Gladman Developments Limited

White Post Road, Banbury

Geotechnical and geoenvironmental site assessment

313498-01 (00)

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RSK GENERAL NOTES

Project No.: 313498-01 (00)

Title: Geotechnical and geoenvironmental site assessment: White Post Road, Banbury

Client: Gladman Developments Limited, Gladman House, Alexandria Way, Congleton, Cheshire, CW12 1LB

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1 INTRODUCTION

RSK Environment Limited (RSK) was commissioned by Gladman Developments Limited (the Client) to carry out a geo-environmental assessment of the land off White Post Road, Banbury; in relation to a proposal to market the site for residential development.

This report is subject to the RSK service constraints given in Appendix A.

1.1 Proposed development

It is understood that the site is to be marketed for a proposed residential development; with the construction of new low-rise residential units, associated private gardens and infrastructure. Figure 2 shows the proposed general arrangement for the site.

1.2 Objective

This investigation has been commissioned in order to obtain and collate information pertaining to the ground conditions beneath the site; from which potential risks to human health and the environment can be assessed, an assessment of the potential waste implications of soil arisings can be made; and outline geotechnical soil parameters can be provided for preliminary design purposes.

The objectives of the investigation are as follows:

1. to accurately record the ground conditions encountered within the exploratory holes;
2. to identify and assess potential risks to human health, buildings / structures and the environment;
3. to inform of-site waste disposal options;
4. to recommend appropriate soil parameters for geotechnical design purposes; and
5. to establish the need for any additional investigations.

1.3 Scope

The scope of the investigation and layout of this report has been designed with consideration of CLR11 (Environment Agency, 2014) and BS 10175: 2013 (BSI, 2013) and guidance on land contamination reports issued by the Environment Agency (EA) (2010a).

The project was carried out to an agreed brief as set out in RSK's proposal (ref. 313498-T01 (00), dated 30th September 2016). The scope of works for the assessment included:

- a review of a preliminary risk assessment (PRA) undertaken by GRM Development Solutions. This information is used to review and develop an initial conceptual site model (CSM) to consider any potentially complete pollutant linkages;
- an intrusive investigation consisting of 13no boreholes and 30no trial pits with laboratory analysis and subsequent groundwater and gas monitoring;
- a subsequent programme of gas and groundwater monitoring consisting of six visits;
- the development of a refined CSM following the intrusive investigation;
- Generic Quantitative Risk Assessment (GQRA) to assess any potentially complete pollutant linkages identified by the PRA;
- the identification of outline mitigation measures for the remediation of complete pollutant linkages, if present;
- an assessment of the soil chemical test results with regard to the waste disposal implications of arisings; and
- a review of geotechnical data and recommendations for geotechnical design in relation to the proposed development.

1.4 Existing reports

The site has previously been subject to a Preliminary Risk Assessment (PRA), undertaken by GRM development Solutions in July 2013 (Phase 1 Site Appraisal (Desk Study), GRM Development Solutions, ref.: GRM/P6914/DS.2). The intrusive investigation and site assessment undertaken herein has been designed on the basis of the recommendations made within the PRA, as summarised within Section 2.

1.5 Limitations

The comments given in this report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account.

In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows may vary from those reported due to seasonal, or other, effects.

Whilst asbestos containing materials were not identified during the fieldworks or supporting laboratory analysis, asbestos is often present in discrete areas. Thus, although not encountered during the site investigation, may be found during more extensive ground works.

2 PRELIMINARY CONCEPTUAL MODEL

As discussed above, the Site Appraisal undertaken by GRM has been used to compile the following preliminary Conceptual Site Model (CSM).

2.1 Site details

The site is located off Whitepost Road, Banbury at National Grid reference SP 445586 238312, as shown on Figure 1.

The site is located approximately 2km south west of Banbury town centre, and is presently used mainly for crops consisting of two fields. An area of allotments is present adjacent to the south west of the site, and grounds associated with a nursery in the east of the site.

The site is generally flat with a very gentle grade to the south and consists of two fields, the largest of which occupies most of the site in the western area.

Several large mature trees are present at the northern field boundary in the east of the site, south of the vicarage. Hedgerows occur along most of the site boundaries and along an internal north south aligned field boundary.

No evidence of asbestos, waste, fly tipping or drums were noted at the site. Overhead telephone cables occur in the north of the site crossing in an east west direction and also in a north south direction partly along the boundary between the western and eastern fields. A public footpath crosses the site through the western field in a north south direction from Salt Way at the northern boundary to Wykham Lane at the southern boundary.

An area of allotments which are owned by a local charity occurs adjacent to the south west of the site and is accessed off Wykham Lane.

A tarmaccadam access road off White Post Road and to Banbury Cricket Club occurs in the east of the site, and this has various mature trees set back from the access road.

2.2 Sources

The potential sources of contamination identified included:

- Pesticides and herbicides associated with agricultural use of land (low risk);
- Potential ground gasses from organic materials or made ground;
- Radon from natural strata; and

- Possible naturally elevated levels of metals (particularly arsenic) in topsoil.

2.3 Receptors

Given that the site is to be developed for residential redevelopment, the following receptors have been identified:

- future site users (residential occupants);
- groundwater beneath the site (Secondary (A) aquifer);
- buried concrete; and
- future buildings and structures.

Please note that short-term exposure to construction workers has not been evaluated as part of this assessment, as any risks are likely to be managed through health and safety procedures according to CDM regulations.

2.4 Pathways

The following potential pathways were identified, which could result in the formation of a potentially complete pollutant linkage:

- direct contact (soil and dust ingestion, dust inhalation and dermal contact);
- permeation of plastic water supply pipes and subsequent ingestion of impacted water supply;
- inhalation of hazardous ground gas;
- migration and accumulation of explosive gases;
- leaching and migration;
- direct contact with 'aggressive' ground chemistry, and
- plant root uptake

2.5 Risk levels

Based on the general absence of significant historical development at the site, and the agricultural nature of the previous use, the overall risk from land contamination at the site was considered to be low; however recommendations were made for intrusive investigation to confirm the absence of risks.

2.5.1 Data gaps and uncertainties

The above risk assessment has been based on data presented by GRM in their Site Appraisal report, as referenced above. Whilst RSK have endeavoured to validate the findings of the report from freely available information, maps and environmental

database reports included within appendices within the report, RSK has not undertaken a full desk based review. Freely available maps and online information has been reviewed to identify any changes occurring since the publication of the above report.

It should be appreciated that the GRM report has identified the site to be located within a radon affected area, as between 10% and 30% of homes are affected. The GRM report therefore recommends that full radon protection measures be adopted.

3 SITE INVESTIGATION METHODOLOGY

RSK carried out intrusive investigation work between 5th and 9th December 2016, with subsequent ground gas and groundwater monitoring between 12th December 2016 and 3rd February 2017; in order to assess the pollutant linkages identified within the outline conceptual model and to obtain further information relating to the engineering characteristics of the soils beneath the site.

The initial Conceptual Site Model (CSM) developed within the previous PRA has been refined following the investigation works, as detailed within Section 4.5.

3.1 Sampling strategy and methodology

The techniques adopted for the intrusive investigation were chosen based on the aims of the investigation and the anticipated ground conditions.

The sampling strategy was primarily focused on the characterisation of the shallow soils; in order to confirm or otherwise the presence of contamination, to inform drainage options, and to obtain soil parameters to facilitate geotechnical design.

The layout of the investigation was designed to provide non-targeted coverage across the site. An exploratory location plan is presented as Figure 3.

The investigation points were located with a Leica Smart Rover GPS based on coordinates obtained from planned location points plotted prior to site works.

Window sample boreholes were used to obtain representative samples for chemical and geotechnical laboratory testing, facilitate in-situ testing for geotechnical purposes and allow the installation of ground gas / groundwater monitoring wells.

Trial holes were used to accurately log the soils beneath the site, obtain representative samples for chemical and geotechnical laboratory testing, and to facilitate in-situ testing. Four of the trial pits were selected to undertake soakaway testing, in order to provide information on the infiltration characteristics of the shallow soils.

3.1.1 Health and safety considerations

Prior to breaking ground, each exploratory location was surveyed using a Cable Avoidance Tool (CAT), a corresponding signal generator, and published service records. Prior to commencing drilling, an inspection pit was excavated by hand to a depth of 1.20m bgl, or to rock head if shallower, in order to confirm the absence of buried utility apparatus at each borehole position. Buried utility apparatus was not encountered during the investigation.

3.1.2 Investigation locations

The investigation undertaken at the site comprised the following activities:

- construction of thirteen shallow window-sampler boreholes to depths of between 1.20m and 4.00m bgl;
- excavation of thirty trial pits to depths of between 1.30m and 4.50m bgl;
- in-situ soakage testing within three selected trial holes;
- the installation of eight combined ground gas and groundwater monitoring wells;
- completion of eight Clegg Impact Hammer tests to obtain indicative CBR values;
- a return ground gas and groundwater monitoring programme comprising six monitoring events; and
- associated laboratory testing of soil samples for environmental and geotechnical purposes.

The investigation and the soil descriptions were carried out in general accordance with 'BS 5930:2015 Code of Practice for Ground Investigations' (BSI, 2015) Full exploratory hole records, including results of the associated in-situ testing, are presented in Appendix E and the findings are discussed within Section 4.

3.1.3 Soil sampling, in-situ testing and laboratory analysis

A programme of laboratory testing, scheduled by RSK as detailed below, was carried out on selected samples obtained from the natural soils encountered beneath the site.

The environmental testing was undertaken in order to characterise the soils beneath the site, and to assess contaminant concentrations within soils encountered with regard to the potential sources identified within the CSM.

The details of the soil samples obtained during the intrusive investigation are recorded on the borehole records presented within Appendix E. The programme of chemical testing undertaken on the soil samples is presented in Table 1. Soils collected for laboratory analysis were collected in a variety of containers appropriate to the anticipated testing suite required. Samples were stored in accordance with the RSK quality procedures to maintain sample integrity and preservation and to minimise the chance of cross contamination.

Table 1: Summary of chemical analysis - soil

Analysis	No	Rationale
pH	28	Standard suite of geoenvironmental laboratory testing undertaken on representative samples of the shallow soil profile encountered in
Polycyclic Aromatic Hydrocarbons (PAH)	12	
Asbestos Screen	13	

Total Petroleum Hydrocarbons of the Criteria Working Group (TPHCWG), BTEX, MBTE	11	order to enable a quantitative assessment of risks to human health, and an evaluation of the potential implications for off-site disposal of site won arisings.
Total Organic Carbon (TOC)	12	
Metals (As, Cd, tCr, CrVI, Pb, Hg, Se, wsB, Cu, Ni, Zn)	28	
Pesticides	6	
Herbicides	6	
Leachable Metals (As, Cd, tCr, CrVI, Pb, Hg, Se, wsB, Cu, Ni, Zn)	5	
BARGE PBET testing	10	To enable detailed assessment of bioaccessibiltiy

The programme of geotechnical testing undertaken on samples obtained from the natural soils is presented within Table 2 below. The purpose of the laboratory testing was to assess the classification properties of the soils encountered, in order to inform the outline geotechnical design advice.

Table 2: Summary of geotechnical testing programme undertaken on soil samples

Analysis	No	Rationale
Moisture content	25	Classification testing undertaken on representative samples, to enable outline engineering parameters to be determined for the proposed foundation strata. Moisture content testing has been scheduled in order to determine the water content of the formation materials. Consistency limits have been scheduled in order to characterise the behaviour of clays when the water content is changing.
Consistency limits	25	
Sulphate BRE	6	Chemical testing undertaken on soil samples in order to determine levels of sulphates and thus evaluate the possible impacts on buried concrete structures.
Recompacted CBR	3	Laboratory analysis undertaken to determine the CBR values achieved when the sample is re-compacted at natural moisture content.

Standard penetration tests (SPTs) were undertaken at regular intervals within the boreholes in accordance with part 9 of BS 1377:1990 (BSI, 1990). Test results are given on the borehole records presented in Appendix E.

3.1.4 Ground gas monitoring

In line with the conceptual model, which indicated that made ground if present would represent the only potential gas source with a gas generation potential of low to moderate, response zones were installed to target the shallow soils. Dual gas taps were installed in line with BS8576. Monitoring has been undertaken over the course of six events, including periods of falling atmospheric pressures and after/during rainfall.

An infrared gas meter was used to measure gas flow, concentrations of carbon dioxide (CO_2), methane (CH_4) and oxygen (O_2) in percentage by volume, while hydrogen sulphide (H_2S) and carbon monoxide (CO) were recorded in parts per million. Initial and steady state concentrations were recorded. In addition, during the first monitoring round,

all wells were screened with a PID to establish if there are any interferences and cross-sensitivity of other hydrocarbons with the infrared gas meter.

The atmospheric pressure before and during monitoring, together with the weather conditions, were recorded.

All monitoring results together with the temporal conditions are contained within Appendix E and discussed in Section 4.4.

3.1.5 In-situ infiltration testing

Soakaway tests were carried out in TP08, TP27, and TP28 to establish the infiltration characteristics of the shallow soils.

The tests were carried out generally in accordance with the method described in BRE Digest 365 (BRE, 2007). This involved filling the pits with water from a water bowser and recording the drop in water level with time as the water soaked into the ground.

Given the limited rate of infiltration observed during the testing, testing was limited to one test per location.

The data is presented in Appendix D including the calculations in accordance with BS5930 (BSI, 1999).

4 GROUND CONDITIONS

The results of the intrusive investigation and subsequent laboratory analysis undertaken are detailed below. The descriptions of the strata encountered, notes regarding visual or olfactory evidence of contamination, list of samples taken, field observations of soil and groundwater, in-situ testing and details of monitoring well installations are included on the exploratory hole records presented in Appendix D.

4.1 Soil

The intrusive investigation generally confirmed the published geological sequence, with firm to stiff clays, weathered mudstones, sandstones and limestones associated with the Marlstone Rock Formation, which outcrops across the majority of the site, and the underlying Dyrham Formation, which was found to outcrop within the vicinity of TP17.

Made ground or visual / olfactory indicators of gross contamination were not encountered during the investigation.

For the purpose of discussion, the ground conditions encountered are summarised in Table 3 below, and discussed in further details within the subsequent sub-sections.

Table 3: General succession of strata encountered

Strata	Exploratory holes encountered	Depth to top of stratum (m bgl)	Thickness (m)
Topsoil	All	GL	0.20 to 0.95
Marlstone Rock Formation	All except TP17	0.20 to 0.95	0.25 to >3.10 (base not proven)
Dyrham Formation	WS2, WS3, WS5, WS6, WS9, WS11 TP5, TP6, TP8, TP9, TP12, TP13, TP16, TP17, TP18, TP20, TP21, TP23, TP25, TP26, TP28, TP29	0.50 to 1.90	Not proven (encountered to full depth of investigation)

4.1.1 Topsoil

Agricultural topsoil was encountered at all exploratory locations across the site, and typically comprised sandy gravelly clay with rounded fine to coarse gravel and many rootlets.

Visual or olfactory indicators of potential contamination were not encountered within the topsoil.

4.1.2 Marlstone Rock Formation

Weathered deposits associated with the Marlstone Rock Formation were encountered directly beneath the topsoil across the site, with the exception of TP17, where the Dyrham Formation outcrops at surface.

