

# Interim Verification Report

**30a Highgate Road  
London NW5**

Client

Mr Colin Serlin

Engineer


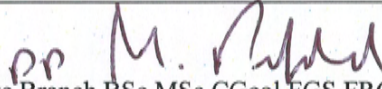

Elliott Wood Partnership

J12041B

January 2014



## Document Control

|   |               |  |   |         |
|---|---------------|--|---|---------|
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## APPENDIX

## 1.0 INTRODUCTION

Geotechnical and Environmental Associates (GEA) has been commissioned by Mr Colin Serlin to provide an Interim Verification Report on the remedial works at 30a Highgate Road, London, NW5 1NS. GEA have previously carried out a number of phases of work at the site, as detailed below:

- Desk Study and Ground Investigation Report (ref J12041, dated 24 April 2012);
- Supplementary Contamination Report (ref J12041A, dated 6 December 2012); and
- Letter report (ref J12041A/JF/3, dated 8 May 2013).

Copies of these reports were provided to the Local Authority and National House Building Council (NHBC). A written response has been received from the NHBC, dated 24 September 2013 who indicated that they require additional investigation into the presence of a fuel tank, contaminated soils following the site strip and assessment of whether vapours are present and validation of imported topsoil.

The previous investigations generally encountered a moderate thickness of made ground overlying the London Clay Formation. Contamination testing indicated elevated concentrations of sulphide, total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAH) in samples of made ground. A single fuel tank was discovered and removed from site as described in the May 2013 letter report. However further work was required to provide confirmation that contaminated soils had been removed from site.

Proposals for validation work were outlined in an email to the NHBC dated 31 October 2013, but a response has not been received. Since the above reports were produced, and following the email to the NHBC, further investigation has been carried out in the area of the tank and other areas of the site. Validation work for imported topsoil is on-going and will be reported at a later date.

### 1.1 Proposed Development

The previous buildings have been demolished and the site will be redeveloped through the construction of two-storey and three-storey mews houses and apartment blocks. It is understood that there will be a communal central courtyard with some soft landscaping; the layout will be similar to previous although it is proposed to lower the level of the entire site by approximately 300 mm.

This report is specific to the proposed development and the advice herein should be reviewed if the development proposals are amended.

### 1.2 Ground Conditions

The ground model that has been established by the previous investigations, prior to validation work is outlined below:

- ❑ in general a moderate thickness of made ground is present, extending to a maximum depth of 1.40 m, but it is apparent that a much more significant thickness, of up to about 4 m, is present along the line of a sewer that passes below the site;
- ❑ the made ground initially comprised dark brown and grey sandy gravel or gravelly

sand with fragments of brick, concrete and occasionally ash and coal, which extends to depths of between 0.25 m and 1.4 m;

- ❑ a blackish grey, dark grey and brown silty gravelly clay with brick was encountered below this initial layer in Borehole Nos 1, 2, 7, 8 and 9 and extends to depths of between 1.0 m and 3.9 m. This material was noted to have a slight hydrocarbon odour with the exception of Borehole No 2;
- ❑ suspected weathered London Clay has been logged as made ground in Borehole Nos 3, 4 and 5A, and extends to depths of between 0.50 m and 1.00 m;
- ❑ the London Clay initially comprises a weathered layer, below which firm becoming stiff fissured brown mottled grey silty clay with sandy silt parting and selenite crystals extends to at least a depth of 15.0 m;
- ❑ groundwater is present in the made ground;
- ❑ elevated concentrations of sulphide, TPH, and a range of PAHs were recorded in samples of made ground tested;
- ❑ Graham Construction located and removed a tank in the west of the site and carried out a site strip across the entire site to depths of between 0.65 m and 1.00 m;
- ❑ a specialist contractor emptied the tank and testing indicated it to contain 99.99% water and 0.01% TPH;
- ❑ four samples of this reduced level were tested for contamination and did not show any elevated concentrations of contaminants.

### 1.3 Further Work and Validation

Further work was required to investigate the sides and base of the tank excavation made by Graham Construction, determine the nature of the material within the tank excavation, determine if the site strip removed the contamination noted in the made ground across the site and to install vapour monitoring wells.

In order to meet these above objectives, nine boreholes were advanced to a maximum depth of 3.0 m using window sampling equipment. Due to the position of the former underground tank being under the new building, four of these boreholes were drilled at an angle of approximately 45 degrees (Validation Borehole Nos 1 to 4). These boreholes enabled samples from the excavation side and base to be collected, along with a sample from the infill material.

Validation Borehole Nos 5 to 9 were positioned across the site to confirm that the site strip removed the contaminated soil, specifically in areas noted previously, to confirm that the site strip had removed the made ground.

Monitoring standpipes were installed in all the boreholes to facilitate subsequent vapour and groundwater monitoring. In addition, three dynamic probe holes were made, roughly in the centre of the site to allow the installation of vapour monitoring standpipes, which extended to depths of 2.0 m. The standpipes have been monitored on a single occasion, about a week after installation.



Disturbed samples were recovered for subsequent laboratory examination and testing.

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

A sample of the tank infill material was subject to analysis for a range of common industrial contaminants and contamination indicative parameters. For this investigation the analytical suite for the soil included a range of metals, speciated petroleum hydrocarbons (TPH), polyaromatic hydrocarbons (PAH), total cyanide and monohydric phenols. Samples from both the base and sides of the tank excavation was tested for a suite of aliphatic/aromatic TPH speciation testing, as were three samples from the made ground at Validation Borehole Nos 5, 7 and 8.

A photo ionisation detector (PID) was used during logging to screen all soils for the presence of vapours.

The soil samples were selected to provide a general view of the chemical conditions of the soils that are likely to be involved in a human exposure or groundwater pathway and to provide advice in respect of re-use or for waste disposal classification. The contamination analyses were carried out at an MCERTs accredited laboratory with the majority of the testing suite accredited to MCERTS standards. Details of the MCERTs accreditation and test methods are included in the Appendix together with the analytical results.

## **2.0 GROUND CONDITIONS**

The investigation has confirmed the expected ground conditions in that, below a limited but locally significant thickness of made ground, the London Clay Formation extended to the full depth of the investigation.

### **2.1 Made Ground**

The validation boreholes encountered a generally lower thickness of made ground than expected, and the composition was also different to found previously.

The made ground initially comprised a layer of grey and brown sandy cobbly gravel or gravelly sand with concrete, brick and very rare coal fragments or suspected spilled mortar which extended to depths of between 0.20 m and 1.50 m. Below this in Validation Borehole No 8 brown silty occasionally gravelly clay with fragments of brick and rare concrete was encountered to a depth of 2.50 m.

Obstructions were encountered in Validation Borehole Nos 3 and 7, which are anticipated to be due to new foundations or services.

#### **2.1.1 Tank Excavation**

Validation Borehole Nos 1 to 4 investigated the tank excavation and were drilled at an approximate angle of 45°.

Validation Borehole No 1 did not encounter any soil interpreted as infill to a tank excavation. Validation Borehole Nos 2 and 4 encountered a layer of London Clay below a layer of made ground, and due to the angle of drilling this was underlain by the tank infill material which was in turn underlain by the London Clay. It has been interpreted that the boreholes have

drilled through the made ground and into the side of the former tank excavation, then through the tank infill to the base of the former excavation.

The made ground within the tank excavation comprised blackish grey sandy gravel and had a slight hydrocarbon odour and extended to 'depths' of 2.00 m in both Validation Borehole No 2 and 4. No vapours were detected when screened with a PID.

