HBPW LLP
Civil & Structural Engineering Services

Geoenvironmental Assessment
For
Proposed Development
at
63-71 High Street, Hampton Hill
TW12 1LZ

REPORT PREPARED ON BEHALF OF
GREATPLANET LIMITED

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1. INTRODUCTION

HBPW LLP (HBPW) was instructed by P2M UK Limited on behalf of GreatPlanet Limited (the Client) to undertake a Geoenvironmental Site Investigation at a site known as 63-71 High Street, Hampton Hill, TW12 1LZ hereafter referred to as 'the site').

The proposed development includes;

- the demolition of all existing buildings and associated infrastructure;
- installation of a perimeter contiguous piled retaining wall to enable excavation of the basement areas underlying the majority of the Site; and
- construction of a number of town houses and apartments and retail units fronting onto High Street.

The ground works for the development will therefore result in the removal of the upper 4-5 m of strata. There is no scope for re-use of excavated materials on site. The contaminated land assessments will therefore focus on the geochemical and geotechnical classification of excavation arisings for removal off site for re-use and/or disposal.

This report describes an intrusive ground investigation carried out by HBPW LLP following completion of a Phase 1 Preliminary Risk Assessment by HBPW LLP (report reference SL05030-REP-01, May 2016). It is recommended that this report be read in conjunction with the initial Phase 1 report.

This report considers the content of the Phase 1 report and includes a description and interpretation of a site investigation carried out to characterise the ground conditions at the site in order to complete a Conceptual Site Model (CSM) and to undertake a Risk Based Land Quality Assessment.

This report has been prepared in general accordance with Contaminated Land Report 11 (CLR) Model Procedures for the Management of Contaminated land (DEFRA and the Environment Agency) and BS10175:2011 (Investigation of Potentially Contaminated Sites – Code of Practice).

The objectives of the investigation were as follows:-

i) Undertake a site reconnaissance visit to inspect the site and determine appropriate ground investigation methods;

ii) Drill two exploratory boreholes using cable percussive methods to target depths of 15 m with the installation of monitoring wells to monitor potential ground gases and groundwater;

iii) Excavate up to six trial pits in order to obtain samples of near surface soils for geochemical and geotechnical analysis and to inspect ground stability;

iv) Carry out in-situ and geotechnical laboratory testing to obtain soil parameters for use in the design of the proposed scheme;

v) Carry out geochemical testing to determine the concentration of a range of common potential contaminants, as identified during the Phase 1 desk study;

vi) Return monitoring visit to record groundwater level and concentrations of ground gases; and

vii) Prepare an interpretative report providing an updated risk assessment and advice on the geoenvironmental and geotechnical aspects of the project.

The information and conclusions contained with this assessment have been made based upon information provided by the Client, QTS Environmental Laboratories (laboratory analysis results), Landmark Envirocheck (report reference 81953700_1_1) and from publicly available information published by the Environment Agency (EA), British Geological Survey (BGS), Ordnance Survey (OS), and others, where appropriate.

HBPW LLP cannot be held responsible for inaccuracies in the data supplied or published by any other party. In addition, no responsibility can be accepted by HBPW LLP for any variations in environmental liabilities which arise from information or reports not provided at the time of the assessment and where the presence of such information could not be foreseen.

It is intended that this Report be submitted to the Local Authority as part of a staged process required to discharge any contamination related planning conditions.

In relation to contaminated land, Options Appraisal and an Outline Remediation Method Statement are presented where required along with recommendations and or information for cost effective materials management and waste disposal.

Other development implications, resulting from the ground conditions at the site have been discussed or identified such as the requirement for gas protection measures, special precautions for buried water pipes, and for buried concrete.

This report considers the proposals for the subject site at the time of issue of the report. Should the scheme change significantly then the implications regarding the geoenvironmental and geotechnical aspects will need consideration relative to the new proposals.

2 SITE SETTING

2.1 Site Location

The site address is 63-71 High Street, Hampton Hill, TW12 1LZ. The subject site is located on the western side of High Street, and can be approximately located by National Grid Reference TQ 708 142.

2.2 Site Description

A site reconnaissance visit was undertaken as part of the Phase 1 report (May 2016) and found the site to be in the following condition:-

The site formed a rectangular piece of land measuring 68 m in a northwest to south east orientation by 38 m in a northeast to southwest direction and was occupied primarily by three buildings. Two office buildings fronted onto High Street were joined by an enclosed overhead link walkway at first floor level. The third building was located in the southwest quadrant backing onto the access road to the St. Clare Business Park.

Vehicular access to the site was gained by metal gates located centrally between the frontage buildings with a pedestrian entrance along the western boundary, adjacent to the building in the southwest corner.

To the south of the site is a mixed office and residential terraces. To the north of the site, at the time of writing, a number of houses were under construction.

2.3 Phase 1 Report

A Phase 1 Preliminary Risk Assessment (ref SL05030-REP-01) was prepared in May 2016 and has been updated to reflect the proposed development. A brief summary of the report's findings are summarised below.

The site had been occupied by three residential buildings with associated gardens since at least 1869. From approximately 1959 to 1975 to 1985, the northern half of the site was in use as a builder's yard, whilst the southern half was labelled as 'Works'. After this, the site was occupied by present day developments.

Based on knowledge of the area and geological information provided by the British Geological Society, the site was anticipated to be underlain by superficial deposits of Taplow Gravel Formation (Sands and Gravel) to a depth of at least 8 m, overlain by a

thin veneer of made ground. The underlying bedrock was anticipated to be London Clay Formation.

No ground stability hazards were recorded on site.

The nearest recorded surface water feature was Longford River, approximately 200 m to the west of the site, flowing to the south.

BGS Groundwater Vulnerability Map Sheet 39, West London, indicated the site to be underlain by soils of a high leaching potential. Superficial deposits were recorded as a Principal Aquifer, considered to represent the Taplow Gravel Formation whilst the underlying London Clay Formation was recorded to be Unproductive Strata.

Potentially contaminative land uses were present within 250 m of the site including sheet metal workers, garages, printers and dry cleaners. A petrol filling station (PFS) was also present 240 m to the northeast of the site.

3 INITIAL CONCEPTUAL SITE MODEL

An initial Conceptual Site Model (CSM) was developed in the Phase 1 report, adopting the source-pathway-receptor approach.

The initial CSM is developed during the preliminary risk assessment stage and is then used to design the Phase 2 Intrusive Investigations.

For a risk from ground contamination to exist, a contaminant source, pathway for migration and viable receptor must exist. The presence of all three of these elements is known as a 'pollutant linkage'. The criteria used for risk assessment classifications in the table below are broadly based on those presented in Section 6.3 of CIRIA Report 552 "*Contaminated Land Risk Assessment: A Guide to Good Practice*".

- **Sources (S)** are potential or known contaminant sources e.g. soil contamination resulting from a former land use;
- **Pathways (P)** are environmental systems thorough which a contaminant could migrate e.g. air, groundwater;
- **Receptors (R)** are sensitive environmental receptors that could be adversely affected by a contaminant. e.g. Human End User (longer- term risks) or groundworkers (shorter-term risks), surface or groundwater resources and ecology.

A preliminary CSM detailing the pollutant linkages identified and the associated risks is detailed in Table 3.1 overleaf. The full methodology is presented in Appendix 1.

Table 3.1 Preliminary Qualitative Risk Assessment

Potential Source	Potential Receptor	Potential Pathway	Consequence	Probability	Risk	Comments
S1: Potential for asbestos containing materials (ACMs) present in existing buildings and made ground	**R1**: Construction/ maintenance workers/end users	**P1**: Human uptake pathways (Inhalation of fibers).	Medium	Low likelihood	Low	There is a potential for asbestos to be present within buildings at the site and within the made ground. Inspection of existing asbestos register, if present or appropriate asbestos inspections of buildings prior to refurbishment followed by appropriate removal will mitigate risks. As a precautionary measure, asbestos screening of soils during Phase 2 Intrusive Investigations will be undertaken.
S2: Potential for contamination within any made ground at the site.	**R1**: Construction/ maintenance workers/end users.	**P1**: Human uptake pathways (inhalation, dermal, ingestion).	Medium	Low likelihood	Low/Very Low	Phase 2 Intrusive Site investigation works with appropriate testing will assess the presence and concentration of contamination in made ground. This will inform risk based assessment of contamination. The overall risk to human health is considered likely to be low as the existing buildings and infrastructure are anticipated to remain in-situ.
S3: Potential for on-Site groundwater contamination resulting from previous contaminative Site use	**R2**: Controlled waters (groundwater beneath the site) **R4**: Construction Materials - Buried concrete and potable water supply pipes.	**P2**: Horizontal and vertical migration of contaminants through the unsaturated zone. **P3**: Horizontal and vertical migration of contaminants within groundwater.	Medium	Low likelihood	Moderate/Low	Groundwater is thought to be located at the boundary between the Taplow Gravels and the London Clay at approximately 8 m bgl. There is likely to be a thick unsaturated zone but mobile contaminants can migrate vertically relatively quickly.
S4: Potential off-site sources of hazardous ground gas.	**R1**: Construction/ maintenance workers/end users. **R5**: Buildings -	**P1**: Human uptake pathways (inhalation). **P2**: Horizontal and	Medium	Low likelihood	Moderate/Low	There are no landfills close to the Site or natural Peat or other organic soils with the potential to generate ground gases. Degradation of hydrocarbons may lead to the

	Hazardous ground gas accumulation and explosion.	vertical migration of contaminants through the unsaturated zone;				generation of hazardous ground gases, which will be assessed as part of the Phase 2 investigation.
S5: Potential for groundwater contamination from off-Site sources	**R1**: Construction/ maintenance workers/end users. **R2**: Controlled waters (groundwater with Secondary Principal Aquifer); **R4**: Construction Materials - Buried concrete and potable water supply pipes.	**P1**: Human uptake pathways (ingestion, dermal contact). **P3**: Horizontal and vertical migration of contaminants within groundwater.	Medium	Low likelihood	Moderate/Low	There are a number of adjacent historical and on-going potentially contaminative Site uses that could have led to groundwater contamination.

4 PHASE 2 GROUND INVESTIGATION WORKS

This section explains the rationale and techniques employed during fieldwork.

4.1 Fieldwork

In order to provide a suitable level of assessment based on the information obtained at desk study stage and the requirements for structural and geotechnical design, the site investigation comprised the following:

- Drilling of two cable percussion boreholes (CP1) and (CP2) using a cable percussion rig to a maximum depth of 15.05 m to assess deeper ground conditions and included Standard Penetration Tests SPT and collection of U100 samples for the purposes of foundation design. Borehole CP1 was located in the northeastern area, whilst CP2 was located in the northwestern area. The works were undertaken by Kiwa CMT Limited
- Excavation of five trial pits using a JCB3cx backhoe excavator with hydraulic breaker (TP01 to TP05). The trial pits were located throughout the external areas of hardstanding, where access allowed to a maximum depth of 2.7 m to enable investigation of shallow soils.

The site work was carried out between 19th and 20th May 2016. An Exploratory Hole Location Plan is presented later in this report.

During the excavation of the trial pits on 19th May, a small water service pipe, not previously identified during service clearance, was struck within TP01 at 0.85 m depth. The Client was informed and the pipe was sealed off and repaired on 20th May 2016.

Concrete hardstanding was located across the Site at approximately 150 mm thickness and reinforced in TP01. Concrete obstructions were observed at approximately 1.2 m in TP02 and 1.8 m in TP04. Within TP3 an in-situ brick footings or a wall were encountered at approximately 0.3 m depth.

The exploratory holes were logged by an engineer from HBPW LLP, who attended site full time to supervise the works.

Selected representative sub-samples were retrieved and sealed in suitable containers to prevent deterioration and moisture content loss. The samples were kept cool before and during transit to the laboratory.

Standard Penetration Tests (SPTs) were undertaken in CP1 and CP2 to assess relative density (N value). The results of the tests are recorded as 'N' values and given on the borehole logs.

In order to monitor ground gas emissions and groundwater levels, a 500 mm internal diameter well was installed in each of the boreholes to a depth of 6 m bgl. The details of the construction are shown on the borehole log. A protective cover was installed at ground level over the well.

The fieldwork and laboratory testing for the investigation were carried out generally in accordance with BS 5930: 1999 +A2: 2010, 'Code of Practice for Site Investigations' and BS 1377:1990, 'Methods of test for soils for civil engineering purposes', respectively.

Full details of the fieldwork and the ground conditions are shown in the logs later in this report, Appendix 3.

4.2 Laboratory Testing

The programme of laboratory testing was designed to obtain the following data:-

i) pH and water soluble sulphate
ii) concentrations of commonly occurring contaminants including inorganics, cyanide and heavy metals,
iii) speciated polycyclic aromatic hydrocarbons (PAH)
iv) total petroleum hydrocarbons (TPH) with CWG banding including BTEX and MTBE
v) screening for the presence of asbestos containing materials (ACM)
vi) Volatile Organic Compounds (VOC) and Semi-Volatile Organic Compounds (SVOC)
vii) Polychlorinated biphenyls (PCBs) and speciated phenols
viii) Waste Acceptance Criteria (WAC) testing

Geochemical analysis was carried out between 25th May and 1st June 2016 on selected samples by QTS Environmental Limited who hold MCERTS and UKAS accreditation. The results of the laboratory testing are presented at Appendix 4.