The stratum was typically encountered as an initial residual clay layer, progressing into more intact limestones and sandstones with depth.

In-situ and ex-situ testing (including laboratory testing) was undertaken on the weathered Marlstone Rock Formation, and key geotechnical parameters from the testing are included within Table 4.

In-situ Standard Penetration Tests (SPTs) undertaken within the residual soil layer typically returned N values in the order of 10 to 20, whilst SPTs undertaken within the more intact limestones and sandstones typically recorded N values in excess of 50, with the majority of the window sample boreholes being terminated at shallow depth due to the underlying bedrock.

Lower SPT N values were recorded within the north west corner of the site (WS1, WS12), suggesting that the near surface clays in this area may be of a softer consistency / lower strength than typically encountered across the remainder of the site. This is not considered typical of the strata encountered across the site, and may be due to a localised weathering / water action / reworking of the soils.

Further discussion of the consistency of the weathered clays and recommendations for foundations are given within Section 6.

Table 4: Summary of in-situ and laboratory test results for the Marlstone Rock Formation

Soil parameters	Range	Reference
Liquid limit (%)	43 to 63	Appendix F
Plasticity limit (%)	24 to 44	Appendix F
Plasticity index (%)	15 to 27	Appendix F
Modified Plasticity Index	9 to 22	Appendix F
Volume change potential	Low to medium	Appendix F
Plasticity term	Intermediate (CI) to High (CH)	Appendix F
Moisture content (%)	23 to 48	Appendix F
SPT 'N' values	Typically 10 to 20 (clay), and >50 (weak limestones and sandstones)	Appendix D
Undrained shear strength measured by shear vane testing (kN/m^2)	Typically >80kN/m^2	Appendix D
Stiffness term	Stiff	-

4.1.3 Dyrham Formation

Weathered deposits associated with the Dyrham Formation were predominantly encountered beneath the overlying Marlstone Rock Formation, with the exception of TP17, where the Dyrham Formation was found to outcrop at surface.

The stratum was typically encountered as an initial residual clay layer, progressing into more intact mudstones and siltstones with depth.

In-situ and ex-situ testing (including laboratory testing) was undertaken on the weathered Marlstone Rock Formation, and key geotechnical parameters from the testing are included within Table 5.

In-situ Standard Penetration Tests (SPTs) undertaken within the residual soil layer typically returned N values in the order of 10 to 20, whilst SPTs undertaken within the more intact mudstones and siltstones typically recorded N values in excess of 50, with the majority of the window sample boreholes being terminated at shallow depth due to the underlying bedrock.

Table 5: Summary of in-situ and laboratory test results for the Dyrham Formation

Soil parameters	Range	Reference
Liquid limit (%)	31 to 48	Appendix F
Plasticity limit (%)	22 to 30	Appendix F
Plasticity index (%)	9 to 27	Appendix F
Modified Plasticity Index	8 to 27	Appendix F
Volume change potential	Low to medium	Appendix F
Plasticity term	Low (CL) to High (CH)	Appendix F
Moisture content (%)	21 to 27	Appendix F
SPT 'N' values	Typically 10 to 20 (clay), and >50 (weak mudstones and siltstones)	Appendix D
Undrained shear strength measured by shear vane testing (kN/m^2)	Typically >80kN/m^2	Appendix D
Stiffness term	Stiff	-

4.2 Groundwater

Localised groundwater strikes and seepages were encountered during the intrusive investigation works, as summarised in Table 6, below.

Table 6: Groundwater results during investigation

Location	Stratum	Depth (rise) (m bgl)	Notes on flow

Location	Stratum	Depth (rise) (m bgl)	Notes on flow
WS2	Marlstone Rock Formation	2.85	Strike
WS3	Marlstone Rock Formation	2.00	Strike
WS9	Marlstone Rock Formation	3.50	Strike
TP5	Marlstone Rock Formation	2.80	Seepage (minor)
TP6	Dyrham Formation	2.30	Seepage (minor)
	Dyrham Formation	4.50	Seepage (minor)
TP21	Dyrham Formation	2.80	Seepage (minor)
TP29	Dyrham Formation	3.10	Seepage (minor)

During the subsequent monitoring programme, groundwater was only encountered within four of the wells, as summarised within Table 7, and full details of the monitoring programme are presented within Appendix E.

It should be noted that groundwater levels might fluctuate for a number of reasons including seasonal variations. Ongoing monitoring would be required to establish both the full range of conditions and any trends in groundwater levels.

Table 7: Groundwater monitoring data

Location	Depth to groundwater (m bgl)
WS1	DRY
WS2	1.14 to 2.69
WS4	DRY
WS5	0.67 to 2.02
WS6	DRY to 2.17
WS7	DRY
WS8	DRY
WS11	0.90 to 2.86

4.3 Results of soakaway testing

The results of the soakaway testing are summarised in Table 8, and the results are presented in full in Appendix D, including the calculations in accordance with BS 5930 (BSI, 1999).

Table 8: Soakaway test results

Test ID	Stratum	Test result (m/s)
TP08	Marlstone Rock Formation	2.77×10^{-6}
TP27	Marlstone Rock Formation	5.92×10^{-6}
TP28	Dyrham Formation	7.77×10^{-7}

4.4 Ground gas regime

A programme of six ground gas monitoring visits has been undertaken at the site. The monitoring visits to date have been undertaken under atmospheric pressure conditions of 980 to 1020mb. The results of the ground gas monitoring programme indicate methane concentrations of 0.1% and carbon dioxide concentrations of up to 1.4%. Steady state flow rates of up to 1.3l/hr were recorded. The full results of the ground gas monitoring are given in Appendix G, and are assessed within Section 5.2.4, below.

4.5 Refinement of the initial conceptual site model

The initial CSM presented within Hydrock's PRA envisaged that the site would generally be underlain by mudstones and limestones, weathered to clays near surface.

This was generally confirmed by the intrusive investigation; which identified firm to stiff clays, weathered mudstones, sandstones and limestones associated with the Marlstone Rock Formation, which outcrops across the majority of the site, and the underlying Dyrham Formation, which was found to outcrop within the vicinity of TP17.

Made ground or visual / olfactory indicators of gross contamination were not encountered during the investigation.

The CSM identified potential receptors as being residential end-users, and groundwater within the underlying Secondary (A) aquifer body. Although groundwater strikes and seepages were recorded at several locations during the intrusive investigation works, depths were typically in the order of 2 to 3m bgl. Furthermore, the soils encountered typically comprised low permeability clayey deposits associated with the weathered mudstones and limestones. In-situ trial pit soakage testing identified shallow infiltration rates as being in the order of 10^{-6} to 10^{-7} m/s. The significance of any migration pathways is therefore likely to be reduced.

The results of the laboratory analysis will therefore be used to inform a Generic Quantitative Risk Assessment (GQRA), undertaken in order to confirm the absence of risks for the following potentially complete pollutant linkages:

1. direct contact with impacted soil by future residential occupants of the site;
2. Inhalation of asbestos fibres;
3. accumulation and inhalation and / or explosion of hazardous ground gas;

4. ingestion of water supply impacted via permeation of potable water supply pipes; and
5. leaching and subsequent dissolved phase migration.

5 QUANTITATIVE RISK ASSESSMENT

In line with CLR11 (EA, 2014), there are two stages of quantitative risk assessment, Generic Quantitative Risk Assessment (GQRA) and Detailed Quantitative Risk Assessment (DQRA). The assessment undertaken within this report comprises a GQRA, and involves the comparison of the laboratory test results with the Generic Assessment Criteria (GAC) appropriate to the pollutant linkage being assessed.

Chemical analysis, including screening for asbestos fibres, has been undertaken on non-targeted soil samples obtained from a maximum depth of 0.70m bgl. The full results of the chemical laboratory analysis are presented within Appendix F.

The GAC used for this assessment are presented, along with details of their derivation; within Appendix G for human health, Appendix H for controlled water receptors and Appendix I for potable water supply pipes.

5.1 Linkages for assessment

The linkages requiring assessment, together with the method of assessment, are detailed in Table 9, below;

Table 9: Linkages for generic quantitative risk assessment

Potentially relevant pollutant linkage	Assessment method
1. Direct contact with impacted soil by residential end-users of the site	The assessment has been undertaken using the GAC calculated for a residential end use scenario, as it is understood that the site is to be redeveloped with new low rise residential dwellings with associated private gardens. This has initially been undertaken as a direct comparison of the laboratory data against a set of GAC calculated based on a combined direct contact and inhalation exposure pathway. Further detailed assessment using bioaccessibility data obtained from PBET BARGE testing has been undertaken.
2. Inhalation exposure of future residents to asbestos fibres	The risk associated with inhalation exposure to asbestos fibres has been undertaken on the basis of the asbestos mineral present (if any); their form, concentration, location and the nature of the proposed development.
3. Hazardous ground gas entering and accumulating in enclosed spaces or small rooms within buildings, which could result in inhalation by the Site end-users, or subsequent	Gas screening values (GSV) have been calculated using maximum methane and carbon dioxide concentrations with maximum flow rates recorded at the site. The GSV have been compared with the generic Traffic Lights, as presented within the NHBC ground gases guide (Boyle and Witherington, 2007) and the aforementioned CIRIA report

Potentially relevant pollutant linkage	Assessment method
explosion	C665, owing to the development comprising low-rise housing with suspended floors. In addition, the gas regime is considered within the context of a conceptual model as required by both aforementioned guidance documents and BS8576.
4. Ingestion of water supply impacted via permeation of potable water supply pipes	The assessment has been undertaken by means of a comparison of soil data against the relevant GAC for plastic water supply pipes using UKWIR (2010) guidance.
5. Leaching of soil contaminants and vertical migration	Comparison of soil leachate data to assessment criteria derived on the basis of a drinking water receptor. Consideration of the ground conditions encountered and the results of the laboratory testing programme undertaken on soils.

5.2 Methodology and results

The methodology for, and results of, the GQRA are presented for each pollutant linkage in turn.

5.2.1 Direct contact with impacted soil by end users of the site

End users of the site are defined as those who are exposed to sources of contamination on a regular and predictable basis. In the case of developments for a residential end use, the critical receptor is defined within SR3 as a 0 to 6 year old female. This is considered to be the most appropriate assessment model for the site, based on the proposed development of the site with low-rise residential dwellings and associated private gardens.

The chemical test results have been compared directly to the appropriate assessment criteria for each contaminant, based upon a Soil Organic Matter (SOM) of 1%. The direct comparison table, which presents the chemical laboratory data set compared against the appropriate GAC, is included within Appendix J.

The results of the initial screening indicate that concentrations are typically well below the relevant GAC.

Concentrations of arsenic, however, range from 44 to 168mg/kg; all of which are elevated above the relevant GAC (37mg/kg).

As such, a potentially complete pollutant linkage has been identified with regard to direct contact between the elevated arsenic concentrations within the shallow soils at the site, and residential end-users.

As discussed above, it should be appreciated that the site investigation did not identify any made ground or other potential anthropogenic sources of contamination; and the

elevated arsenic is therefore considered a naturally occurring product of the Jurassic mudstones which underlie the site.

5.2.2 Detailed human health risk assessment of naturally occurring arsenic using PBET extraction testing.

The generic assessment presented in Section 5.2.1 has indicated the presence of naturally occurring arsenic above the GAC indicating that potential risks to human health could potentially exist that require further assessment.

In order to assess whether a potential human health risk may exist, it is important to further understand the influence of the main exposure pathway for Arsenic in soil, which is via soil ingestion. It is not the total amount of As in the soil but the fraction that is absorbed into the body during soil ingestion (i.e. the bioavailable fraction), that is important for assessing human health risk.

This section provides further details on the expected background concentrations and a detailed human health assessment of the arsenic concentrations using the PBET BARGE test to determine the bioaccessible fraction.

a) Typical Background Concentrations

The site is noted to be underlain by the Marlstone Rock Formation at shallow depths, the BGS lexicon notes that locally this formation can increase in iron content into generally a ooidal ironstone. With reference to the borehole logs in Appendix D, some orange staining was noted in the Marlstone rock formation indicating the presence of an elevated iron content.

With reference to the contaminant distribution map located on the BGS website the site lies within an area where high background concentrations (above 74.4mg/kg) are present.

The Defra BGS document “Normal Background Concentrations (NBCs) of contaminants in English Soils”, 2012, indicates that ironstone has an NBC of 220mg/kg.

b) Arsenic Concentrations and PBET results

A summary of the arsenic concentrations detected along with the bioaccessible fraction analysed using the BARGE PBET test are presented in Table 10.

Table 10: Summary of the arsenic concentrations detected

Exploratory Hole Location	Depth (m)	Arsenic Concentration (mg/kg)	AS Barge Bioaccessible Fraction (%)
WS1	0.2	168	1.9
WS2	0.2	51	

Exploratory Hole Location	Depth (m)	Arsenic Concentration (mg/kg)	AS Barge Bioaccessible Fraction (%)
WS3	0.7	66	3.6
WS4	0.2	105	2.4
WS5	0.1	58	
WS6	0	84	
WS7	0	123	2.1
WS8	0.2	106	1.6
WS9	0	58	
WS11	0.1	84	3
TP1	0.5	148	1.4
TP3	0.2	139	1.6
TP4	0.2	124	
TP5	0	77	
TP7	0.1	141	1.6
TP27	0.2	44	
TP13	0.35	87	
TP14	0.4	125	
TP25	0.25	81	
TP21	0.35	54	
TP26	0.30	76	
TP10	0.20	129	
TP5	0.20	99	
TP20	0.50	89	
TP29	0.20	80	4.3
TP11	0.20	134	
TP22	0.10	101	
TP2	0.40	129	

As can be seen in the above table the testing for Arsenic indicates a range between 44mg/kg and 168mg/kg with a mean of 98.6mg/kg, all 28 of the tests undertaken are noted to be above the GAC of 37mg/kg. The arsenic concentrations detected are considered to be similar to the expected background concentrations noted in the section above.

The PBET BARGE testing indicates bioaccessibility fractions ranging from 1.4% to 4.3% with a mean of 2.35%. The PBET testing results are presented within Appendix M.

Statistical analysis of the results has been conducted in accordance with *Guidance on Comparing Soil Contamination Data with a Critical Concentration* (CIEH and CL:AIRE, 2008). Statistical analysis of the data has been undertaken using the CIEH statistics spreadsheet which is presented as Appendix M.

The statistical tests applied to the dataset are selected based on whether the data is normally or non-normally distributed. The distribution of the dataset has been assessed using the Shapiro-Wilks normality test. Where the dataset has been found to be normally distributed the one sample t-test is undertaken. Where data has been found to be non-normally distributed Chebyshev's theorem is utilised.

Analysis of the data set indicates that the data is normally distributed and therefore the one sample t-test has been undertaken, no outliers of the data set were indicated to be present.

The statistical analysis undertaken for Arsenic from the data presented in Appendix F indicated that the data was normally distributed and had a 95% UCL of 109mg/kg.

The Statistical analysis undertaken on the PBET bioaccessibility results indicated that the data was normally distributed and had a 95% UCL of 2.48%.

c) Detailed Risk Assessment for Arsenic

The detailed human health risk assessment is carried out for a site by comparing sample results directly and/or statistically to SSACs. SSACs are calculated with consideration given to the chemical and toxicological properties of the contaminant in question, the characteristics of soil, buildings, relevant pathways, exposure duration, ingestion rates, source depth etc. For this assessment consideration has been given to the soil type, including its Total Organic Carbon (TOC) and pH content, and the ingestion rate via PBET testing. No alterations have been made to toxicological, background or chemical specific parameters.