Validation Borehole No 3 encountered an obstruction before sampling soil interpreted as infill to the tank.

A slight hydrocarbon odour and black staining was noted in the soil within the former tank excavation however no odours were detected when screened with a PID. With the exception of the above no visual or olfactory evidence of contamination was observed within the made ground, although extraneous material such as fragments of coal and ash were present. A sample of the tank infill and three other made ground samples were analysed for a range of contaminants and the results are summarised in Section 4.4.

## 2.2 London Clay

The London Clay comprised firm brown mottled grey silty fissured clay and extended to the maximum depth investigated of 3.0 m.

No visual or olfactory evidence of contamination was observed within these soils. Two samples from the clay at the side and base of the tank excavation were analysed for TPH aliphatic/aromatic speciation testing and the results are summarised in Section 4.4.

## 2.3 Groundwater

Groundwater was encountered in the infilled tank excavation at a 'depth' of 1.4 m and 1.0 m in Validation Borehole Nos 2 and 4 respectively.

A seepage of water was noted at the base of the made ground in Validation Borehole No 6 at a depth of 0.70 m.

## 2.4 Soil Contamination

The test results of the sample from the infill material show no elevated concentrations of TPH when compared to generic assessment criteria, however arsenic, lead benzo(a)pyrene and total PAH were elevated.

The results from the samples from the side and base of the excavation do not indicate any elevated concentrations of TPH.

Three samples of the made ground were analysed for TPH and no elevated concentrations were recorded when compared to generic assessment criteria for the site.

The laboratory test sheet is appended and the significance of these results is discussed below.

## 2.5 Vapour Monitoring

Approximately one week after installation, the ten installed standpipes were monitored for vapours using a PID. No vapours were detected in any of the standpipes.

### 3.0 DISCUSSION

Consideration is being given to the construction of two-storey and three-storey mews houses and apartment blocks. It is understood that there will be a communal central courtyard with some soft landscaping; the layout will be similar to previous although it is proposed to lower the level of the entire site by approximately 300 mm.

A tank was located during a site strip and was removed by Graham Construction and a specialist contractor, who indicated that the tank contained 99.99% water and 0.01% TPH, probably as a sheen on the surface. Due to the presence of the new buildings, boreholes were drilled to carry out retrospective validation of the tank excavation. Interpretation of the borehole logs showed the tank excavation to have been filled with a grey gravelly sand which had a slight hydrocarbon odour and sheen. The PID did not register any vapours in both boreholes that encountered the made ground and speciated TPH testing of aliphatic/aromatic compounds did not show any elevated concentrations when compared to generic risk guideline values. Although that there is a residual sheen on the soil within the infilled tank excavation, the above information shows that it is not a risk to end users or the environment from the concentrations encountered, and additionally that there is no source of vapours, which has been confirmed as none have been recorded during the site works and during a monitoring visit.

The borehole logs showed the sides and base of the excavation to be of London Clay and test results of samples collected from these did not indicate any contamination above risk based assessment criteria for the site.

As mentioned previously, it was anticipated that the site strip would have removed the majority of made ground at the site, which has previously been found to contain contaminants including TPH and metals amongst others. The Validation Boreholes generally indicate the previous made ground to have been removed and a layer of crush has been placed above the London Clay. The exception of this is toward the south of the site where made ground was deeper in Validation Borehole Nos 7, 8 and 9. Chemical testing of soil within Validation Borehole No 7 and 9 did not indicate any elevated concentrations of contaminants and it is assumed that they have been removed during the site strip process carried out by Graham Construction.

Observations made during the validation work, with the assistance of a PID indicated no vapours present within any soil in the boreholes. A single round of vapour monitoring similarly did not indicate any vapours. The contamination testing of soil which did have a slight hydrocarbon odour indicated no elevated concentrations above generic risk assessment guideline values, and as such there is not considered to be a potential source of vapours. With no source of vapours encountered and none measured with the PID at the potential source there is not considered to be a vapour risk to end users, thus no gas or vapour protection membranes are considered necessary.

Elevated concentrations of arsenic, lead, benzo(a)pyrene and total PAH have been encountered in the sample of soil that has been used to infill the tank excavation. Analysis of the compounds that make up the elevated total PAH concentration generally indicate the source to be of pyrogenic origin, such as coal, part burnt coal or coal tar. Fragments of ash and coal could account for the elevated concentrations, however it is likely the source of this is from the degraded TPH. Arsenic, lead and the PAH contaminants are considered to be non-volatile or of a low volatility, and therefore do not present a significant vapour risk or a significant risk of leaching and migration within any groundwater.



Below is an updated table providing a summary of the risk assessment following the validation work to date.

| SOURCE   | RECEPTOR                         | PATHWAY  | COMMENTS  |
|--|----------------------------------|--|---|
| Inorganic and organic contamination within near surface soils, petrol and diesel tanks | end users                        | vapours  | The source of potential vapours has been removed by the site strip and tank removed. Chemical validation testing has shown no TPH above assessment criteria and no vapours were detected during sampling or monitoring. Nuisance vapours may be present and vent bricks may prove useful.         |
|  |                                  | direct contact   | The majority of the made ground soil has been removed, end users will potentially come into contact with shallow surface soils in areas of soft landscaping. Imported soil will be incorporated in these areas.   |
|  | groundwater                      | percolation  | The presence of buildings and hardstanding will prevent percolation of surface run-off. The proposals will introduce areas of soft landscaping, however the majority of the made ground soil has been removed. Contaminates remaining on site as not considered to present a risk to groundwater. |
|  |                                  | groundwater  | The London Clay will inhibit downward percolation to the groundwater at depth within the chalk principal aquifer.   |
|  | site workers during construction | ingestion of contaminated soil or dust, skin contact, inhalation     | Ongoing - appropriate protective equipment and working practices required during ground work.   |
|  | adjacent sites                   | migration of mobile contamination, along sewer that crosses the site | The risk of lateral migration of contamination will need to be minimised, removal of tank and made ground has removed the source of contamination.  |
|  | plastic services                 | direct contact   | It is considered that plastic pipes were protect, as per our previous guidance. However following the validation work it is evident that the TPH contamination has been removed from the site.  |
|  | vegetation                       | uptake via soil, ground water or vapour                              | Provision of a suitable growing medium will be required in areas of public open space. This is likely to be dealt with in association with the protection of end users.   |

It is proposed to carry our further validation work to confirm that work in soft landscaping areas is as agreed and a report will be submitted upon completion.