5 GROUND CONDITIONS

5.1 Geology

The British Geological Survey (BGS) online Geology of Britain Viewer and information provided in the Landmark Envirocheck report indicated the site to be underlain by the Taplow Gravel Formation overlying the London Clay Formation.

5.2 Ground Model

For full descriptions of the strata encountered please refer to the exploratory hole logs presented in Appendix 3.

Table 5.2 Ground Model		
Stratum	***Typical Description***	**Typical depth m bgl**
Site Surface	*Flexible surfacing over 150 mm nominal unreinforced Concrete*	To 0.150 m
Made Ground	*Made ground was identified within both the boreholes and the trial pits. Made ground within the boreholes ranged in thickness between 1.25 and 1.75 m and typically comprised of discontinuous layers of sandy matrix with gravel and cobbles of crushed stone, concrete, brick, ash.*	To between 1.3 and 1.8 m
Relic Topsoil	*A relic topsoil and subsoil layer was encountered in all trial pits this representing the previous gardens to the historical residential developments.*	To between 0.8 and 1.2 m
Sand and Gravel – Taplow Gravel	*Medium dense to dense Sand and Gravel*	To 5.6 m
London Clay	*Very stiff bluish grey Clay was encountered within both boreholes and extended beyond the maximum depth of the investigation.*	In excess of 15.05 m

5.3 Groundwater

During drilling groundwater strikes were encountered at 4.5 m within the Sands and Gravel of both boreholes CP1 and CP2 before rising to rest at 4.2 m bgl.

5.4 Indications of Contamination

No obvious significant visual or olfactory evidence of contamination was recorded at ground level or during the intrusive investigation. Ash was noted in several exploratory hole locations. Made ground will most likely of been imported to Site or is formed from the demolition of previous structures at the Site.

6 ASSESSMENT OF CONTAMINATION

6.1 Introduction

This section describes the chemical contamination analyses carried out as part of the recent investigation and assesses the implications of any significant contamination found. The results of the chemical analyses have been reviewed against the appropriate guidelines in general use at the time of preparing this report.

A qualitative risk assessment has been carried out in terms of source-pathway-receptor analysis. The risk assessment analyses the significance of any contamination that has been identified on the proposed development and other identified site receptors.

6.2 Legislative Background

The legislative document regarding land contamination is the 1995 Environment Act. Forming Part 2A of the Environmental protection Act of 1990, this Act created the framework for the identification and remediation of contaminated land. It established the Environment Agency as the overall National Enforcement Agency with regional control provided by the Local Authorities.

The Act defines "contaminated land" as any land, which is deemed by the Local Authority to be "in such a condition, by reason of substances, in, on, or under the land that:-

i) significant harm is being caused or there is significant possibility of such harm being caused; or
ii) significant pollution of Controlled Waters is being caused, or there is significant possibility of such harm being caused".

In relation to Regulatory intervention (Part 2A) and 'voluntary' investigation (including redevelopment of the sites which may be affected by contamination), the Model Procedures (CLR-11, Environment Agency 2004), provide a generic framework indicating key technical activities applicable in each of these contexts. The management of land contamination broadly comprises three components which are identified as 'Risk Assessment', 'Options Appraisal' and 'Implementation'. These, in turn, determine if any unacceptable risks exist, ascertain the most appropriate remediation strategy for the site and demonstrate that the strategy will be effective.

In accordance with this and other current guidance, where a 'land quality' risk assessment is required each 'Relevant Pollutant Linkage' (formerly referred to as

'source – pathway – receptor' framework), is separately identified and a level of risk attached. The risk assessment takes account of the environment, end user behaviour and the nature of the development in relation to proven 'unacceptable' risk. This is the approach supported by current guidance and therefore has been adopted in the assessment of this site.

The guidance requires a Phase 1 investigation or desk study to be undertaken as the first stage of the risk assessment. This identifies potential sources, pathways and receptors for the site taking into account the proposed end use. Potential pollutant linkages are then documented in the form of an 'Initial Conceptual Site Model'. This is then used to direct and target a Phase 2 or intrusive investigation. The outcome of the intrusive investigation and subsequent 'land quality' risk assessment is the establishment of plausible relevant pollutant linkages shown in the form of a 'Refined Conceptual Model'. This is used to determine the need for further investigation, or remediation to appropriately mitigate any determined unacceptable risks. In accordance with the Model Procedures and Regulatory preference, detailed remedial measures should be provided in a separate report to the investigation and risk assessment, generally referred to as a Remediation Method Statement (RMS).

6.3 Published Guidelines

In the absence of a complete published set of screening values, the results of chemical analysis from the recent investigation has been compared with the various published guidelines that are currently in use for land quality risk assessments. The following have been used in this assessment:-

- The LQM/CIEH Safe for Use Levels (S4ULs) for Human Health Risk Assessment. '*Copyright Land Quality Management Limited reproduced with permission Number S4UL3512. All rights reserved.'*
- Contaminated Land Exposure Assessment Model (CLEA) including the 2009 SGVs for certain determinands.
- EIC/AGS/CL:AIRE – Soil Generic Assessment Criteria for Human Health Risk Assessment, 2010.
- In house Generic Screening Values (HH-GSVs) derived by the Consultant and other non UK values where considered relevant.
- Category 4 Screening Levels (C4SLs), DEFRA, 2014.

- Guidance For The Selection Of Water Supply Pipes To Be Used In Brownfield Sites, UK Water Industry Research (UKWIR) Ltd, Report Reference No. 10/WM/03/21, 2010.

- Environment Agency Technical Advice to Third Parties on Pollution of Controlled Water for Part 2A.

6.4 Generic Qualitative Risk Assessment

The following subsection reviews the results of the chemical analyses from the recent investigation, with respect to the potential receptors identified in subsection 4 of report number SL05030-Rep-01 dated May 2016.

In order to classify the anticipated risk associated with contamination identified on site, a classification system in Appendix 2 has been adopted.

The respective generic Tier 1 screening values used are presented in Appendix 3.

The proposed development is considered to include the refurbishment and redevelopment of existing office buildings into residential apartments with associated areas of hardstanding, carparking and access from High Street. As such, any areas of soft landscaping are considered likely to be limited, or comprise raised planters. Therefore, for the purposes of this assessment, the analytical results have been assessed against guidance values for a '*Residential without Plant Uptake'* land-use.

In cases where contaminants are present in one or more samples in a specific averaging area, above their respective Tier 1 GAC, the results are subject to statistical assessment in accordance with current best practice to establish if the true mean (upper 95th percentile) is above the screening criteria. It is also used to determine whether elevated concentrations are outliers from the general test result population and thus can be considered as discrete 'hotspots' of contamination that could be remediated independently, or whether the concentrations would be considered representative of site-wide contamination within the soils. If so, further consideration is given to the risk presented by the contaminant of concern. This may include further detailed quantitative risk assessment and/or further sampling and testing.

6.5 Analytical Test Results

Some screening values for organic determinands vary according to the soil organic matter (SOM). A conservative value of 1% has been used in the application of Tier 1 screening value for this site, based on measured values.

The full analytical results are presented in Appendix 5, at the back of this report.

6.5.1 Soils

i) Inorganics

Twelve samples of soil recorded concentrations of lead above the Tier 1 screening value of 310 mg/kg for a 'residential without plant uptake' end use. A statistical analysis was carried out on lead and summarized in Table 6.5.1.

Table 6.5.1 Inorganic determinands assuming 'Residential without Plant Uptake' end use

	Concentration (mg/kg)			
Determinand	**Max**	**Mean**	**Tier 1 Screening Value**	**Number of results > T1SV**
Lead	1520	350.1	310	4

The highest concentrations of lead were encountered in the made ground at 1.2 m depth in TP02 (1520 mg/kg) and at 0.85 m depth in TP04 (952 mg/kg). However, these values were considered statistically significant as even once they had been removed from the dataset, the upper confidence limit was still above the Tier 1 Screening Value. It is considered that there is a low to moderate risk to human health from elevated concentrations of lead within the made ground. However, since these soils are to be removed during the reduced dig for basement construction, the source and pathway are removed and as is the risk to end users.

All other inorganic results including total, free and complex cyanides, metals and metalloids were either below the limit of detection or below the respective Tier 1 Screening Value. Therefore, a negligible risk has been determined to end users from all of the other inorganic determinands analysed.

pH values ranged between 7.4 and 9.2, indicating a slightly alkaline soil.

ii) Organics

No visible staining or odours were observed within any of the exploratory holes whilst drilling.

A slightly elevated concentration of TPH was recorded at 1.2 m depth in TP02 of 1174 mg/kg. However, this does not exceed the T1 Screening Value based on a 'residential without plant uptake' end use.

All concentrations of PAH, phenols, BTEX &MTBE, VOCs and SVOCs and PCBs recorded were either below the limit of detection or did not exceed the respective Tier 1 Screening Values, as listed in Appendix 5.

iii) Asbestos Containing Materials (ACM)

Ten soil samples were screened for the presence of asbestos. However, the presence of asbestos was not positively identified. Therefore, a negligible risk is considered to end users from asbestos or asbestos containing materials within soil.

6.5.2 Ground Gas

The made ground beneath and adjacent to the site was considered a potential source of ground gas. Should any potential excavation be undertaken as part of the development process, by means of the installation of a basement, the potential for the lateral migration of ground gases was identified.

As a precautionary measure, wells were installed within CP1 and CP2 to allow the monitoring of ground gas and groundwater levels, where encountered and a return monitoring visit was undertaken on 16 June 2016.

The results of the ground gas monitoring from this investigation have been evaluated using latest guidance contained in BS8485:2015 which provides a classification system using the measured *ground gas concentrations* and the *borehole hazardous gas flow rates (Q_{hg})* to calculate a gas screening value (GSV). The GSV is then used with professional judgement to define a *characteristic situation (CS)* for methane and carbon dioxide for the Site.

The GSV is calculated by multiplying Q_{hg} (L/hr) by the measures gas concentration (% v/v), using the maximum recordable concentrations of methane and carbon dioxide

and the maximum recordable positive gas flow rate, or the instrument limit of detection (typically 0.1L/hr) where no flow is recorded.

In the circumstance of a negative flow the instrument limit has been used and other monitoring events and site observations considered in making judgements on GSV derivation.

Once calculated, the GSV is used to determine the CS using Table 2 BS8485:2015.

A summary of the monitoring event is presented in Table 6.5.2. Full monitoring results are presented in Appendix 5.

Table 6.5.2 Ground Gas Monitoring

Location ID	CH_4 %	CO_2 %	O2 %	Flow L/hr	GSV L/hr	CS
CP1	0.0	5.5	11.2	15.4	0.847	3
CP2	0.0	4.8	15.1	15.4	0.739	3

Based on the readings, the worst case calculated GSV would place the site gas regime in CS3. The gas flow recorded at both locations was very high, but was considered erroneous as it remained constant on turning the monitor on and off and between boreholes, and so it is thought due to a fault with the gas monitor. The slightly elevated concentrations of CO_2 , which are considered to be as a result of materials within the made ground particularly the buried topsoil layer (maximum depth of 1.8 m) exceeded the trigger value of 5%, which would elevate the classification to CS2.

There are no landfills close to the Site but there are buried relic topsoil with the potential to generate ground gases. Should the end use of the proposed development change, it would be considered prudent to carry out further ground gas monitoring to clarify the ground gassing regime beneath the site.

The proposed basement construction will result in a tanked basement socketed into the London Clay. No additional gas protection measures will then be required.

6.5.3 Summary of End User Risk Assessment

A low to moderate risk has been determined to end users from elevated concentrations of lead within the made ground. However, the basement construction will result in the complete removal of these soils.

Concentrations of other determinands analysed within soil as part of the investigation were not considered to pose a significant risk to end users.

A negligible risk was determined to end users from asbestos containing materials. However, the inherent variability of made ground means that the potential for asbestos to be present cannot completely be dismissed. Asbestos containing materials may be present within existing buildings on the site and consequently a potential low risk associated with asbestos remains for end users.

A low risk to end users is considered from ground gas, however should the proposed development scheme change, and a tanked basement not be constructed, it would be considered prudent to further categorise the gassing regime by means of further monitoring.

6.6 Controlled Waters

During drilling, groundwater was encountered at 4.2 m depth within the Taplow Gravel Formation.

A return visit on 16 June 2016 recorded groundwater within the boreholes to be standing at between 2.98 and 3.07 m bgl.

Based on the very low concentrations of contaminants recorded within the soils, chemical analysis of the groundwater was not considered necessary.

A negligible risk to Controlled Waters was considered from the site.

Sampling and testing of the groundwater will be required to determine its suitability for dewatering disposal to sewer (under consent) during construction.

6.7 Construction Workers

Construction workers, are likely to come into direct contact with the near surface soils during the groundworks phase of the project. The recorded concentrations of determinands within made ground/topsoil did not indicate a significant risk to construction workers. However there is always the potential for previously undiscovered contamination to be encountered. Overall a low risk was determined to ground workers.