PBET testing simulates the human digestive system to determine how much arsenic will be retained within each of the digestive organs and is presented as a Relative Bioaccessibility (RBA) of the contaminants. The tests indicated that the RBA for arsenic ranged between 1.4% to 4.3% with a 95% UCL of 2.48%. The 95% UCL has been used for the assessment.

SSACs have been calculated for the site using the CLEA 1.07 human health risk assessment model and are based on a residential with plant uptake end use as defined within SR3 (female child aged 0-6 years old as the relevant receptor). The CLEA 1.07 model calculation sheets and the settings used in the model are presented within Appendix M.

The following parameters have been used within the CLEA model:

- Soil Type: Clay
- Soil Organic Matter: 1.43%

- pH: 6.85
- RBA Arsenic: 2.48%

The CLEA model run for arsenic with the input parameters noted above produces an SSAC for arsenic of 154mg/kg, which is noted to be higher than the calculated 95% UCL of 109mg/kg from the laboratory data presented in Appendix F, indicating an absence of a human health risk from the naturally occurring arsenic detected.

Potentially there could be some uncertainty over the degree of bioaccessibility across the site and whether the UCL could increase with a larger sample population. Though a sample population of n = 10, is considered sufficient to determine the UCL with some confidence there is a potential that an increase in population could vary the UCL.

To examine the potential effect in increasing the bioaccessibility the maximum value of 4.3% was inputted into the CLEA Model. This provided a calculated value of 144mg/kg. As can be seen this value is still higher than arsenic UCL of 109mg/kg indicating that an increase in the bioaccessibility is unlikely to result in an increase of risk.

It is therefore considered that the naturally occurring arsenic concentrations detected do not represent a risk to human health.

5.2.3 Inhalation exposure to asbestos fibres

Laboratory screening for asbestos identified no evidence of Asbestos Containing Material (ACM) within the samples screened. Furthermore, given the general absence of made ground at the site, the risk associated with inhalation exposure to asbestos fibres is considered to be low.

5.2.4 Inhalation and / or accumulation of hazardous ground gas

The results have been assessed in accordance with the guidance provided in BS8576, NHBC guidance and *CIRIA Report C665*.

CIRIA C665 identifies two types of development, termed Situation A (modified Wilson and Card method), appropriate to all development excluding traditional low-rise construction, and Situation B (National House-Building Council, NHBC) only appropriate to traditional low-rise construction with ventilated sub-floor voids.

Both methods are based on calculations of the limiting borehole gas volume flow for methane and carbon dioxide, renamed as the gas screening value (GSV). The GSV (litres of gas per hour) is calculated by multiplying borehole flow rate (litres per hour) and gas concentration (percent by volume).

In both situations, it is important to note that the GSV thresholds are guideline values and not absolute. The GSV thresholds may be exceeded in certain circumstances, if the site conceptual model indicates it is safe to do so. Similarly, consideration of additional factors such as very high concentrations of methane, should lead to consideration of the need to adopt a higher risk classification than the GSV threshold indicates.

The site is to be marketed for redevelopment with residential housing, and therefore falls under Situation B.

Situation B is a characterisation system developed by the NHBC (Boyle and Witherington, 2007), which relates only to low rise housing development constructed with a clear ventilated under-floor void. The system provides a risk-based approach that is designed to allow an identification of the required gas protection measures for low-rise housing by comparing the measured gas emission rates to generic “Traffic Lights”. The Traffic Lights include typical maximum concentrations that are provided for initial screening purposes and risk-based GSVs for situations where the typical maximum concentrations are exceeded. Based on the typical maximum gas concentrations and the GSVs, the appropriate Traffic Light, ranging from Green through Amber 1 and Amber 2 to Red, is determined from Table 8.7 of CIRIA C665.

In line with guidance presented within CIRIA C665 ‘Assessing Risks Posed by Hazardous Ground Gasses to Buildings’, a programme of six ground gas monitoring visits has been undertaken at the site.

The monitoring visits to date have been undertaken under atmospheric pressure conditions of 980 to 1020mb. The results of the ground gas monitoring programme indicate methane concentrations of 0.1% and carbon dioxide concentrations of up to 1.4%/vol. Steady state flow rates of up to 1.4l/hr were recorded.

The calculated GSVs for methane and carbon dioxide are therefore 0.0014l/hr and 0.0197l/hr respectively. Based on the results discussed above, the site has been given a classification of Green, a negligible gas regime, for which no protection measures are likely to be required.

It should be noted that the GRM report identified the site to be located within a radon affected area, as between 10% and 30% of homes are affected. The GRM report recommended that full radon protection measures be adopted.

5.2.5 Ingestion of impacted potable water supply

The results have been compared with the assessment criteria presented in Appendix I, which are reproduced from *UKWIR Report 10/WM/03/21 Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites* (UKWIR, 2010). For the purpose of this assessment, the results of the investigation have been compared against the threshold concentrations specified in Table 3.1 of Report 10/WM/03/21.

The results of the assessment indicate that a pollutant linkage associated with organic contamination of the shallow soils has not been identified at the site.

It should be noted that at the time of this investigation the future routes of water supply pipes had not been established, hence the investigation and sampling strategy may not be fully compliant with UKWIR recommendations. Consequently, a targeted investigation and specific sampling/analytical strategy may be required at a later date once the route(s) of the supply pipe(s) are known. It is recommended that the relevant water

supply company be contacted at an early stage to confirm its requirements for assessment.

5.2.6 Leaching and vertical migration of mobile contaminants

Based on the identification within the CSM of the underlying Secondary (A) aquifer as a potentially sensitive receptor, leachate analysis was undertaken on five representative samples of the shallow soils; in order to determine their metal leaching potential, and thus evaluate the potential risk level.

The results compared directly to the RSK's controlled waters GAC based on UK Drinking Water Standards (DWS).

The concentrations of metals identified within the soil leachate were all below the relevant GAC, with the majority being less than the laboratory limit of detection. Furthermore, made ground soils or visual / olfactory indicators of potential contamination were not encountered at the site during the intrusive investigation. As such, risks to controlled water bodies have not been identified to date.

6 GEOTECHNICAL SITE ASSESSMENT

6.1 Engineering considerations

Based on the information provided, it is understood that the site is being considered for development with the construction of new low-rise residential dwellings with associated private gardens, infrastructure and access roads.

At this stage, specific information has not been provided with regard to the design of the proposed development, and it has therefore been assumed that the proposed development will comprise relatively lightly loaded structures. It has also been assumed the ground-bearing floor slabs will not be required for the development, and that beam and block suspended flooring will be utilised.

6.2 Geotechnical hazards

A summary of commonly occurring geotechnical hazards is given in Table 11 together with an assessment of whether the site may be affected by each of the stated hazards.

Table 11: Summary of main potential geotechnical hazards that may affect site

Hazard category	Hazard status based on investigation findings / proposed development
Sudden lateral changes in ground conditions	The intrusive investigation identified firm to stiff clays, weathered mudstones and limestones, associated with the Marlstone Rock Formation which outcrops at surface across the majority of the site, and the Dyrham Formation which was found to outcrop at surface within TP17. The strength and composition of the soils encountered was found to be relatively consistent throughout. Lower SPT N values were recorded within the north west corner of the site (WS1, WS12), suggesting that the near surface clays in this area may be of a softer consistency / lower strength than typically encountered across the remainder of the site.
Shrinkable clay soils	Laboratory classification analysis indicates that the clay soils associated with the Marlstone Rock Formation and Dyrham Formation are of a medium volume change potential.
Highly compressible and low bearing capacity soils	As discussed above, the intrusive investigation typically encountered firm to stiff clays and weathered mudstones / limestones associated with the Marlstone Rock Formation and Dyrham Formation across the site, both of which were found to be relatively consistent and competent. Lower SPT N values were recorded within the north west corner of the site (WS1, WS12), suggesting that the near surface clays in this area may be of a softer consistency / lower strength than typically encountered across

Hazard category	Hazard status based on investigation findings / proposed development
	the remainder of the site. This is not considered typical of the strata encountered across the site, and may be due to a localised weathering / water action / reworking of the soils. Given the results of the in-situ testing, however, it is recommended that a watching brief be adopted during construction of foundations in this area, in order to confirm the presence of competent firm to stiff clays at foundation level.
Silt-rich soils susceptible to rapid loss of strength in wet conditions	Silts and silt rich clays were encountered at the site during the intrusive investigation, typically associated with the weathering of the siltstones and mudstones associated with the Dyrham Formation. It is therefore recommended that excavations do not remain open for prolonged periods, particularly in the presence of groundwater or during periods of inclement weather, due the susceptibility of the clays to loss of strength when exposed to wet conditions.
Running sand at and below water table	Instability of trial pits was recorded at a number of locations during the intrusive investigation, and consideration should therefore be given to the use of adequate support for open excavations and trenches.
Ground subject to or at risk from landslides	Unlikely to affect the site.
Rising groundwater table due to diminishing abstraction	Unlikely to affect the site.
Underground mining	The PRA report indicates that the site is not located within an area of recorded mining.
Existing sub-structures	Given the absence of previous development at the site, significant sub-structures are not likely to be encountered. The potential for buried utility apparatus should, however, be taken into account.
Adverse ground chemistry	See Section 6.3.6.
Note: Seismicity is not included in the above table as this is not normally a design consideration in the UK.	

6.3 Foundations

6.3.1 General suitability

Given the presence of competent natural soils at a relatively shallow depth it is considered likely that traditional spread footings will be suitable for the proposed residential development.

Lower SPT N values were recorded within the north west corner of the site (WS1, WS12), suggesting that the near surface clays in this area may be of a softer consistency / lower strength than typically encountered across the remainder of the site.

This is not considered typical of the strata encountered across the site, and may be due to a localised weathering / water action / reworking of the soils.

Given the results of the in-situ testing, however, it is recommended that a watching brief be adopted during construction of foundations in this area, in order to confirm the presence of competent firm to stiff clays at foundation level.

Should softened clays be identified by the watching brief, foundations may need to be locally deepened until competent clays are identified.

6.3.2 Shallow spread foundations

The recommendations for the design and construction of spread foundations in relation to the ground conditions are set out in Table 12.

Table 12: Design and construction of spread foundations

Design/construction considerations	Design/construction recommendations
Founding stratum	Competent firm to stiff clays, and weathered mudstones, sandstones, siltstones or limestones associated with the Marlstone Rock Formation and Dyrham Formation.
Depth	Foundations should be taken to a minimum depth of 0.90m below finished ground level and at least 0.1m into the founding stratum, or to any greater depth required in respect of the special design considerations given below.
Special design considerations	Owing to the presence of shrinkable soils, foundations should be designed taking into account all the normal precautions, including minimum founding depths, to minimise the risk of future foundation movements in accordance with NHBC standards or similar. The findings of the ground investigation indicate that foundation depths should be designed for shrinkable soils of medium volume change potential.
Bearing capacity	Spread foundations with a width of up to 1m and constructed on the competent firm to stiff clays at a minimum depth of 0.90m may be designed using a net allowable bearing pressure of 100kN/$m^{2.}$ The allowable bearing capacity includes an overall safety factor of 3 against bearing capacity failure and with total settlements associated with the bearing pressure estimated to be less than 25mm.
Stability of excavations	Instability of trial pits was recorded at a number of locations during the intrusive investigation, and consideration should therefore be given to the use of adequate support for open excavations and trenches.
Dewatering	Localised groundwater seepages and strikes were recorded at several locations during the intrusive investigation works, as discussed within

Design/construction considerations	Design/construction recommendations
	Section 4.2. Although widespread and persistent groundwater influx is not considered likely, it should be appreciated that some dewatering is likely to be required to facilitate foundation excavation. The nature of the weathered bedrock encountered suggests that pumping from open sumps should be sufficient to keep the excavations reasonably dry at the majority of locations. Where silts are encountered, however, pumping from open sumps should be avoided in order to minimise the loss of fines from the surrounding soils.
Construction considerations	All foundation excavations should be inspected, and any made ground and soft, organic or otherwise unsuitable materials removed and replaced with mass concrete.

6.4 Roads and hardstanding

The intrusive investigation encountered a shallow soil profile typically comprising topsoil over low to medium plasticity sandy / gravelly clays and silts, associated with the weathering of the Marlstone Rock Formation, which outcrops across the majority of the site, and the Dyrham Formation, which outcrops across the central part of the site.

Laboratory testing of the clay soils identified modified plasticity indices ranging from <10% to 27%.

Reference to Table C1 in TRRL (1984) Report LR1132 (Ref No.15) indicates the estimated equilibrium CBR value for medium plasticity sandy / gravelly clays and silts under a completed pavement, is 2 to 3%.

In-situ determination of indicative CBR values has been undertaken at the site using hand-held Clegg Impact Hammer apparatus. For the purpose of discussion, the results are summarised in Table 13.

Table 13: Summary of CBR values determined from Clegg Hammer approximation

Test location	Depth	Soil type	CBR range (%)
TP1	0.30	Soft slightly sandy Clay	6
TP8	0.30	Soft slightly sandy Clay	5
TP9	0.4	Soft slightly sandy Clay	5
TP12	0.35	Soft slightly sandy Clay	5
TP13	0.3	Soft slightly sandy Clay	6
TP14	0.35	Soft slightly sandy Clay	6
TP15	0.25	Soft slightly sandy Clay	9

Test location	Depth	Soil type	CBR range (%)
TP20	0.20	Soft slightly sandy Clay	6

In addition, recompacted CBR analysis has been undertaken within the laboratory, on representative remoulded samples of the weathered Marlstone Rock Formation. The results identified CBR values of between 3 and 8%; although it should be appreciated that the silt rich nature of the soils means that they are likely to be susceptible to degradation under the influence of water.

Following consideration of the in-situ Clegg Hammer results, the laboratory analysis on remoulded samples, and the recommended equilibrium values for the ground conditions encountered; a CBR value of 3% is recommended for design purposes.

This value assume careful examination and rolling of the formation. Localised soft and hard spots should be identified during construction, excavated, and replaced with suitable engineered fill.

Given the potential for deterioration of the surface during construction, it is recommended that CBR testing is undertaken at the final formation level of the proposed road pavement when exposed during enabling works, in order to confirm the CBR adopted for design.

Based on the results of the laboratory classification testing undertaken, the soils are likely to be frost-susceptible, based upon the criteria given in Appendix 1 of TRRL (1970) Report Road Note 29.

6.4.1 Chemical attack on buried concrete

This assessment of the potential for chemical attack on buried concrete is based on current BRE guidance, as outlined within *Special Digest 1: 2005 Concrete in aggressive ground* (BRE, 2005).

The results of chemical tests carried out on soil samples indicate water soluble sulphate contents of <10mg/l to 344mg/l, with a characteristic value of 186mg/l (taken as lowest 20% of available results).

pH values were found to range from 5.53 to 7.89, with a characteristic value of 6.14 (taken as lowest 20% of available results).

