



128-130 GRAFTON ROAD, LONDON, NW5 4BA
Phase 1 Desk Study: Preliminary Risk Assessment

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Client:

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1. Introduction

Ground and Project Consultants Ltd (G&PC) have been instructed by Southend Point Ltd to undertake a Phase 1 desk study (Preliminary Risk Assessment) at 128-130 Grafton Road, London, NW5 4BA. The site's location is indicated on Figure 1.

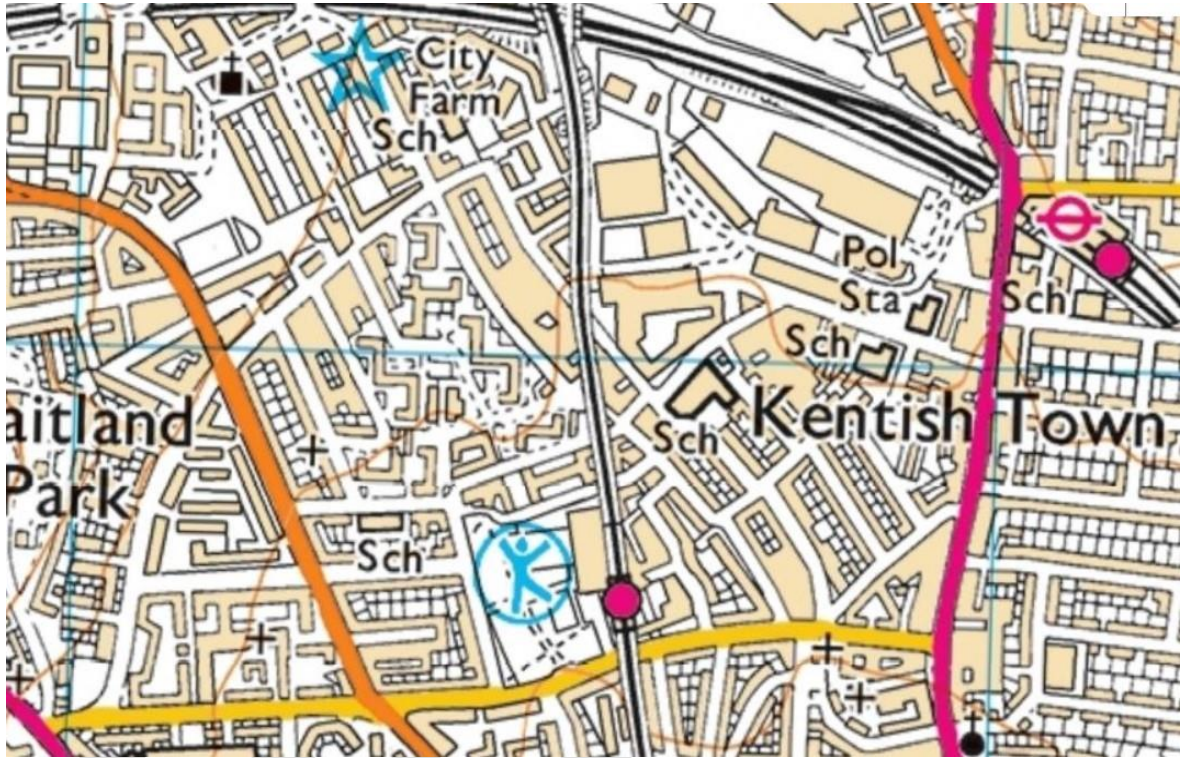


Figure 1: Site Location

Ordnance Survey Data © Crown copyright and database right 2016

2. Scope and Objectives

The scope of this report and approach is as follows:

- A review existing data on the environment, geology, hydrogeology and history of the site and surroundings relevant to the development
- Assess and Appraise acquired data
- Development of an outline 'Conceptual Site Model' which develops an assessment of potential pollutant linkages at the site
- Develop outline proposals for a Phase 2 intrusive investigation, if appropriate.
- Provide clear justification for conclusions and recommendations reached.

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3. Data and Information Sources

The following information has been used in the development of this report:

- Ordnance Survey mapping
- Historical Maps provided by Groundsure
- Environmental Data provided by Groundsure (Enviro-Insight Report GS-4228184)
- Geological data from British Geological Survey (BGS). Mapping and freely available borehole data

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4. Existing Property and Basement Proposals

The property at 128-130 Grafton Road is located on the east side of the road. The property is around 1.4 km North of Regent's Park and 900m north of Camden Locks. The National Grid reference for the property is TQ 28495 85038. The location of the property is indicated in Figure 1 above.