Groundworkers should be made aware for the potential of contamination to be present within soils. Appropriate levels of personal protective equipment should be employed as a matter of course to prevent direct contact or inhalation, and damping

down should be undertaken in periods of dry weather to prevent the generation of dust this to also prevent nuisance to neighbouring residential properties. Suitable welfare facilities should be established on site.

It is recommended that any buildings that are to be refurbished or demolished as part of this development should be subjected to a Refurbishment and Demolition asbestos survey, unless this has already been carried out. Any asbestos containing materials identified prior to (and during) refurbishment or demolition should be appropriately managed or removed and disposed of by a specialist contractor following current statutory and best industry practice.

Groundworkers in confined spaces such as excavations may be at a low risk from elevated levels of carbon dioxide and depleted oxygen levels, and safe methods of working accounting for current Health and Safety regulations and best practice should be followed on a precautionary basis.

6.8 Other Development Considerations

6.8.1 Off-site Receptors

Neighbouring properties were considered to be at negligible risk from mobile and leachable contaminants migrating from the site, because of the generally low concentrations recorded within the soils and groundwater.

The general public could be subjected to nuisances from windblown dust and soil attached to the wheels of vehicles leaving the site. Precautions such as damping down during periods of dry weather to prevent the generation of dust and the use of wheel washes should be implemented as required during the site works. A low risk was determined to off-site receptors.

6.8.2 Potable Water Pipes

Organic contaminants can potentially taint drinking water if some types of plastic pipes are used. Based on the very low concentrations of PAH and TPH recorded during the investigation, it is anticipated that should new potable water supply infrastructure be required as part of the proposed development, that normal plastic pipework could be adopted.

Further assessments may be required to satisfy utility provider risk assessment procedures most of which are based upon UKWIR guidance. However, testing undertaken as part of this investigation should be suitable for this purpose.

New water supply will not pass through made ground soils as these will have been substantially removed during basement construction.

6.8.3 Waste Disposal and Materials Management

The proposed development will require the excavation of a large quantity of materials most of which will be uncontaminated natural materials. The latter will comprise predominantly natural sands and gravels and these could be sold on for re-use at another development Site. The Made Ground and buried topsoil layer are likely to require removal to landfill as waste although the granular made ground may be suitable for re-use as engineering or general fill subject to geotechnical classification. London Clay excavated from the lower levels will be suitable as engineering Class 2 fill subject to classification.

CL:aire operate a register of materials for re-use and can arrange collaborative agreements between developers to effectively re-use quality materials on other sites through the use of the Development Industry Code of Practice. and it may be prudent to consider registering these materials, should programme allow. This could offer good cost savings on materials management and/or disposal costs.

As part of the analytical testing, one representative composite soil sample was analysed for Waste Acceptance Criteria.

Whatever the planned materials management it is strongly recommended that the excavated materials are segregated at excavation to avoid cross contamination of granular soils with the highly organic buried topsoil layer located in all trial pits. The organic content of the buried topsoil may require a higher cost of disposal.

Based on the results of the analytical testing, the shallow soils, including the granular made ground and buried topsoil, may be accepted as Non- Hazardous, as concentrations of Antimony exceeded the acceptance criteria limits for 'Inert'. Where it is proposed to discard soils from Site it is recommended that the chemical test results are forwarded to a waste disposal contractor or landfill operator to establish the waste classification, as they are the regulator in this regard.

All waste exported off site will need to be accompanied by waste transfer notes or consignment notes. Waste must be transported by a Licensed carrier. Copies of these waste transfer notes should be kept for inspection as necessary, as part of any validation/verification works. Details of the waste carriers and receiving treatment/landfill facilities must be clearly provided as evidence that waste removed off site has been disposed of appropriately under Duty of Care.

It is recommended that further materials management effort is afforded once the construction programme is finalised. Some minimal additional laboratory testing may be required at that time.

6.9 Refined Conceptual Site Model

The refined conceptual model shown in Table 6.7 represents the relevant pollutant linkages as defined by the interpretation of the intrusive investigation. Negligible and discounted risks have not been included.

Table 6.7 Plausible Relevant Pollutant Linkages						
Potential Source	**Potential Receptor**	**Potential Pathway**	**Consequence**	**Probability**	**Risk**	**Comments**
S1: Potential for asbestos containing materials (ACMs) present in existing buildings	**R1**: Construction/ maintenance workers/end users	**P1**: Human uptake pathways (inhalation).	Medium	Low	Low	There is a potential for asbestos to be present within buildings at the site If demolition or refurbishment is proposed, appropriate asbestos inspections and removal or management is required.
S2: Made ground as a source of ground gases	**R1**: Construction/ maintenance workers/end users. **R2**: Buildings - Hazardous ground gas accumulation and explosion.	**P1**: Human uptake pathways (inhalation). **P2**: Horizontal and vertical migration of contaminants through the unsaturated zone	Medium	Low likelihood	Moderate/Low	A low risk to end users is considered from ground gas, however should the proposed development scheme change, it would be considered prudent to further categorise the gassing regime by means of further monitoring.

7 ENGINEERING ASSESSMENT

7.1 Material Properties

The ground conditions as encountered in the investigations have been interpreted in order to derive geotechnical material parameters.

Material properties are derived solely from in-situ testing and soils descriptions.

7.1.1 Sands and Gravels (Granular) (0 m – 5.6 m bgl)

This strata is encountered as medium dense to dense Sand and Gravel.

SPTs carried out in these strata yielded N values of 43, 31, 37, 28 and 32. Applying a correction factor after Seed et al yields an average SPT value of 44 [10]. This indicates a dense strata with a shearing angle of 40°.

The selected characteristic shearing angle is 40°.

7.1.2 London Clay (Cohesive) (5.6 m - 15 m)

This strata is generally encountered as a very stiff bluish grey CLAY.

SPTs were carried out recording N values of 22, 42, 55, 51, 60, 23, 37, 43, 50 and 57 and yielding an average value of 44. Adopting Stroud and Butler's relationship [5] the undrained shear strength of these strata are estimated to be 180kPa.

The selected characteristic undrained shear strength is 120kPa.

The selected characteristic shearing angle is 26° based upon soil descriptions and typical values in London Clay.

7.2 Foundation & Retaining Wall

The foundation and retaining wall details are as follows;

Structure Type: A secant piled wall placed at the perimeter of the structure will act as both a support for the building and will retain a total 3.6 m of earth. A ground bearing concrete slab cast at the base of the excavation will act as a lateral prop.

Design life: 120 years

Pile Design: Piles are 8 m long, 600 mm CFA piles spaced 425 mm c/c (175 mm overlap, 850 mm spacing between male piles) in C35/45. Male piles are to be reinforced to full depth using 8x25 mm bars with 12 mm shear links at 150 mm c/c and a cover of 75 mm.

7.3 Foundation Design

7.3.1 Geotechnical Parameters

Geotechnical parameters used in the design are presented below;

Strata	SPT (N)	∅ (°)	Bulk Density γ (kN/m^3)	Cu (kN/m^2)
Sands and Gravels (Granular)	44	40	21	NA
London Clay (Cohesive)	44	26	20	120

Table 7.3.1: Geotechnical Parameter Selection

7.3.2 Groundwater

Groundwater has been located approximately 3.8 m below ground level.

7.3.3 Vertical Sheet Pile Design

Foundation design is to Eurocode BS EN 1997 - Design Approach 1 Combination 1 and Combination 2. Factors were applied to the base resistance and shaft resistance separately and no total factor was applied.

Combination 1		Combination 2	
γ_G	1.35	γ_G	1.00
$\gamma_{G,fav}$	1.00	$\gamma_{G,fav}$	1.00
γ_Q	1.50	γ_Q	1.30
$\gamma_{Q,fav}$	0.00	$\gamma_{Q,fav}$	0.00
γ_b	1.10	γ_b	2.00
γ_s	1.00	γ_s	1.60

Table 7.3.3a: Geotechnical Partial Factors, Vertical

At the time of this report no loadings have been provided and pile capacity has been calculated based upon an 8 m long pile using a 1 m wide section.

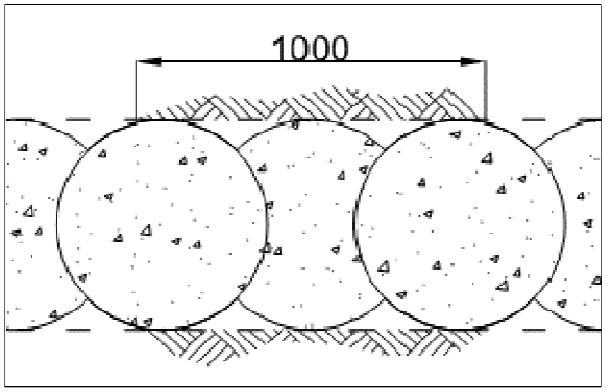
It has been assumed that the basement floor is supported through ground bearing and so no vertical loads will be transferred into the piles.

Vertical capacity of piles has been calculated methods as described in M.J. Tomlinson [12].

Shaft resistance in London Clay has been calculated using standard practice. The ultimate bond stress has been calculated using an alpha (α) value of 0.45 and a shape factor (S) of 1 indicating a straight/non-tapered pile.

Shaft resistance in Sands and Gravels has been calculated on each side of the wall separately using standard practice. The coefficient of lateral earth pressure (K) has been taken as 0.9 (typical for sands) and an angle of friction between the shaft and the soil of 3/4Ø (30) as described in Aas (1966).

The active area for skin friction calculations assumes a 1 m strip of wall



Shaft Resistance Area

Base resistance in London clay has been calculated using a base contact factor (w) of 0.8 and a bearing capacity factor of 9.0.

Using an 8 m long pile the vertical capacity per 1 m long section is as follows;

		Combination 1	Combination 2
$R_{d,\ Sand\ and\ Gravels}$	$R_{d,\ Outer\ Face}$	165.0	103.2
	$R_{d,\ Inner\ Face}$	14.0	8.7
$R_{d,\ London\ Clay}$	$R_{d,\ Skin\ Friction}$	270.0	168.8
	$R_{d,\ Base\ Resistance}$	444.2	244.3
TOTAL		893.2	524.9

Table 7.3.3.b Pile Capacity (All values in kN/m)

7.3.4 Lateral Sheet Pile Design

Lateral design of piles has been completed using CADS Piled Wall Suite to Eurocode BS EN 1997. This program uses a standard Rankine earth pressure model to calculate overturning and restoring forces and internal stresses in the pile using a 1 m wide model. Reinforcement has been checked using CADS Piled Wall Suite.

Combination 1		Combination 2	
γ active soil pressure	1.35	γ active soil pressure	1.00
γ passive soil pressure	1.00	γ passive soil pressure	1.00
γ active water pressure	1.35	γ active water pressure	1.00
γ passive water pressure	1.35	γ passive water pressure	1.00
$\gamma_{Q,\ Wall}$	1.50	$\gamma_{Q,\ Wall}$	1.30
$\gamma_{Q,\ Soil}$	1.11	$\gamma_{Q,\ Soil}$	1.30
γ_{phi}	1.00	γ_{phi}	1.25
γ_{cu}	1.00	γ_{cu}	1.40

Table 7.3.4: Geotechnical Partial Factors, Lateral

Loading from a nearby buildings strip foundation has been applied assuming a formation 1 m below the pile head and 1 m wide carrying a total load of 90kN/mrun. An additional variable load of 5kPa has been applied to the rear of the wall to account for pedestrian loading.

Both permanent and temporary cases have been checked.

Permanent design assumes long term (drained) soil properties in London Clay and utilises the basement slab as a propping mechanism at the base of the wall. The temporary design utilises short term (un-drained) properties in London Clay. A typical wall friction value of 2/3Ø has been assumed throughout the design.

Temporary and permanent designs yielded over design factors of 1.33 and 10.87 respectively.

A design bending moment of 150kNm/m and design shear force of 228kN/m have been calculated from CADS Piled Wall Suite analysis. The prop force acting on the floor slab has been calculated as 130 kN/m.

Main piles are to be reinforced to a full 8 m depth using 8.No 25 mm Bars and 12 mm shear links at 150 mm c/c, intermediate piles are to be un-reinforced. C35/45 concrete and 75 mm cover to reinforcement is specified.

7.4 Geotechnical Risk

Geotechnical risk will be considered for the construction phase of the structure. Geotechnical risk shall be included in the Designer's Risk Assessment.

Where a geotechnical risk also represents an unusual health and safety risk that the Contractor may not normally consider these are communicated via inclusion on the drawings and within the Designer's Risk Assessment.

7.5 Strengthened Earthworks

(Not Used)

7.6 Drainage

Dewatering of the basement excavations will be required. Additional testing of the groundwater may be required to determine the suitability for discharge to sewer during the works. The construction programme will need to allow foe arranging the necessary Consents for Discharge.

7.7 Highways, Subgrade & Capping

(Not Used)

7.8 Ground Treatment & Stabilisation

Temporary works design will be required.