Due to the potential for pyrite-bearing materials to be present within the underlying geology, characteristic values of Acid Soluble (AS) sulphate, Total Potential Sulphate (TPS) and Oxidisable Sulphides (OS) have been determined. The results of the laboratory testing indicates maximum values of 3.93% (TPS) and 3.8% (OS).

Within the majority of the samples analysed, the proportion of OS was less than 0.3%, and thus significant pyrite was not found to be present within the majority of the samples analysed.

It should be appreciated that the majority of the samples analysed reflect the shallow residual soils (i.e. completely weathered deposits), where sulphate, sulphide and pyrite contents may typically be lower due to prior weathering of the material and subsequent leaching of sulphates via rainfall.

Within a sample of the intact siltstones associated with the Dyrham Formation, obtained at a depth of 4.40m bgl within TP6, elevated concentrations of TPS (3.95%) and OS (3.8%) were identified, indicating the presence of pyrite within the un-weathered bedrock materials.

As such, on the basis of the water soluble sulphate contents identified, a Design Sulphate class of DS-1 and a corresponding Aggressive Chemical Environment for Concrete (ACEC) class of AC-1 may be assumed for the completely weathered residual clays.

Should foundations / excavations extend into the un-weathered zone and encounter more intact siltstones and mudstones, it should be appreciated that the available test data indicates that a significant pyrite content is likely to be present.

These pyrites will be susceptible to rapid oxidisation to sulphates if exposed to air and water by construction activities.

Based on the TPS and OS content identified within the sample of this material taken from TP6 at 4.40m bgl, a Design Sulphate class of DS-5 and a corresponding ACEC class of AC-5 would be expected within the un-weathered zone. As the DS class for water soluble sulphate is less than DS3, the DS5 class noted above can be limited to DS4.

As this is based on a single test result, should construction activities be planned which are likely to result in the exposure and disturbance of the un-weathered geology, it is recommended that additional testing of the intact material be undertaken to ascertain the final design class.

6.4.2 Soakaways

Based upon the results of the preliminary in-situ soakage testing, infiltration rates within the Marlstone Rock Formation ranged between 2.77 and 5.92 x 10^{-6} m/s.

Additional testing undertaken within the Dyrham Formation at TP28 identified an infiltration rate of 7.77 x 10^{-7}m/s.

Based on the general composition of the materials encountered, the Marlstone Rock Formation is more likely to prove suitable for the adoption of shallow soakaways to discharge surface run-off; due to the presence of weathered sandstones and limestones.

By comparison, the Dyrham Formation, which outcrops within the central part of the site, comprised primarily siltstones and mudstones, hence the lower recorded infiltration rates.

Careful consideration should therefore be given to selecting the location and design details of any proposed soakaways, in relation to the variation in ground conditions encountered.

The EA should also be contacted at the design stage in order to obtain a 'consent to discharge'. This may not be forthcoming where soakage will be into or just above the water table. In addition, planning approval will have to be sought for their use.

7 REUSE OF MATERIALS AND WASTE

7.1 Reuse of suitable materials

Under the Waste Framework Directive naturally occurring soils are not considered waste if re-used on the site of origin for the purposes of development.

The Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) (CoP) was developed in consultation with the Environment Agency and development industry to enable the re-use of materials under certain scenarios and subject to demonstrating that specific criteria are met. The current re-use scenarios covered by the CoP comprise:

- re-use on the site of origin (with or without treatment)
- direct transfer of clean and natural soils between sites
- use in the development of land other than the site of origin following treatment at an authorised Hub site (including a fixed Soil Treatment Facility).

The importation of made ground soils (irrespective of contamination status) or crushed demolition materials is not currently permitted under the CoP and requires either a standard rules environmental permit or a U1 waste exemption (see below).

In the context of excavated materials used on sites undergoing development, four factors are considered to be of particular relevance in determining if the material is a waste or when it ceases to be waste:

- the aim of the Waste Framework Directive is not undermined, i.e. if the use of the material will create an unacceptable risk of pollution of the environment or harm to human health it is likely to be waste
- the material is certain to be used
- the material is suitable for use both chemically and geotechnically
- only the required quantity of material will be used.

The CoP requires the preparation of a materials management plan (MMP) that confirms the above factors will be met. This plan needs to be reviewed by a 'Qualified Person' (QP) who will then issue a declaration form to the EA. As the project progresses, data must be collated and on completion a verification report produced that shows the MMP was followed and describes any changes.

As the site has not been previously developed all excavation works are expected to generate only clean and naturally occurring soils. Under the Waste Framework Directive naturally occurring soils are not considered waste if re-used on the site of origin. However, if it is proposed to import clean and naturally occurring soils direct from another site, an MMP would need to be in place at the receiving site.

7.2 Wastes for landfill disposal

Wastes require pre-treatment prior to disposal at landfill. Pre-treatment must be a physical, thermal, chemical or biological process (including sorting) that changes the characteristics of the waste to reduce its volume, reduce its hazardous nature, facilitate its handling and enhance its recovery.

The latest, edition of the EA's 'Technical Guidance WM3' (2015) Guidance on the classification and assessment of waste, requires that within a mixed waste* the separately identifiable wastes are assessed separately. Mixing of different types of hazardous waste and hazardous waste with other waste substances is prohibited under the Waste Framework Directive. Wastes that have been mixed must be separated whenever possible.

It is best practice to provide your waste carrier (or the disposal site) with details of how the waste has been treated. Your waste carrier may provide a pre-treatment confirmation form or space on the waste transfer note to detail the pre-treatment.

The classification of waste soil is a two-stage process, the first being an assessment of whether the soil is considered hazardous or not following the guidance within Technical Guidance WM3. For off-site disposal to landfill the results of Waste Acceptance Criteria (WAC) testing must then be reviewed to establish if the soil is acceptable at the relevant class of landfill or requires pre-treatment to reduce specific hazardous properties.

7.2.1 Waste acceptance criteria

All inert, stable non-reactive hazardous and hazardous wastes have limit values (waste acceptance criteria) set out in legislation that must be met before that class of landfill can accept the waste. Currently, no WAC are in place for non-hazardous waste.

Soil and other materials that are found not to be hazardous may be classified as either non hazardous or inert. In order to determine whether they can be classed as inert the soil must be tested and found to be below the inert waste acceptance criteria.

7.2.2 Preliminary waste assessment

Envirolab (an RSK company) has developed a waste soils characterisation assessment tool (HASWASTE), which follows the guidance within Technical Guidance WM3. The analytical results have been assessed using this tool for potential off-site disposal of materials in the future. The results of the preliminary assessment indicate that none of the samples analysed have been classified as hazardous waste for landfill disposal purposes.

Furthermore, it is likely that natural soil arisings from site excavations can be designated as inert waste, subject to appropriate WAC screening.

7.3 Landfill tax

Waste producers disposing of material to landfill are required to pay landfill tax by HM Revenue and Customs.

The tax is chargeable by weight (tonnage) and two rates apply, either standard or lower rate. The lower rate only applies to those less polluting wastes as set out in the Landfill Tax (Qualifying Material) Order 2011, which include naturally occurring rock and soil, concrete, some minerals, some furnace slags and ash, and some low-activity organic compounds. Evidence confirming that the waste qualifies for the lower rate will be required, and standard rate tax will apply for the whole waste load for any loads of mixed waste.

Currently (since April 2016), standard rate landfill tax is £84.40 per tonne.

The lower rate of landfill tax applicable to less polluting wastes (i.e. 'inert' wastes) remains at £2.60 per tonne.

Material disposed of at a soil treatment centre will not be subject to landfill tax.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Environmental

The results of the Generic Quantitative Risk Assessment (GQRA) indicate that unacceptable risks to human health inhalation of asbestos fibres or ingestion of impacted water supply are unlikely to be associated with the site.

The results of the initial screening indicate that concentrations are typically well below the relevant GAC.

Concentrations of arsenic, however, range from 44 to 168mg/kg; all of which are elevated above the relevant GAC (37mg/kg).

As such, a potentially complete pollutant linkage has been identified with regard to direct contact between the elevated arsenic concentrations within the shallow soils at the site, and residential end-users.

As discussed above, it should be appreciated that the site investigation did not identify any made ground or other potential anthropogenic sources of contamination; and the elevated arsenic is therefore considered a naturally occurring product of the Jurassic mudstones which underlie the site.

In order to assess potential risks associated with naturally occurring arsenic associated with ironstone, 10no. samples were selected for the Physiologically Based Extraction Test (PBET) in order to ascertain the bioaccesibility of the identified arsenic. The PBET tests as a statistically calculated 95% UCL were input into the CLEA Model 1.07 to calculate an SSAC to compare against the arsenic concentrations presented in Appendix F.

The results of the assessment indicated that statistically the arsenic concentrations were below the SSAC, as such it is considered that the naturally occurring arsenic concentrations detected do not represent a risk to human health.

For soil gas risks the calculated GSVs, and the findings of the monitoring programme suggest that the site has been given a preliminary classification of Green; a negligible gas regime; and specific gas protection measures are not likely to be required.

8.2 Reuse of materials and waste

The results of the assessment indicate that the shallow samples obtained during the investigation have not been classified as hazardous. In addition, it is likely that natural soil arisings may be disposed of as inert wastes, subject to appropriate Waste Acceptance Criteria (WAC) analysis.

8.3 Geotechnical

Given the presence of competent natural soils at a relatively shallow depth it is considered likely that traditional spread footings will be suitable for the proposed residential development.

Lower SPT N values were recorded within the north west corner of the site (WS1, WS12), suggesting that the near surface clays in this area may be of a softer consistency / lower strength than typically encountered across the remainder of the site.

This is not considered typical of the strata encountered across the site, and may be due to a localised weathering / water action / reworking of the soils.

Given the results of the in-situ testing, however, it is recommended that a watching brief be adopted during construction of foundations in this area, in order to confirm the presence of competent firm to stiff clays at foundation level.

Should softened clays be identified by the watching brief, foundations may need to be locally deepened until competent clays are identified.

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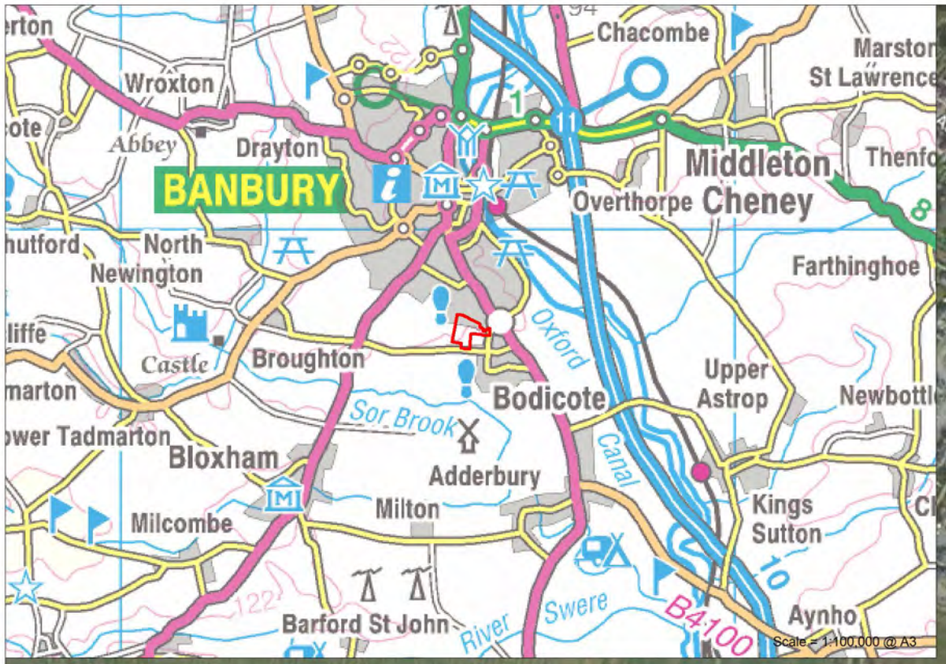
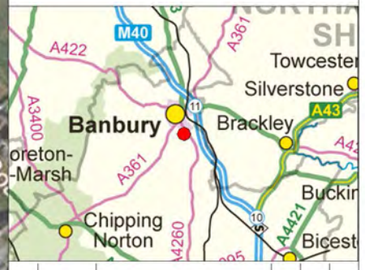
FIGURES



Site boundary



Rev	Date	Description	Drn	Chk	App
00	24.01.17	313498	RG	SP	MD

Whitepost Road Banbury

RSK

Figure 1

Site Location Plan

0 150
metres
Scale = 1:5,000 @ A3

N W E S

REV 00

File Name : Z:\GIS\Projects\Geo\313498 - Whitepost Road Banbury\GIS

Site boundary

Window Sample (WS)

Trial Pit (TP)

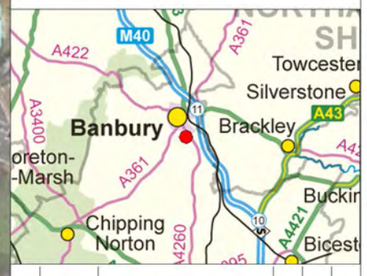
Trial Pit / California Bearing Ratio (TP/CBR)

Trial Pit / Shell and Auger (TP/SA)

Trial Pit / Shell and Auger/ California Bearing Ratio (TP/SA/CBR)

Archaeologically Sensitive Area

Footpath



Rev	Date	Description	Drn	Chk	App
00	02.02.17	313498	RG	SP	MD

Whitepost Road Banbury

RSK

Figure 2

Exploratory Borehole Plan

0 75

metres

Scale = 1:2,500 @ A3

N W E S

REV 00

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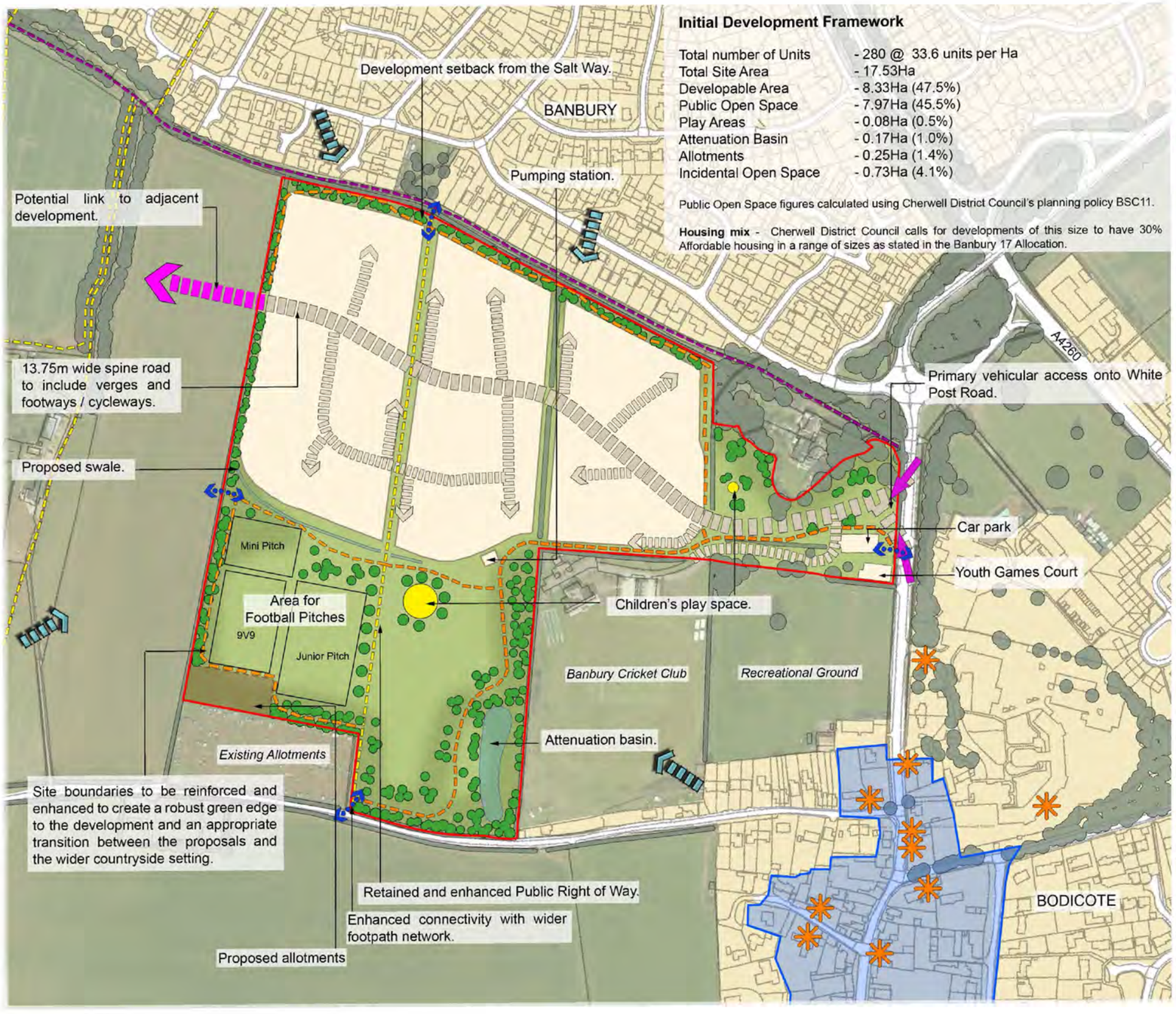