## **APPENDIX**


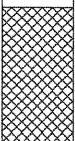
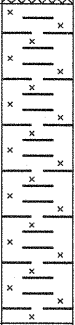
Borehole Records





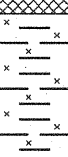
Vapour Monitoring Results

Contamination Results

Generic Risk-Based Soil Guideline Values

Site Plan

|   |                       |                        |                      |   |                              |   |  |   |                        |
|---|-----------------------|------------------------|----------------------|---|------------------------------|---|--|---|------------------------|
|                          |                       |                        |                      | Tyttenhanger House<br>Coursers Road<br>St Albans<br>AL4 0PG |                              | <b>Site</b><br>30a Highgate Road, London NW5 1NS                  |  | <b>Number</b><br><b>VBH1</b>  |                        |
| <b>Excavation Method</b><br>Drive-in Window Sampler   |                       | <b>Dimensions</b>      |                      | <b>Ground Level (mOD)</b>                                   |                              | <b>Client</b><br>Mr Colin Serlin                                  |  | <b>Job Number</b><br>J12041B  |                        |
|   |                       | <b>Location</b>        |                      | <b>Dates</b><br>13/11/2013                                  |                              | <b>Engineer</b><br>Elliott Wood Partnership                       |  | <b>Sheet</b><br>1/1   |                        |
| <b>Depth (m)</b>  | <b>Sample / Tests</b> | <b>Water Depth (m)</b> | <b>Field Records</b> | <b>Level (mOD)</b>  | <b>Depth (m) (Thickness)</b> | <b>Description</b>  |  | <b>Legend</b>   | <b>Water</b>           |
| 3.00  | D                     |                        |                      |   | 0.00                         | MADE GROUND (brown and grey sandy gravel with concrete fragments) |  |  |                        |
|   |                       |                        |                      |   | 0.90                         | Soft becoming firm brown silty fissured CLAY                      |  |  |                        |
|   |                       |                        |                      |   | 2.10                         |   |  |   |                        |
|   |                       |                        |                      |   | 3.00                         | Complete at 3.00m   |  |   |                        |
| <b>Remarks</b><br>Groundwater not encountered<br>Borehole drilled at an approximate angle of 45 degrees |                       |                        |                      |   |                              |   |  | <b>Scale (approx)</b><br>1:50   | <b>Logged By</b><br>ME |
|   |                       |                        |                      |   |                              |   |  | <b>Figure No.</b><br>J12041B.VBH1   |                        |

|  |                       |                        |                           |   |                              |  |  |   |                        |
|--|-----------------------|------------------------|---------------------------|---|------------------------------|--|--|---|------------------------|
|  <b>Geotechnical &amp; Environmental Associates</b> |                       |                        |                           | Tyttenhanger House<br>Coursers Road<br>St Albans<br>AL4 0PG |                              | <b>Site</b><br>30a Highgate Road, London NW5 1NS               |  | <b>Number</b><br><b>VBH2</b>  |                        |
| <b>Excavation Method</b><br>Drive-in Window Sampler  |                       | <b>Dimensions</b>      |                           | <b>Ground Level (mOD)</b>                                   |                              | <b>Client</b><br>Mr Colin Serlin                               |  | <b>Job Number</b><br>J12041B  |                        |
|  |                       | <b>Location</b>        |                           | <b>Dates</b><br>13/11/2013                                  |                              | <b>Engineer</b><br>Elliott Wood Partnership                    |  | <b>Sheet</b><br>1/1   |                        |
| <b>Depth (m)</b>   | <b>Sample / Tests</b> | <b>Water Depth (m)</b> | <b>Field Records</b>      | <b>Level (mOD)</b>  | <b>Depth (m) (Thickness)</b> | <b>Description</b>   |  | <b>Legend</b>   | <b>Water</b>           |
| 1.30   | D                     |                        | Water strike(1) at 1.40m. |   | (0.90)                       | Brown and grey gravelly sand with brick and concrete fragments |  |  | V1                     |
| 1.50   | D                     |                        |                           |   | 0.90<br>(0.50)               | Firm brown silty fissured CLAY                                 |  |  |                        |
|  |                       |                        |                           |   | 1.40<br>(0.60)               | Blackish grey sandy gravel. Slight hydrocarbon odour and sheen |  |  |                        |
| 2.10   | D                     |                        |                           |   | 2.00<br>(1.00)               | Firm brown sily fissured CLAY                                  |  |  |                        |
|  |                       |                        |                           |   | 3.00                         | Complete at 3.00m  |  |   |                        |
| <b>Remarks</b><br>Borehole drilled at an approximate angle of 45 degrees   |                       |                        |                           |   |                              |  |  |   |                        |
|  |                       |                        |                           |   |                              |  |  | <b>Scale (approx)</b><br>1:50   | <b>Logged By</b><br>ME |
|  |                       |                        |                           |   |                              |  |  | <b>Figure No.</b><br>J12041B.VBH2   |                        |



Tythenhanger House  
Coursers Road  
St Albans  
AL4 0PG

Site

30a Highgate Road, London NW5 1NS

Number  
VBH3

**Excavation Method**  
Drive-in Window Sampler

## Dimensions

Ground Level (mOD)

|               |  |
|---------------|--|
| <b>Client</b> |  |
|---------------|--|

Mr Colin Serlin

Job  
Number  
J12041B

Location

|              |            |
|--------------|------------|
| <b>Dates</b> | 13/11/2013 |
|--------------|------------|

**Engineer**

Elliott Wood Partnership

Sheet  
1/1

Depth  
(m)

### Sample / Tests

Water  
Depth  
(m)

## Field Records

Level  
(mOD)

Depth  
(m)  
(Thickness)

### Description

### Legend

Water

1.20

D

$$(1.30)$$

1.30  
1.31

MADE GROUND (brown and grey clayey gravelly sand with  
fragments of brick and concrete)

Concrete

Complete at 1.31m

### Remarks

Groundwater not encountered  
Borehole drilled at an approximate angle of 45 degrees

Scale (approx)

1:50

Logged  
By

ME

**Figure No.**




J12041B.VBH3


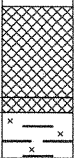




|  |                 |                            |   |                     |
|--|-----------------|----------------------------|---|---------------------|
|  | <b>Location</b> | <b>Dates</b><br>13/11/2013 | <b>Engineer</b><br>Elliott Wood Partnership | <b>Sheet</b><br>1/1 |
|--|-----------------|----------------------------|---|---------------------|








|      |                   |                           |  |                        |   |  |                |
|------|-------------------|---------------------------|--|------------------------|---|--|----------------|
| 1.50 | D                 | Water strike(1) at 1.00m. |  | 0.60<br>(0.20)<br>0.80 | MADE GROUND (brown and grey sandy gravel with brick and concrete fragments and rare coal fragments) |  | ▽ <sub>1</sub> |
|      |                   |                           |  | 0.60<br>(0.20)<br>0.80 | Soft orange-brown sandy gravelly CLAY   |  |                |
|      |                   |                           |  | (1.20)                 | MADE GROUND (blackish grey silty gravelly sand. Slight hydrocarbon odour and oily sheen)            |  |                |
|      |                   |                           |  | 2.00                   | Firm brown mottled grey silty fissured CLAY   |  |                |
|      |                   |                           |  | (1.00)                 |   |  |                |
| 3.00 | Complete at 3.00m |                           |  |                        |   |  |                |