7.9 Specification Appendices

(Not Used)

7.10 Instrumentation & Monitoring

It will be necessary to undertake condition and dilapidation surveys for Party wall Act purposes and for control of the earthworks. A piling specification will be developed including limiting values for ground vibration and noise and/or mitigation measures.

8 CONCLUSIONS

Based on the results of the intrusive investigations and laboratory chemical analysis and other Site observations, the following conclusions are made.

8.1 Contaminated Land

i) Elevated concentrations of lead were encountered within the made ground across the site. However, as the area is to remain covered by either buildings or hardstanding, the pollutant linkage does not exist, and there is no significant risk to end users of the development.

ii) Whilst no asbestos containing materials were positively identified within the soils on site, asbestos containing materials may be present within existing buildings on site and consequently a potential low risk associated with ACM remains. It is recommended that any buildings that are to be refurbished or demolished as part of this development should be subjected to a Refurbishment and Demolition asbestos survey, unless this has already been carried out. Any asbestos containing materials identified prior to (and during) demolition should be appropriately removed and disposed of by a specialist contractor following best industry practice.

iii) Notwithstanding the low levels of contamination detected to date a precautionary approach to any excavation and movement of soils is recommended;

All of the remediation recommendations made in this report will need to be approved by the Local Authority. As there is no identified risk to groundwater it is unlikely that the Environment Agency will be consulted by the LPA.

For the existing and proposed end use no remediation activity is considered to be required.

8.2 Engineering Assessment

At the time of this report no loadings have been provided and pile capacity has been calculated based upon an 8 m long pile using a 1 m wide section.

Dewatering of excavations may be required. Groundwater will require testing prior to applications for Consent to Discharge to sewer.

The most economical solution for excavated materials management will be developed at construction planning stage.

Appropriate surveys and monitoring will be designed and employed during piling works including detailed method statements and limiting values for vibration and noise.

9 LIMITATIONS

This Report has been produced on behalf of The Client, as detailed in Section 1.0 of this Report, and no responsibility is accepted to any Third Party for all or any part.

This Report should not be relied upon or transferred to any other parties without the express written authorisation of HBPW LLP. If, as happens from time to time, any unauthorised Third Party comes into possession of this Report, they rely upon it at their own risk and HBPW LLP owes them no duty of care or skill.

Any other issues not listed in the scope of works, but subsequently identified during the completion of the Site investigation and reported herein (such as the potential presence of Schedule 2 Invasive Weeds, flood assessment studies or ecological surveys) are provided for information only and fall outside the scope of this Assessment. The Report does not constitute an archaeological or ecological assessment, nor does it constitute an 'asbestos inspection' or flood assessment.

HBPW LLP has based parts of the report on information sources detailed within the report text and believes them to be reliable, but cannot and does not guarantee the authenticity or reliability of this third party information. Advice and recommendations given in this report have been based on the findings of the investigation. It must be appreciated that not finding indicators does not mean that hazardous substances do not exist at the site. There is no warranty regarding the accuracy of the information provided to HBPW LLP who cannot accept liability for any opinions that have been expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

The locations of the exploratory holes were influenced by the proximity to buried services, practicable access and other existing site infrastructure.

Whilst this Report may express an opinion on the possible configuration of strata, contaminants or gases between or beyond exploratory hole positions or on the possible presence of features based on either visual, verbal (anecdotal) or published evidence, this is for guidance only and no liability is accepted for its accuracy.

Groundwater and gas conditions vary with time, season, climatic conditions and Site activities as such any observations are strictly based upon conditions at the time of the investigations.

10 REFERENCES

1. Design Manual for Roads and Bridges, Volume 4 Section 1, HD22/08 Managing Geotechnical Risk.2. (Not Used)
3. Foundation Design and Construction, Tomlinson 7th edition.
4. NR/L3/CIV/071 Level 3 Geotechnical Design. 3rd September 2011.
5. Stroud MA, and Butler, F, G, 1975, The standard penetration test and The Engineering Properties of Glacial Materials. Proceedings of the European Symposium on Penetration testing, 2.
6. Terzaghi, K & Peck, R. B (1967) Soil Mechanics in Engineering Practice 2nd Edition.
7. Bowles, J. E (1977) Foundation Analysis & Design 2nd Edition.
8. BS5930:1999 British Standard, Code of Practice for Site Investigations.
9. BRE Special Digest 1, Concrete in Aggressive Ground, September 2001.
10. Tomlinson, M. J (2001) Foundation Design and Construction 7th edition, Pearson Education Limited, Essex.
11. NR/L3/CIV/071 Level 3 Design of Bridges.
12. Tomlinson, M. J (2008) Pile Design and Construction Practice 5th edition, Taylor and Francis, oxon.
13. BS8002:2015 British Standard, Code of Practice for Foundations 2nd Edition, BSI Standards Limited

Drawings

DO NOT SCALE - IF IN DOUBT ASK

A3

NOTES

1. DO NOT SCALE
2. This drawing is to be read in conjunction with all other relevant drawings.
3. Should there be any conflict between the details indicated on this drawing and those indicated on other drawings the Engineer should be informed PRIOR to construction on site.
4. Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings and details issued are PRELIMINARY and NOT FOR CONSTRUCTION. Should the contractor commence site work prior to approval being given, it is entirely at his own risk.
5. All dimensions are in millimetres unless otherwise stated.

DESCRIPTION	REV	DATE	BY	CHKD	APPR
FIRST ISSUE	A	18/08/16	EN	JF	APPR

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DRAWING STATUS

FOR INFORMATION

CLIENT

GREAT PLANET LTD

PROJECT TITLE

HAMPTON HILL

DRAWING DETAIL

SITE INVESTIGATION
LOCATION PLAN

DRAWN	EN	DATE	AUGUST 2016
PROJECT ENGINEER	JF		
CHECKED	JF	SCALE	AS SHOWN @ A3
APPROVED	JF		
DRAWING NUMBER	SL05030/SK001	REVISION	A

Appendix 1

Risk Assessment Methodology

Contaminated Land Risk Assessment Methodology

The following classification was published by the NHBC, EA, and CIEH (2008). This was developed from *DOE Guide to Risk Assessment and Risk Management for Environmental Protection and the Statutory Guidance on Contaminated Land* (Defra September 2006).

The methodology differs from that presented in *Contaminated Land Risk Assessment, A Guide to Good Practice* (CIRIA C552, 2001), particularly in terms of the definitions of classification of consequence, which includes consideration of immediacy of hazards. The risk assessment methodology is now better aligned with health and safety and geotechnical risk assessment processes.

The designation of risk is based upon the consideration of both:

- **the magnitude of the potential consequence (i.e. severity).**
  [takes into account both the potential severity of the hazard and the sensitivity of the receptor]
- **the magnitude of probability (i.e. likelihood).**
  [takes into account both the presence of the hazard and receptor and the integrity of the pathway]

The potential consequences of contamination risks occurring at this Site are classified in accordance with Table 1 below:

Table 1: Classification of Consequence (Source: R&D 66:2008)

Classification	Definition of Consequence
Severe	Highly elevated concentrations **likely** to result in "significant harm" to human health as defined by the EPA 1990, Part 2A, if exposure occurs. Equivalent to **EA Category 1** pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce. Major damage to aquatic or other ecosystems, which is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long-term maintenance of the population. Catastrophic damage to crops, buildings or property.
Medium	Elevated concentrations which could result in "significant harm" to human health as defined by the EPA 1990, Part 2A if exposure occurs. Equivalent to **EA Category 2** pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce. Significant damage to aquatic or other ecosystems, which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population. Significant damage to crops, buildings or property.
Mild	Exposure to human health unlikely to lead to "significant harm". Equivalent to **EA Category 3** pollution incident including minimal or short lived effect on water quality; marginal effect on amenity value, agriculture or commerce. Minor or short lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change in its functioning or harm to a species of special interest that would endanger the long- term maintenance of the population. Minor damage to crops, buildings or property.
Minor	No measurable effect on humans. Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems. Repairable effects of damage to buildings, structures and services.

The probability of contamination risks occurring at this Site is classified in accordance with Table 2 below. Note: A pollution linkage must first be established before probability is classified. If there is no pollution linkage then there is no potential risk. If there is no pollution linkage then it follows that there is no need to apply tests for probability and consequence.

Table 2: Classification of Probability

Classification	Definition of Probability
High Likelihood	There is pollutant linkage and an event would appear very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution.
Likely	There is pollutant linkage and all the elements are present and in the right place which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.
Low Likelihood	There is pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a long period such an event would take place, and is less likely in the shorter term.
Unlikely	There is a pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long-term.

For each possible pollutant linkage (source-pathway-receptor) identified, the potential risk can be evaluated based upon the following probability x consequence matrix shown in Table 3 below.

Table 3: Overall Contamination Risk Matrix

		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**High likelihood**	Very high risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Moderate / Low risk	Low risk
	Low likelihood	Moderate risk	Moderate / Low risk	Low risk	Very low risk
	Unlikely	Moderate / Low risk	Low risk	Very low risk	Very low risk

R&D 66:2008 presents definitions of the risk categories, together with the investigatory and remedial actions that are likely to be necessary for each outcome. These definitions are reproduced in Table 4. These risk categories apply to each pollutant linkage, i.e. not only to each hazard or receptor.

[Continued next page]

Table 4: Definition of Risk Categories and Likely Actions Required

Risk Category	Definition and likely actionsrequired
Very high	There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the Site without remediation action OR there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to be Site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in theshort-term.
High	Harm is likely to arise to a designated receptor from an identified hazard at the Site without remediation action. Realisation of the risk is likely to present a substantial liability to the Site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short-term and are likely over the longer term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to Site owner/occupier. Some remediation works may be required in the longer term.
Low	It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst, that this harm if realised would normally be mild. It is unlikely that the Site owner/or occupier would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.
Very low	It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.
No potential risk	There is no potential risk if no pollution linkage has been established.

Appendix 2

Tier 1 Screening Values – ‘Residential without Plant Uptake’ End Use

Determinant	Tier 1 Screening Value (mg/kg
Inorganics	
Arsenic	**40**
Barium	**1300**
Beryllium	**1.7**
Cadmium	**85**
Chromium	**910**
Copper	**7100**
Lead	**310**
Mercury	**56**
Nickel	**180**
Selenium	**430**
Vanadium	**1200**
Water Soluble Boron	**11000**
Zinc	**40000**
phenol	**750**
cyanide	**34**
Chromium (VI)	**6**
PAH	
2-Chloronaphthalene	nv
2-Methylnaphthalene	nv
Naphthalene	**2.3**
Acenaphthylene	**2900 (86.1)**
Acenaphthene	**3000 (57)**
Fluorene	**2800 (30.9)**
Phenanthrene	**1300 (36)**
Anthracene	**31000 (1.17)**
Fluoranthene	**1500**
Pyrene	**37000**
Benzo(a)anthracene	**11**
Chrysene	**30**
Benzo(bk)fluoranthene	**nv**
Benzo(a)pyrene	**3.2**
Indeno(123cd)pyrene	**45**
Dibenzo(ah)anthracene	**0.31**
Benzo(ghi)perylene	**360**
Benzo(b)fluoranthene	**3.9**
Benzo(k)fluoranthene	**110**

Tier 1 Screening Values Continued	
TPH	
Aliphatics	
>C5-C6	**42**
>C6-C8	**100**
>C8-C10	**27**
>C10-C12	**130(48)**
>C12-C16	**1100 (24)**
>C21-C35	
>C35-C44	**65001 (8.48)**
Aromatics	
>C5-EC7 (benzene)	**370**
>EC7-EC8 (toluene)	**860**
>EC8-EC10	**47**
>EC10-EC12	**250**
>EC12-EC16	**1800**
>EC16-EC21	**1900**
>EC21-EC35	**1900**
>C35-C44	**65001 (8.48)**
Basic	
EPH >C6-C8	**100**
EPH >C8-C10	**27**
EPH >C10-C12	**130 (48)**
EPH >C12-C16	**1100 (24)**
EPH >C16-C21	**1900**
EPH >C21-C35	
BTEX	
MTBE	**73**
Benzene	**0.38**
Toluene	**880 (869)**
Ethylbenzene	**83**
m/p-Xylene	**79**
o-Xylene	**88**

Tier 1 Screening Values Continued	
SVOC/ VOC	
Tetrachloroethene	**0.18**
Trichloroethene	**0.017**
Vinyl Chloride	**0.00077**
Trichloroethane (1,1,1)	**9**
Tetrachloroethane (1,1,1,2)	**1.5**
Tetrachloroethane (1,1,2,2)	**3.9**
Chlorobenzene	**0.46**
Phthalate, butylbenzyl	
Phthalate, bis (2-ethylhexyl)	
1,2-Dichloroethane	**0.0092**
Carbon Tetrachloride	**0.026**
OTHER	
Antimony	**550**
Molybdenum	**670**
1,1,2 Trichloroethane	**0.88**
1,1-dichloroethane	**2.5**
1,1-Dichloroethene	**0.23**
1,2,4-Trimethylbenzene	**0.41**
1,2-Dichloropropane	**0.024**
1,3,5-Trimethylbenzene	**nv**
1-Methylnaphthalene	**nv**
2,4-Dimethylphenol	**210**
2,4-Dinitrotoluene	**170**
2,6-Dinitrotoluene	**78**
2-Chloronaphthalene	**3.8**
2-Methylnaphthalene	**nv**
2-Methylphenol	**3700**
3-Methylphenol	**3700**
4-Methylphenol	**3700**
Biphenyl	**220**
Bis (2-ethylhexyl) phthalate	**2700**
Bromobenzene	**0.91**
Bromodichloromethane	**0.019**
Bromoform	**5.2**
Butyl benzyl phthalate	**42000**
Carbazole	**nv**
Chloroethane	**8.4**
Chloromethane	**0.0085**
Cis 1,2 Dichloroethene	**0.12**
Dichloromethane	**2.1**
Diethyl Phthalate	**1800**