Initial Development Framework

Total number of Units	- 280 @ 33.6 units per Ha
Total Site Area	- 17.53Ha
Developable Area	- 8.33Ha (47.5%)
Public Open Space	- 7.97Ha (45.5%)
Play Areas	- 0.08Ha (0.5%)
Attenuation Basin	- 0.17Ha (1.0%)
Allotments	- 0.25Ha (1.4%)
Incidental Open Space	- 0.73Ha (4.1%)

Public Open Space figures calculated using Cherwell District Council's planning policy BSC11.

Housing mix - Cherwell District Council calls for developments of this size to have 30% Affordable housing in a range of sizes as stated in the Banbury 17 Allocation.

Key:

- Site Boundary
- Existing Vegetation to be Retained
- Proposed Indicative Vegetation Structures
- Developable Area
- Public Open Space
- Proposed Road Corridor (13.75m wide)
- Proposed Secondary Road Corridor
- Existing Access to Banbury Cricket Club
- Potential Site Access
- Existing Public Right of Way
- The Salt Way Public Right of Way
- Proposed Footway / Cycleway
- Potential Pedestrian / Cycle Access Points to be Enhanced
- Key Views
- Listed Buildings
- Conservation Area
- Potential Link to Adjacent Development
- Proposed Additional Allotments

REV	DATE	NOTE		
H	10.02.16	Updated to client comments	SLB	RF
G	29.09.15	Updated to client comments	SLB	RF
F	07.07.15	Updated to client comments	SLB	
E	01.07.15	Amended developable area	SLB	
D	30.06.15	Amended attenuation	SLB	RF
C	08.06.15	Updated to client comments	SLB	RF

REVISIONS

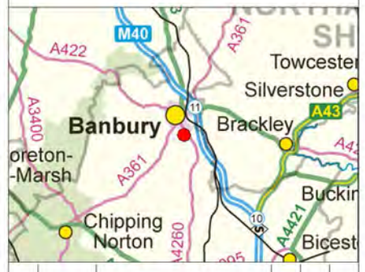
aspect landscape planning

TITLE
White Post Road, Banbury
Development Framework Plan

CLIENT
Gladman Developments

SCALE	DATE	DRAWN	CHK'D
not to scale	MAY 2015	SLB	RF

DRAWING NUMBER: 5713 / ASP03
REVISION: H



Rev	Date	Description	Drn	Chk	App
00	02.02.17	313498	RG	SP	MD

Whitepost Road Banbury

RSK

Figure 3

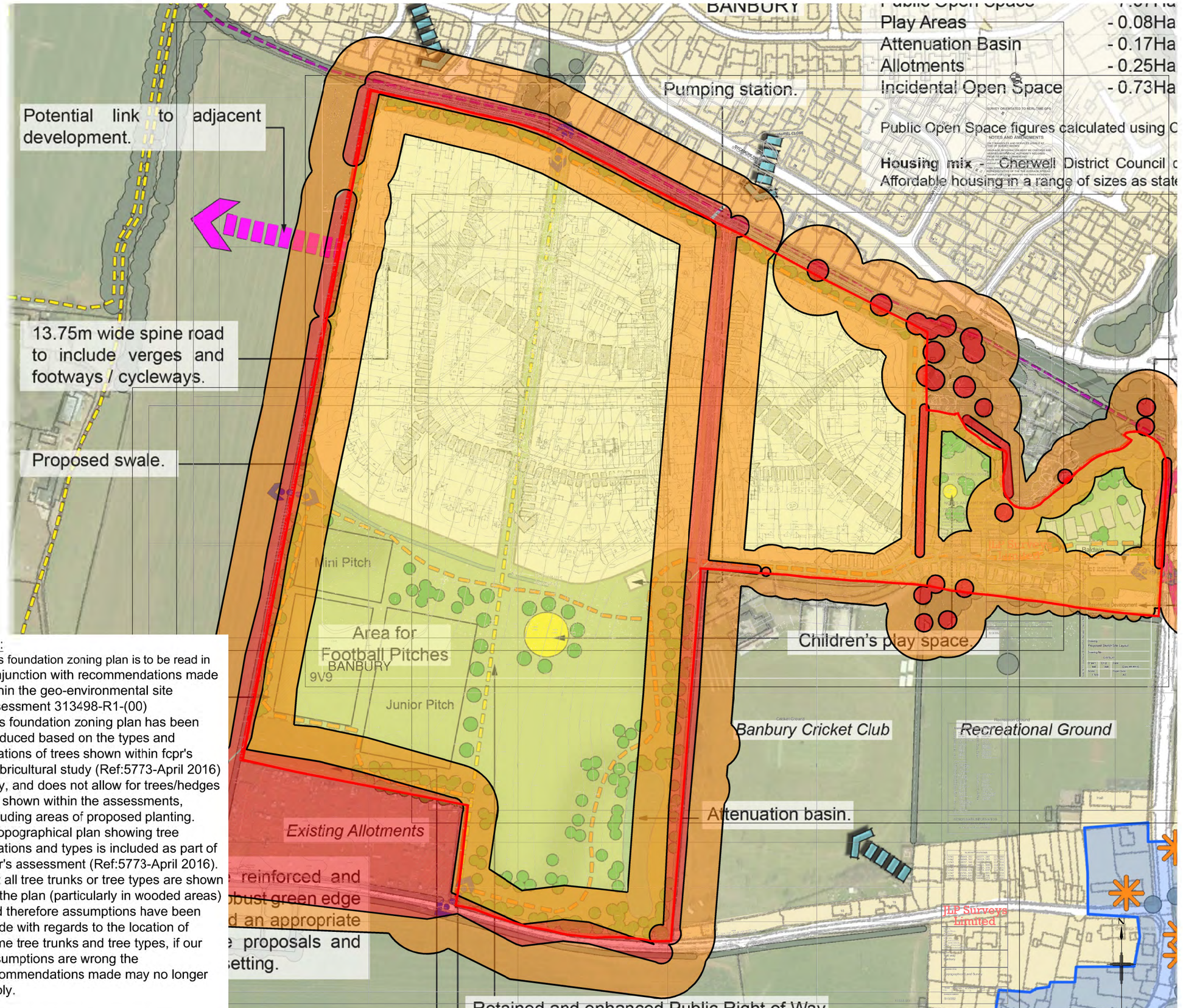
Development Framework Plan

0 120
metres
Scale = 1:4,000 @ A3

N W E S

REV 00

File Name : Z:\GIS\Projects\Geo\313498 - Whitepost Road Banbury\GIS



Notes:

- This foundation zoning plan is to be read in conjunction with recommendations made within the geo-environmental site assessment 313498-R1-(00)
- This foundation zoning plan has been produced based on the types and locations of trees shown within fcpr's arobricultural study (Ref:5773-April 2016) only, and does not allow for trees/hedges not shown within the assessments, including areas of proposed planting.
- A topographical plan showing tree locations and types is included as part of fcpr's assessment (Ref:5773-April 2016). Not all tree trunks or tree types are shown on the plan (particularly in wooded areas) and therefore assumptions have been made with regards to the location of some tree trunks and tree types, if our assumptions are wrong the recommendations made may no longer apply.

INDICATIVE LAYOUT

LEGEND:

- Foundations require piling
- Foundations require deepening
- Spread foundations with min. founding depths of 0.90m from existing ground level

Notes:

- Foundations on this site are to be designed and constructed in accordance with NHBC: Chapter 4.2 (Building near trees), a medium volume change potential and fcpr's arboricultural assessment (Ref: 5773- April 2016).
- Foundation strategy indicated above in accordance with existing levels. Foundation requirements subject to change following receipt of proposed FFL's.
- Foundations are to be taken to a moisture stable level which should be taken as the greater of:
  1) The minimum depths shown on the drawing, which are derived from chapter 4.2
  2) 500mm below evidence of live roots or other signs of desiccation.
- It is essential to ensure that the foundation bottom is inspected and approved by a competent person to ensure that there are no tree roots present. Alternatively material excavated from the trench bottom should be examined.
- If there is any doubt regarding the foundation depths, RSK should be contacted for advice.

REV	DATE	DESCRIPTION	BY	CHD.	APR.
A	30.01.17	FIRST ISSUE	JM	JG	JG

Dimensions	Projection	Scale	Orig Size
m		AS SHOWN	A3

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Web: www.rsk.co.uk

CLIENT
GLADMAN DEVELOPMENTS Ltd

PROJECT
WHITE POST ROAD, BANBURY

TITLE
FOUNDATION ZONING PLAN

JOB No.:	DRAWING FILE:
313498	Figure 4

BY:	DATE:	CONTRACT NO.		REV:
JM	30.01.17		DRAFT	A

Scale bar
0 12.5 25 27.5 50m

APPENDIX A
SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for Gladman developments Limited (the "client") in accordance with the terms of a contract between RSK and the "client". The Services were performed by RSK with the skill and care ordinarily exercised by a reasonable environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the client.

2. Other than that expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.

3. Unless otherwise agreed in writing the Services were performed by RSK exclusively for the purposes of the client. RSK is not aware of any interest of or reliance by any party other than the client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**

4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK 's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.

5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.

6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials.

7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a walk-over survey of the site together with RSK's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The Services are also based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely. The Services clearly are limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the walk-over survey. Further RSK was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services. RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the client and RSK.

8. The intrusive environmental site investigation aspects of the Services is a limited sampling of the site at pre-determined borehole and soil vapour locations based on the operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and RSK] [based on an understanding of the available operational and historical information,] and it should not be inferred that other chemical species are not present.

9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (boreholes, trial pits etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.

APPENDIX B
SUMMARY OF LEGISLATION AND POLICY RELATING TO CONTAMINATED LAND

Part IIA of the Environmental Protection Act 1990 (EPA) and its associated Contaminated Land Regulations 2000 (SI 2000/227), which came into force in England on 1 April 2000, formed the basis for the current regulatory framework and the statutory regime for the identification and remediation of contaminated land. Part IIA of the EPA 1990 defines contaminated land as 'any land which appears to the Local Authority in whose area it is situated to be in such a condition by reason of substances in, on or under the land, that significant harm is being caused, or that there is significant possibility of significant harm being caused, or that pollution of controlled waters is being or is likely to be caused'. Controlled waters are considered to include all groundwater, inland waters and estuaries.

In August 2006, the Contaminated Land (England) Regulations 2006 (SI 2006/1380) were implemented, which extended the statutory regime to include Part IIA of the EPA as originally introduced on 1 April 2000, together with changes intended chiefly to address land that is contaminated by virtue of radioactivity. These have been replaced subsequently by the Contaminated Land (England) (Amendment) Regulations 2012, which now exclude land that is contaminated by virtue of radioactivity.

The intention of Part IIA of the EPA is to deal with contaminated land issues that are considered to cause significant harm on land that is not undergoing development (see Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, April 2012). This document replaces Annex III of Defra Circular 01/2006, published in September 2006 (the remainder of this document is now obsolete).

Water Framework Directive (WFD)

The Water Framework Directive 2000/60/EC is designed to:

- enhance the status and prevent further deterioration of aquatic ecosystems and associated wetlands that depend on the aquatic ecosystems
- promote the sustainable use of water
- reduce pollution of water, especially by 'priority' and 'priority hazardous' substances
- ensure progressive reduction of groundwater pollution.

The WFD requires a management plan for each river basin be developed every six years.

Groundwater Directive (GWD)

The 1980 Groundwater Directive 80/68/EEC and the 2006 Groundwater Daughter Directive 2006/118/EC of the WFD are the main European legislation in place to protect groundwater. The 1980 Directive is due to be repealed in December 2013. The European legislation has been transposed into national legislation by regulations and directions to the Environment Agency.

Environmental Permitting Regulations (EPR)

The Environmental Permitting (England and Wales) Regulations 2010 provide a single regulatory framework that streamlines and integrates waste management licensing, pollution prevention and control, water discharge consenting, groundwater authorisations, and radioactive substances regulation. Schedule 22, paragraph 6 of EPR 2010 states: 'the regulator must, in exercising its relevant functions, take all necessary measures - (a) to prevent the input of any hazardous substance to groundwater; and (b) to limit the input of non-hazardous pollutants to groundwater so as to ensure that such inputs do not cause pollution of groundwater.'

Water Resources Act (WRA)

The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 updated the Water Resources Act 1991, which introduced the offence of causing or knowingly permitting pollution of controlled waters. The Act provides the Environment Agency with powers to implement remediation necessary to protect controlled waters and recover all reasonable costs of doing so.

Priority Substances Directive (PSD)

The Priority Substances Directive 2008/105/EC is a 'Daughter' Directive of the WFD, which sets out a priority list of substances posing a threat to or via the aquatic environment. The PSD establishes environmental quality standards for priority substances, which have been set at concentrations that are safe for the aquatic environment and for human health. In addition, there is a further aim of reducing (or eliminating) pollution of surface water (rivers, lakes, estuaries and coastal waters) by pollutants on the list. The WFD requires that countries establish a list of dangerous substances that are being discharged and EQS for them. In England and Wales, this list is provided in the River Basin Districts Typology, Standards and Groundwater threshold values (Water Framework Directive) (England and Wales) Directions 2010. In order to achieve the objectives of the WFD, classification schemes are used to describe where the water environment is of good quality and where it may require improvement.

