17.0610/CK
17 October 2017

FAO Julie Sims
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building & project consultants

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BY EMAIL

Dear Julie

ARLINGTON STUDIOS, CAMDEN, NW1 – GROUND INVESTIGATION AND INTERNAL AIR SPACE MONITORING

Introduction

Paragon Building Consultancy Ltd (Paragon) was commissioned by David Sims Studio to complete a geoenvironmental assessment, with letter report, for a site at 104 Arlington Road, Camden in north-west London. A Phase 1 Environmental Risk Assessment report was initially completed for the site, which should be read in conjunction with this report for detailed background information. The report included the development of a Conceptual Site Model (CSM), which concluded there was a low to medium risk associated with the site's redevelopment.

This was discussed with the London Borough of Camden's Contaminated Land Officer (CLO) - Anona Arthur. The CLO indicated there were concerns relating to the potential for historical solvent use at the adjacent site, which was a former sheet metal works.

Therefore, some investigation was required to assess the risk to human health, which was considered to be the most sensitive receptor. Owing to the constraints at the site and that it is only being refurbished for commercial use, a pragmatic approach of shallow soil sampling and internal air space monitoring was agreed (Appendix 1). Therefore, this separate quantitative assessment has been completed by Paragon, which includes the following:

- Summary of desk based information for the site;
- Details of site works undertaken and the ground conditions encountered;
- Chemical laboratory test data, gas monitoring records and site characterisation;
- Updated CSM; and
- Contamination risk assessment and recommendations.

These works have been completed in relation to the refurbishment of the previous commercial / retail land to a photographer's studio.

This letter report may be submitted to the Local Planning Authority, London Borough of Camden, to seek approval of the discharge of associated land contamination conditions.

Background

Development proposals

The current property is a late 19th Century-early 20th Century building and has a basement below the original footprint. Owing to its condition and access constraints, the basement does not form part of the refurbishment works. It will be subject to redecoration only as it is not intended to be used as a workspace.

A small extension will be constructed at the rear of the existing building extending across the footprint of an original extension and across the ground- and first-floor level only. The studio will be arranged as follows:

- Ground Level: lobby, studio, kitchen, lounge, toilets and hair and make-up studios;
- First Floor: Green room, offices, studio, server and tea room; and
- Second Floor: Studio, library and plant.

The site will be entirely covered by hard standing offered by the footprint of the existing slab and extension, which will not be excavated down to basement level. The extension will be accommodated by the completion of one new pad footing; the remainder will be supported on the existing slab wall and pad stone. Therefore, very limited groundworks will actually be completed.

Planning constraints

The building is listed under the Planning (Listed Buildings and Conservation Areas) Act 1990 as amended, for its special architectural or historic interest. The change in use from a shop to a photographer's studio has been granted under application reference 2015/1985/P with land quality conditions. These stated that a written programme of ground investigation should be agreed with the local planning authority and that remediation measures should be implemented (if required) prior to occupation.

The adjacent residential development at 100-102 Arlington Road was subject to similar conditions for the change in use from commercial to residential flats. Based on the site investigation completed, by others, the risk was determined as low; no specific remediation measures were required at that development.

Site location and description

The site is located off Arlington Road between a currently vacant commercial property (the former metal sheet works at 106) and new-build residential flats at 100-102. The property is centred around National Grid Reference 528937,183659 and extends across 0.04 hectares in size. It is occupied by vacant property that has been more recently lent to commercial / retail use. It is currently undergoing refurbishment in connection with the development proposals set out above. There are no areas of soft landscaping.

The property is immediately surrounded by mixed commercial, retail and residential land use.

Desk based information

Earliest available historical mapping indicated that the site was occupied by residential properties in the west and gardens in the east from circa 1873. By c. 1896 the gardens were no longer present and a commercial type property had been constructed in the east, which also extended off the site. The site was completely redeveloped by c. 1908-1916 and comprised one single commercial type property. Anecdotally, we understand that the site formed part of London County Council's tramway property and infrastructure. By the 1950s, there appeared to be a narrow separate structure constructed in the east. The site then remained undeveloped until present day, although it is understood that it had been used more recently for commercial / retail activities.

Historically, the site was within an area of wider commercial and industrial land use common for a central London site. The main source of potential concern was perceived to be the adjacent metal sheet works, which may have used degreasers (solvents) as part of the activities completed there.

Environmental setting

Geological records indicate that the site is directly underlain by the London Clay Formation, which is classified by the Environment Agency (EA) as an Unproductive Stratum. The site is not located within a Source Protection Zone (SPZ). There is no licensed groundwater abstraction within 500m of the property and the site is not located within a groundwater Source Protection Zone (SPZ) as designated by the EA.

British Geological Survey records from a nearby site were confirmatory of the ground conditions anticipated from published records but also described a thin veneer of Made Ground, which may also be present at the site due to developmental changes.

There are no surface water features within a 250m radius of the site and there is subsequently no surface water abstraction. EA data also revealed that the site is not within an indicative flood risk zone and is not prone to groundwater flooding.

Based on the foregoing, the overall environmental sensitivity of the site's surroundings was anticipated to be low. The preliminary CSM concluded that there would be a low risk to Controlled Waters. There is no sensitive groundwater table / aquifer beneath the site and the presence of the cohesive, London Clay Formation would be expected to restrict vertical and lateral pathways for mobile contaminants. However, owing to the potential for Made Ground and use of solvents at a site adjacent there is the potential for soil contamination and ground gas / vapours. Therefore, as a precautionary measure, it was agreed that soil samples from the extension areas would be screened for a comprehensive suite of testing to confirm the risk in relation to residual contamination (if any) in shallow Made Ground to the site users. Furthermore, internal air space monitoring would be completed in relation to human health risks, which were perceived to be low to medium overall.

The full Paragon Phase 1 Environmental Risk Assessment (Ref: 170610, dated September 2017) should be read, in conjunction with this letter report, for further details.

Fieldwork

Two phases of investigation were undertaken at the site in accordance with the principles of BS 5930:1999 and BS 10175:2011. The first phase was undertaken on 20 September 2017 and involved soil sampling from inspection pits at locations shown on Figure 1. A Paragon representative logged the ground conditions and took representative soil samples for chemical laboratory analysis. The soil samples were collected into dedicated containers (clean glass amber jars and plastic tubs). The samples were stored under cooled conditions for submission to i2 Analytical, an MCERTS and UKAS-accredited facility, for chemical laboratory testing including:

- pH;
- Total Organic Carbon (TOC);
- Heavy metals and metalloids;
- Speciated Total Petroleum Hydrocarbons (TPH);
- Speciated Polycyclic Aromatic Hydrocarbons (PAH);
- Total monohydric phenols;
- Benzene, Toluene, Ethylbenzene and Xylenes (BTEX);
- Total cyanide;
- Total sulphate / sulphide,
- Volatile Organic Compounds and Semi Volatile Organic Compounds (VOCs and SVOCs); and
- Asbestos screening (Made Ground samples only).