Dimethyl phthalate	**nv**
Tier 1 Screening Values Continued	
Di-n-butyl phthalate	**450**
Di-n-octyl phthalate	**3400**
Hexachloroethane	**0.22**
Iso-propylbenzene	**12**
Isopropyltoluene	**nv**
Methyl tert-butyl ether	**73**
n butylbenzene	**nv**
Propylbenzene	**40**
sec butylbenzene	**nv**
Styrene	**35**
tert butylbenzene	**nv**
Trans 1,2 Dichloroethene	**0.34**
Tributyl tin oxide	**0.59**

Appendix 3

Exploratory Hole Logs

Borehole Log

Borehole No. **CP1** Sheet 1 of 2

Project Name: Hampton Hill	Project No. 51831	Co-ords: -	Hole Type CP
Location: Former offices and studios, 65b High Street, Hampton Hill, Hampton, Greater London		Level:	Scale 1:50
Client: HBPW LLP		Dates: 19/05/2016 - 19/05/2016	Logged By AJ

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20 - 1.20	B		0.05 0.20			MADE GROUND (bituminous surfacing) MADE GROUND (crushed stone) MADE GROUND (crushed brick and concrete)
		1.20		N=43 (6,10/9,10,12,12)	1.30			Dense SAND and GRVEL
		1.20 - 2.00	B					
		2.50		N=31 (5,7/8,7,7,9)				
		4.00		N=37 (6,10/8,10,9,10)				
		4.50	B					
		5.50		N=22 (7,6/5,4,6,7)				
		5.60 - 6.00	B		5.60			Very stiff bluish grey CLAY (London Clay)
		6.00 - 6.45	U					
		7.50		N=42 (7,9/10,10,11,11)				
		9.00 - 9.45	U					
		9.45 - 9.60	D					

Continued on next sheet

Remarks
Waiting for access - 1.5 hours, hand excavated trial pit from 0.00m to 1.20m - 1 hour

Borehole Log

Borehole No. **CP1** Sheet 2 of 2

Project Name: Hampton Hill	Project No. 51831	Co-ords: -	Hole Type CP
Location: Former offices and studios, 65b High Street, Hampton Hill, Hampton, Greater London		Level:	Scale 1:50
Client: HBPW LLP		Dates: 19/05/2016 - 19/05/2016	Logged By AJ

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.50		N=55 (9,12/12,13,14,16)				
		12.00 - 12.60	U					
		13.50		N=51 (11,11/11,13,13,14)				
		14.60		N=60 (12,13/14,15,15,16)				
					15.05			End of borehole at 15.05 m

Remarks
Waiting for access - 1.5 hours, hand excavated trial pit from 0.00m to 1.20m - 1 hour

Borehole Log

Borehole No. **CP2** Sheet 1 of 2

Project Name: Hampton Hill	Project No. 51831	Co-ords: -	Hole Type CP
Location: Former offices and studios, 65b High Street, Hampton Hill, Hampton, Greater London		Level:	Scale 1:50
Client: HBPW LLP		Dates: 20/05/2016 - 20/05/2016	Logged By AJ

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.05			MADE GROUND (Bituminous surface)
					0.20			MADE GROUND (Crushed Stone)
		0.40 - 1.20	B		0.40			MADE GROUND (Concrete)
								MADE GROUND (Ash and Stone fill)
		1.20		N=5 (1,2/1,2,1,1)				
					1.80			Medium dense becoming dense SAND and GRAVEL
		2.50		N=28 (6,7/7,6,8,7)				
		2.50 - 3.50	B					
		4.00		N=32 (5,6/8,7,9,8)				
		5.50		N=23 (6,8/7,6,5,5)				
		5.60 - 6.00	B		5.60			Very stiff bluish grey CLAY (London clay)
		6.00 - 6.45	U					
		6.45 - 6.60	D					
		7.00 - 7.45	U					
		7.45 - 7.60	D					
		8.50		N=37 (8,8/9,9,10,9)				
		10.00 - 10.45	U					

Continued on next sheet

Remarks
Hand excavation - 1 Hr

Borehole Log

Borehole No. **CP2** Sheet 2 of 2

Project Name: Hampton Hill	Project No. 51831	Co-ords: -	Hole Type CP
Location: Former offices and studios, 65b High Street, Hampton Hill, Hampton, Greater London		Level:	Scale 1:50
Client: HBPW LLP		Dates: 20/05/2016 - 20/05/2016	Logged By AJ

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.45 - 10.60	D					
		11.50		N=43 (9,10/11,10,10,12)				
		13.00		N=50 (8,9/10,12,13,15)				
		14.00 - 14.60	U					
		14.60		N=57 (10,12/13,14,14,16)				
					15.05			End of borehole at 15.05 m

Remarks
Hand excavation - 1 Hr

HBPW LLP — Civil and Structual Engineering Services

Site	Trial Pit Number
Hampton Hill	TP01

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit			Greatplanet Ltd	SL05030
	Location	**Dates** 19/05/2016	**Engineer** HBPW LLP	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.15) 0.15	Reinforced Concrete.		
						MADE GROUND. Brown / orange sandy gravel with brick rubble. Gravel is of medium coarse mixed lithology.		
1.00	D1				(1.05)			
					1.20	Complete at 1.20m		

Remarks

Pot and Jar Taken for all Samples
Water Pipe at 0.85m
Pit Dry
Pit Stable

Scale (approx)	Logged By	Figure No.
1:20	RB	SL05030.TP01

HBPW LLP — Civil and Structual Engineering Services

Site	Trial Pit Number
Hampton Hill	TP02

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit			Greatplanet Ltd	SL05030
	Location	**Dates** 19/05/2016	**Engineer** HBPW LLP	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.15) 0.15	Unreinforced Concrete.		
0.20	D1				(0.20) 0.35	MADE GROUND. Orange / red gravelly sand. Gravel is of brick, sand matrix is of crushed brick. Possibly old brick pavement.		
0.60	D2				(0.85) 1.20	MADE GROUND. Dark brown silty sandy CLAY. Possibly relic top soil.		
						Complete at 1.20m		

Remarks

Pot and Jar Taken for all Samples and WAC Sample Taken at 0.8m
Concrete obstruction at 1.2m
Pit Dry
Pit Stable

Scale (approx)	Logged By	Figure No.
1:20	RB	SL05030.TP02

HBPW LLP — Civil and Structual Engineering Services

Site	Trial Pit Number
Hampton Hill	TP03

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit			Greatplanet Ltd	SL05030
	Location	**Dates** 19/05/2016	**Engineer** HBPW LLP	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.15)	Unreinforced concrete.		
					0.15			
					(0.15)	MADE GROUND. Brick rubble.		
					0.30			
					0.35	MADE GROUND. Buff to yellow lean mix concrete.		
					(0.35)	MADE GROUND. Black and brown gravelly sand. Gravel is mixed of concrete, coal, brick, masonary and ash.		
0.60	D1							
					0.70	MADE GROUND. Dark brown sandy clay. Relic top soil.		
					(0.50)			
1.00	D2							
					1.20	Orange gravelly SAND. Gravel is medium coarse, rounded to subangular flint and chert.		
					(1.50)			
2.30	D3							
					2.70	Complete at 2.70m		

Remarks

Pot and Jar Taken for all Samples and WAC Sample Taken at 2.3m
Pit Dry
Pit Stable

Scale (approx)	Logged By	Figure No.
1:20	RB	SL05030.TP03

HBPW LLP — Civil and Structual Engineering Services

Site	Trial Pit Number
Hampton Hill	TP04

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit			Greatplanet Ltd	SL05030
	Location	**Dates** 19/05/2016	**Engineer** HBPW LLP	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.15)	Unreinforced concrete.		
					0.15			
0.20	D1				(0.15)	MADE GROUND. Orange / red gravelly sand. Gravel is of medium to coarse brick.		
					0.30	MADE GROUND. Dark brown sandy clay. Relic top soil.		
					(0.55)			
0.80	D2				0.85	Orange gravelly SAND. Gravel is medium coarse, rounded to subangular flint and chert.		
1.30	D3				(0.95)			
					1.80	Complete at 1.80m		

Remarks

Pit Stable
Pit Dry
Pot and Jar Taken for all Samples and WAC Sample Taken at 0.7m

Scale (approx)	Logged By	Figure No.
1:20	RB	SL05030.TP04

HBPW LLP — Civil and Structual Engineering Services

Site	Trial Pit Number
Hampton Hill	TP05

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit			Greatplanet Ltd	SL05030
	Location	**Dates** 19/05/2016	**Engineer** HBPW LLP	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.15) 0.15	Unreinforced concrete.		
					(0.20) 0.35	MADE GROUND. Orange brown gravelly sand. Gravel is of medium to coarse chert and brick.		
0.30	D1					MADE GROUND. Dark brown silty sandy clay. Relic top soil.		
					(0.75) 1.10			
0.90	D2					Ornage gravelly SAND. Gravel is of medium to coarse rounded to subangular flint and chert.		
					(1.50) 2.60			
2.00	D3					Complete at 2.60m		

Remarks

Pot and Jar Taken for all Samples and WAC Sample Taken at 0.3m
Pit Dry
Pit Stable

Scale (approx)	Logged By	Figure No.
1:20	RB	SL05030.TP05

Appendix 4

Analytical Results

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Retford
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DN22 7UX

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Rose Lane Industrial Estate
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Lenham Heath
Kent
ME17 2JN
t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 16-44642

Site Reference:	High Street Hampton Hill
Project / Job Ref:	SL05030
Order No:	519
Sample Receipt Date:	25/05/2016
Sample Scheduled Date:	25/05/2016
Report Issue Number:	1
Reporting Date:	01/06/2016

Authorised by:

Russell Jarvis
Associate Director of Client Services
On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Associate Director of Laboratory
On behalf of QTS Environmental Ltd

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate							
QTS Environmental Report No: 16-44642	Date Sampled	19/05/16	19/05/16	19/05/16	19/05/16	19/05/16	
HBPW	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: High Street Hampton Hill	TP / BH No	TP01	TP02	TP02	TP03	TP03	
Project / Job Ref: SL05030	Additional Refs	01	01	02	01	02	
Order No: 519	Depth (m)	0.90	0.35	1.20	0.70	1.20	
Reporting Date: 01/06/2016	QTSE Sample No	208545	208546	208547	208548	208549	

Determinand	Unit	RL	Accreditation					
Asbestos Screen	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	8.0	9.2	8.9	8.3	7.8
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Complex Cyanide	mg/kg	< 2	NONE	< 2	< 2		< 2	
Free Cyanide	mg/kg	< 2	NONE	< 2	< 2		< 2	
Total Sulphate as SO_4	mg/kg	< 200	NONE	1366	415	5367	1774	781
Total Sulphate as SO_4	%	< 0.02	NONE	0.14	0.04	0.54	0.18	0.08
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	442	37		132	
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	0.44	0.04		0.13	
Elemental Sulphur	mg/kg	< 10	NONE	< 10	< 10		< 10	
Sulphide	mg/kg	< 5	NONE	< 5	< 5	< 5	< 5	< 5
Organic Matter	%	< 0.1	MCERTS	1.8	0.5	1.4	1.5	1.9
Total Organic Carbon (TOC)	%	< 0.1	MCERTS	1.1	0.3	0.8	0.9	1.1
Fraction Organic Carbon (FOC)	Units	< 0.001	MCERTS	0.011	0.003		0.009	
Ammonium as NH_4	mg/kg	< 0.5	NONE	45.4	25.8		35.6	
Ammonium as NH_4	mg/l	< 0.05	NONE	4.54	2.58		3.56	
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	18	9		19	
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS	9.2	4.6		9.6	
Antimony (Sb)	mg/kg	< 1	NONE	3.1	1.2		3.8	
Arsenic (As)	mg/kg	< 2	MCERTS	21	9	15	18	13
Barium (Ba)	mg/kg	< 5	NONE	171	21		320	
Beryllium (Be)	mg/kg	< 0.5	NONE	1	< 0.5		1	
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	23	11	38	28	21
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2		< 2	
Cobalt (Co)	mg/kg	< 1	NONE	11	2.1		10.2	
Copper (Cu)	mg/kg	< 4	MCERTS	66	< 4	133	38	26
Lead (Pb)	mg/kg	< 3	MCERTS	183	< 3	1520	378	213
Manganese (Mn)	mg/kg	< 5	NONE	327	45.5		219	
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Molybdenum (Mo)	mg/kg	< 1	NONE	1.8	< 1		1.6	
Nickel (Ni)	mg/kg	< 3	MCERTS	21	4	14	20	12
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3	< 3	< 3
Tin (Sn)	mg/kg	< 10	NONE	< 10	< 10		< 10	
Vanadium (V)	mg/kg	< 2	NONE	46	19		47	
Zinc (Zn)	mg/kg	< 3	MCERTS	170	11	296	234	169
Total Phenols (monohydric)	mg/kg	< 2	NONE			< 2		< 2
VPH (C6 - C10)	mg/kg	< 0.05	NONE	< 0.05	< 0.05		< 0.05	
DRO (C10 - C24)	mg/kg	< 6	MCERTS	< 6	< 6		68	
EPH (C10 - C40)	mg/kg	< 6	MCERTS	7	< 6	5770	157	130
Mineral Oil (C10 - C40)	mg/kg	< 10	MCERTS	< 10	< 10		< 10	