Planning Policy

Contaminated land is often dealt with through planning because of land redevelopment. This approach was documented in Planning Policy Statement: Planning and Pollution Control PPS23, which states that it remains the responsibility of the landowner and developer to identify land affected by contamination and carry out sufficient remediation to render the land suitable for use.

PPS23 was withdrawn early in 2012 and has been replaced by much reduced guidance within the National Planning Policy Framework (NPPF).

The new framework has only limited guidance on contaminated land, as follows:

- *"planning policies and decisions should also ensure that:*
    - *the site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation;*
    - *after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and*
    - *adequate site investigation information, prepared by a competent person, is presented".*

APPENDIX C
RISK ASSESSMENT METHODOLOGY

CLR11 outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. Under CLR11, three stages of risk assessment exist: preliminary, generic quantitative and detailed quantitative. An outline conceptual model should be formed at the preliminary risk assessment stage that collates all the existing information pertaining to a site in text, tabular or diagrammatic form. The outline conceptual model identifies potentially complete (termed possible) pollutant linkages (contaminant–pathway–receptor) and is used as the basis for the design of the site investigation. The outline conceptual model is updated as further information becomes available, for example as a result of the site investigation.

Production of a conceptual model requires an assessment of risk to be made. Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the likelihood and the consequences of an event must be taken into account when assessing risk. RSK has adopted guidance provided in CIRIA C552 for use in the production of conceptual models.

The likelihood of an event can be classified on a four-point system using the following terms and definitions based on CIRIA C552:

- highly likely: the event appears 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: it is probable that an event will occur or circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term
- low likelihood: circumstances are possible under which an event could occur, but it is not certain even in the long term that an event would occur and it is less likely in the short term
- unlikely: circumstances are such that it is improbable the event would occur even in the long term.

The severity can be classified using a similar system also based on CIRIA C552. The terms and definitions relating to severity are:

- severe: short term (acute) risk to human health likely to result in ‘significant harm’ as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. Short-term risk to an ecosystem or organism forming part of that ecosystem (note definition of ecosystem in ‘Draft Circular on Contaminated Land’, DETR 2000)
- medium: chronic damage to human health (‘significant harm’ as defined in ‘Draft Circular on Contaminated Land’, DETR 2000), pollution of sensitive water resources, significant change in an ecosystem or organism forming part of that ecosystem

- mild: pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures or the environment
- minor: harm, not necessarily significant, but that could result in financial loss or expenditure to resolve. Non-permanent human health effects easily prevented by use of personal protective clothing. Easily repairable damage to buildings, structures and services.

Once the probability of an event occurring and its consequences have been classified, a risk category can be assigned according to the table below.

		Consequences			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**Highly likely**	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very low	Very low

Definitions of these risk categories are as follows together with an assessment of the further work that may be required:

- Very high: there is a high probability that severe harm could occur or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability; urgent investigation and remediation are likely to be required.
- High: harm is likely to occur. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required. Remedial works may be necessary in the short term and are likely over the long term.
- Moderate: it is possible that harm could arise, but it is unlikely that the harm would be severe and it is more likely that the harm would be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term.
- Low: it is possible that harm could occur, but it is likely that if realised this harm would at worst normally be mild.
- Very low: there is a low possibility that harm could occur and if realised the harm is unlikely to be severe.

APPENDIX D
FIELD RECORDS

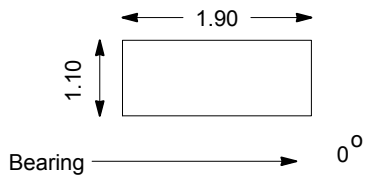
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP1**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**07.12.16**	**---**	**---**	**1** of **1**
	End: **07.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.50 0.50 0.50	1 2	B ES PID	1xT, 1xJ, 1xV 4.0ppm			Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	0.25	
						Soft to firm grey and reddish brown gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse limestone and sandstone. (MARLSTONE ROCK FORMATION)	(0.50) 0.75	
						Shelly limestone and sandstone recovered as gravel and cobbles in very sandy CLAY matrix. Iron staining present. (MARLSTONE ROCK FORMATION) . . . at 1.00m large cobbles.	(0.75) 1.50	
						Trial pit terminated at 1.50m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. Backfilled with arisings on completion.
4. Hole unstable from 1.00m depth so hand vane not possible.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

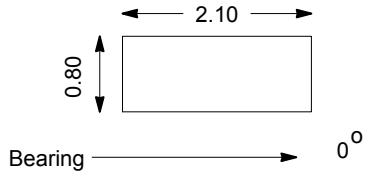
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP2**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**07.12.16** End: **07.12.16**	**---**	**---**	**1** of **1**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.35) 0.35	
0.40	1	ES	1xT, 1xJ, 1xV			Soft to firm dark brown sandy gravelly CLAY. Gravel is angular fine to coarse limestone and sandstone. (MARLSTONE ROCK FORMATION)	(0.50) 0.85	
0.60 0.60	2	B PID	2.1ppm					
1.20 1.20	3	B PID	2.2ppm			Shelly crystalline LIMESTONE AND SANDSTONE with calcite veining recovered as gravel and cobbles in a sandy clayey matrix. Gravel is angular medium to coarse limestone. Cobbles up to 800mm. (MARLSTONE ROCK FORMATION)	(1.45) 2.30	
						Trial pit terminated at 2.30m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. Backfilled with arisings on completion.
4. Unstable from 1.30m depth.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

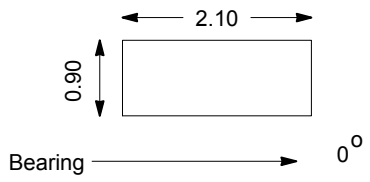
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP3**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**07.12.16**	**---**	**---**	**1** of **1**
	End: **07.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20	1	ES	1xT, 1xJ, 1xV			Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.30)	
0.30-0.50	1	B					0.30	
						Soft to firm dark brown sandy slightly gravelly CLAY. Gravel is subangular to angular fine to coarse limestone and sandstone. (MARLSTONE ROCK FORMATION)	(0.30)	
							0.60	
0.80		PID	2.7ppm			Firm light orangish brown slightly gravelly sandy CLAY. Gravel is subangular to angular fine to coarse limestone. (MARLSTONE ROCK FORMATION)		
0.90	2	B					(1.00)	
							1.60	
2.10	3	B				Shelly crystalline LIMESTONE AND SANDSTONE recovered as gravel and cobbles up to 300mm with very sandy CLAY matrix. (MARLSTONE ROCK FORMATION)	(0.90)	
2.10		PID	3.1ppm					
							2.50	
						Trial pit terminated at 2.50m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. Backfilled with arisings on completion.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

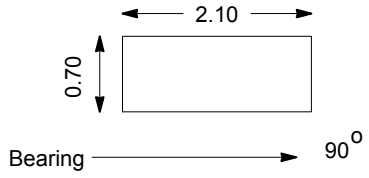
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP4**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**07.12.16**	**---**	**---**	**1** of **1**
	End: **07.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.30)	
0.20	1	ES					0.30	
0.40	2	B				Soft to firm dark brown sandy slightly gravelly CLAY. Gravel is subangular to angular fine to coarse limestone and sandstone. (MARLSTONE ROCK FORMATION)	(0.50)	
							0.80	
						Shelly crystalline LIMESTONE AND SANDSTONE recovered as gravel and cobbles up to 300mm with very sandy CLAY matrix. (MARLSTONE ROCK FORMATION)		
						. . . from 1.10m many large cobbles.		
1.50-2.00 1.50	3	B PID	0.3ppm				(1.30)	
							2.10	
						Trial pit terminated at 2.10m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. Backfilled with arisings on completion.
4. Unstable from 0.80m depth.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

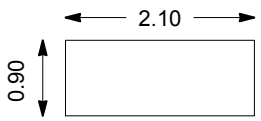
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP5**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**07.12.16**	**---**	**---**	**1** of **1**
	End: **07.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.00-0.20	1	ES	1xT, 1xJ, 1xV			Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.30) 0.30	
						Soft to firm dark brown sandy slightly gravelly CLAY. Gravel is subangular to angular fine to coarse limestone and sandstone. (MARLSTONE ROCK FORMATION)	(0.80) 1.10	
1.40 1.40	1	B PID	0.9ppm			Firm to stiff light grey mottled orangish brown silty CLAY with occasional reddish brown mudstone lithorelicts. (DYRHAM FORMATION)		
						. . . from 1.90m imprints of shells along relict bedding. . . . from 2.00m fine sandy orangish brown laminae.	(1.80)	
2.50 2.50	2	B PID	1.1ppm	≈		. . . from 2.20m relict blocky bedding >5cm. Completely weathered mudstone. . . . from 2.30m becoming very stiff recovered as fine coarse gravel sized pieces.	2.90	
						Trial pit terminated at 2.90m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. Backfilled with arisings on completion.
3. Seepage at 2.80m depth (minor).

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

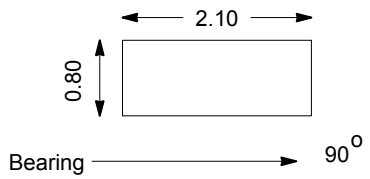
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP6**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**07.12.16**	**---**	**---**	**1** of **1**
	End: **07.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10-0.30	1	ES				Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.30) 0.30	
						Soft to firm dark brown sandy slightly gravelly CLAY. Gravel is subangular to angular fine to coarse limestone and sandstone. (MARLSTONE ROCK FORMATION)	(1.00) 1.30	
1.10-1.30	2	ES						
1.35 1.35	1	B PID	2.2ppm			Light firm light grey mottled orangish brown slightly sandy silty CLAY. Sand is fine to medium. (MARLSTONE ROCK FORMATION)	(0.60) 1.90	
2.35	2	B		≈		Very weak to strong light grey mottled orangish brown stained MUDSTONE. Recovered as subangular to subrounded fine to coarse gravel and cobble sized lithorelicts. Gravel is very weak lithorelicts. (DYRHAM FORMATION) . . . at 2.40m recovered of gravel to cobble sized mudstone lithorelicts with micaceous bands.	(1.80) 3.70	
3.80 3.80	3	B PID	3.1ppm			Very weak bluish grey micacous SILTSTONE (completely weathered. (DYRHAM FORMATION)	(0.80) 4.50	
				≈		Trial pit terminated at 4.50m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. Water seepages encountered at 2.40 and 4.50m bgl.
3. Backfilled with arisings on completion.

All dimensions in metres | Scale: **1:28**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

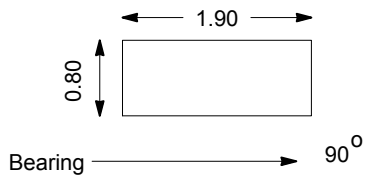
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP7**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**07.12.16**	**---**	**---**	**1** of **1**
	End: **07.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10	1	ES	1xT, 1xJ, 1xV			Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.40) 0.40	
						Soft to firm dark brown sandy slightly gravelly CLAY. Gravel is subangular to angular fine to coarse limestone and sandstone. (MARLSTONE ROCK FORMATION)	(0.40) 0.80	
1.80	1	B				Firm light orangish grey very sandy CLAY. Gravel is angular fine to coarse sandstone, calcite and veined limestone. (MARLSTONE ROCK FORMATION)	(1.80)	
1.80		PID	1.1ppm			. . . from 1.30m cobbles of sandstone and veined limestone.		
2.00	2	B						
2.00		PID	2.4ppm					
						Completely mottled SANDSTONE and LIMESTONE bedrock recovered as angular cobbles and boulders. Cobbles are shelly with orangish brown staining. (MARLSTONE ROCK FORMATION)	(0.50) 3.10	
						Trial pit terminated at 3.10m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. Backfilled with arisings on completion.
4. Unstable from 2.10m depth to collapse of wall.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

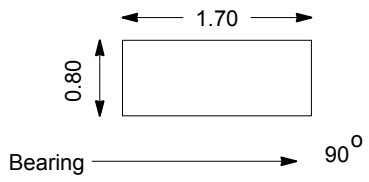
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP8**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**07.12.16**	**---**	**---**	**1** of **1**
	End: **07.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20	1	ES	1xT, 1xJ, 1xV			Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.30) 0.30	
0.60 0.60	1	B PID	2.1ppm			Soft to firm dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is subangular to angular fine to coarse sandstone. (MARLSTONE ROCK FORMATION)	(0.60) 0.90	
						Stiff light grey mottled orangish brown silty CLAY with fine sandy laminae. Completely weathered siltstone. (DYRHAM FORMATION)	(1.30)	
						. . . from 1.80m blocky structure.	2.20	
						Trial pit terminated at 2.20m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. Backfilled with arisings on completion.
4. Soakaway conducted.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

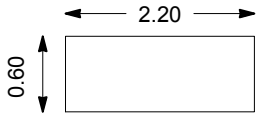
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP9**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**06.12.16**	**---**	**---**	**1** of **1**
	End: **06.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10	1	ES	1xJ, 1xV			Grass over dark reddish brown very clayey SAND very sandy CLAY. Sand is fine. (AGRICULTURAL TOPSOIL) (TOPSOIL)	(0.40) 0.40	
						Soft to firm dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is subangular to angular fine to coarse sandstone. (MARLSTONE ROCK FORMATION)	(0.30) 0.70	
0.70	1	D				Stiff light grey mottled orangish brown silty CLAY with fine sandy laminae. Completely weathered siltstone. (DYRHAM FORMATION)		
0.70		V	c_u=92/82/102					
1.70	2	D				. . . from 1.60m recovery of very weak to weak mudstone lithorelicts. Sandy in laminations.	(1.90)	
2.10	3	D				. . . from 1.80m recovered of cobble sized mudstone lithorelicts deep purple staining.		
2.60	4	D				Trial pit terminated at 2.60m depth.	2.60	

Plan (Not to Scale)



General Remarks

1. Scanned with CAT, GPR and Genny. No services.
2. No groundwater encountered.
3. Stable during excavation.
4. Backfilled with arisings on completion.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**HBovenizer**	

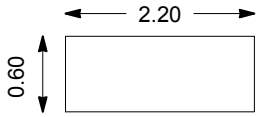
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP10**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**06.12.16**	**---**	**---**	**1** of **1**
	End: **06.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Grass cover over dark brown very sandy CLAY. Sand is fine to medium. (AGRICULTURAL TOPSOIL) . . . untill 0.20m occasional rootlets.	(0.40) 0.40	
0.20	1	ES	1xT, 1xJ, 1xV					
0.40	1	D				Firm light reddish brown very sandy CLAY. Sand is fine to medium. (MARLSTONE ROCK FORMATION) . . . from 0.50m recovery of occasional gravel of sandstone/limestone lithorelicts.	(0.40) 0.80	
0.60	2	D						
						Completely mottled SANDSTONE and LIMESTONE bedrock recovered as angular cobbles and boulders. Cobbles are shelly with orangish brown staining. (MARLSTONE ROCK FORMATION)	(1.00) 1.80	
1.10	3	D						
						Trial pit terminated at 1.80m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT, GPR and Genny. No services.
2. No groundwater encountered.
3. Unstable from 0.80m depth.
4. Archaeological watching brief to 0.70m depth.
5. Backfilled with arisings on completion.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**HBovenizer**	