One sample was screened for the presence of Polychlorinated Biphenyls (PCBs) to supplement the generic suite of testing.

The second phase of investigation was completed on 29 September 2017 and involved internal air space monitoring, by Ground Gas Solutions (GGS), using hand held analysers to detect carbon dioxide (CO2), methane (CH4) & Total Volatile Organic Compounds (TVOCs). During monitoring, the technician manually recorded specific events (elevated readings); when a 'hot spot' was identified a location reference was created to identify the location of the elevated reading and the maximum readings presented. Data was captured at ppmv levels and the detection levels are as follows:

- CH4: 0.1ppmv;
- CO2: 1.0ppmv; and
- PID: 0.1ppmv.

The basement was sealed as far as reasonably practicable prior to the monitoring to allow for internal air space of the basement. Readings were taken at all accessible air intakes such as service entry points, cracks and gaps. For comparison, monitoring was also completed on the ground-floor level, which is an active construction site and in ambient air.

Site photographs are provided in Appendix 2, together with the inspection pit records. The laboratory data is provided in Appendix 3 and the internal air space monitoring data is provided in Appendix 4.

Ground and Groundwater Conditions

The ground conditions encountered during the investigation are summarised in Table 1 below and are also reported on the inspection pit records presented in Appendix 2, together with site photographs.

No groundwater was encountered during the investigation.

Other than man-made materials within the Made Ground, including abundant brick, concrete, coal and clinker, no foreign materials were recorded in the on-site soils.

There were no visual or olfactory signs of gross contamination; no visual evidence for Asbestos Containing Materials (ACMs) or free product were observed.

Table 1 – Ground conditions

Stratum	**Depth to surface (m bgl)**	**Typical thickness (m)**	**Samples taken**
MADE GROUND: Concrete hard standing over brick subbase.	0.00	0.15-0.27	None
MADE GROUND: Clayey sandy gravel and sandy gravelly clay. Sand is medium to coarse. Gravels are subangular to subrounded fine to coarse sized of glass, flint, brick, concrete, coal and clinker.	0.15-0.27	0.35-0.49	FP 1 – 0.35m bgl TP 1 – 0.50m bgl TP2 – 0.35m bgl
Soft to firm orange brown and grey mottled fissured silty CLAY with occasional pockets of fine orange sand. Sand is medium. [WEATHERED LONDON CLAY FORMATION]	0.72-0.90	0.18 – unproven	None
Firm to stiff dark brown / grey CLAY with occasional pockets of fine sand. *Only encountered in TP3.* [LONDON CLAY FORMATION]	0.96	Unproven	TP3 – 1.0m bgl

Geoenvironmental Assessment - Soil

Soil samples were taken from three inspection pit locations from within the Made Ground. An additional soil sample was taken from the natural London Clay Formation in a deeper pit that was excavated to view incoming services into the site. Laboratory test results have been compared against the commercially available 'AtRisk Soil Screening Values (SSVs) developed by Atkins. The SSVs are based on minimal or low toxicological risk and utilise the standard land uses and exposure assumptions set out in the C4SL Project Methodology published by Defra and used in the derivation of applicable Category 4 Screening Levels (C4SLs). The statutory C4SLs are assumed for arsenic, cadmium, chromium VI, lead, benzene and benzo(a)pyrene. The SSVs have been generated for a sandy soil type and a Soil Organic Material (SOM) of 1% or a sandy loam and an SOM of 6%. Based on a conversion of the Total Organic Carbon results to SOM, the most relevant to the site is 1%.

The SSVs represent conservative screening criteria (set at acceptable or minimal risk) and have generally been calculated using the default parameters for the standard land use scenarios and toxicological inputs set out in the various Contaminated Land Exposure Assessment (CLEA) technical reports and the CL:AIRE EIC Generic Assessment (GAC) documentation. For the proposed end use of the site, the appropriate land use scenario for the assessment is 'Commercial'.

Currently, there is no authoritative threshold for acceptable levels of asbestos fibres in soil. Therefore, a positive identification of fibres would warrant additional assessment of the risks including further quantification analysis as appropriate.

Owing to the limited number of samples that it was possible to take (and were agreed with the CLO), a direct comparison of the results to the SSVs has been completed rather than a statistical analysis. The findings are summarised in Table 2 below.

Table 2 – Measured Soil Contaminant Concentrations vs SSVs for 1% SOM Commercial Land use

Contaminant	Measured concentration range (mg/kg)	SSV (mg/kg)	Exceedance (Y/N)
Metals and Metalloids			
Arsenic (C4SL)	7.7-16	635	N
Boron	2.5-4.4	No SSV	NA
Cadmium	<0.2	410	N
Chromium	12-34	208,000	N
Copper	20-63	10,600	N
Lead	47-630	2,310	N
Mercury	<0.3	3,600	N
Nickel	13-33	1,770	N
Selenium	<1.0-1.1	13,000	N
Zinc	63-220	1,100,00	N

Contaminant	Measured concentration range (mg/kg)	SSV (mg/kg)	Exceedance (Y/N)
Polycyclic Aromatic Hydrocarbons (PAH)			
Benzo(a)pyrene*	<0.05-1.2	76.3	N
Total Petroleum Hydrocarbons			
TPH-CWG - Aliphatic >EC5 - EC6	<0.001	4,490	N
TPH-CWG - Aliphatic >EC6 - EC8	<0.001	10,400	N
TPH-CWG - Aliphatic >EC8 - EC10	<0.001	1,370	N
TPH-CWG - Aliphatic >EC10 - EC12	<1.0	7,900	N
TPH-CWG - Aliphatic >EC12 - EC16	<2.0-5.3	34,000	N
TPH-CWG - Aliphatic >EC16 – EC35	<16.0-50	3,620,000	N
TPH-CWG - Aromatic >EC5 - EC7	<0.001	12.5	N
TPH-CWG - Aromatic >EC7 - EC8	<0.001	27,900	N
TPH-CWG - Aromatic >EC8 - EC10	<0.001	2,210	N
TPH-CWG - Aromatic >EC10 - EC12	<1.0	12,300	N
TPH-CWG - Aromatic >EC12 - EC16	<2.0-5.7	41,300	N
TPH-CWG - Aromatic >EC16 - EC21	<10-26	28,400	N
TPH-CWG - Aromatic >EC21 - EC35	<10-37	28,400	N

Note

* BaP used as an indicator as it has the most conservative SSV of all the PAH congeners, which have thresholds several orders of magnitude higher in most cases. BaP has not been exceeded by the measured concentrations and all of the other measured concentrations for the remaining PAH congeners do not exceed this level either.

Where tested, none of the detectable contaminants exceeded the SSV / C4SL thresholds for a Commercial land use.