Figure No. J12041B.VBH4





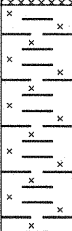
|  |                       |                        |                      |   |                              |   |  |   |                        |
|--|-----------------------|------------------------|----------------------|---|------------------------------|---|--|---|------------------------|
|  <b>Geotechnical &amp; Environmental Associates</b> |                       |                        |                      | Tyttenhanger House<br>Coursers Road<br>St Albans<br>AL4 0PG |                              | <b>Site</b><br>30a Highgate Road, London NW5 1NS  |  | <b>Number</b><br><b>VBH5</b>  |                        |
| <b>Excavation Method</b><br>Drive-in Window Sampler  |                       | <b>Dimensions</b>      |                      | <b>Ground Level (mOD)</b>                                   |                              | <b>Client</b><br>Mr Colin Serlin  |  | <b>Job Number</b><br>J12041B  |                        |
|  |                       | <b>Location</b>        |                      | <b>Dates</b><br>13/11/2013                                  |                              | <b>Engineer</b><br>Elliott Wood Partnership   |  | <b>Sheet</b><br>1/1   |                        |
| <b>Depth (m)</b>   | <b>Sample / Tests</b> | <b>Water Depth (m)</b> | <b>Field Records</b> | <b>Level (mOD)</b>  | <b>Depth (m) (Thickness)</b> | <b>Description</b>  |  | <b>Legend</b>   | <b>Water</b>           |
| 0.50   | D                     |                        |                      |   | 0.40                         | MADE GROUND (suspected mortar recovered as light brown gravelly sand)                     |  |  |                        |
|  |                       |                        |                      |   | 0.40                         | MADE GROUND (dark grey gravelly clayey sand of concrete)                                  |  |  |                        |
| 0.80   | D                     |                        |                      |   | 0.20                         |   |  | x   |                        |
|  |                       |                        |                      |   | 0.60                         |   |  | x   |                        |
|  |                       |                        |                      |   | 0.40                         | Firm brown mottled grey silty fissured CLAY with partings of orange-brown silty fine sand |  | x   |                        |
|  |                       |                        |                      |   | 1.00                         | Complete at 1.00m   |  | x   |                        |
|  |                       |                        |                      |   |                              |   |  |   |                        |
| <b>Remarks</b><br>Groundwater not encountered  |                       |                        |                      |   |                              |   |  | <b>Scale (approx)</b><br>1:50   | <b>Logged By</b><br>ME |
|  |                       |                        |                      |   |                              |   |  | <b>Figure No.</b><br>J12041B.VBH5   |                        |

|  <b>Geotechnical &amp; Environmental Associates</b> |                | Tyttenhanger House<br>Coursers Road<br>St Albans<br>AL4 0PG |                           | <b>Site</b><br>30a Highgate Road, London NW5 1NS |                       | <b>Number</b><br><b>VBH6</b>  |   |
|--|----------------|---|---------------------------|--|-----------------------|---|---|
| <b>Excavation Method</b><br>Drive-in Window Sampler  |                | <b>Dimensions</b>   |                           | <b>Ground Level (mOD)</b>                        |                       | <b>Client</b><br>Mr Colin Serlin  |   |
|  |                | <b>Location</b>   |                           | <b>Dates</b><br>13/11/2013                       |                       | <b>Engineer</b><br>Elliott Wood Partnership   |   |
|  |                |   |                           |  |                       | <b>Job Number</b><br>J12041B  |   |
|  |                |   |                           |  |                       | <b>Sheet</b><br>1/1   |   |
| Depth (m)  | Sample / Tests | Water Depth (m)   | Field Records             | Level (mOD)                                      | Depth (m) (Thickness) | Description   | Legend  |
| 0.50   | D              |   |                           |  | (0.60)                | MADE GROUND (dark grey gravelly sand with fragments of concrete and occasional brick) |  |
|  |                |   |                           |  | 0.60                  |   |   |
|  |                |   |                           |  | 0.70                  | MADE GROUND (orange brown gravel, pea gravel)   |   |
| 0.90   | D              |   | Water strike(1) at 0.70m. |  | (0.30)                | Firm brown mottled grey silty gravelly CLAY   |   |
|  |                |   |                           |  | 1.00                  | Complete at 1.00m   |   |
| <b>Remarks</b>   |                |   |                           |  |                       |   | <b>Scale (approx)</b><br>1:50   |
|  |                |   |                           |  |                       |   | <b>Logged By</b><br>ME  |
|  |                |   |                           |  |                       |   | <b>Figure No.</b><br>J12041B.VBH6   |

|   |                       |                        |                      |   |                              |  |  |   |                  |
|---|-----------------------|------------------------|----------------------|---|------------------------------|--|--|---|------------------|
| <b>GEA</b> Geotechnical & Environmental Associates  |                       |                        |                      | Tyttenhanger House<br>Coursers Road<br>St Albans<br>AL4 0PG |                              | <b>Site</b><br>30a Highgate Road, London NW5 1NS                                   |  | <b>Number</b><br><b>VBH7</b>  |                  |
| <b>Excavation Method</b><br>Drive-in Window Sampler |                       | <b>Dimensions</b>      |                      | <b>Ground Level (mOD)</b>                                   |                              | <b>Client</b><br>Mr Colin Serlin   |  | <b>Job Number</b><br>J12041B  |                  |
|   |                       | <b>Location</b>        |                      | <b>Dates</b><br>13/11/2013                                  |                              | <b>Engineer</b><br>Elliott Wood Partnership  |  | <b>Sheet</b><br>1/1   |                  |
| <b>Depth (m)</b>                                    | <b>Sample / Tests</b> | <b>Water Depth (m)</b> | <b>Field Records</b> | <b>Level (mOD)</b>  | <b>Depth (m) (Thickness)</b> | <b>Description</b>   |  | <b>Legend</b>   | <b>Water</b>     |
| 0.60  | D                     |                        |                      |   | (0.40)                       | MADE GROUD (suspected mortar recovered as light brown gravelly sand)               |  |  |                  |
|   |                       |                        |                      |   | 0.40                         | MADE GROUND (dark grey gravelly sand with concrete, brick and rare coal fragments) |  |   |                  |
|   |                       |                        |                      |   | (0.60)                       |  |  |  |                  |
|   |                       |                        |                      |   | 1.00                         | Concrete   |  |   |                  |
|   |                       |                        |                      |   | 1.01                         | Complete at 1.01m  |  |   |                  |
| <b>Remarks</b>                                      |                       |                        |                      |   |                              |  |  | <b>Scale (approx)</b>   | <b>Logged By</b> |
|   |                       |                        |                      |   |                              |  |  | 1:50  | ME               |
|   |                       |                        |                      |   |                              |  |  | <b>Figure No.</b><br>J12041B.VBH7   |                  |

|  <b>Geotechnical &amp; Environmental Associates</b> |                |                   |               | Tyttenhanger House<br>Coursers Road<br>St Albans<br>AL4 0PG |                       | <b>Site</b><br>30a Highgate Road, London NW5 1NS  |   | <b>Number</b><br><b>VBH8</b> |  |
|--|----------------|-------------------|---------------|---|-----------------------|---|---|------------------------------|--|
| <b>Excavation Method</b><br>Drive-in Window Sampler  |                | <b>Dimensions</b> |               | <b>Ground Level (mOD)</b>                                   |                       | <b>Client</b><br>Mr Colin Serlin  |   | <b>Job Number</b><br>J12041B |  |
|  |                | <b>Location</b>   |               | <b>Dates</b><br>13/11/2013                                  |                       | <b>Engineer</b><br>Elliott Wood Partnership   |   | <b>Sheet</b><br>1/1          |  |
| Depth (m)  | Sample / Tests | Water Depth (m)   | Field Records | Level (mOD)   | Depth (m) (Thickness) | Description   | Legend  | Water                        |  |
| 0.50   | D              |                   |               |   | (0.20)<br>0.20        | MADE GROUND (suspected mortar recovered as light brown gravelly sand)                           |  |                              |  |
|  |                |                   |               |   | (0.80)                | MADE GROUND (dark brown to grey clayey gravelly sand with fragments of concrete, ash and brick) |  |                              |  |
| 1.50   | D              |                   |               |   | 1.00                  | MADE GROUND (brown silty occasionally gravelly clay with fragments of brick and rare concrete)  |  |                              |  |
| 2.00   | D              |                   |               |   | (1.50)                |   |   |                              |  |
|  |                |                   |               |   | 2.50                  | Firm brown mottled grey silty fissured CLAY   |  |                              |  |
|  |                |                   |               |   | (0.50)                |   |  |                              |  |
|  |                |                   |               |   | 3.00                  | Complete at 3.00m   |  |                              |  |
| <b>Remarks</b><br>Groundwater not encountered  |                |                   |               |   |                       |   |   |                              |  |
|  |                |                   |               |   |                       |   | <b>Scale (approx)</b><br>1:50   | <b>Logged By</b><br>ME       |  |
|  |                |                   |               |   |                       |   | <b>Figure No.</b><br>J12041B.VBH8   |                              |  |