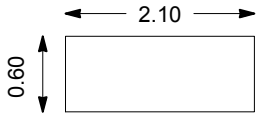
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP11**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**06.12.16**	**---**	**---**	**1** of **1**
	End: **06.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20	1	ES	1xJ, 1xV			Grass over dark reddish brown very sandy CLAY. Sand is fine. (AGRICULTURAL TOPSOIL)	(0.40) 0.40	
0.40-0.50	1	D				Firm reddish brown very clayey SAND/Very sandy CLAY. Sand is fine to medium. (MARLSTONE ROCK FORMATION) . . . from 0.60m becoming slightly gravelly and light reddish brown.	(0.70) 1.10	
0.90	2	D						
1.30	3	D				Completely mottled SANDSTONE and LIMESTONE bedrock recovered as angular cobbles and boulders. Cobbles are shelly with orangish brown staining. (MARLSTONE ROCK FORMATION)	(1.00) 2.10	
1.50-2.00	5	B						
1.80	4	D						
						Trial pit terminated at 2.10m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT, GPR and Genny. No services.
2. No groundwater encountered.
3. Archaeological watching brief from 0.50m depth.
4. Unstable from 1.10m depth.
5. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**HBovenizer**	

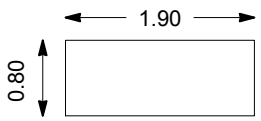
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP12**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**09.12.16**	**---**	**---**	**1** of **1**
	End: **09.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Grass over very soft dark brown slightly gravelly very sandy CLAY. Sand is fine to medium. Gravel is subangular to rounded sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.30) 0.30	
0.60 0.60	1	B PID	2.8ppm			Soft to firm dark reddish brown slightly gravelly very clayey SAND. Gravel is rounded fine to medium sandstone. (MARLSTONE ROCK FORMATION)	(1.30) 1.60	
2.30 2.30	2	B PID	4.9ppm			Firm to stiff light grey mottled orangish brown slightly sandy silty CLAY. (DYRHAM FORMATION) . . . from 2.10m very stiff with slightly blocky structure and fine sandy laminae. . . . from 2.70m recovered as weak dark grey gravel sized pieces of completely weathered siltstone.	(1.30) 2.90	
						Trial pit terminated at 2.90m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

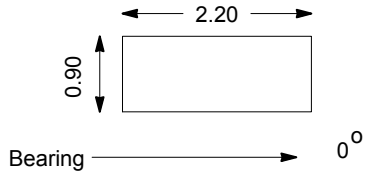
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP13**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**09.12.16**	**---**	**---**	**1** of **1**
	End: **09.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Grass over very soft dark brown slightly gravelly very sandy CLAY. Sand is fine to medium. Gravel is subangular to rounded sandstone with many tree rootlets. (AGRICULTURAL TOPSOIL)	(0.30) 0.30	
0.35	1	ES	1xT, 1xJ, 1xV			Soft dark reddish brown slightly gravelly very clayey SAND. Gravel is rounded fine to medium sandstone. (MARLSTONE ROCK FORMATION)	(0.60) 0.90	
						Light brown slightly clayey very sandy GRAVEL with frequent cobbles. Gravel of subangular to angular sandstone. (MARLSTONE ROCK FORMATION)		
1.50	1	B				. . . from 1.30m large cobbles of sandstone and limestone. Cobbles are strong subangular to angular up to 300mm diameter.	(0.80)	
1.50		PID	6.2ppm				1.70	
						Trail pit terminated at 1.70m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

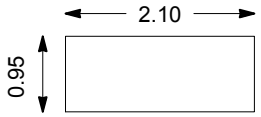
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP14**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**09.12.16**	**---**	**---**	**1** of **1**
	End: **09.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Grass over very soft dark brown slightly gravelly very sandy CLAY. Sand is fine to medium. Gravel is subangular to rounded sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.95)	
0.40	1	ES	1xT, 1xJ, 1xV					
0.60 0.60	1	B PID	2.0ppm					
							0.95	
						LIMESTONE and SANDSTONE recovered as gravel and cobbles in very sandy clay matrix. Cobbles of crystalline limestone and fine reddish brown calcite veins. (MARLSTONE ROCK FORMATION)	(1.15)	
						. . . from 1.80m large cobbles present diameter >300mm.		
2.00 2.00	2	B PID	3.6ppm				2.10	
						Trail pit terminated at 2.10m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. Unstable from 1.80m depth.
4. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

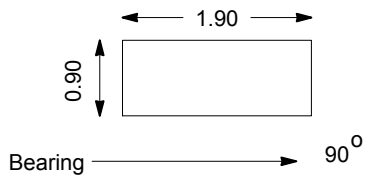
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP15**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**08.12.16**	**---**	**---**	**1** of **1**
	End: **08.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20	1	ES	1xT, 1xJ, 1xV			Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.30) 0.30	
0.80 0.80	1	B PID	6.1ppm			Firm dark brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is fine to medium angular to subangular sandstone and limestone. (MARLSTONE ROCK FORMATION)	(0.80) 1.10	
						LIMESTONE recovered as gravelly cobbles in very sandy clay matrix. Cobbles of limestone have shells present. (MARLSTONE ROCK FORMATION)	1.30	
						Trial pit terminated at 1.30m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

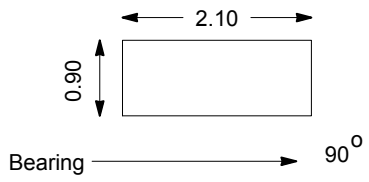
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP16**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**08.12.16**	**---**	**---**	**1** of **1**
	End: **08.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.30) 0.30	
0.40 0.40	1	B PID	0.2ppm			Light orangish brown very sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to medium sandstone. (MARLSTONE ROCK FORMATION)	(0.60) 0.90	
						Firm light grey orangish brown mottled very clayey SILT. (DYRHAM FORMATION)		
						. . . from 1.10m to 1.20m becoming stained band.		
1.50 1.50	2	B PID	1.6ppm					
1.90 1.90	3	B PID	3.7ppm				(2.10)	
						. . . from 2.20m bands of reddish brown shelly sandstone/limestone.		
						. . . from 2.40m blocky material recovered as weak completely weathered gravel sized pieces of siltstone.		
							3.00	
						Trial pit terminated at 3.00m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

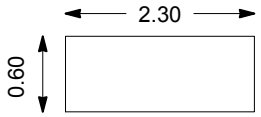
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP17**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**06.12.16**	**---**	**---**	**1** of **1**
	End: **06.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Grass over dark reddish brown very sandy CLAY. Sand is fine. (AGRICULTURAL TOPSOIL)	(0.50)	
							0.50	
0.60	1	D				Firm to stiff light grey very silty CLAY with occasional brown mottling. (DYRHAM FORMATION)		
0.60		V	c_u=90/100/90					
0.90	2	D						
						. . . from 1.20m blocky material recovered as weak completely weathered siltstone/mudstone.	(1.70)	
1.40	3	D						
1.80	4	B						
							2.20	
						Trial pit terminated at 2.20m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT, GPR and Genny. No services.
2. No groundwater encountered.
3. Pit remained stable.
4. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**HBovenizer**	

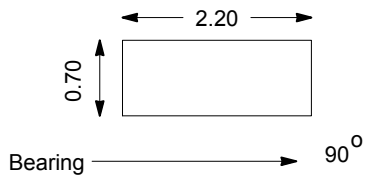
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP18**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**07.12.16**	**---**	**---**	**1** of **1**
	End: **07.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.35) 0.35	
0.40	1	ES	1xT, 1xJ, 1xV			Soft to firm dark brown slightly gravelly slightly sandy very silty CLAY. Sand is fine to coarse. Gravel is angular limestone. (MARLSTONE ROCK FORMATION)		
0.75	2	ES	1xT, 1xJ, 1xV				(0.85)	
							1.20	
1.25 1.25	1	B PID	4.7ppm			Firm light grey mottled orangish brown slightly sandy very clayey SILT. (DYRHAM FORMATION) . . . from 1.20m sandy laminae present.		
						. . . from 2.20m blocky structure to stiff becoming stiff (completely weathered).	(2.25)	
2.80 2.80	2	B PID	4.6ppm					
							3.45	
3.55	3	B				Weak to strong dark grey. Recovered as fine to coarse subangular to subrounded gravel and cobble sized lithorelicts. (DYRHAM FORMATION)	3.65	
						Trial pit terminated at 3.65m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

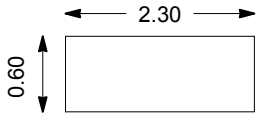
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP19**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**06.12.16**	**---**	**---**	**1** of **1**
	End: **06.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Dark brown slightly sandy slightly gravelly CLAY. Sand is fine. Gravel of subangular fine to medium limestone. (AGRICULTURAL TOPSOIL)	(0.40)	
0.40	1	ES	1xT, 1xJ, 1xV				0.40	
0.40	2	D				Firm light reddish brown sandy CLAY. Sand is fine to medium. Occasional gravel of subangular fine to medium limestone. (MARLSTONE ROCK FORMATION)	(0.50)	
0.80	3	D					0.90	
						LIMESTONE recovered as gravel and cobbles in sandy clayey matrix. Gravel of subangular to angular medium to coarse limestone and cobbles of limestone. (MARLSTONE ROCK FORMATION)	(0.90)	
							1.80	
						Trial pit terminated at 1.80m depth due to machine refusal.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT, GPR and Genny. No services.
2. No groundwater encountered.
3. Unstable from 0.90m to 1.80m depth.
4. Archaeology watching brief.
5. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**HBovenizer**	

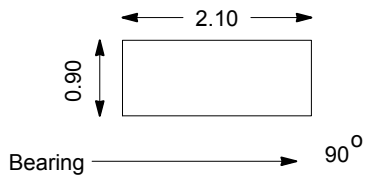
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP20**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**08.12.16**	**---**	**---**	**1** of **1**
	End: **08.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	0.25	
0.50	1	ES				Soft to firm grey and reddish brown gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse limestone and sandstone. (MARLSTONE ROCK FORMATION)	(0.70)	
							0.95	
1.20 1.20	1	B PID	2.8ppm			Firm to stiff grey mottled brown slightly gravelly sandy CLAY. (MARLSTONE ROCK FORMATION)	(0.65)	
							1.60	
						Limestone and sandstone band recovered as GRAVEL and COBBLES. Cobbles of limestone are shelly with reddish brown calcite veining and heavily stained reddish brown. (MARLSTONE ROCK FORMATION)	(0.30)	
							1.90	
2.20 2.20	2	B PID	3.9ppm			Firm to grey mottled brown silty CLAY. Gravel is angular fine to coarse mudstone lithorelicts. Recovered as fine to coarse subangular to subrounded gravel and cobble sized lithorelicts with laminations. (DYRHAM FORMATION)	(1.15)	
						. . . from 2.95m bands of strong completely weathered mudstone.	3.05	
						Trial pit terminated at 3.05m depth due to refusal.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

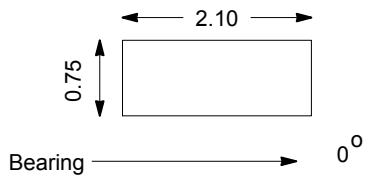
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP21**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**08.12.16**	**---**	**---**	**1** of **1**
	End: **08.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.30) 0.30	
0.35	1	ES	1xT, 1xJ, 1xV			Soft to firm dark brown sandy slightly gravelly CLAY. Gravel is subangular to angular fine to coarse limestone and sandstone. (MARLSTONE ROCK FORMATION)	(0.50) 0.80	
1.00 1.00	1	B PID	2.7ppm			Firm light grey dark brown very silty CLAY. (DYRHAM FORMATION)	(1.00) 1.80	
1.85 1.85	2	B PID	2.8ppm	≈		Stiff light grey reddish brown CLAY recovered as very weak gravel sized mudstone lithorelicts in a clay matrix. (DYRHAM FORMATION) . . . from 2.20m lithorelicts displays laminations in clay. . . . from 2.80m blocky.	(2.00) 3.80	
3.00 3.00	3	B PID	3.1ppm					
						Soft greyish blue completely weathered MUDSTONE with few orangish brown laminations. (DYRHAM FORMATION)	(0.30) 4.10	
						Trial pit terminated at 4.10m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. Water seepage at 2.90m depth.
3. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

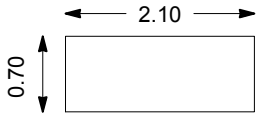
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP22**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**06.12.16**	**---**	**---**	**1** of **1**
	End: **06.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10	1	ES	1xT, 1xJ, 1xV			Dark brown slightly sandy CLAY. Sand is fine. Occasional rootlets. Occasional gravel of subangular fine to medium limestone. (AGRICULTURAL TOPSOIL)	(0.40)	
							0.40	
						Firm light brown very gravelly CLAY. Gravel is subangular to angular fine to coarse limestone. (MARLSTONE ROCK FORMATION)	(0.30)	
							0.70	
0.70-0.80	1	B				Light brown slightly clayey very sandy GRAVEL with frequent cobbles. Gravel of subangular to angular sandstone. (MARLSTONE ROCK FORMATION)		
0.70-0.80	2	D				. . . at 0.70m recovery of limestone cobbles.	(0.90)	
							1.60	
1.60	3	B				Trial pit terminated at 1.60m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT, GPR and Genny. No services.
2. No groundwater encountered.
3. Hole collapsed from 0.70m to 1.60m depth.
4. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**HBovenizer**	

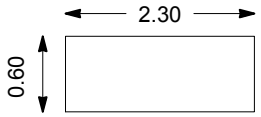
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP23**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**06.12.16**	**---**	**---**	**1** of **1**
	End: **06.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.35)	
						(TOPSOIL)	0.35	
0.40	1	ES	1xT, 1xJ, 1xV			Soft to firm dark brown sandy slightly gravelly CLAY. Gravel is subangular to angular fine to coarse limestone and sandstone. (MARLSTONE ROCK FORMATION)	(0.45)	
0.50	2	D						
0.50-0.80	4	B					0.80	
						Stiff light greyish brown slightly silty CLAY. (DYRHAM FORMATION)		
1.20	3	D						
1.80	5	D					(2.50)	
2.80	6	D				. . . from 2.70m frequent cobbles.		
							3.30	
						Trial pit terminated at 3.30m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT, GPR and Genny. No services.
2. No groundwater encountered.
3. Not stable from 0.80m to 1.80m depth.
5. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**HBovenizer**	

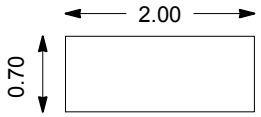
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP24**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**06.12.16**	**---**	**---**	**1** of **1**
	End: **06.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Dark brown slightly sandy CLAY. Sand is fine. Occasional rootlets. Occasional gravel of subangular fine to medium limestone. (AGRICULTURAL TOPSOIL)	(0.40)	
							0.40	
0.40	1	ES	1xT, 1xJ, 1xV			Firm light brown very gravelly CLAY. Gravel is subangular to angular fine to coarse limestone. (MARLSTONE ROCK FORMATION)		
0.40	2	D					0.60	
0.50	3	D				Light brown slightly clayey very sandy GRAVEL with frequent cobbles. Gravel of subangular to angular sandstone. (MARLSTONE ROCK FORMATION) . . . at 0.80m depth boulder.	(0.60)	
1.00	4	B					1.20	
						Trail pit terminated at 1.20m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT, GPR and Genny. No services.
2. No groundwater encountered.
3. Stable during excavation.
4. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**HBovenizer**	