The existing structure is a single-storey terraced industrial building/warehouse comprising a ground floor and a mezzanine floor, forecourt area and off-street parking for approximately 5 vehicles.

It is currently occupied by E & D Scaffolding Co Ltd. The building is brick built and is understood to be in overall good condition, with minor signs of distress

It adjoins a large residential scheme on its eastern side (no. 126). There is a single-storey industrial building "Spring Lighting" on its western side (no. 132-134). The properties back onto a significantly larger building fronting Spring Place which is in residential use.

It is proposed to construct a five storey residential building with a basement and roof terrace. The basement will be approximately 3m deep. The footprint of the basement including sunken terraces is approximately 14.1m wide by 16.8m deep with a resultant area of around 237m². The descriptions and dimensions above have been estimated from drawings provided by Redrock Development Group.

It is understood that there are no trees in the existing property. There are some trees close by to the front of the property immediately to the south and trees along the road. Some shrubs may be present. The front of the property is directly adjacent to the pavement.

i. Topography

The OS map indicates the property is at around 36m AOD. The ground surface is relatively flat.

ii. Geology

The available geological mapping (Ref 1.) indicates that the site lies on London Clay. London Clay typically comprises a stiff grey fissured clay, weathering to brown near surface. Concretions of argillaceous limestone in nodular form (Claystones) occur throughout the formation. The base of the London Clay is likely to occur at significant depth below the property. An area of worked ground (the hatched area) is indicated close by to the East and North. An area of potential Head Deposit is shown around 300m to the Northwest. See Figure 2 below.



Figure 2: Geology

BGS copyright and database right 2015

iii. Hydrology and Hydrogeology

The OS Map indicates that there are no surface water bodies in the near vicinity of the site. The Hampstead Ponds are located approximately 1.4km to the NW. Tributaries of the 'lost' River Fleet are understood to run in culvert around 100-200m to the east and west of the site.

The underlying London Clay is classified by the Environment Agency as unproductive strata (rock layers with low permeability and negligible significance for water supply or river base flow). The site is not within a source protection zone of a public water supply. There are no ground or surface water abstraction licences within 250m of the site.

5. Site History

Historical land use and the development of the village over the last 150 years or so has been derived from old OS and National Grid maps provided by Groundsure. The findings from the study of the maps are outlined in the table below:

Date Map Published	Scale	On-site	Off-site
1872-3	1:1,056	Occupied by a pair of terraced houses formed as 2 of a short row of 4.	Grafton Road is fully developed by housing. A 'Colour Works' is indicated adjoining to the N. The railway line (existing) is indicated close by to the E. A further 'Colour Works' is indicated to the SE.
1879	1:2,500	As above	Smaller scale map shows wider context. Much of the area is built up with a Coal Depot indicated to the E of the railway line.
1896	1:1,056	As above	Little change although the 'Colour Works', now named 'North London Color Works' has expanded and is built up right up to the boundary with the subject site. The other Colour Works is indicated as a warehouse.
1896	1:2,500	As above	Smaller scale map shows wider context. A large railway sidings area is shown 300-500m to the NE and 'Midland Works

			(Road Vehicle) is shown 150m to the N.
1915-16	1:2,500	As above	No significant changes
1952	1:1,250	The two properties which occupied the site have gone and two small building are indicated in the N and E corners of the site	The site of the Colour Works is indicated as a Shoe Factory and other unnamed properties. An Optical Works is indicated to the E at no.s 8-9 Spring Place and a Glass Works at no 6. The house at 105 Grafton Rd is marked as a 'ruin', possibly indicating bomb damage. The Coal Depot is again indicated to the E of the railway line. A Metal Works is indicated around 70m to the NNE on the other side of Spring Place. Other ruins are indicated in the general vicinity.
1952/1953 (National Grid maps)	1:1,250	As Above	As Above
1966-1968	1:1,250	The site is now built up again indicated as one property.	The surrounding industrial uses remain whilst new apartment/maisonettes are shown on the W side of Grafton Rd. A 'Paper Salvage Works' is shown 150m to the ENE and a 'British Rd Services Depot' shown around 120m to the E.
1967-1968	1:2,500	As above	As above