|  |                       |                        |                      |   |  |   |  |  |                        |
|--|-----------------------|------------------------|----------------------|---|--|---|--|--|------------------------|
|  <b>Geotechnical &amp; Environmental Associates</b> |                       |                        |                      | Tyttenhanger House<br>Coursers Road<br>St Albans<br>AL4 0PG |  | <b>Site</b><br>30a Highgate Road, London NW5 1NS  |  | <b>Number</b><br><b>VBH9</b>   |                        |
| <b>Excavation Method</b><br>Drive-in Window Sampler  |                       | <b>Dimensions</b>      |                      | <b>Ground Level (mOD)</b>                                   |  | <b>Client</b><br>Mr Colin Serlin  |  | <b>Job Number</b><br>J12041B   |                        |
|  |                       | <b>Location</b>        |                      | <b>Dates</b><br>13/11/2013                                  |  | <b>Engineer</b><br>Elliott Wood Partnership   |  | <b>Sheet</b><br>1/1  |                        |
| <b>Depth (m)</b>   | <b>Sample / Tests</b> | <b>Water Depth (m)</b> | <b>Field Records</b> | <b>Level (mOD)</b>  | <b>Depth (m) (Thickness)</b>   | <b>Description</b>  |  | <b>Legend</b>  | <b>Water</b>           |
| 0.50   | D                     |                        |                      |   | (0.30)<br>0.30<br>(0.70)<br>1.00<br>(0.50)<br>1.50<br>(1.50)<br>3.00 | MADE GROUND (possibly mortar recovered as light brown gravelly sand)<br>MADE GROUND (dark grey gravelly sand with rare ash and rotted wood)<br>MADE GROUND (brown sandy gravel, pea gravel)<br>Firm brown mottled grey silty fissured CLAY with partings of orange-brown silty sand y and rare selenite crystals<br>Complete at 3.00m |  | <br><br><br> |                        |
| <b>Remarks</b>   |                       |                        |                      |   |  |   |  | <b>Scale (approx)</b><br>1:50  | <b>Logged By</b><br>ME |
|  |                       |                        |                      |   |  |   |  | <b>Figure No.</b><br>J12041B.VBH9  |                        |



Geotechnical &  
Environmental  
Associates

Coursers Road

Tythenhanger House  
St  
Albans  
Herts AL4 0PG

## Vapour Monitoring

|                 |                                    |                     |
|-----------------|------------------------------------|---------------------|
| <b>Site</b>     | 30a Highgate Road, London, NW5 1NS | <b>Job Number</b>   |
| <b>Client</b>   | Mr Colin Serlin                    | J12041B             |
| <b>Engineer</b> | Elliott Wood Partnership           | <b>Sheet</b><br>1/1 |

### VAPOUR MONITORING - 21 DECEMBER 2013

|                        |      |      |      |      |      |      |      |     |     |
|------------------------|------|------|------|------|------|------|------|-----|-----|
| <b>Survey Position</b> | VBH1 | VBH2 | VBH4 | VBH5 | VBH6 | VBH8 | VBH9 | SP1 | SP2 |
| <b>VOCS (ppmv)</b>     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0 | 0.0 |
| <b>Survey Position</b> | SP3  |      |      |      |      |      |      |     |     |
| <b>VOCS (ppmv)</b>     | 0.0  |      |      |      |      |      |      |     |     |
| <b>Survey Position</b> |      |      |      |      |      |      |      |     |     |
| <b>VOCS (ppmv)</b>     |      |      |      |      |      |      |      |     |     |
| <b>Survey Position</b> |      |      |      |      |      |      |      |     |     |
| <b>VOCS (ppmv)</b>     |      |      |      |      |      |      |      |     |     |

**Equipment** Photo-ionisation detector (PID) fitted with a 10.6 eV lamp

GEA  
Tyttenhanger House  
Coursers Road  
St Albans Herts  
AL4 0PG

FAO Matthew Elcock  
13 December 2013

Dear Matthew Elcock

**Test Report Number**                      **244988a Amended Test Report**  
**Your Project Reference**                **J12041B- 30a Highgate Road, London**

Please find enclosed the results of analysis for the samples received 20 November 2013.

Please see additional analysis. Disregard all previous reports.

All soil samples will be retained for a period of one month and all water samples will be retained for 7 days following the date of the test report. Should you require an extended retention period then please detail your requirements in an email to [customerservices@chemtest.co.uk](mailto:customerservices@chemtest.co.uk). Please be aware that charges may be applicable for extended sample storage.

If you require any further assistance, please do not hesitate to contact the Customer Services team.

Yours sincerely



Darrell Hall, Director



*Notes to accompany report:*

- The sign < means 'less than'
- Tests marked 'U' hold UKAS accreditation
- Tests marked 'M' hold MCertS (and UKAS) accreditation
- Tests marked 'N' do not currently hold UKAS accreditation
- Tests marked 'S' were subcontracted to an approved laboratory
- n/e means 'not evaluated'
- i/s means 'insufficient sample'
- u/s means 'unsuitable sample'
- Comments or interpretations are outside of the scope of UKAS accreditation
- The results relate only to the items tested
- Stones represent the quantity of material removed prior to analysis
- All results are expressed on a dry weight basis
- The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, phenols
- For all other tests the samples were dried at < 37°C prior to analysis
- Uncertainties of measurement for the determinands tested are available upon request
- Soil descriptions, including colour and texture, are beyond the scope of MCertS accreditation
- None of the test results included in this report have been recovery corrected