No VOCs were detected above the laboratory Limits of Detection (LoD). BTEX, cyanide and PCBs were also below the relevant LoDs.

No SVOCs, with exception of the PAH congeners, were detected above the laboratory limits of detection. Additionally, carbazole (0.8µg/kg in TP1 at 0.5m bgl) and dibenzofuran (0.3µg/kg in TP1 at 0.5m bgl), were identified in one location. There are no assessment criteria thresholds for these contaminants, however, these contaminants are typically present as a result of carbonisation. Therefore, they may be associated with traces of coal and clinker within Made Ground. At such low concentrations there is unlikely to be a significant risk and these contaminants are highly unlikely to be indicative of solvent use at the adjacent site.

No asbestos fibres were detected in the screened samples from the Made Ground.

Overall, the results are not indicative of significant ground contamination issues on site.

Gas and Vapour Risk Assessment

Based on the internal gas monitoring results and information provided by GGS (also presented in Appendix 4), the maximum concentrations have been summarised in Table 3 below.

Table 2 – Maximum internal gas monitoring results

Internal Gas Survey results			
Location ref	**Maximum CO2 (ppmv)**	**Maximum CH4 (ppmv)**	**Maximum TVOC (ppmv)**
External Ambient Air	401	1.9	<0.1
Basement Area*	445	1.9	<0.1
Ground Floor Area*	460	1.9	0.7

Carbon dioxide results within the building are higher than external ambient air, but this is very likely due to site workers completing works in the building during the survey. For example, carbon dioxide concentrations within an office environment are usually between 400 and 1000ppm, depending on room size and number of people. Therefore, the results from the ground floor are within the normal range expected within a workspace.

Methane was not detected above expected ambient air concentrations.

Low level TVOC concentrations (0.7 ppmv) were detected in the ground floor area. However, given the absence of TVOCs in the basement area (<0.1 ppmv) and the ongoing refurbishment being undertaken during the survey, it is likely these low level concentrations are simply residual vapours emitted from drying paints and adhesives, rather than ingress from an external ground contamination source. Photographs showing the adhesives etc. being used in the ground floor refurbishment are shown in Appendix 2.

Overall, the results are not indicative of significant gas or vapour issues on site.

Updated Conceptual Site Model

Based on the findings of the investigation, the preliminary conceptual site model that was presented in the Phase 1 report has been updated. It provides a qualitative risk assessment of the potential pollutant linkages at the site. In connection with Part IIA of the Environmental Protection Act (1990) and the regulatory planning framework, the assessment is based on the potential sources identified, the site's environmental setting and the development proposals. The potential source-pathway-receptor linkages, which must exist to define a site as contaminated land, are evaluated in the model as summarised in Appendix 5.

Based on the foregoing, no significant issues of environmental concern have been identified that would be considered to cause a risk of significant harm to human health of future site users, whilst the site remains in commercial use. The full coverage of hardstanding across the subject site would limit direct dermal contact and ingestion pathways with trace contaminants (if present). In any case, the results returned from the quantitative analysis are not indicative of gross contamination that would present a risk to human health at a commercial site. Construction workers completing the minor extension works shall be equipped with suitable Personal Protective Equipment (PPE) as a precautionary measure.

From a comparison of the soils results, which are not indicative of a source of VOCs in the underlying Made Ground / clay, to the internal gas and vapour monitoring, there is nothing to suggest that further assessment or remediation is warranted.

Geoenvironmental Recommendations

The proposed development will comprise a photographer's studio with basement level, although the basement will only be used for minor storage of ancillary items for the site and will have no 'workspace' occupation. The geoenvironmental assessment for human health risk has been completed against assessment criteria for a 'Commercial' land use scenario. On this basis it is considered that the risk to human health is low, providing that certain mitigation measures are implemented to protect site workers who may come into contact with Made Ground during site works. Given the environmental setting of the site and the ground conditions encountered, the risk to Controlled Waters is considered to be negligible.

Soil contamination and remediation

On the basis of the testing completed as part of this investigation, no specific remediation is considered necessary at the site. The overall risk to human health from the development is considered to be low.

Gas / vapour protection measures

On the basis of the testing completed as part of this investigation, no specific remediation is considered necessary at the site. The overall risk to human health from the development is considered to be low.

Material management and waste classification

It is not anticipated that significant volumes of waste soil arisings will require disposal from the site as only one new pad footing will be completed for the excavation. In any case, all waste arisings generated from the site should be managed according to Environmental Protection (Duty of Care) Regulations, 1991 and the Landfill (England and Wales) Regulations, 2002 (as amended).

Building materials

With reference to the UK Water Industry Research (UKWIR) 'Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites' (10/WM/03/21), localised concentrations of contaminants such as PAH recorded in the Made Ground indicate that standard polyethylene pipes may not be suitable. The water supply company have been to confirm their requirements for water supply pipes.

However, owing to the limited nature of the development, it is understood that there are to be no changes to the on-site service pipes. Where observed, the drinking water supply pipework was generally within pea shingle backfill, which would prevent direct contact with the pipes in any case. The concentrations of PAH are greater in samples where many fragments of coal and clinker were observed in the Made Ground. Therefore, the concentrations may not be wholly representative of materials directly surrounding the pipes (i.e. pea shingle that did not comprise such materials). Therefore, the risk to the pipes is considered to be minimal.

A geotechnical assessment is outside of the scope of this assessment, however, the potential for sulphate within the London Clay should be considered by the structural engineer when forming the new concrete pad.

Watching brief

No significant ground works will take place at the site owing to the nature of the refurbishment. However, as a precautionary measure it is recommended that a watching brief is maintained by the Main Contractor where open excavations are required.

Should any gross contamination, such as oily material or material of an unusual colour or odour, be encountered during excavation, an environmental specialist and / or the local Contaminated Land Officer should be contacted and works ceased until a way forward has been agreed.

Health and safety

All site works will be undertaken in accordance with the guidelines prepared by the Health and Safety Executive (HSE, 1991). In this context, the risks are considered to be low providing that nominal safety precautions, such as the adoption of good hygiene practices and the use of overalls, gloves and dust masks, are employed by all site workers and visitors.

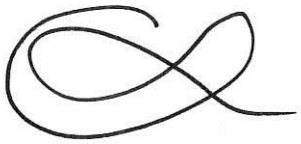
Limitations

It is accepted that the investigation has been constrained by the site layout and the nature of the redevelopment works as refurbishment rather than redevelopment. However, the scope was agreed with the CLO in advance and based on an absence of evidence that gross contamination or vapours exist, then further investigation or remediation is not warranted.

Regulatory approval

This report should be submitted to the London Borough of Camden for their comments and approval in support of discharging planning condition 5 of application 2015/1985/P.