1970 (National Grid Map)	1:2,500	As above (note map faint so difficult to read)	As above (note map faint so difficult to read)
1973-4 (National Grid Map)	1:1,250	As above (note map faint so difficult to read)	As above (note map faint so difficult to read)
1974-77 (National Grid Map)	1:1,250	As above	As above (note that some of the industrial properties are simply named 'Works'). 'Tank' indicated 90m to N on Arctic St
1979-82 (National Grid Map)	1:1,250	As above	As above (Partial coverage)
1982-87 (National Grid Map)	1:1,250	As above	As above (Partial coverage)
1990-91 and 1991-92, 1992 (National Grid Map)	1:1,250	As above	As above the large works to the E is labelled 'Garage'. Electricity substations are indicated 60m NE, 120m NE and 230m ENE. (Partial coverage)
1995 (National Grid Map)	1:1,250	Not covered	As above (Partial coverage)

Smaller scale maps have also been obtained at 1:10,560 scale, giving a wider geographical coverage. These have also been reviewed and significant findings over and above those described above.

Date Map Published	Scale	On-site	Off-site (additional comments)
1872-3 and 1879-82	1:10,560	Occupied by a pair of terraced houses formed as 2 of a short row of 4.	Kentish Town (Rail) Sheds indicated 300-400m to the N.
1920	1:10,560	As above	Timber Yard indicated ~250m to the N. Locomotive sheds and bottling stores shown ~500m to N and NE. Wider area to N more built up
1957-58	1:10,560	Site is unoccupied	

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6. Environmental Data from Groundsure

The Groundsure report gives a wealth of background data on local environmental issues and hazards. (See Appendix A). The key issues of significance are summarised in the table below:

<p>Historical Land Uses</p>	<ul style="list-style-type: none"> • The Colour Works are noted 'on-site' which is not strictly accurate. They were adjacent. • The various nearby industrial uses mentioned in the maps review above are recorded. • Electricity substations are noted from 51m NE, 123m NE , 158m SE, 166m N, 169mSE, 208m E with others further afield • Garage 56m E (1990's)
<p>Environmental Permits, Incidents and Registers</p>	<ul style="list-style-type: none"> • There are no records of IPC, Part A(1) and IPPC Authorised Activities authorisations at site • Jt Coachwks, Spring Pl, Kentish Town, NW5 3BH Process: Respraying of Road Vehicles, Historical Permit Type: Part B 26m SE of site • Hexagon of Highgate, 1 Browns Lane, Regis Road, Kentish Town, London, NW5 3EX Process: Respraying of Road Vehicles Status: Current Permit, Permit Type: Part B 135m E of site • Other processes further afield include metal coating, respraying, dry cleaning
<p>Waste Sites</p>	<ul style="list-style-type: none"> • Scrap Metal Depots, 89m NE and 124m NE There is a recycling Centre 259m NE

Current Land Use: On-site	<ul style="list-style-type: none"> E&D Scaffold Co Ltd, 128-130, Grafton Road, London, NW5 4BA: Construction and Tool Hire
Current Land Uses: Off-site	<ul style="list-style-type: none"> Spring House 10, Spring Place, London, NW5 3BH Lampshades and Lighting Consumer Products 34m to N Chimney, Industrial Features 37m N The Car Surgery Ltd and The End Garage, Arctic Motors, and othersall Vehicle Repair, Testing and Servicing 106m, 117m and 118m 126m N and 129m E
Ground Water Abstraction	449m to SE, the site is not within or close to a Source Protection Zone
Shrink/ Swell	There is a moderate hazard of shrink and swell from the bearing strata at site
Landslide	Very Low Risk
Soluble Rocks	Negligible Risk
Compressible Ground	Negligible Risk
Collapsible Ground	Very Low Risk
Running Sand	Negligible Risk
Radon	The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level. No radon protective measures are necessary
Mining	None recorded.

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7. Land Quality Assessment:

i. Preliminary Risk Assessment

The development of a conceptual model for the site is a key approach outlined in CLR11 and has become standard industry practice. CLR11 defines a conceptual model as a representation of the characteristics of the site in diagrammatic or written form that shows the possible relationships between contaminants, pathways and receptors. For there to be a 'significant possibility of significant harm' there needs to be a pollutant linkage between the contaminant or hazard and the receptor via a plausible pathway.