GEA  
Tyttenhanger House  
Coursers Road  
St Albans Herts  
AL4 0PG

FAO Matthew Elcock

# AMENDED LABORATORY TEST REPORT

Results of analysis of 6 samples  
received 20 November 2013



Report Date  
13 December 2013

J12041B- 30a Highgate Road, London

## Login Batch No

Chemtest LIMS ID

Sample ID

Sample No

Sampling Date

Depth

Matrix

SOP↓ Determinand↓

CAS No↓

Units↓

\*

|      |                                    |          |                     |   | 244988     |            |            |            |            |            |
|------|------------------------------------|----------|---------------------|---|------------|------------|------------|------------|------------|------------|
|      |                                    |          |                     |   | AJ45871    | AJ45872    | AJ45876    | AJ45877    | AJ45882    | AJ45883    |
|      |                                    |          |                     |   | VBH2       | VBH2       | VBH4       | VBH5       | VBH7       | VBH8       |
|      |                                    |          |                     |   | 13/11/2013 | 13/11/2013 | 13/11/2013 | 13/11/2013 | 13/11/2013 | 13/11/2013 |
|      |                                    |          |                     |   | 1.3m       | 1.5m       | 2.1m       | 0.5m       | 0.5m       | 0.5m       |
|      |                                    |          |                     |   | SOIL       | SOIL       | SOIL       | SOIL       | SOIL       | SOIL       |
| 2030 | Moisture                           |          | %                   | M | 21.3       | 21.6       | 22         | 14.9       | 7.25       | 13.1       |
|      | Stones content (>50mm)             |          | %                   | M | <0.02      | <0.02      | <0.02      | <0.02      | <0.02      | <0.02      |
| 2040 | Soil colour                        |          |                     | M |            | brown      |            |            |            |            |
|      | Soil texture                       |          |                     | M |            | clay       |            |            |            |            |
|      | Other material                     |          |                     | M |            | stones     |            |            |            |            |
| 2010 | pH                                 |          |                     | M |            | 9.8        |            |            |            |            |
| 2300 | Cyanide (total)                    | 57125    | mg kg <sup>-1</sup> | M |            | <0.50      |            |            |            |            |
| 2325 | Sulfide (Easily Liberatable)       | 18496258 | mg kg <sup>-1</sup> | M |            | 24         |            |            |            |            |
| 2625 | Total Organic Carbon               |          | %                   | M |            | 2.8        |            |            |            |            |
| 2220 | Chloride (extractable)             | 16887006 | g l <sup>-1</sup>   | M |            | 0.14       |            |            |            |            |
| 2430 | Sulfate (total) as SO <sub>4</sub> |          | mg kg <sup>-1</sup> | M |            | 6400       |            |            |            |            |
| 2450 | Arsenic                            | 7440382  | mg kg <sup>-1</sup> | M |            | 37         |            |            |            |            |
|      | Cadmium                            | 7440439  | mg kg <sup>-1</sup> | M |            | <0.10      |            |            |            |            |
|      | Chromium                           | 7440473  | mg kg <sup>-1</sup> | M |            | 43         |            |            |            |            |
|      | Copper                             | 7440508  | mg kg <sup>-1</sup> | M |            | 1300       |            |            |            |            |
|      | Mercury                            | 7439976  | mg kg <sup>-1</sup> | M |            | 0.73       |            |            |            |            |
|      | Nickel                             | 7440020  | mg kg <sup>-1</sup> | M |            | 72         |            |            |            |            |
|      | Lead                               | 7439921  | mg kg <sup>-1</sup> | M |            | 1400       |            |            |            |            |
|      | Selenium                           | 7782492  | mg kg <sup>-1</sup> | M |            | <0.20      |            |            |            |            |
|      | Zinc                               | 7440666  | mg kg <sup>-1</sup> | M |            | 1500       |            |            |            |            |
| 2675 | TPH aliphatic >C5-C6               |          | mg kg <sup>-1</sup> | N | < 0.1      | < 0.1      | < 0.1      | < 0.1      | < 0.1      | < 0.1      |
|      | TPH aliphatic >C6-C8               |          | mg kg <sup>-1</sup> | N | < 0.1      | < 0.1      | < 0.1      | < 0.1      | < 0.1      | < 0.1      |
|      | TPH aliphatic >C8-C10              |          | mg kg <sup>-1</sup> | N | < 0.1      | < 0.1      | < 0.1      | < 0.1      | < 0.1      | < 0.1      |
|      | TPH aliphatic >C10-C12             |          | mg kg <sup>-1</sup> | M | < 1        | < 1        | < 1        | < 1        | < 1        | < 1        |

All tests undertaken between 20/11/2013 and 11/12/2013

\* Accreditation status

*This report should be interpreted in conjunction with the notes on the accompanying cover page.*

Column page 1

Report page 1 of 3

LIMS sample ID range AJ45870 to AJ45887

# AMENDED LABORATORY TEST REPORT

Results of analysis of 6 samples  
received 20 November 2013

J12041B- 30a Highgate Road, London

Report Date  
13 December 2013

|                              |                        |        |                     |   | 244988     |            |            |            |            |            |
|------------------------------|------------------------|--------|---------------------|---|------------|------------|------------|------------|------------|------------|
|                              |                        |        |                     |   | AJ45871    | AJ45872    | AJ45876    | AJ45877    | AJ45882    | AJ45883    |
|                              |                        |        |                     |   | VBH2       | VBH2       | VBH4       | VBH5       | VBH7       | VBH8       |
|                              |                        |        |                     |   |            |            |            |            |            |            |
|                              |                        |        |                     |   | 13/11/2013 | 13/11/2013 | 13/11/2013 | 13/11/2013 | 13/11/2013 | 13/11/2013 |
|                              |                        |        |                     |   | 1.3m       | 1.5m       | 2.1m       | 0.5m       | 0.5m       | 0.5m       |
|                              |                        |        |                     |   | SOIL       | SOIL       | SOIL       | SOIL       | SOIL       | SOIL       |
| 2675                         | TPH aliphatic >C12-C16 |        | mg kg <sup>-1</sup> | M | < 1        | < 1        | < 1        | < 1        | < 1        | < 1        |
|                              | TPH aliphatic >C16-C21 |        | mg kg <sup>-1</sup> | M | < 1        | < 1        | < 1        | < 1        | 20         | < 1        |
|                              | TPH aliphatic >C21-C35 |        | mg kg <sup>-1</sup> | M | < 1        | 27         | < 1        | < 1        | 88         | < 1        |
|                              | TPH aliphatic >C35-C44 |        | mg kg <sup>-1</sup> | N | < 1        | < 1        | < 1        | < 1        | < 1        | < 1        |
|                              | TPH aromatic >C5-C7    |        | mg kg <sup>-1</sup> | N | < 0.1      | < 0.1      | < 0.1      | < 0.1      | < 0.1      | < 0.1      |
|                              | TPH aromatic >C7-C8    |        | mg kg <sup>-1</sup> | N | < 0.1      | < 0.1      | < 0.1      | < 0.1      | < 0.1      | < 0.1      |
|                              | TPH aromatic >C8-C10   |        | mg kg <sup>-1</sup> | N | < 0.1      | < 0.1      | < 0.1      | < 0.1      | < 0.1      | < 0.1      |
|                              | TPH aromatic >C10-C12  |        | mg kg <sup>-1</sup> | N | < 1        | < 1        | < 1        | < 1        | < 1        | 3.0        |
|                              | TPH aromatic >C12-C16  |        | mg kg <sup>-1</sup> | M | 1.7        | 4.4        | 5.6        | < 1        | 24         | 7.5        |
|                              | TPH aromatic >C16-C21  |        | mg kg <sup>-1</sup> | M | 3.9        | 16         | 23         | < 1        | 56         | 36         |
|                              | TPH aromatic >C21-C35  |        | mg kg <sup>-1</sup> | N | 4.6        | 18         | 37         | < 1        | 55         | 98         |
|                              | TPH aromatic >C35-C44  |        | mg kg <sup>-1</sup> | N | < 1        | 1.5        | 2.2        | < 1        | < 1        | 12         |
| Total Petroleum Hydrocarbons |                        |        | mg kg <sup>-1</sup> | N | 10         | 68         | 68         | < 10       | 240        | 160        |
| 2700                         | Naphthalene            | 91203  | mg kg <sup>-1</sup> | M |            | 1.2        |            |            |            |            |
|                              | Acenaphthylene         | 208968 | mg kg <sup>-1</sup> | M |            | 0.47       |            |            |            |            |
|                              | Acenaphthene           | 83329  | mg kg <sup>-1</sup> | M |            | 1.5        |            |            |            |            |
|                              | Fluorene               | 86737  | mg kg <sup>-1</sup> | M |            | 1.1        |            |            |            |            |
|                              | Phenanthrene           | 85018  | mg kg <sup>-1</sup> | M |            | 6.2        |            |            |            |            |
|                              | Anthracene             | 120127 | mg kg <sup>-1</sup> | M |            | 1.7        |            |            |            |            |
|                              | Fluoranthene           | 206440 | mg kg <sup>-1</sup> | M |            | 9          |            |            |            |            |
|                              | Pyrene                 | 129000 | mg kg <sup>-1</sup> | M |            | 7.3        |            |            |            |            |
|                              | Benzo[a]anthracene     | 56553  | mg kg <sup>-1</sup> | M |            | 4.9        |            |            |            |            |
|                              | Chrysene               | 218019 | mg kg <sup>-1</sup> | M |            | 5.8        |            |            |            |            |
|                              | Benzo[b]fluoranthene   | 205992 | mg kg <sup>-1</sup> | N |            | 5.6        |            |            |            |            |
|                              | Benzo[k]fluoranthene   | 207089 | mg kg <sup>-1</sup> | N |            | 3          |            |            |            |            |