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C
Analysis carried out on the dried sample is corrected for the stone content
The samples have been examined to identify the presence of asbestiform minerals by polarising light microscopy and dispersion staining technique to In-House Procedures QTSE600 Determination of Asbestos in Bulk Materials; Asbestos in Soils/Sediments (fibre screening and identification)
This report refers to samples as received, and QTS Environmental Ltd, takes no responsibility for the accuracy or competence of sampling by others.
The material description shall be regarded as tentative and is not included in our scope of UKAS Accreditation.
Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation.
Asbestos Analyst: Wioletta Goral
RL: Reporting Limit
Pinch Test: Where pinch test is positive it is reported "Loose Fibres - PT" with type(s).
Subcontracted analysis (S)

QTS Environmental Ltd
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4480

Soil Analysis Certificate							
QTS Environmental Report No: 16-44642	**Date Sampled**	19/05/16	19/05/16	19/05/16	19/05/16	19/05/16
HBPW	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: High Street Hampton Hill	**TP / BH No**	TP03	TP04	TP04	TP04	TP05
Project / Job Ref: SL05030	**Additional Refs**	03	01	02	03	01
Order No: 519	**Depth (m)**	2.70	0.30	0.85	1.80	0.40
Reporting Date: 01/06/2016	**QTSE Sample No**	208550	208551	208552	208553	208554

Determinand	Unit	RL	Accreditation					
Asbestos Screen	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	7.7	7.5	7.6	7.9	8.1
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Complex Cyanide	mg/kg	< 2	NONE		< 2			< 2
Free Cyanide	mg/kg	< 2	NONE		< 2			< 2
Total Sulphate as SO_4	mg/kg	< 200	NONE	< 200	3149	1823	236	1445
Total Sulphate as SO_4	%	< 0.02	NONE	< 0.02	0.31	0.18	0.02	0.14
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS		300			39
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS		0.30			0.04
Elemental Sulphur	mg/kg	< 10	NONE		< 10			< 10
Sulphide	mg/kg	< 5	NONE	< 5	< 5	< 5	< 5	< 5
Organic Matter	%	< 0.1	MCERTS	0.3	1.3	4.5	0.7	2.4
Total Organic Carbon (TOC)	%	< 0.1	MCERTS	0.2	0.7	2.6	0.4	1.4
Fraction Organic Carbon (FOC)	Units	< 0.001	MCERTS		0.007			0.014
Ammonium as NH_4	mg/kg	< 0.5	NONE		38.3			52.3
Ammonium as NH_4	mg/l	< 0.05	NONE		3.83			5.23
W/S Chloride (2:1)	mg/kg	< 1	MCERTS		16			7
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS		8.2			3.7
Antimony (Sb)	mg/kg	< 1	NONE		2.8			2.5
Arsenic (As)	mg/kg	< 2	MCERTS	19	13	22	14	20
Barium (Ba)	mg/kg	< 5	NONE		218			295
Beryllium (Be)	mg/kg	< 0.5	NONE		0.8			1
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	0.3	0.6	< 0.2	0.3
Chromium (Cr)	mg/kg	< 2	MCERTS	24	26	25	19	26
Chromium (hexavalent)	mg/kg	< 2	NONE		< 2			< 2
Cobalt (Co)	mg/kg	< 1	NONE		5.7			8.3
Copper (Cu)	mg/kg	< 4	MCERTS	8	50	67	17	411
Lead (Pb)	mg/kg	< 3	MCERTS	20	209	952	72	475
Manganese (Mn)	mg/kg	< 5	NONE		264			278
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Molybdenum (Mo)	mg/kg	< 1	NONE		1.4			1.7
Nickel (Ni)	mg/kg	< 3	MCERTS	19	16	22	13	18
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3	< 3	< 3
Tin (Sn)	mg/kg	< 10	NONE		< 10			309
Vanadium (V)	mg/kg	< 2	NONE		41			47
Zinc (Zn)	mg/kg	< 3	MCERTS	40	266	535	70	256
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2		< 2	< 2	
VPH (C6 - C10)	mg/kg	< 0.05	NONE		< 0.05			< 0.05
DRO (C10 - C24)	mg/kg	< 6	MCERTS		< 6			< 6
EPH (C10 - C40)	mg/kg	< 6	MCERTS	< 6	8	104	< 6	19
Mineral Oil (C10 - C40)	mg/kg	< 10	MCERTS		< 10			< 10

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C
Analysis carried out on the dried sample is corrected for the stone content
The samples have been examined to identify the presence of asbestiform minerals by polarising light microscopy and dispersion staining technique to In-House Procedures QTSE600 Determination of Asbestos in Bulk Materials; Asbestos in Soils/Sediments (fibre screening and identification)
This report refers to samples as received, and QTS Environmental Ltd, takes no responsibility for the accuracy or competence of sampling by others.
The material description shall be regarded as tentative and is not included in our scope of UKAS Accreditation.
Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation.
Asbestos Analyst: Wioletta Goral
RL: Reporting Limit
Pinch Test: Where pinch test is positive it is reported "Loose Fibres - PT" with type(s).
Subcontracted analysis $^{(S)}$

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
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Tel : 01622 850410

4480

Soil Analysis Certificate							
QTS Environmental Report No: 16-44642	Date Sampled	19/05/16	19/05/16				
HBPW	Time Sampled	None Supplied	None Supplied				
Site Reference: High Street Hampton Hill	TP / BH No	TP05	TP05				
Project / Job Ref: SL05030	Additional Refs	02	03				
Order No: 519	Depth (m)	1.10	2.60				
Reporting Date: 01/06/2016	QTSE Sample No	208555	208556				

Determinand	Unit	RL	Accreditation					
Asbestos Screen	N/a	N/a	ISO17025	Not Detected	Not Detected			
pH	pH Units	N/a	MCERTS	7.4	7.5			
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2			
Complex Cyanide	mg/kg	< 2	NONE		< 2			
Free Cyanide	mg/kg	< 2	NONE		< 2			
Total Sulphate as SO_4	mg/kg	< 200	NONE	297	208			
Total Sulphate as SO_4	%	< 0.02	NONE	0.03	0.02			
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS		23			
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS		0.02			
Elemental Sulphur	mg/kg	< 10	NONE		< 10			
Sulphide	mg/kg	< 5	NONE	< 5	< 5			
Organic Matter	%	< 0.1	MCERTS	2.1	0.6			
Total Organic Carbon (TOC)	%	< 0.1	MCERTS	1.2	0.4			
Fraction Organic Carbon (FOC)	Units	< 0.001	MCERTS		0.004			
Ammonium as NH_4	mg/kg	< 0.5	NONE		38.6			
Ammonium as NH_4	mg/l	< 0.05	NONE		3.86			
W/S Chloride (2:1)	mg/kg	< 1	MCERTS		7			
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS		3.3			
Antimony (Sb)	mg/kg	< 1	NONE		1.7			
Arsenic (As)	mg/kg	< 2	MCERTS	13	16			
Barium (Ba)	mg/kg	< 5	NONE		48			
Beryllium (Be)	mg/kg	< 0.5	NONE		0.8			
W/S Boron	mg/kg	< 1	NONE	< 1	< 1			
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2			
Chromium (Cr)	mg/kg	< 2	MCERTS	16	21			
Chromium (hexavalent)	mg/kg	< 2	NONE		< 2			
Cobalt (Co)	mg/kg	< 1	NONE		10.2			
Copper (Cu)	mg/kg	< 4	MCERTS	33	13			
Lead (Pb)	mg/kg	< 3	MCERTS	143	36			
Manganese (Mn)	mg/kg	< 5	NONE		235			
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1			
Molybdenum (Mo)	mg/kg	< 1	NONE		< 1			
Nickel (Ni)	mg/kg	< 3	MCERTS	11	16			
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3			
Tin (Sn)	mg/kg	< 10	NONE		< 10			
Vanadium (V)	mg/kg	< 2	NONE		40			
Zinc (Zn)	mg/kg	< 3	MCERTS	86	42			
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2				
VPH (C6 - C10)	mg/kg	< 0.05	NONE		< 0.05			
DRO (C10 - C24)	mg/kg	< 6	MCERTS		< 6			
EPH (C10 - C40)	mg/kg	< 6	MCERTS	< 6	< 6			
Mineral Oil (C10 - C40)	mg/kg	< 10	MCERTS		< 10			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C
Analysis carried out on the dried sample is corrected for the stone content
The samples have been examined to identify the presence of asbestiform minerals by polarising light microscopy and dispersion staining technique to In-House Procedures QTSE600 Determination of Asbestos in Bulk Materials; Asbestos in Soils/Sediments (fibre screening and identification)
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Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation.
Asbestos Analyst: Wioletta Goral
RL: Reporting Limit
Pinch Test: Where pinch test is positive it is reported "Loose Fibres - PT" with type(s).
Subcontracted analysis (S)

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
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Tel : 01622 850410

4480

Soil Analysis Certificate - Speciated PAHs							
QTS Environmental Report No: 16-44642	Date Sampled	19/05/16	19/05/16	19/05/16	19/05/16	19/05/16
HBPW	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: High Street Hampton Hill	TP / BH No	TP01	TP02	TP02	TP03	TP03
Project / Job Ref: SL05030	Additional Refs	01	01	02	01	02
Order No: 519	Depth (m)	0.90	0.35	1.20	0.70	1.20
Reporting Date: 01/06/2016	QTSE Sample No	208545	208546	208547	208548	208549

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	0.15	< 0.1	0.21	0.64	1.43
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.13	0.12
Fluoranthene	mg/kg	< 0.1	MCERTS	0.44	< 0.1	0.40	1.66	2.43
Pyrene	mg/kg	< 0.1	MCERTS	0.41	< 0.1	0.41	1.76	2.08
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.21	< 0.1	0.17	0.73	0.75
Chrysene	mg/kg	< 0.1	MCERTS	0.23	< 0.1	0.23	0.86	0.94
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.33	< 0.1	0.26	0.94	1.16
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.15	< 0.1	< 0.1	0.34	0.40
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.23	< 0.1	0.17	0.74	0.79
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.17	< 0.1	0.13	0.39	0.46
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.19	< 0.1	0.11	0.38	0.41
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	2.5	< 1.6	2.1	8.6	11

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C

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Soil Analysis Certificate - Speciated PAHs							
QTS Environmental Report No: 16-44642	Date Sampled	19/05/16	19/05/16	19/05/16	19/05/16	19/05/16
HBPW	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: High Street Hampton Hill	TP / BH No	TP03	TP04	TP04	TP04	TP05
Project / Job Ref: SL05030	Additional Refs	03	01	02	03	01
Order No: 519	Depth (m)	2.70	0.30	0.85	1.80	0.40
Reporting Date: 01/06/2016	QTSE Sample No	208550	208551	208552	208553	208554

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.14	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	0.32	1.54	0.15	0.24
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.32	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.75	4.82	0.31	0.78
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.67	4.28	0.27	0.71
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.37	2.27	0.12	0.39
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	0.37	2.47	0.15	0.44
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.51	3.51	0.19	0.70
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.20	1.16	< 0.1	0.24
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.36	2.54	0.13	0.46
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.21	1.60	< 0.1	0.33
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.23	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	0.20	1.42	< 0.1	0.30
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	4	26.3	< 1.6	4.6

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C

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Soil Analysis Certificate - Speciated PAHs							
QTS Environmental Report No: 16-44642	Date Sampled	19/05/16	19/05/16			
HBPW	Time Sampled	None Supplied	None Supplied			
Site Reference: High Street Hampton Hill	TP / BH No	TP05	TP05			
Project / Job Ref: SL05030	Additional Refs	02	03			
Order No: 519	Depth (m)	1.10	2.60			
Reporting Date: 01/06/2016	QTSE Sample No	208555	208556			

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Phenanthrene	mg/kg	< 0.1	MCERTS	0.21	< 0.1			
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Fluoranthene	mg/kg	< 0.1	MCERTS	0.57	0.12			
Pyrene	mg/kg	< 0.1	MCERTS	0.48	< 0.1			
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.26	< 0.1			
Chrysene	mg/kg	< 0.1	MCERTS	0.33	< 0.1			
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.45	< 0.1			
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.15	< 0.1			
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.29	< 0.1			
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.17	< 0.1			
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.15	< 0.1			
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	3.1	< 1.6			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C