This section comprises a preliminary risk assessment for the site. The aim is to establish whether there are potentially unacceptable contamination risks. An initial conceptual site model (CSM) has been developed, which identifies source-pathway-receptor 'pollutant linkages' potentially present at the site. If potentially unacceptable risks are identified then it is suggested what further action may be appropriate.

This assessment is based on the information obtained and assessed within this report.

Historically the site has been used for housing and later commercial use, with possible intervening industrial use. Historical and current land uses are characterised by various industrial uses, both transport and chemical industry, as well as residential.

Site Geology is likely to comprise considerable thicknesses of Made Ground overlying London Clay. London Clay is unproductive strata.

On-site, adjacent and nearby land uses may have had the potential to influence the contamination status of the site.

ii. Potential Contaminative Land Uses In and Around the Site

From the available information the following potential sources of contamination have been identified:

On-site Sources
<ul style="list-style-type: none">• On-site Made Ground from previous structures may contain anthropogenic materials including asbestos containing materials (ACM).• Oils, fuels and solvents from current and past uses.
Off-Site Sources
<ul style="list-style-type: none">• Colour Works: Likely to have been a dye works: VOC's, solvents, fuel and lubricating oils, chlorinated solvents, metals. Oils, fuels and solvents from current and past uses. Old waste tips on-site if present may generate gases• Vehicle Maintenance and Repair: Oils, Solvents, PAHs, Metals• Electricity Substations: PCBs, Oils, Metals

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iii. Preliminary Conceptual Site Model

An initial conceptual site model (CSM) has been developed, which identifies source-pathway-receptor, 'pollutant linkages' potentially present at the site.

Preliminary Conceptual Site Model (CSM)		
Source (including potential contaminants)	Pathway	Receptor
On-site Made Ground (heavy metals, Polycyclic Aromatic Hydrocarbons (PAH), Total Petroleum Hydrocarbons (TPH), Benzene Toluene Ethylene Xylene (BTEX), PCBs)	Ingestion, inhalation, dermal contact	Humans: future site users, visitors and construction workers
	Migration through the ground	Underlying soils (e.g. Made Ground/ London Clay interface)
	Direct uptake from soil	Vegetation
On-site Made Ground (sulphates, pH)	Direct contact	Below ground concrete
On-site Made Ground (landfill gases such as methane and carbon dioxide)	Migration through the ground and inhalation	Humans: future site users, visitors and construction workers
On-site Made Ground (ACM and asbestos fibres)	Inhalation	Humans: future site users, visitors, neighbours and construction workers

iv. Qualitative Risk Assessment

Following on from the identification of potential pollutant linkages at this site, and compilation of an initial CSM, a qualitative risk assessment has been undertaken to assess the probability/likelihood vs. consequence/severity of occurrence for each pollutant linkage and hence determine an overall level of risk for each pollutant linkage and any appropriate follow on action.

The qualitative risk assessment for this site is outlined in the following table:

Potential Hazard	Potential Receptor	Probability	Consequence	Risk
On-site made ground (as presented in the CSM: general anthropogenic contaminants associated with former and adjacent site uses)	Human health	Low likelihood	Medium	Moderate / Low risk
	Controlled waters	Unlikely	Medium	Moderate / low risk
	Vegetation	Moderate/Low Likelihood	Medium	Moderate risk
On-site made ground (sulphates)	Below ground concrete	Moderate/Low Likelihood	Medium	Moderate / low risk
On-site made ground (landfill gases)	Human health	Unlikely	Severe	Moderate / low risk
On-site made ground (asbestos fibres and ACM)	Human health	Low likelihood	Severe	Moderate risk

The hierarchy and definitions of probability vs. consequence and risks are based upon CIRIA good practice guidance principally detailed within C552 and C665.

From the qualitative risk assessment above, overall contamination risks are considered to be low to moderate with the main risks being to human health and controlled waters.

Potential hazards where the risk is rated very low or low would usually require no further action. However, where risks are rated as moderate/ low or higher, further assessment is required.

The nature and extent of Made Ground at site is currently unknown. Potential contamination risks associated with on-site sources as identified in the CSM should be quantified via a programme of intrusive site investigation and subsequent chemical testing, including testing of samples of made and natural ground and leachate testing as appropriate. Appropriate testing to enable selection of suitable new potable water supply pipes may also be required.