# AMENDED LABORATORY TEST REPORT

Results of analysis of 6 samples  
received 20 November 2013

Report Date  
13 December 2013

J12041B- 30a Highgate Road, London

|      |                        |        |                     |   | 244988     |            |            |            |            |            |
|------|------------------------|--------|---------------------|---|------------|------------|------------|------------|------------|------------|
|      |                        |        |                     |   | AJ45871    | AJ45872    | AJ45876    | AJ45877    | AJ45882    | AJ45883    |
|      |                        |        |                     |   | VBH2       | VBH2       | VBH4       | VBH5       | VBH7       | VBH8       |
|      |                        |        |                     |   |            |            |            |            |            |            |
|      |                        |        |                     |   | 13/11/2013 | 13/11/2013 | 13/11/2013 | 13/11/2013 | 13/11/2013 | 13/11/2013 |
|      |                        |        |                     |   | 1.3m       | 1.5m       | 2.1m       | 0.5m       | 0.5m       | 0.5m       |
|      |                        |        |                     |   | SOIL       | SOIL       | SOIL       | SOIL       | SOIL       | SOIL       |
| 2700 | Benzo[a]pyrene         | 50328  | mg kg <sup>-1</sup> | M |            | 4.5        |            |            |            |            |
|      | Dibenzo[a,h]anthracene | 53703  | mg kg <sup>-1</sup> | M |            | 0.89       |            |            |            |            |
|      | Indeno[1,2,3-cd]pyrene | 193395 | mg kg <sup>-1</sup> | M |            | 2.9        |            |            |            |            |
|      | Benzo[g,h,i]perylene   | 191242 | mg kg <sup>-1</sup> | M |            | 2.9        |            |            |            |            |
|      | Total (of 16) PAHs     |        | mg kg <sup>-1</sup> | M |            | 59         |            |            |            |            |
| 2920 | Phenols (total)        |        | mg kg <sup>-1</sup> | M |            | <0.3       |            |            |            |            |

|   |             |   |                       |   |  |
|---|-------------|---|-----------------------|---|--|
|    |             | Tyttenhanger House<br>Coursers Road<br>St Albans<br>AL4 0PG |                       | Generic Risk-Based Soil<br>Guideline Values |  |
| Site30a Highgate Road, London, NW5 1NS  |             |   |                       | Job Number<br>J12041A                       |  |
| ClientMr Colin Serlin   |             |   |                       | Sheet<br>1 / 1                              |  |
| EngineerElliott Wood Partnership  |             |   |                       |   |  |
| Proposed End Use Residential with plant uptake  |             |   |                       |   |  |
| Soil pH 8   |             |   |                       |   |  |
| Soil Organic Matter content % 6.0   |             |   |                       |   |  |
| Contaminant   |             |   | Guideline Value mg/kg | Data Source                                 |  |
| Metals  |             |   |                       |   |  |
| Arsenic   | 32          | SGV   |                       |   |  |
| Cadmium   | 10          | SGV   |                       |   |  |
| Chromium (III)  | 3000        | LQM/CIEH  |                       |   |  |
| Chromium (VI)   | 4.3         | LQM/CIEH  |                       |   |  |
| Copper  | 2,330       | LQM/CIEH  |                       |   |  |
| Lead  | 450         | withdrawn SGV   |                       |   |  |
| Elemental Mercury   | 1           | SGV   |                       |   |  |
| Inorganic Mercury   | 170         | SGV   |                       |   |  |
| Nickel  | 130         | LQM/CIEH  |                       |   |  |
| Selenium  | 350         | SGV   |                       |   |  |
| Zinc  | 3,750       | LQM/CIEH  |                       |   |  |
| Hydrocarbons  |             |   |                       |   |  |
| Benzene   | 0.33        | SGV   |                       |   |  |
| Toluene   | 610         | SGV   |                       |   |  |
| Ethyl Benzene   | 350         | SGV   |                       |   |  |
| Xylene  | 230         | SGV   |                       |   |  |
| Aliphatic C5-C6   | 110         | LQM/CIEH  |                       |   |  |
| Aliphatic C6-C8   | 370         | LQM/CIEH  |                       |   |  |
| Aliphatic C8-C10  | 110         | LQM/CIEH  |                       |   |  |
| Aliphatic C10-C12   | 540         | LQM/CIEH  |                       |   |  |
| Aliphatic C12-C16   | 3000        | LQM/CIEH  |                       |   |  |
| Aliphatic C16-C35   | 76,000      | LQM/CIEH  |                       |   |  |
| Aromatic C6-C7  | See Benzene | LQM/CIEH  |                       |   |  |
| Aromatic C7-C8  | See Toluene | LQM/CIEH  |                       |   |  |
| Aromatic C8-C10   | 151         | LQM/CIEH  |                       |   |  |
| Aromatic C10-C12  | 346         | LQM/CIEH  |                       |   |  |
| Aromatic C12-C16  | 593         | LQM/CIEH  |                       |   |  |
| Aromatic C16-C21  | 770         | LQM/CIEH  |                       |   |  |
| Aromatic C21-C35  | 1230        | LQM/CIEH  |                       |   |  |
| PRO (C5 –C10)   | 1351        | Calc  |                       |   |  |
| DRO (C12 –C28)  | 80,363      | Calc  |                       |   |  |
| Lube Oil (C28 –C44)   | 77,230      | Calc  |                       |   |  |
| TPH   | 500         | Trigger for speciated testing                               |                       |   |  |
| Contaminant   |             |   | Guideline Value mg/kg | Data Source                                 |  |
| Anions  |             |   |                       |   |  |
| Soluble Sulphate  | 0.5 g/l     | Structures  |                       |   |  |
| Sulphide  | 50          | Structures  |                       |   |  |
| Chloride  | 400         | Structures  |                       |   |  |
| Others  |             |   |                       |   |  |
| Organic Carbon (%)  | 6           | Methanogenic potential                                      |                       |   |  |
| Total Cyanide   | 140         | WRAS  |                       |   |  |
| Total Mono Phenols  | 420         | SGV   |                       |   |  |
| PAH   |             |   |                       |   |  |
| Naphthalene   | 8.70        | LQM/CIEH  |                       |   |  |
| Acenaphthylene  | 850         | LQM/CIEH  |                       |   |  |
| Acenaphthene  | 1,000       | LQM/CIEH  |                       |   |  |
| Fluorene  | 780         | LQM/CIEH  |                       |   |  |
| Phenanthrene  | 380         | LQM/CIEH  |                       |   |  |
| Anthracene  | 9,200       | LQM/CIEH  |                       |   |  |
| Fluoranthene  | 670         | LQM/CIEH  |                       |   |  |
| Pyrene  | 1,600       | LQM/CIEH  |                       |   |  |
| Benzo(a) Anthracene   | 5.9         | LQM/CIEH  |                       |   |  |
| Chrysene  | 9           | LQM/CIEH  |                       |   |  |
| Benzo(b) Fluoranthene   | 7.0         | LQM/CIEH  |                       |   |  |
| Benzo(k) Fluoranthene   | 10.0        | LQM/CIEH  |                       |   |  |
| Benzo(a) pyrene   | 1.00        | LQM/CIEH  |                       |   |  |
| Indeno(1 2 3 cd) Pyrene   | 4.2         | LQM/CIEH  |                       |   |  |
| Dibenzo(a h) Anthracene   | 0.90        | LQM/CIEH  |                       |   |  |
| Benzo (g h i) Perylene  | 47          | LQM/CIEH  |                       |   |  |
| Total PAH   | 6.7         | B(a)P / 0.15  |                       |   |  |
| Chlorinated Solvents  |             |   |                       |   |  |
| 1,1,1 trichloroethane (TCA)   | 28          | LQM/CIEH  |                       |   |  |
| tetrachloroethane (PCA)   | 4.8         | LQM/CIEH  |                       |   |  |
| tetrachloroethene (PCE)   | 4.8         | LQM/CIEH  |                       |   |  |
| trichloroethene (TCE)   | 0.49        | LQM/CIEH  |                       |   |  |
| 1,2-dichloroethane (DCA)  | 0.014       | LQM/CIEH  |                       |   |  |
| vinyl chloride (Chloroethene)   | 0.00099     | LQM/CIEH  |                       |   |  |
| tetrachloromethane (Carbon tetrac   | 0.089       | LQM/CIEH  |                       |   |  |
| trichloromethane (Chloroform)   | 2.7         | LQM/CIEH  |                       |   |  |
| Notes   |             |   |                       |   |  |
| Concentrations measured below the above values may be considered to represent 'uncontaminated conditions' which do not pose a risk to human health. Concentrations measured in excess of these values indicate a potential risk, and thus require further, site specific risk assessment. |             |   |                       |   |  |
| SGV - Soil Guideline Value, derived from the CLEA model and published by Environment Agency 2009  |             |   |                       |   |  |
| withdrawn SGV - Former SGV, derived from the CLEA 2000 model and published by DEFRA pending confirmation of new approach to modeling lead   |             |   |                       |   |  |
| LQM/CIEH - Generic Assessment Criteria for Human Health Risk Assessment 2nd edition (2009)derived using CLEA 1.04 model 2009  |             |   |                       |   |  |
| Calc - sum of nearest available carbon range specified including BTEX for PRO fraction  |             |   |                       |   |  |
| B(a)P / 0.15 - GEA experience indicates that Benzo(a) pyrene (one of the most common and most carcenogenic of the PAHs) rarely exceeds 15% of the total PAH concentration, hence this Total PAH threshold is regarded as being conservative   |             |   |                       |   |  |