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Soil Analysis Certificate - TPH CWG Banded							
QTS Environmental Report No: 16-44642	Date Sampled	19/05/16	19/05/16	19/05/16	19/05/16	19/05/16
HBPW	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: High Street Hampton Hill	TP / BH No	TP01	TP02	TP02	TP03	TP03
Project / Job Ref: SL05030	Additional Refs	01	01	02	01	02
Order No: 519	Depth (m)	0.90	0.35	1.20	0.70	1.20
Reporting Date: 01/06/2016	QTSE Sample No	208545	208546	208547	208548	208549

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	7	< 3	< 3
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	207	< 3	< 3
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10	648	< 10	< 10
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	861	< 21	< 21
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	6	< 3	69	< 3	6
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10	244	< 10	14
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	< 21	313	< 21	< 21
Total >C5 - C35	mg/kg	< 42	NONE	< 42	< 42	1174	< 42	< 42

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than $30^{O}C$

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Soil Analysis Certificate - TPH CWG Banded							
QTS Environmental Report No: 16-44642	Date Sampled	19/05/16	19/05/16	19/05/16	19/05/16	19/05/16
HBPW	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: High Street Hampton Hill	TP / BH No	TP03	TP04	TP04	TP04	TP05
Project / Job Ref: SL05030	Additional Refs	03	01	02	03	01
Order No: 519	Depth (m)	2.70	0.30	0.85	1.80	0.40
Reporting Date: 01/06/2016	QTSE Sample No	208550	208551	208552	208553	208554

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	10	< 3	< 3
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10	42	< 10	< 10
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	< 21	52	< 21	< 21
Total >C5 - C35	mg/kg	< 42	NONE	< 42	< 42	52	< 42	< 42

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C

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Soil Analysis Certificate - TPH CWG Banded							
QTS Environmental Report No: 16-44642	Date Sampled	19/05/16	19/05/16				
HBPW	Time Sampled	None Supplied	None Supplied				
Site Reference: High Street Hampton Hill	TP / BH No	TP05	TP05				
Project / Job Ref: SL05030	Additional Refs	02	03				
Order No: 519	Depth (m)	1.10	2.60				
Reporting Date: 01/06/2016	QTSE Sample No	208555	208556				

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01			
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05			
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2			
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2			
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3			
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3			
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10			
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21			
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01			
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05			
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2			
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2			
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2			
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3			
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10			
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	< 21			
Total >C5 - C35	mg/kg	< 42	NONE	< 42	< 42			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C

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Soil Analysis Certificate - BTEX / MTBE							
QTS Environmental Report No: 16-44642	Date Sampled	19/05/16	19/05/16	19/05/16	19/05/16	19/05/16
HBPW	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: High Street Hampton Hill	TP / BH No	TP01	TP02	TP02	TP03	TP03
Project / Job Ref: SL05030	Additional Refs	01	01	02	01	02
Order No: 519	Depth (m)	0.90	0.35	1.20	0.70	1.20
Reporting Date: 01/06/2016	QTSE Sample No	208545	208546	208547	208548	208549

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C

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Soil Analysis Certificate - BTEX / MTBE							
QTS Environmental Report No: 16-44642	Date Sampled	19/05/16	19/05/16	19/05/16	19/05/16	19/05/16
HBPW	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: High Street Hampton Hill	TP / BH No	TP03	TP04	TP04	TP04	TP05
Project / Job Ref: SL05030	Additional Refs	03	01	02	03	01
Order No: 519	Depth (m)	2.70	0.30	0.85	1.80	0.40
Reporting Date: 01/06/2016	QTSE Sample No	208550	208551	208552	208553	208554

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C

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Soil Analysis Certificate - BTEX / MTBE							
QTS Environmental Report No: 16-44642	Date Sampled	19/05/16	19/05/16			
HBPW	Time Sampled	None Supplied	None Supplied			
Site Reference: High Street Hampton Hill	TP / BH No	TP05	TP05			
Project / Job Ref: SL05030	Additional Refs	02	03			
Order No: 519	Depth (m)	1.10	2.60			
Reporting Date: 01/06/2016	QTSE Sample No	208555	208556			

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2			
Toluene	ug/kg	< 5	MCERTS	< 5	< 5			
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2			
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2			
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2			
MTBE	ug/kg	< 5	MCERTS	< 5	< 5			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C

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Soil Analysis Certificate - Volatile Organic Compounds (VOC)							
QTS Environmental Report No: 16-44642	**Date Sampled**	19/05/16	19/05/16	19/05/16	19/05/16	19/05/16
HBPW	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: High Street Hampton Hill	**TP / BH No**	TP01	TP02	TP03	TP04	TP05
Project / Job Ref: SL05030	**Additional Refs**	01	01	01	01	01
Order No: 519	**Depth (m)**	0.90	0.35	0.70	0.30	0.40
Reporting Date: 01/06/2016	**QTSE Sample No**	208545	208546	208548	208551	208554

Determinand	**Unit**	**RL**	**Accreditation**					
Dichlorodifluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Chloromethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Chloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromomethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Trichlorofluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
trans-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
cis-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
2,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Chloroform	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1,1-Trichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1-Dichloropropene	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Carbon Tetrachloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
1,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Trichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromodichloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Dibromomethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
TAME	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
trans-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
1,3-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dibromoethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1,1,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethyl Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
m,p-Xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-Xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Styrene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromoform	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Isopropylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2,3-Trichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
n-Propylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
2-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,3,5-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
4-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
tert-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2,4-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
sec-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
p-Isopropyltoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,3-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,4-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
n-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
,2-Dibromo-3-chloropropane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Hexachlorobutadiene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C

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Soil Analysis Certificate - Volatile Organic Compounds (VOC)							
QTS Environmental Report No: 16-44642	Date Sampled	19/05/16					
HBPW	Time Sampled	None Supplied					
Site Reference: High Street Hampton Hill	TP / BH No	TP05					
Project / Job Ref: SL05030	Additional Refs	03					
Order No: 519	Depth (m)	2.60					
Reporting Date: 01/06/2016	QTSE Sample No	208556					

Determinand	Unit	RL	Accreditation					
Dichlorodifluoromethane	ug/kg	< 5	MCERTS	< 5				
Vinyl Chloride	ug/kg	< 5	MCERTS	< 5				
Chloromethane	ug/kg	< 10	MCERTS	< 10				
Chloroethane	ug/kg	< 5	MCERTS	< 5				
Bromomethane	ug/kg	< 10	MCERTS	< 10				
Trichlorofluoromethane	ug/kg	< 5	MCERTS	< 5				
1,1-Dichloroethene	ug/kg	< 5	MCERTS	< 5				
MTBE	ug/kg	< 5	MCERTS	< 5				
trans-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5				
1,1-Dichloroethane	ug/kg	< 5	MCERTS	< 5				
cis-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5				
2,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5				
Chloroform	ug/kg	< 5	MCERTS	< 5				
Bromochloromethane	ug/kg	< 5	MCERTS	< 5				
1,1,1-Trichloroethane	ug/kg	< 5	MCERTS	< 5				
1,1-Dichloropropene	ug/kg	< 10	MCERTS	< 10				
Carbon Tetrachloride	ug/kg	< 5	MCERTS	< 5				
1,2-Dichloroethane	ug/kg	< 5	MCERTS	< 5				
Benzene	ug/kg	< 2	MCERTS	< 2				
1,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5				
Trichloroethene	ug/kg	< 5	MCERTS	< 5				
Bromodichloromethane	ug/kg	< 5	MCERTS	< 5				
Dibromomethane	ug/kg	< 5	MCERTS	< 5				
TAME	ug/kg	< 5	MCERTS	< 5				
cis-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5				
Toluene	ug/kg	< 5	MCERTS	< 5				
trans-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5				
1,1,2-Trichloroethane	ug/kg	< 10	MCERTS	< 10				
1,3-Dichloropropane	ug/kg	< 5	MCERTS	< 5				
Tetrachloroethene	ug/kg	< 5	MCERTS	< 5				
Dibromochloromethane	ug/kg	< 5	MCERTS	< 5				
1,2-Dibromoethane	ug/kg	< 5	MCERTS	< 5				
Chlorobenzene	ug/kg	< 5	MCERTS	< 5				
1,1,1,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5				
Ethyl Benzene	ug/kg	< 2	MCERTS	< 2				
m,p-Xylene	ug/kg	< 2	MCERTS	< 2				
o-Xylene	ug/kg	< 2	MCERTS	< 2				
Styrene	ug/kg	< 5	MCERTS	< 5				
Bromoform	ug/kg	< 10	MCERTS	< 10				
Isopropylbenzene	ug/kg	< 5	MCERTS	< 5				
1,1,2,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5				
1,2,3-Trichloropropane	ug/kg	< 5	MCERTS	< 5				
n-Propylbenzene	ug/kg	< 5	MCERTS	< 5				
Bromobenzene	ug/kg	< 5	MCERTS	< 5				
2-Chlorotoluene	ug/kg	< 5	MCERTS	< 5				
1,3,5-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5				
4-Chlorotoluene	ug/kg	< 5	MCERTS	< 5				
tert-Butylbenzene	ug/kg	< 5	MCERTS	< 5				
1,2,4-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5				
sec-Butylbenzene	ug/kg	< 5	MCERTS	< 5				
p-Isopropyltoluene	ug/kg	< 5	MCERTS	< 5				
1,3-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5				
1,4-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5				
n-Butylbenzene	ug/kg	< 5	MCERTS	< 5				
1,2-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5				
,2-Dibromo-3-chloropropane	ug/kg	< 10	MCERTS	< 10				
Hexachlorobutadiene	ug/kg	< 5	MCERTS	< 5				

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C

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Soil Analysis Certificate - Semi Volatile Organic Compounds (SVOC)							
QTS Environmental Report No: 16-44642	**Date Sampled**	19/05/16	19/05/16	19/05/16	19/05/16	19/05/16
HBPW	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: High Street Hampton Hill	**TP / BH No**	TP01	TP02	TP03	TP04	TP05
Project / Job Ref: SL05030	**Additional Refs**	01	01	01	01	01
Order No: 519	**Depth (m)**	0.90	0.35	0.70	0.30	0.40
Reporting Date: 01/06/2016	**QTSE Sample No**	208545	208546	208548	208551	208554

Determinand	Unit	RL	Accreditation					
Phenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,4-Trichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nitrobenzene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
0-Cresol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
bis(2-chloroethoxy)methane	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
bis(2-chloroethyl)ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chlorophenol	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,3-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dimethylphenol	mg/kg	< 0.15	ISO17025	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
Isophorone	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachloroethane	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
p-Cresol	mg/kg	< 0.15	MCERTS	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
2,4,6-Trichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	< 0.15	MCERTS	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
2-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 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	< 0.1
2-Methylnaphthalene	mg/kg	< 0.1	MCERTS	0.1	< 0.1	0.1	< 0.1	0.1
Hexachlorocyclopentadiene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethyl phthalate	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloroanaline	mg/kg	< 0.15	NONE	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
4-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chlorophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Bromophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobenzene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Diethyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzofuran	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Azobenzene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibutyl phthalate	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Carbazole	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
bis(2-ethylhexyl)phthalate	mg/kg	< 0.15	MCERTS	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
Benzyl butyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Di-n-octyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C

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Soil Analysis Certificate - Semi Volatile Organic Compounds (SVOC)							
QTS Environmental Report No: 16-44642	Date Sampled	19/05/16					
HBPW	Time Sampled	None Supplied					
Site Reference: High Street Hampton Hill	TP / BH No	TP05					
Project / Job Ref: SL05030	Additional Refs	03					
Order No: 519	Depth (m)	2.60					
Reporting Date: 01/06/2016	QTSE Sample No	208556					

Determinand	Unit	RL	Accreditation					
Phenol	mg/kg	< 0.1	NONE	< 0.1				
1,2,4-Trichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1				
2-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1				
Nitrobenzene	mg/kg	< 0.1	MCERTS	< 0.1				
0-Cresol	mg/kg	< 0.1	NONE	< 0.1				
bis(2-chloroethoxy)methane	mg/kg	< 0.1	MCERTS	< 0.1				
bis(2-chloroethyl)ether	mg/kg	< 0.1	MCERTS	< 0.1				
2,4-Dichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1				
2-Chlorophenol	mg/kg	< 0.1	ISO17025	< 0.1				
1,3-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1				
1,4-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1				
1,2-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1				
2,4-Dimethylphenol	mg/kg	< 0.15	ISO17025	< 0.15				
Isophorone	mg/kg	< 0.1	NONE	< 0.1				
Hexachloroethane	mg/kg	< 0.1	MCERTS	< 0.1				
p-Cresol	mg/kg	< 0.15	MCERTS	< 0.15				
2,4,6-Trichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1				
2,4,5-Trichlorophenol	mg/kg	< 0.15	MCERTS	< 0.15				
2-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1				
4-Chloro-3-methylphenol	mg/kg	< 0.1	NONE	< 0.1				
2-Methylnaphthalene	mg/kg	< 0.1	MCERTS	< 0.1				
Hexachlorocyclopentadiene	mg/kg	< 0.1	NONE	< 0.1				
Hexachlorobutadiene	mg/kg	< 0.1	ISO17025	< 0.1				
2,6-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1				
Dimethyl phthalate	mg/kg	< 0.1	NONE	< 0.1				
2-Chloronaphthalene	mg/kg	< 0.1	MCERTS	< 0.1				
4-Chloroanaline	mg/kg	< 0.15	NONE	< 0.15				
4-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1				
4-Chlorophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1				
3-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1				
4-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1				
4-Bromophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1				
Hexachlorobenzene	mg/kg	< 0.1	MCERTS	< 0.1				
2,4-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1				
Diethyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1				
Dibenzofuran	mg/kg	< 0.1	MCERTS	< 0.1				
Azobenzene	mg/kg	< 0.1	NONE	< 0.1				
Dibutyl phthalate	mg/kg	< 0.1	ISO17025	< 0.1				
Carbazole	mg/kg	< 0.1	ISO17025	< 0.1				
bis(2-ethylhexyl)phthalate	mg/kg	< 0.15	MCERTS	< 0.15				
Benzyl butyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1				
Di-n-octyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1				