The former structures at the site are likely to have contained ACM. As such an asbestos screen should be added to the soil contamination testing schedule for samples of Made Ground, to quantify the risk posed by possible ACM or asbestos fibres.

Former on site or more likely adjacent site waste tips may be present and could be a potential source of ground gas. As the proposed end use of the site is for housing, which is a sensitive end-use, it is likely that ground gas monitoring will be required by the Local Authority.

These are recommendations based on the current level of knowledge regarding the site. As the site investigation works commence more information will become available and the particulars of the overall site investigation scheme should be modified accordingly as required.

During construction, site workers should wear appropriate PPE and adopt safe working practices to prevent unnecessary exposure to made or potentially contaminated ground or ACM.

Given the location of the site in an industrial area with railway siding close-by, evidence of bomb damage in post war maps (e.g. indication of ruins) and possibly including the destruction of the subject property, indicates that Unexploded Ordnance may be a risk, albeit small.

8. Conclusions

This Phase 1 Geo-Environmental Desk Study includes a review of a Groundsure report compiled for the site, a review of published information, a preliminary geotechnical appraisal and a qualitative contamination risk assessment for this site and concludes:

- The site has previously been used as residential and light industrial use.
- Adjacent and nearby land uses have included various industrial uses.
- Made Ground is highly likely to be present at the site, associated with former structures, and possible demolition/infilling of cellars. The natural deposits beneath the Made Ground are London Clay, which is unproductive strata.
- The site is not in a coal mining or brine affected area.
- Radon protective measures are not required within buildings on site.
- There are some potential pollutant linkages from on-site or off-site sources, as identified by the Conceptual Site Model (CSM). Ground investigation is required to further quantify possible contamination risks identified by the CSM.
- UXO is a minor risk but warrants further assessment, initially this should be desk-based.

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9. Recommendations

Ground investigation is recommended to confirm and further establish on-site ground conditions, to aid scheme development and to enable quantitative contamination risk assessment. The following is suggested:

- It is recommended that three boreholes are drilled at site in order to assess the extent and physical and chemical nature of the Made Ground at site. It will be prudent and cost effective to extend these boreholes into the London Clay to establish geotechnical characteristics of the clay, to enable the design of the basement and foundations.
- The exploratory holes should be appropriately logged in detail to BS5930.
- Samples of made and natural ground should be collected from the exploratory holes for subsequent contamination testing in accordance with the CSM (specifically metals, speciated PAH, speciated TPH, BTEX, SVOCs, VOCs, pH, sulphates and include SOM and an asbestos screen on samples of Made Ground as appropriate) in order to address the risks to human health and below ground concrete. Tests to enable selection of suitable potable water supply pipes will also be required such that conductivity and redox potential and phenols should be added to the test suite. A minimum of 10 samples should be tested. The testing regime and schedule can be altered depending on-site conditions and observations. If additional sources of contamination are apparent then these should also be assessed via additional testing.
- Carry out a desk based assessment for UXO risk

During construction, site workers should wear appropriate PPE and adopt safe working practices to prevent unnecessary exposure to made or potentially contaminated ground or ACM. Health and Safety Risk assessments and working methods should be developed and approved as appropriate.

These are recommendations based on the current level of knowledge regarding the site. As the ground investigation works commence more information will become available, and the particulars of the overall ground investigation scheme should be modified accordingly if necessary.

The conclusions and recommendations made within this report should be agreed by the approving bodies, such as the Local Authority and Environment Agency, prior to commencing site works.

10. References

1. BGS open source mapping: <http://mapapps2.bgs.ac.uk/geoindex/home.html>
2. BGS Sheet 1:50000 scale 256 North London
3. Groundsure Report GS-4228183 Enviro-Insight
4. Groundsure Report GS-4228184 Historical Mapping
5. Southend Point Ltd: Design drawings available at the time of reporting.
6. DEFRA/EA Contaminated Land Report 11(CLR11). Model Procedures for the Management of Land Contamination. September 2004.
7. CIRIA, 2014. Asbestos in Soil and Made Ground: A Guide to Understanding and Managing Risks. 2014.

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APPENDIX A

Groundsure

Enviroinsight Report GS-4228183

Historical Maps GS-4228184