Geotechnical &  
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Tythenhanger House  
Coursers Road  
St Albans  
Herts AL4 0PG

## Site Plan

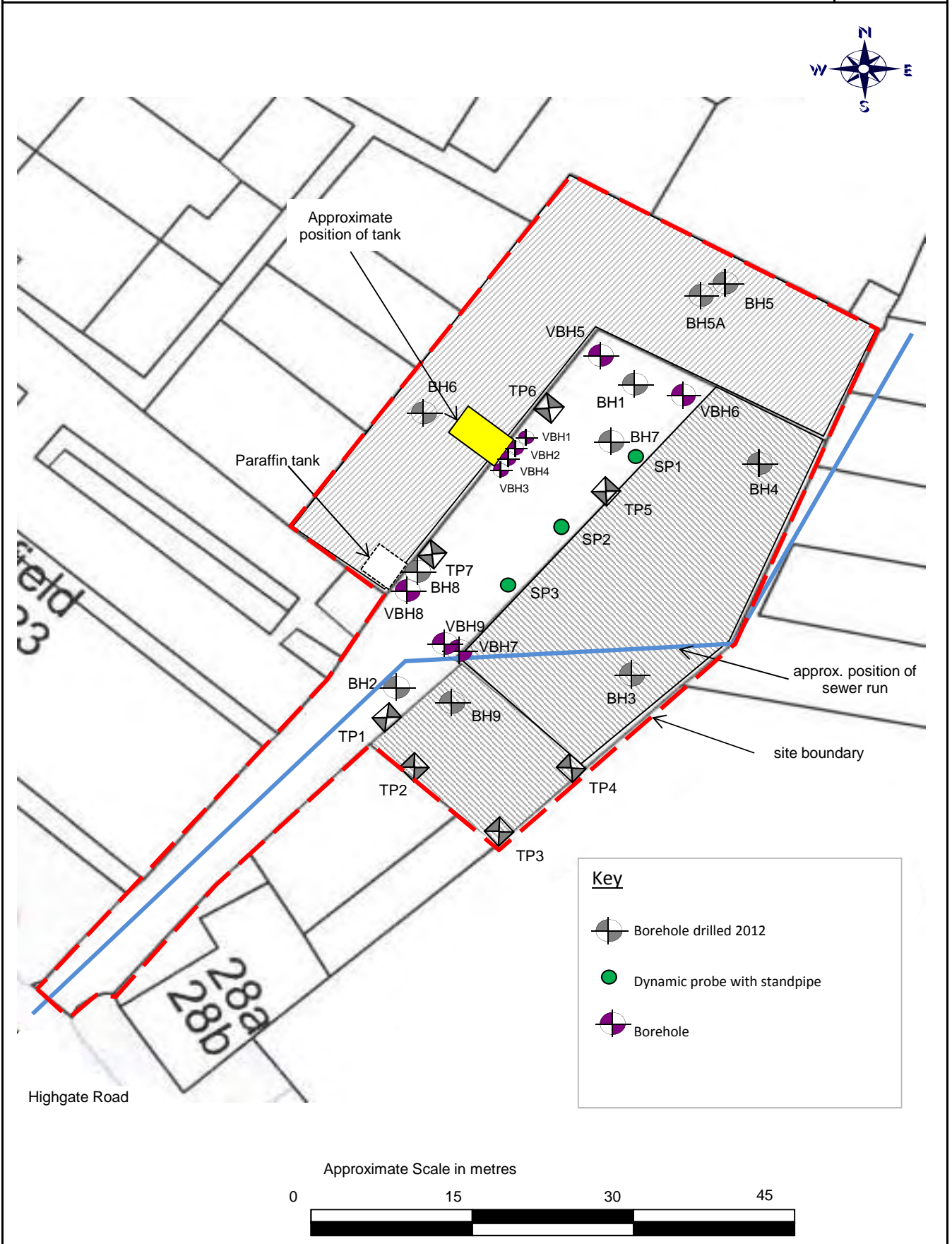
**Site** 30a Highgate Road, London, NW5 1NS

**Client** Mr Colin Serlin

**Engineer** Elliott Wood Partnership

**Job Number**  
J12041A

**Sheet**  
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