Yours sincerely



Charlie Knox MSc CEnv
Associate Director – Environmental
Paragon Building Consultancy Ltd
M: 07468698001

Figures

FIGURE 1 – INSPECTION PIT LOCATION PLAN

Appendices

APPENDIX 1 – REGULATORY CORRESPONDENCE
APPENDIX 2 – INSPECTION PIT RECORDS AND PHOTOGRAPHS
APPENDIX 3 – LABORATORY DATA – SOILS
APPENDIX 4 – INTERNAL AIR SPACE MONITORING DATA AND CORRESPONDENCE
APPENDIX 5 – UPDATED CONCEPTUAL SITE MODEL

FIGURE 1 – INSPECTION PIT LOCATION PLAN

Figure 1 Inspection Pit Location Plan

Client
David Sims Studio

Job Number
17.0610

Site
104 Arlington Road, Camden

Description
Base plan provided by Originate Architects, ref: 1218

Reproduction is not to scale

APPENDIX 1 – REGULATORY CORRESPONDENCE

Charlie Knox

From: Arthur, Anona <Anona.Arthur@camden.gov.uk>
Sent: 19 September 2017 11:51
To: Charlie Knox
Cc: Masterson, Helen
Subject: RE: Planning Application - 104 Arlington Road, Camden (2015/1985/P)

Follow Up Flag: Follow up
Flag Status: Completed

Hi Charlie

Thank you for your email.

I can confirm that I am satisfied with your proposals as set out in your email below.

Regards

Anona Arthur BSc (Hons) Env Health; Dip Acoustics
Environmental Health Officer / Contaminated Land Officer
Communities
Supporting Communities
London Borough of Camden

Telephone: 020 7974 2990
Fax: 020 7974 6940
Web: camden.gov.uk
8th Floor
5 Pancras Square
London N1C 4AG

From: Charlie Knox [mailto:CharlieKnox@paragonbc.co.uk]
Sent: 08 September 2017 14:46
To: Arthur, Anona <Anona.Arthur@camden.gov.uk>
Cc: Masterson, Helen <Helen.Masterson@camden.gov.uk>
Subject: RE: Planning Application - 104 Arlington Road, Camden (2015/1985/P)
Importance: High

Hi Anona,

Thanks for your email and apologies for my delayed reply – a busy week!

So to confirm the strategy:

We will take 3 samples from the shallow excavations at the site and aim to take at least two from the flank with the metal sheet works.

We will screen the samples for - Asbestos Screen & ID , pH, TOC, Total Sulphate, Sulphide, Monohydric Phenols, Total Cyanide, W/S Boron, As, Cr, Cu, Pb, Se, Zn, Cd, Hg, Ni, Speciated PAH, TPH & TPH CWG, VOCs and SVOCs.

In the basement we will complete internal air monitoring with hand held analysers to detect CO2, CH4 & TVOCs. Data will be captured at ppmv levels and the detection levels are as follows:

- CH4: 0.1ppmv,
- CO2: 1.0ppmv,
- PID: 0.1ppmv

The basement will be sealed as far as is reasonably practicable prior to the monitoring and it will then be completed in the internal air space of the basement and at all accessible air intakes such as service entry points etc.

If, based on the above lines of evidence, potential issues are identified then additional quantitative investigation / risk assessment will be completed. Otherwise if no significant issues are identified in the context of commercial use then we will submit our final report.

We trust these proposals are acceptable and we will look to complete them ASAP.

Thanks

Charlie

From: Arthur, Anona [mailto:Anona.Arthur@camden.gov.uk]
Sent: 04 September 2017 18:17
To: Charlie Knox <CharlieKnox@paragonbc.co.uk>
Cc: Masterson, Helen <Helen.Masterson@camden.gov.uk>
Subject: RE: Planning Application - 104 Arlington Road, Camden (2015/1985/P)

Dear Charlie

As the proposed application is for a commercial development I am willing to agree with your approach as outlined below, however you will need to be explicit about the detection levels.

Regards

Anona Arthur
Environmental Health Officer / Contaminated Land Officer
Communities
Supporting Communities
London Borough of Camden

Telephone: 020 7974 2990
Fax: 020 7974 6940
Web: camden.gov.uk
8th Floor
5 Pancras Square
London N1C 4AG

From: Charlie Knox [mailto:CharlieKnox@paragonbc.co.uk]
Sent: 18 August 2017 09:46
To: Arthur, Anona <Anona.Arthur@camden.gov.uk>

Cc: Masterson, Helen <Helen.Masterson@camden.gov.uk>
Subject: Re: Planning Application - 104 Arlington Road, Camden (2015/1985/P)

Hi Anona and Helen,

Thanks for your email. We will test the soil samples from the extension area for VoCs and SVOCs additionally in that case and we will be sure to excavate samples from the boundary with the sheet metal works.

With regard to the basement, it is not going to be developed or used in any way other than storage of some ancillary tools if anything. It is a historical basement and so it is it not commercially viable for the scheme to refurbish it when the space isn't needed for the proposed end use. The investigation in the basement will be logistically difficult as access is poor and won't be reached with a rig, to hand dig a larger pit into the shallow water table means we may bring water up into the basement.

Would a more pragmatic approach be to complete some internal air space monitoring to see if there is any vapour actually increasing into the basement? We can seal off the basement and complete air space monitoring. Would this be agreeable to your department?

Thanks,

Charlie

Charlie Knox MSc CEnv
Associate Director

Mobile: 07468 698001
Switchboard: 020 7125 0112
Web: www.paragonbc.co.uk
Address: 7 Swallow Place London W1B 2AG

On 18 Aug 2017, at 09:22, Arthur, Anona <Anona.Arthur@camden.gov.uk> wrote:

Dear Charlie

Thank you for your emails below of which I have considered and I have the following comments.

The National Planning Policy Framework states the following:

> **Paragraph 120**. To prevent unacceptable risks from pollution and land instability, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.
>
> **Paragraph 121.** Planning policies and decisions should also ensure that:
>
> - the site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation;
>
> - after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and

The sheet metal works (see map below) could in my judgement use solvents therefore, I would expect the basement floor and the new build extension to be investigated.

As the site has been prioritised as high risk, and the application is for a proposed commercial development with alterations at ground floor level and a new build commercial extension, the contaminated land condition on the decision notice would still apply.

Please note I am out of the office now and returning on 11th September 2017, however, I will check my emails from time to time.

Regards

Anona Arthur BSc (Hons) Env Health; Dip Acoustics
Environmental Health Officer / Contaminated Land Officer
Communities
Supporting Communities
London Borough of Camden

Telephone: 020 7974 2990
Fax: 020 7974 6940
Web: camden.gov.uk
8th Floor
5 Pancras Square
London N1C 4AG

Please consider the environment before printing this email.