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C

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Soil Analysis Certificate - PCB (7 Congeners)							
QTS Environmental Report No: 16-44642	**Date Sampled**	19/05/16	19/05/16	19/05/16	19/05/16	19/05/16
HBPW	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: High Street Hampton Hill	**TP / BH No**	TP01	TP02	TP03	TP04	TP05
Project / Job Ref: SL05030	**Additional Refs**	01	01	01	01	01
Order No: 519	**Depth (m)**	0.90	0.35	0.70	0.30	0.40
Reporting Date: 01/06/2016	**QTSE Sample No**	208545	208546	208548	208551	208554

Determinand	**Unit**	**RL**	**Accreditation**					
PCB Congener 28	mg/kg	< 0.008	NONE	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008
PCB Congener 52	mg/kg	< 0.008	NONE	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008
PCB Congener 101	mg/kg	< 0.008	NONE	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008
PCB Congener 118	mg/kg	< 0.008	NONE	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008
PCB Congener 138	mg/kg	< 0.008	NONE	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008
PCB Congener 153	mg/kg	< 0.008	NONE	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008
PCB Congener 180	mg/kg	< 0.008	NONE	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008
Total PCB (7 Congeners)	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C

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Soil Analysis Certificate - PCB (7 Congeners)							
QTS Environmental Report No: 16-44642	**Date Sampled**	19/05/16					
HBPW	**Time Sampled**	None Supplied					
Site Reference: High Street Hampton Hill	**TP / BH No**	TP05					
Project / Job Ref: SL05030	**Additional Refs**	03					
Order No: 519	**Depth (m)**	2.60					
Reporting Date: 01/06/2016	**QTSE Sample No**	208556					

Determinand	**Unit**	**RL**	**Accreditation**					
PCB Congener 28	mg/kg	< 0.008	NONE	< 0.008				
PCB Congener 52	mg/kg	< 0.008	NONE	< 0.008				
PCB Congener 101	mg/kg	< 0.008	NONE	< 0.008				
PCB Congener 118	mg/kg	< 0.008	NONE	< 0.008				
PCB Congener 138	mg/kg	< 0.008	NONE	< 0.008				
PCB Congener 153	mg/kg	< 0.008	NONE	< 0.008				
PCB Congener 180	mg/kg	< 0.008	NONE	< 0.008				
Total PCB (7 Congeners)	mg/kg	< 0.1	NONE	< 0.1				

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than $30^{O}C$

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Soil Analysis Certificate - Speciated Phenols							
QTS Environmental Report No: 16-44642	**Date Sampled**	19/05/16	19/05/16	19/05/16	19/05/16	19/05/16
HBPW	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: High Street Hampton Hill	**TP / BH No**	TP01	TP02	TP03	TP04	TP05
Project / Job Ref: SL05030	**Additional Refs**	01	01	01	01	01
Order No: 519	**Depth (m)**	0.90	0.35	0.70	0.30	0.40
Reporting Date: 01/06/2016	**QTSE Sample No**	208545	208546	208548	208551	208554

Determinand	**Unit**	**RL**	**Accreditation**					
2, 3, 5-trimethylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2, 3, 6-trimethylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2, 3-xylenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2, 4, 6-trimethylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2, 4-xylenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2, 5-xylenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2, 6-xylenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-ethylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-isopropylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3, 4, 5-trimethylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3, 4-xylenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3, 5-xylenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3-ethylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3-isopropylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-ethylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-isopropylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
m-cresol (3-methylphenol)	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
o-cresol (2-methylphenol)	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
p-cresol (4-methylphenol)	mg/kg	< 0.15	NONE	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
phenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C

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Soil Analysis Certificate - Speciated Phenols							
QTS Environmental Report No: 16-44642	**Date Sampled**	19/05/16					
HBPW	**Time Sampled**	None Supplied					
Site Reference: High Street Hampton Hill	**TP / BH No**	TP05					
Project / Job Ref: SL05030	**Additional Refs**	03					
Order No: 519	**Depth (m)**	2.60					
Reporting Date: 01/06/2016	**QTSE Sample No**	208556					

Determinand	Unit	RL	Accreditation					
2, 3, 5-trimethylphenol	mg/kg	< 0.1	NONE	< 0.1				
2, 3, 6-trimethylphenol	mg/kg	< 0.1	NONE	< 0.1				
2, 3-xylenol	mg/kg	< 0.1	NONE	< 0.1				
2, 4, 6-trimethylphenol	mg/kg	< 0.1	NONE	< 0.1				
2, 4-xylenol	mg/kg	< 0.1	NONE	< 0.1				
2, 5-xylenol	mg/kg	< 0.1	NONE	< 0.1				
2, 6-xylenol	mg/kg	< 0.1	NONE	< 0.1				
2-ethylphenol	mg/kg	< 0.1	NONE	< 0.1				
2-isopropylphenol	mg/kg	< 0.1	NONE	< 0.1				
3, 4, 5-trimethylphenol	mg/kg	< 0.1	NONE	< 0.1				
3, 4-xylenol	mg/kg	< 0.1	NONE	< 0.1				
3, 5-xylenol	mg/kg	< 0.1	NONE	< 0.1				
3-ethylphenol	mg/kg	< 0.1	NONE	< 0.1				
3-isopropylphenol	mg/kg	< 0.1	NONE	< 0.1				
4-ethylphenol	mg/kg	< 0.1	NONE	< 0.1				
4-isopropylphenol	mg/kg	< 0.1	NONE	< 0.1				
m-cresol (3-methylphenol)	mg/kg	< 0.1	NONE	< 0.1				
o-cresol (2-methylphenol)	mg/kg	< 0.1	NONE	< 0.1				
p-cresol (4-methylphenol)	mg/kg	< 0.15	NONE	< 0.15				
phenol	mg/kg	< 0.1	NONE	< 0.1				

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than $30^{O}C$

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mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

UKAS TESTING 4480

Waste Acceptance Criteria Analytical Certificate - BS EN 12457/3

QTS Environmental Report No: 16-44642	**Date Sampled**	19/05/16	
HBPW	**Time Sampled**	None Supplied	
Site Reference: High Street Hampton Hill	**TP / BH No**	WAC Composite	
Project / Job Ref: SL05030	**Additional Refs**	None Supplied	
Order No: 519	**Depth (m)**	None Supplied	
Reporting Date: 01/06/2016	**QTSE Sample No**	208557	

Determinand	**Unit**	**MDL**		**Landfill Waste Acceptance Criteria Limits**		
				Inert Waste Landfill	**Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
TOC[MU]	%	< 0.1	0.6	3%	5%	6%
Loss on Ignition	%	< 0.01	2	--	--	10%
BTEX[MU]	mg/kg	< 0.05	< 0.05	6	--	--
Sum of PCBs	mg/kg	< 0.1	< 0.1	1	--	--
Mineral Oil[MU]	mg/kg	< 10	< 10	500	--	--
Total PAH[MU]	mg/kg	< 1.7	< 1.7	100	--	--
pH[MU]	pH Units	N/a	10.2	--	>6	--
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	1.9	--	To be evaluated	To be evaluated

Eluate Analysis	**2:1 mg/l**	**8:1 mg/l**		**Cumulative 10:1 mg/kg**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
Arsenic[U]	< 0.01	< 0.01		< 0.2	0.5	2	25
Barium[U]	0.09	0.02		0.3	20	100	300
Cadmium[U]	< 0.0005	< 0.0005		< 0.02	0.04	1	5
Chromium[U]	0.049	0.010		< 0.20	0.5	10	70
Copper[U]	0.08	< 0.01		< 0.5	2	50	100
Mercury[U]	< 0.005	< 0.005		< 0.01	0.01	0.2	2
Molybdenum[U]	0.011	0.002		< 0.1	0.5	10	30
Nickel[U]	< 0.007	< 0.007		< 0.2	0.4	10	40
Lead[U]	< 0.005	< 0.005		< 0.2	0.5	10	50
Antimony[U]	0.020	0.007		0.09	**0.06**	0.7	5
Selenium[U]	< 0.005	< 0.005		< 0.1	0.1	0.5	7
Zinc[U]	< 0.005	< 0.005		< 0.2	4	50	200
Chloride[U]	4	1		17	800	15000	25000
Fluoride[U]	0.6	< 0.5		< 1	10	150	500
Sulphate[U]	257	25		540	1000	20000	50000
TDS	369	92		1271	4000	60000	100000
Phenol Index	< 0.01	< 0.01		< 0.5	1	-	-
DOC	17.6	4.4		60.7	500	800	1000
Leach Test Information							
Sample Mass (kg)	0.20						
Dry Matter (%)	87.7						
Moisture (%)	14						
Stage 1							
Volume Eluate L2 (litres)	0.33						
Filtered Eluate VE1 (litres)	0.22						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and QTS Environmental cannot be held responsible for any discrepencies with current legislation
M Denotes MCERTS accredited test
U Denotes ISO17025 accredited test

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Soil Analysis Certificate - Sample Descriptions	
QTS Environmental Report No: 16-44642	
HBPW	
Site Reference: High Street Hampton Hill	
Project / Job Ref: SL05030	
Order No: 519	
Reporting Date: 01/06/2016	

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
208545	TP01	1	0.90	10.6	Brown sandy gravel with stones
208546	TP02	1	0.35	9.6	Orange sand with stones
208547	TP02	2	1.20	14.5	Light brown sandy gravel with stones
208548	TP03	1	0.70	13.8	Brown gravelly sand with stones
208549	TP03	2	1.20	15.2	Brown gravelly clay with stones
208550	TP03	3	2.70	9.1	Orange sand with stones
208551	TP04	1	0.30	12.9	Light brown gravelly sand with stones
208552	TP04	2	0.85	13.7	Brown gravelly clay with stones and vegetation
208553	TP04	3	1.80	7.3	Orange sand with stones
208554	TP05	1	0.40	14.5	Brown gravelly sand with stones
208555	TP05	2	1.10	14.3	Light brown sand with stones
208556	TP05	3	2.60	8.8	Light brown gravelly sand with stones
208557	WAC Composite	None Supplied	None Supplied	12.3	Light brown gravelly sand with rubble

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample I/S

Unsuitable Sample U/S

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Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 16-44642
HBPW
Site Reference: High Street Hampton Hill
Project / Job Ref: SL05030
Order No: 519
Reporting Date: 01/06/2016

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10 C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

Appendix 5

Gas Monitoring Results

GROUNDWATER AND GROUND GAS MONITORING RECORD SHEET

Sheet: | **of**

Project Name:	Hampton Hill	Weather Conditions:	overcast, dry
Project Number:	SL05030	Gas Kit Model:	GA5000
Personnel:	HBPW	Gas Kit Serial No:	GA03

Date: 16.06.16

LOCATION	Flow Peak (L/hr)	Flow Steady (L/hr)	CH_4 Peak (%v/v)	CH_4 Steady (%v/v)	CO_2 Peak (%v/v)	CO_2 Steady (%v/v)	O_2 Min. (%v/v)	O_2 Steady (%v/v)	Atmospheric Pressure (mb)	PID (ppm)	Well I.D. (mm)	Depth to Product (DTP) (m)	Product Thickness (m)	Depth to Water (DTW) (m)	Depth to Base (DTB) (m)	Height of Water Column (m)	NOTES
CP1		15.4	0.0	0.0	5.5	5.5	11.2		999		CP1			2.980			
CP2		15.4	0.0	0.0	4.8	4.8	15.1		999		CP2			3.070			

GUIDE TO PURGING VOLUMES

To calculate the number of litres to be purged from a well with a different diameter, use the formula $3\pi r^2 h$ (where r = radius of the well and h = height of the water column). Use the formula $\pi r^2 h$ to calculate the volume of a bailer. Please note that the standard bailers HBPW use are typically 0.95 m in length.

Diameter of Casing (mm)	19	35	50	50	75	100
Diameter of Bailer (mm)	18	19	19	38	38	38
No. bails per m	4	12	22	6	13	23