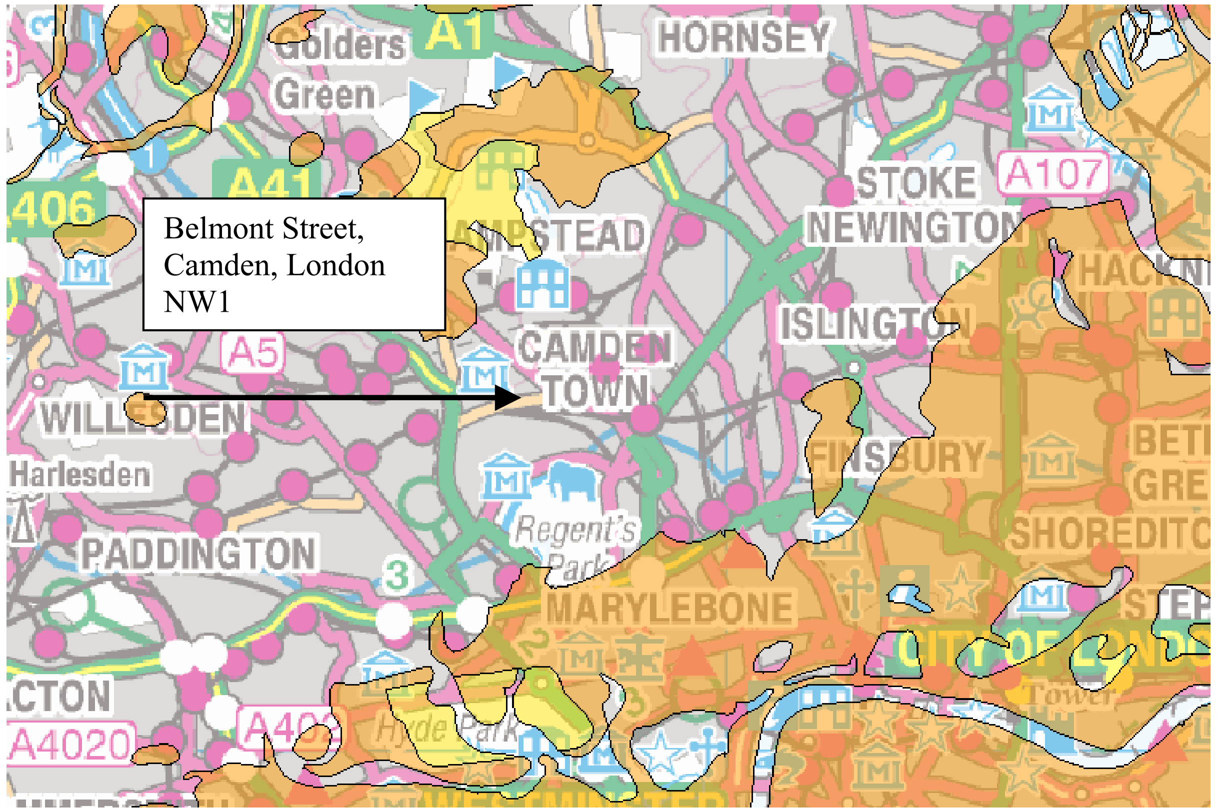

A2. AQUIFER – GROUNDWATER VULNERABILITY ZONES (1:40,000)




A4. AQUIFER – SUPERFICIAL DEPOSITS DESIGNATION (1:75,000)




A5. AQUIFER – BEDROCK DESIGNATION (1:75,000)




A6. AQUIFER – GROUNDWATER VULNERABILITY ZONES (1:75,000)