<image001.jpg>

From: Charlie Knox [mailto:CharlieKnox@paragonbc.co.uk]
Sent: 17 August 2017 19:42
To: Arthur, Anona <Anona.Arthur@camden.gov.uk>
Subject: RE: 104 Arlington Road, Camden

Hi Anona,

In addition, to clarify what we discussed also, we will take 3 samples from the excavations at the site in the extension area and will analyse for the following suite:

Asbestos Screen & ID , pH, TOC, Total Sulphate, Sulphide, Monohydric Phenols, Total Cyanide, W/S Boron, As, Cr, Cu, Pb, Se, Zn, Cd, Hg, Ni, Speciated PAH, TPH & TPH CWG

We will also clarify the age of the building and ergo the basement.

If you can please confirm you are happy with the approach then we will complete these works asap.

Thanks

Charlie

Charlie Knox MSc CEnv
Associate Director

Mobile: 07468 698001
Switchboard: 020 7125 0112
Web: www.paragonbc.co.uk
Address: 7 Swallow Place London W1B 2AG

<image002.jpg> Paragon's Mudathon 2017 is fast approaching on 22 September. Sign up now!!

<image003.png> <image004.png>

From: Charlie Knox
Sent: 17 August 2017 14:54
To: 'anona.arthur@camden.gov.uk'
Subject: RE: 104 Arlington Road, Camden

Please see attached.

Thanks

Charlie

From: Charlie Knox
Sent: 17 August 2017 14:41
To: 'anona.arthur@camden.gov.uk'
Subject: RE: 104 Arlington Road, Camden
Importance: High

Hi Anona,

Sorry we are having an issue with our phones. Do you have a direct line and I will call you back off a landline?

Thanks

Charlie

From: Charlie Knox
Sent: 11 August 2017 16:53
To: 'anona.arthur@camden.gov.uk'
Subject: 104 Arlington Road, Camden
Importance: High

Hi Anona,

We spoke recently and you requested that I send the rationale for the site that is being developed for commercial purposes to a photographers studio – ie commercial use.

Planning conditions were attached to the site's redevelopment owing to former industrial usage at the site and in the surroundings historically. However, it should be noted that the works do not present a total redevelopment of the site, there is a refurbishment planned of the main building with a very small extension to the rear. As such, the original and extensive hard standing at the site will remain and the property will cover the entire footprint of the site.

There is also an existing basement, the excacation of which would be expected to have removed much of the historical contamination. The basement level will be used for minor storage of equipment.

Owing to the limited nature of the redevelopment and the future use as a commercial property with no areas of soft landscaping and low potential for pollutant linkages to exist, no site investigation is recommended. Ground works completed as part of the scheme will be limited to minor excavations for small extension with new foundations and drainage works.

A Watching Brief information has been supplied by the ground worker on site who has confirmed an absence of visual / olfactory observations of contamination within the sub surface soils encountered during breaking out. Risks to site workers were mitigated during these works by employing the use

of Personal Protective Equipment (PPE) and damping down techniques to supress dust / particles. The entire site foot print will be encapsulated by hard standing. Therefore, no viable pollutant linkages to future site users have been identified.

A copy of the Watching Brief is attached.

Additionally, to mitigate risks from the internal refurbishment lead paint analyses and an asbestos survey was commissioned. No significant risks were identified in connection with ACMs and so this is not considered to present an on-going concern for the site. Some lead paint was identified and specialist controls as set out in the contractor reports will be implemented during refurbishment to mitigate risks. The paint is present in the rafters and as such, lead paint is not considered to present a risk to site users. However, the presence of lead paint will be included within the Construction Health and Safety files for the property to inform future site maintenance workers of the presence of lead paint so that it can be incorporated into their risk assessment.

We intend to collate all of this information into a final Phase 1 report with CSM Risk Assessment to be submitted in support of discharge of the associated planning condition providing that you agree in principle with our approach.

Thanks

Charlie

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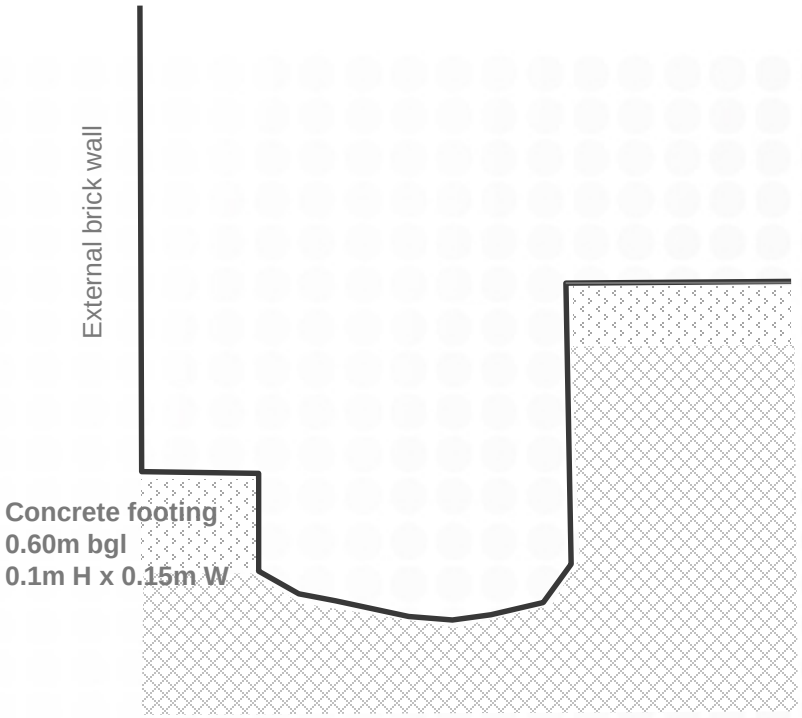
APPENDIX 2 – INSPECTION PIT RECORDS AND PHOTOGRAPHS

Inspection Pit : FP1 Cross Section



Pit Dimensions:

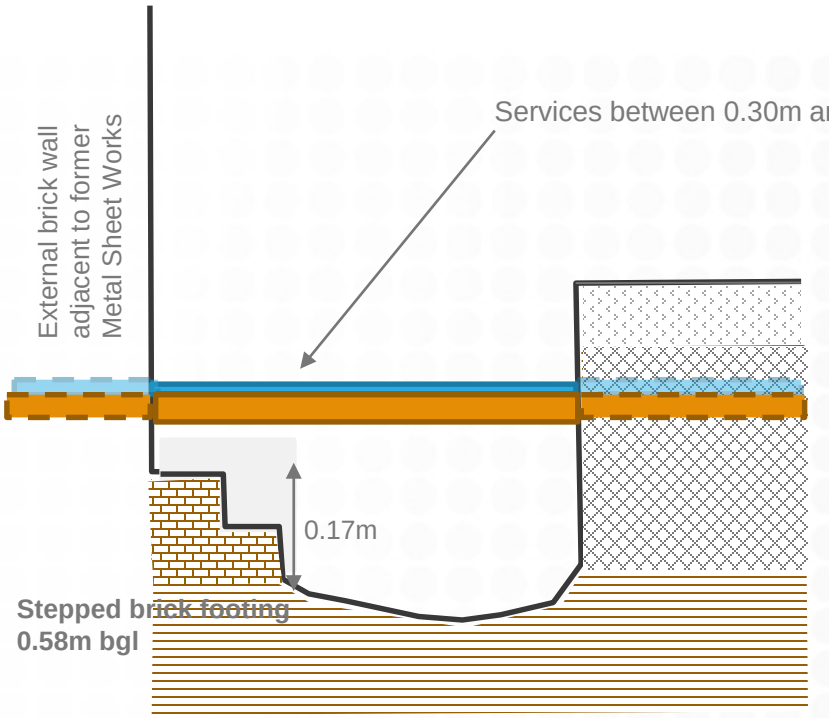
0.00m Ground Level
0.00-0.27m MADE GROUND Concrete hard standing over brick sub-base.

0.27-0.75m MADE GROUND Clayey sandy gravel. Sand is medium to coarse. Gravels are subangular to subrounded fine to coarse sized of plastic, flint, brick, concrete, coal and clinker.

Base of Made Ground not proven as pit terminated once footing had been exposed.

Sample taken @ 0.35m bgl.
No groundwater encountered.

Inspection Pit : TP1 Cross Section



Pit Dimensions:

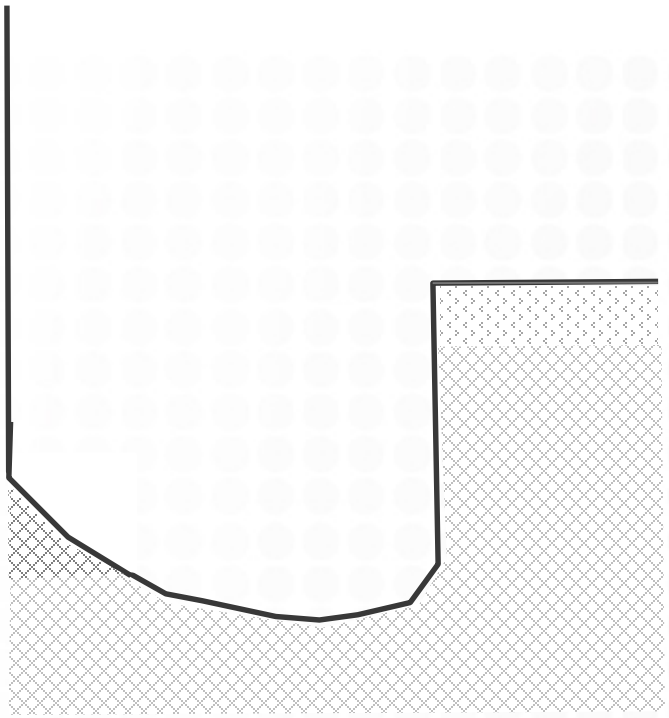
0.00m Ground Level
0.00-0.15m MADE GROUND Concrete hard standing over brick sub-base.

0.15-0.75m MADE GROUND Sandy gravelly clay. Sand is medium to coarse. Gravels are subangular to subrounded fine to coarse sized of flint, brick, concrete, coal and clinker.

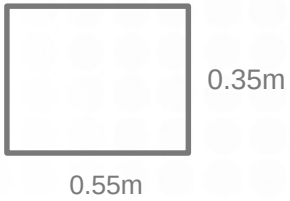
0.75m to unproven depth Soft to firm orange brown and grey mottled fissured silty CLAY with occasional pockets of fine orange sand.
[WEATHERED LONDON CLAY FORMATION]

Sample taken @ 0.50m bgl.
No groundwater encountered.

Inspection Pit : TP2 Cross Section



Pit Dimensions:



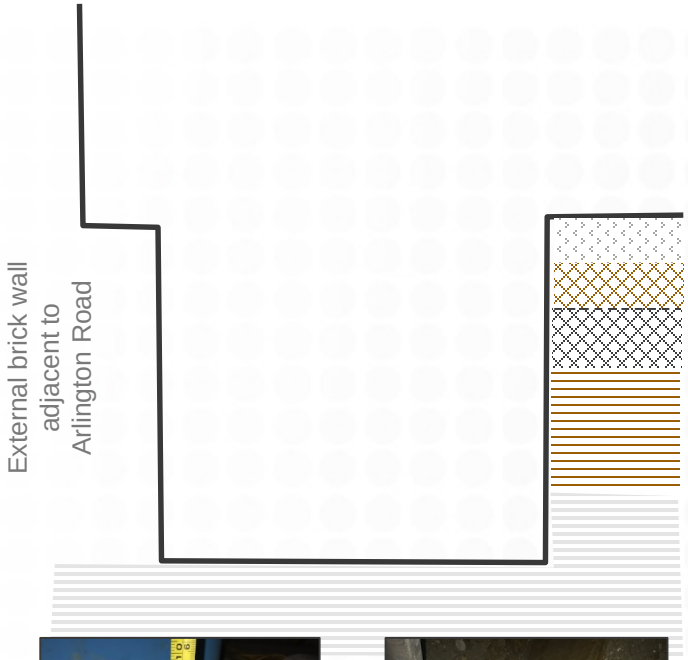
0.00m Ground Level
0.00-0.20m MADE GROUND Concrete hard standing over brick sub-base.

0.27-0.55m MADE GROUND Sandy clayey gravel. Sand is medium to coarse. Gravels are subangular to subrounded fine to very coarse and cobble sized brick, concrete, with flint, coal and clinker.

Base of Made Ground not proven as pit terminated on an obstruction.

Sample taken @ 0.35m bgl.
No groundwater encountered.

Inspection Pit : TP3 Cross Section



0.00m Ground Level
0.00-0.21m MADE GROUND Concrete hard standing.
0.21-0.50m MADE GROUND Concrete cobbles and rubble.
0.50-0.72m MADE GROUND Sandy gravelly clay. Sand is medium to coarse. Gravels are subangular to subrounded fine to coarse sized of flint, brick, concrete, coal and clinker.

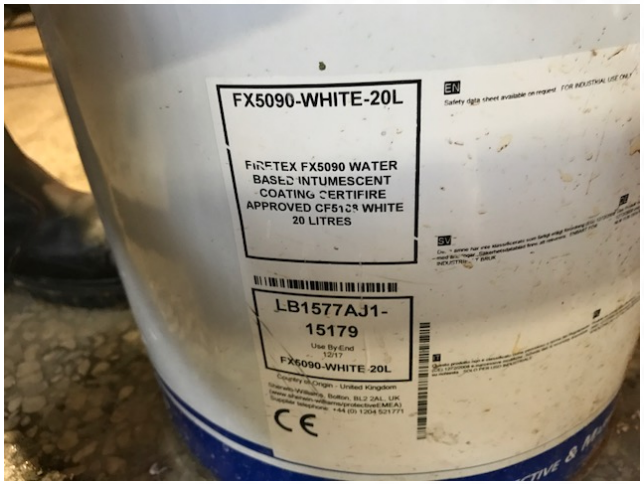
0.72-0.96m Soft to firm orange brown and grey mottled fissured silty CLAY with occasional pockets of fine orange sand.
[WEATHERED LONDON CLAY FORMATION]

0.96m to unproven depth Firm to stiff dark brown / grey CLAY with occasional pockets of fine sand.
[LONDON CLAY FORMATION]

Base of Made Ground not proven as pit terminated on an obstruction.

Sample taken @ 0.50m bgl.
No groundwater encountered.

Site photographs



Paints and adhesives in use for the ground level refurbishment

APPENDIX 3 – LABORATORY DATA – SOILS

Charlie Knox
Paragon New Homes Ltd
7 Swallow Place
London
W1B 2AG

e: charlieknox@paragonbc.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 17-61111

Project / Site name:	Arlington Rd	**Samples received on:**	20/09/2017
Your job number:	17-0610	**Samples instructed on:**	20/09/2017
Your order number:	17-0610	**Analysis completed by:**	29/09/2017
Report Issue Number:	1	**Report issued on:**	29/09/2017
Samples Analysed:	4 soil samples		

Signed: _____

Vineetha Meethale Vettil
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 17-61111

Project / Site name: Arlington Rd
Your Order No: 17-0610

Lab Sample Number				821232	821233	821234	821235	
Sample Reference				FP1	TP1	TP2	TP3	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.35	0.50	0.35	1.00	
Date Sampled				20/09/2017	20/09/2017	20/09/2017	20/09/2017	
Time Taken				0900	1027	1105	1700	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	17	22	20	22	
Total mass of sample received	kg	0.001	NONE	1.8	2.0	1.9	1.6	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	-	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	9.5	8.2	8.8	7.5	
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Total Sulphate as SO_4	mg/kg	50	MCERTS	2300	1600	18000	1700	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.53	0.48	1.1	0.51	
Sulphide	mg/kg	1	MCERTS	5.8	< 1.0	1.0	< 1.0	
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.1	0.7	0.7	0.6	
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.40	< 0.05	< 0.05	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.74	< 0.05	< 0.05	
Phenanthrene	mg/kg	0.05	MCERTS	1.0	6.8	0.57	< 0.05	
Anthracene	mg/kg	0.05	MCERTS	< 0.05	1.6	0.11	< 0.05	
Fluoranthene	mg/kg	0.05	MCERTS	1.6	6.7	0.67	< 0.05	
Pyrene	mg/kg	0.05	MCERTS	1.4	4.9	0.57	< 0.05	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.77	2.3	0.40	< 0.05	
Chrysene	mg/kg	0.05	MCERTS	0.70	1.7	0.32	< 0.05	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.73	1.4	0.43	< 0.05	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.41	0.81	0.21	< 0.05	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.62	1.2	0.35	< 0.05	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.35	0.48	0.24	< 0.05	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.11	< 0.05	< 0.05	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.42	0.59	0.34	< 0.05	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	7.98	29.7	4.21	< 0.80	
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	7.7	12	12	
Boron (water soluble)	mg/kg	0.2	MCERTS	2.5	3.0	4.4	3.1	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	33	12	34	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	47	44	63	20	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	390	170	630	47	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	33	13	21	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.1	< 1.0	< 1.0	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	220	190	66	63	

Analytical Report Number: 17-61111

Project / Site name: Arlington Rd
Your Order No: 17-0610

Lab Sample Number				821232	821233	821234	821235	
Sample Reference				FP1	TP1	TP2	TP3	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.35	0.50	0.35	1.00	
Date Sampled				20/09/2017	20/09/2017	20/09/2017	20/09/2017	
Time Taken				0900	1027	1105	1700	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Petroleum Hydrocarbons								
TPH C10 - C40	mg/kg	10	MCERTS	82	61	64	< 10	
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	5.3	< 2.0	< 2.0	< 2.0	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	18	< 8.0	< 8.0	< 8.0	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	32	< 8.0	< 8.0	< 8.0	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	56	< 10	< 10	< 10	
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	4.5	5.7	< 2.0	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	26	< 10	< 10	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	12	27	37	< 10	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	21	58	52	< 10	

Analytical Report Number: 17-61111

Project / Site name: Arlington Rd
Your Order No: 17-0610

Lab Sample Number				821232	821233	821234	821235	
Sample Reference				FP1	TP1	TP2	TP3	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.35	0.50	0.35	1.00	
Date Sampled				20/09/2017	20/09/2017	20/09/2017	20/09/2017	
Time Taken				0900	1027	1105	1700	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	

Analytical Report Number: 17-61111

Project / Site name: Arlington Rd
Your Order No: 17-0610

Lab Sample Number				821232	821233	821234	821235	
Sample Reference				FP1	TP1	TP2	TP3	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.35	0.50	0.35	1.00	
Date Sampled				20/09/2017	20/09/2017	20/09/2017	20/09/2017	
Time Taken				0900	1027	1105	1700	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.40	< 0.05	< 0.05	
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	0.3	< 0.2	< 0.2	
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.74	< 0.05	< 0.05	
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Phenanthrene	mg/kg	0.05	MCERTS	1.0	6.8	0.57	< 0.05	
Anthracene	mg/kg	0.05	MCERTS	< 0.05	1.6	0.11	< 0.05	
Carbazole	mg/kg	0.3	MCERTS	< 0.3	0.8	< 0.3	< 0.3	
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Fluoranthene	mg/kg	0.05	MCERTS	1.6	6.7	0.67	< 0.05	
Pyrene	mg/kg	0.05	MCERTS	1.4	4.9	0.57	< 0.05	
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.77	2.3	0.40	< 0.05	
Chrysene	mg/kg	0.05	MCERTS	0.70	1.7	0.32	< 0.05	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.73	1.4	0.43	< 0.05	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.41	0.81	0.21	< 0.05	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.62	1.2	0.35	< 0.05	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.35	0.48	0.24	< 0.05	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.11	< 0.05	< 0.05	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.42	0.59	0.34	< 0.05	

Analytical Report Number: 17-61111

Project / Site name: Arlington Rd
Your Order No: 17-0610

Lab Sample Number				821232	821233	821234	821235	
Sample Reference				FP1	TP1	TP2	TP3	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.35	0.50	0.35	1.00	
Date Sampled				20/09/2017	20/09/2017	20/09/2017	20/09/2017	
Time Taken				0900	1027	1105	1700	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs								
PCB Congener 077	mg/kg	0.001	NONE	-	-	< 0.001	-	
PCB Congener 081	mg/kg	0.001	NONE	-	-	< 0.001	-	
PCB Congener 105	mg/kg	0.001	NONE	-	-	< 0.001	-	
PCB Congener 114	mg/kg	0.001	NONE	-	-	< 0.001	-	
PCB Congener 118	mg/kg	0.001	NONE	-	-	< 0.001	-	
PCB Congener 123	mg/kg	0.001	NONE	-	-	< 0.001	-	
PCB Congener 126	mg/kg	0.001	NONE	-	-	< 0.001	-	
PCB Congener 156	mg/kg	0.001	NONE	-	-	< 0.001	-	
PCB Congener 157	mg/kg	0.001	NONE	-	-	< 0.001	-	
PCB Congener 167	mg/kg	0.001	NONE	-	-	< 0.001	-	
PCB Congener 169	mg/kg	0.001	NONE	-	-	< 0.001	-	
PCB Congener 189	mg/kg	0.001	NONE	-	-	< 0.001	-	
Total PCBs	mg/kg	0.012	NONE	-	-	< 0.012	-	

Analytical Report Number : 17-61111

Project / Site name: Arlington Rd

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
821232	FP1	None Supplied	0.35	Brown clay and sand with gravel and rubble.
821233	TP1	None Supplied	0.50	Brown clay with gravel.
821234	TP2	None Supplied	0.35	Brown clay and gravel with rubble and brick.
821235	TP3	None Supplied	1.00	Brown clay with gravel.

Analytical Report Number : 17-61111

Project / Site name: Arlington Rd

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
PCBs WHO 12 in soil	Determination of PCBs (WHO-12 Congeners) by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	NONE

Analytical Report Number : 17-61111

Project / Site name: Arlington Rd

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding.	L076-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

APPENDIX 4 – INTERNAL AIR SPACE MONITORING DATA AND CORRESPONDENCE

Experts in Continuous Monitoring

Internal Gas Survey Monitoring Record

Site ref: GGS1390
Site name: 104 Arlington Road, Camden
Engineer: Krystian Latka
Date: 29th September 2017

EQUIPMENT	Serial Numbers
TDL-500	1340311
Q-Trak 7575	7575X1339006
Mini-RAE PID	110-007368

Site notes	
Weather conditions:	Dry, overcast, light wind, temperature 15° C.
Location Description:	Commercial building undergoing re-development / refurbishment for conversion to residential use.

Internal Gas Survey results			
Location ref	**Maximum CO_2 (ppmv)**	**Maximum CH_4 (ppmv)**	**Maximum TVOC (ppmv)**
External ambient air	401	1.9	<0.1
Basement area*	445	1.9	<0.1
Ground floor area*	460	1.9	0.7

* Includes sweep of all visible/accessible service penetrations, cracks and/or other potential ground gas ingress points.

Charlie Knox

From: Joao Dyer <joao.dyer@ggs-uk.com>
Sent: 06 October 2017 14:05
To: Charlie Knox
Subject: GGS1390 - 104 Arlington Road, Camden
Attachments: GGS1390 _ Internal survey 29092017.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Charlie,

Please find attached the results from the sweep survey. I've provide some notes also:

- Carbon dioxide results within the building are higher than external ambient air, but this is very likely due to people in the building during the survey. For example, carbon dioxide concentrations within an office environment are usually between 400 and 1000ppm, depending on room size and number of people.
- Methane was not detector above expected ambient air concentrations
- Low level TVOC concentrations (0.7 ppmv) were detected in the ground floor area. However, given the absence of TVOCs in the basement area (<0.1 ppmv) and the ongoing refurbishment being undertaken during the survey, it is likely these low level concentrations are just a residue of vapours emitted from drying paints and adhesives, rather than ingress from an external ground contamination source.

Hope the above helps. If you require any further assistance, please let me know.

Many thanks,

JM

Joao Marcos Dyer | BSc (Hons) MSc FGS MIEnvSc

Senior Geo-Environmental Consultant (Operations)

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APPENDIX 5 – UPDATED CONCEPTUAL SITE MODEL

5.0 CONCEPTUAL SITE MODEL

Source	Receptor	Pathway	Risk
On site			
Contamination within Made Ground or near surface natural soils and groundwater including asbestos, heavy metals, hydrocarbons, PCBs, PAHs from historical activities at the site.	Future site users	**Low risk** – Ingestion, inhalation and dermal contact with contaminated soils is likely to be mitigated by the extensive presence of hard standing at the site and absence of new pathways created by the proposed change in use scheme to future occupiers. Furthermore, testing of the on-site soils and internal gas / vapour monitoring has not identified gross contamination issues at the site.	L
	Off site residents	**Low** risk – The underlying low permeability clay would be expected to restrict the migration of contaminants (if present) to off site receptors. Furthermore, the extensive coverage of hardstanding across the site would act as a capping layer and likely restrict contaminant transport pathways. Furthermore, testing of the on-site soils and internal gas / vapour monitoring has not identified gross contamination issues at the site.	L

	Construction workers	**Low risk** – Ingestion, inhalation and dermal contact with contaminated soils and vapours will be mitigated by employing the use of PPE and good hygiene practices on site during any ground works. Furthermore, testing of the on-site soils and internal gas / vapour monitoring has not identified gross contamination issues at the site.	L
	Building and services	**Low** risk – Significant alterations are not being made to the building.	L
	Controlled Waters	**Low** risk - the overall environmental sensitivity of the site's surroundings is anticipated to be low. There is no sensitive groundwater table / aquifer beneath the site and the presence of the cohesive, London Clay Formation would be expected to restrict vertical and lateral pathways for mobile contaminants.	L
Off site			
Contamination within Made Ground or near surface natural soils and groundwater including heavy metals, hydrocarbons (including volatile organics) and PAHs due previous activities off site Metal Sheet Works.	Future site users	**Low risk** – Ingestion, inhalation and dermal contact with contaminated soils is likely to be mitigated by the extensive presence of hard standing at the site and absence of new pathways created by the proposed change in use scheme to future occupiers. The existing hard standing at the former works site is likely to have limited the potential for sub-surface impact in any case and the underlying clay will limit the potential for future migration of contaminants.	L

		Furthermore, testing of the on-site soils and internal gas / vapour monitoring has not identified gross contamination issues at the site.	
		Low risk - Inhalation of vapours from contaminated soils arising from possible solvent use at the Metal Sheet Works is likely to be limited by the extensive presence of hard standing at the site and absence of new pathways created by the proposed change in use scheme to future occupiers. Furthermore, testing of the on-site soils and internal gas / vapour monitoring has not identified gross contamination issues at the site.	L
	Construction workers	**Low risk** – Ingestion, inhalation and dermal contact with contaminated soils and vapours will be mitigated by employing the use of PPE and good hygiene practices on site during any works. Furthermore, testing of the on-site soils and internal gas / vapour monitoring has not identified gross contamination issues at the site.	L
	Building and services	**Low** risk – Significant alterations are not being made to the building.	L