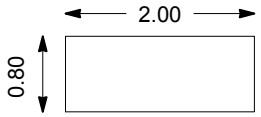
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP25**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	End: **???**	**---**	**---**	**1** of **1**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.25	1	ES	1xT, 1xJ, 1xV			Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.35) 0.35	
						Soft to firm dark brown sandy slightly gravelly CLAY. Gravel is subangular to angular fine to coarse limestone and sandstone. (MARLSTONE ROCK FORMATION)	(0.70) 1.05	
1.10	1	B				Stiff light greyish brown slightly silty CLAY. (DYRHAM FORMATION)		
1.10	2	ES	1xT, 1xJ, 1xV					
1.10		PID	4.1ppm					
1.20		V	c_u=80/70/65			. . . from 1.50m becoming very stiff.		
						. . . from 1.90m very stiff blocky with slighty brown staining on laminations.	(2.50)	
2.60	2	B						
2.60		PID	5.2ppm					
						. . . from 3.00m cobble sized lithorelicts with blocky structure recovered.		
						. . . from 3.20m recovered as fine angular gravel sized pieces of very weak mudstone.		
3.30	3	B						
3.30		PID	3.3ppm				3.55	
						Trial pit terminated at 3.55m on refusal.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. HSV breaks apart strata- inaccurate.
4. Difficult digging from 3.10m depth.
5. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

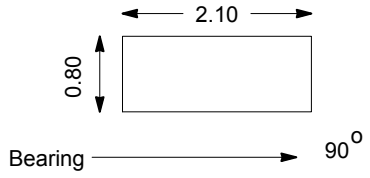
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP26**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**08.12.16**	**---**	**---**	**1** of **1**
	End: **08.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.30) 0.30	
0.40 0.40	1	B PID	3.1ppm			Soft to firm dark brown sandy slightly gravelly CLAY. Gravel is subangular to angular fine to coarse limestone and sandstone. (MARLSTONE ROCK FORMATION)	(0.40) 0.70	
0.80	1	ES	1xT, 1xJ, 1xV			LIMESTONE recovered as gravel and cobbles in very sandy clay matrix. Cobbles of limestone with shells with orangish brown staining. (MARLSTONE ROCK FORMATION)	(0.65) 1.35	
1.50-1.80 1.50	2	B PID	2.8ppm			Stiff light greyish brown mottled slightly sandy very silty CLAY with relic laminations and reddish brown staining (DYRHAM FORMATION)	(2.00)	
						. . . from 2.40m blocky lithorelicts. recovered with shell fragments.		
2.80-3.20 2.80	1	D PID	1.6ppm			. . . from 2.80m thin reddish brown calcite veining within siltstone.	3.35	
						Trail pit terminated at 3.35m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. Hand vane not possible in strata.
4. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**HBovenizer**	

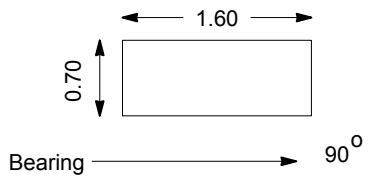
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP27**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**07.12.16**	**---**	**---**	**1** of **1**
	End: **07.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20 0.20 0.20	1 1	ES B PID	1xT, 1xJ, 1xV 3.6ppm			Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.40) 0.40	
						Soft to firm dark brown very sandy CLAY. (MARLSTONE ROCK FORMATION) . . . from 0.90m slightly gravelly. Gravel is rounded fine to medium sandstone.	(1.10) 1.50	
						Trail pit terminated at 1.50m for soakaway.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. HSV not possible- material to weak/brittle.
4. Backfilled with arisingS.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

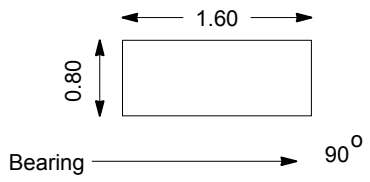
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP28**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**07.12.16**	**---**	**---**	**1** of **1**
	End: **07.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.40) 0.40	
						Soft to firm dark brown sandy slightly gravelly CLAY. Gravel is subangular to angular fine to coarse sandstone. (MARLSTONE ROCK FORMATION)	(0.40) 0.80	
1.00 1.00	1	B PID	1.1ppm			Firm dark brown mottled grey very sandy slightly gravelly CLAY with occasional lithorelicts of sandstone. Gravel is angular fine to medium sandstone. (MARLSTONE ROCK FORMATION)	(0.60) 1.40	
						Stiff firm light grey mottled orangish brown very clayey SILT. (DYRHAM FORMATION)	(0.30) 1.70	
						Trial pit terminated at 1.70m for soakaway.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. Backfilled with arisingS.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

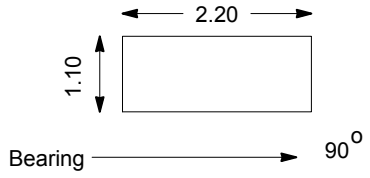
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP29**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**06.12.16**	**---**	**---**	**1** of **1**
	End: **06.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20	1	ES	1xT, 1xJ, 1xV			Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	0.25	
0.40 0.40	1	B PID	1.8ppm			Soft to firm slightly gravelly very sandy CLAY. Sand is fine to medium. Gravel is angular fine to coarse sandstone. (MARLSTONE ROCK FORMATION)	(0.55)	
							0.80	
1.10 1.10	2	B PID	2.2ppm	≈		Firm to stiff light greyish brown slightly sandy very clayey SILT. (DYRHAM FORMATION) . . . from 1.30m becoming blocky with fine laminations. . . . from 2.20m becoming dark brownish grey recovered as fine silt completely weathered siltstone lithorelicts.	(2.70)	
							3.50	
3.80 3.80	3	B PID	4.3ppm			Weak greyish blue completely weathered MUDSTONE with few orangish brown laminations.	(0.35)	
							3.85	
						Trial pit terminated at 3.85m depth.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. Seepage at 3.10m depth.
3. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

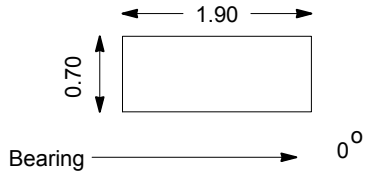
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
White Post Road, Banbury	**Gladman Developments Ltd.**	**TP30**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**07.12.16**	**---**	**---**	**1** of **1**
	End: **07.12.16**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Soft dark reddish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets. (AGRICULTURAL TOPSOIL)	(0.40) 0.40	
0.40	1	ES	1xT, 1xJ, 1xV			Soft to firm dark brown sandy slightly gravelly CLAY. Gravel is subangular to angular fine to coarse sandstone. (MARLSTONE ROCK FORMATION)	(0.40) 0.80	
0.70 0.70	1	B PID	1.1ppm			Dark brown sandy CLAY with cobbles of orangish brown stained sandstone and limestone. (MARLSTONE ROCK FORMATION)	(0.40) 1.20	
1.20 1.20	2	B PID	1.0ppm			LIMESTONE recovered as gravel and cobbles in sandy clay matrix. Cobbles are angular limestone has large calcite shells present. (MARLSTONE ROCK FORMATION)	(0.70) 1.90	
						Trial pit terminated at 1.90m depth on JCB refusal.		

Plan (Not to Scale)



General Remarks

1. Scanned with CAT and Genny. No services.
2. No groundwater encountered.
3. Bulk at 1.20m- rock samples.
4. Hole unstable from 1.10m depth.
5. Backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**MSweeney**	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
White Post Road, Banbury	**Gladman Developments Ltd.**	**WS1**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**05.12.16**	**---**	**---**	**1** of **1**
	End: **05.12.16**			

Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.20-0.40	1	ES	1xT,1xJ+1xV			Dark red brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets (AGRICULTURAL TOPSOIL).	(0.40) 0.40	
	0.40-0.60 0.40 0.60	1	D PID V	 12.1ppm c_u=90/95/90			Firm dark brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is subangular to rounded fine to coarse sandstone and limestone. (MARLSTONE ROCK FORMATION)	(0.60) 1.00	
1.20 - 2.00 (87mm dia) 100% rec	1.00-1.20	2	ES	1xT,1xJ+1xV			Firm to stiff light brown very sandy slightly gravelly CLAY. Gravel is subangular to angular fine to coarse limestone and sandstone. (MARLSTONE ROCK FORMATION)	(1.22)	
	1.20-1.65 1.20-1.60 1.20	1 1	SPT B PID	N=6 3.7ppm					
	1.70-2.00	3	ES	1xT,1xJ+1xV			. . . from 1.80m recovered as weak ferruginous sandstone.		
	2.00-2.22	2	SPT	N=231*				2.22	
							Window sample hole terminated at 2.22m depth on refusal.		

Drilling Progress and Water Observations					
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Hand dug inspection pit to 1.20m depth.
2. No groundwater encountered.
3. Installation installed to 2.00m depth. 1.00m plain with bentonite seal and 1.00m slotted with gravel filter and concrete steel lockable cover.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Premier 110**	**S Murphy**	**MSweeney**	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
White Post Road, Banbury	**Gladman Developments Ltd.**	**WS2**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**05.12.16** End: **05.12.16**	**---**	**---**	**1** of **1**

Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
							Soft dark red brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse siltstone with many rootlets (AGRICULTURAL TOPSOIL).	(0.45)	
								0.45	
	0.50-0.50	1	ES	1xT,1xJ+1xV			Firm light red brown sandy CLAY. Sand is fine to medium. Occasional gravel of sandstone. (MARLSTONE ROCK FORMATION)	0.70	
	1.00-1.20	2	ES	1xT,1xJ+1xV			Stiff light grey occasional brown orange mottled slightly sandy very silty CLAY with occasional mudstone lithorelicts. (DYRHAM FORMATION)		
	1.20-1.65	1	SPT	N=11			. . . from 1.20m sandy orange laminations up to 1cm.		
	1.20-1.40	1	D						
	1.20		PID	9.9ppm					
1.20 - 2.00 (87mm dia)	1.60-2.00	2	D						
	1.60		PID	4.0ppm					
								(2.60)	
	2.00-2.45	2	SPT	N=34					
	2.00-2.50	3	D						
	2.00		PID	2.0ppm			. . . from 2.20m becoming very stiff.		
2.00 - 3.00 (78mm dia)							. . . from 2.55m dark brown.		
					1		. . . from 2.70m blocky completed weathered mudstone.		
	2.85-3.00	4	D						
	2.85		PID	4.1ppm					
	3.00-3.28	3	SPT	N=120*				3.30	
							Window sample hole terminated at 3.30m depth on refusal.		

Drilling Progress and Water Observations					
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Hand dug inspection pit to 1.20m depth.
2. Groundwater strike encountered at 2.85m depth-no movement.
3. Installation installed to 3.00m depth. 1.00m plain with bentonite seal and 2.00m slotted with gravel filter and concrete steel lockable cover.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Premier 110**	**S Murphy**	**MSweeney**	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
White Post Road, Banbury	**Gladman Developments Ltd.**	**WS3**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	End: **05.12.16**	**---**	**---**	**1** of **1**

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
							Soft dark red brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse siltstone with many rootlets (AGRICULTURAL TOPSOIL).	(0.30)	
								0.30	
							Soft to firm light grey brown sandy slightly gravelly silty CLAY. Sand is fine to medium. Gravel is angular to rounded fine to coarse sandstone. (MARLSTONE ROCK FORMATION)	(0.40)	
	0.50		V	c_u=80/90/85/80					
								0.70	
	0.70-0.90	1	ES	1xT,1xJ+1xV			Firm orange with grey mottled slightly sandy silty CLAY. Sand is fine to medium. (DYRHAM FORMATION)		
	0.70-1.20	1	D						
	0.70		PID	4.1ppm					
	1.20-1.65	1	SPT	N=16				(1.30)	
1.20 - 2.00 (87mm dia) 100% rec	1.20-2.00	1	B						
	1.20		PID	2.3ppm					
					1			2.00	
	2.00-2.45	2	SPT	N=21			. . . from 1.95m completely weathered mudstone lithorelicts.		
2.00 - 3.00 (78mm dia) 60% rec							Firm to stiff orange mottled slightly gravelly very silty CLAY. Gravel is angular fine to coarse completely weathered mudstone. (DYRHAM FORMATION) . . . from 2.20m very sandy with 1cm sand bands. Sand is fine.	(1.45)	
	3.00-3.45	3	SPT	N=51*					
								3.45	
							Window sample hole terminated at 3.45m depth on refusal.		

Drilling Progress and Water Observations					
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Hand dug inspection pit to 1.20m depth.
2. Groundwater strike encountered at 2.00m depth-no movement.
3. Core liner shattered down hole, Recovery from 2.50m to 3.00m depth impacted.
4. Hole backfilled with betonite on completion.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Premier 110**	**S Murphy**	**MSweeney**	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
White Post Road, Banbury	**Gladman Developments Ltd.**	**WS4**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**05.12.16**	**---**	**---**	**1** of **1**
	End: **05.12.16**			

Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.20	1	ES	1xT,1xJ+1xV			Dark red brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets (AGRICULTURAL TOPSOIL).	(0.30) 0.30	
	0.65		V	c_u=80/95/80/92			Firm orangish brown very sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is angular fine to coarse completely weathered limestone. (MARLSTONE ROCK FORMATION)		
	0.70	1	D					(1.00)	
	0.70		PID	0.7ppm					
	1.20-1.65	1	SPT	N=21				1.30	
1.20 - 1.70 (87mm dia) 100% rec	1.25-1.55	2	D				Weak weathered SANDSTONE and LIMESTONE with a very sandy clay matrix. (MARLSTONE ROCK FORMATION)	(0.40)	
	1.25		PID	4.0ppm				1.70	
	1.70-2.09	2	SPT	N=58*			Stiff dark orange brown sandy slightly gravelly CLAY. Sand is fine to coarse with common sandstone lithorelicts. Lithorelicts comprise gravel of weak to strong crystalline limestone, shelly sandstone and limestone. (MARLSTONE ROCK FORMATION)	(0.39)	
							Window sample hole terminated at 2.09m depth on refusal.	2.09	

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Hand dug inspection pit to 1.20m depth.
2. No groundwater encountered.
3. Installation installed to 1.70m depth. 1.00m plain with bentonite seal and 0.70m slotted with gravel filter and concrete steel lockable cover.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Premier 110**	**S Murphy**	**MSweeney**	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
White Post Road, Banbury	**Gladman Developments Ltd.**	**WS5**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	End: **05.12.16**	**---**	**---**	**1** of **1**

Progress	Samples / Tests				Water	Backfill & Instru-mentation	Description of Strata	Depth (Thick ness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.40 0.40	1	ES V	1xT,1xJ+1xV c_u=60/80/85/90			Dark red brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets (AGRICULTURAL TOPSOIL).	(0.35) 0.35	
							Firm dark brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is subangular to rounded fine to coarse sandstone and limestone. (MARLSTONE ROCK FORMATION)	(0.40) 0.75	
	1.00 1.00	1	D PID	6.1ppm			Firm light grey brown sandy CLAY with occasional orange sandy laminae from 1.95m to 2.00m. (DYRHAM FORMATION)		
1.20 - 2.00 (87mm dia) 100% rec	1.20-1.65	1	SPT	N=15					
	2.00-2.45	2	SPT	N=31				(2.70)	
	2.10 2.10	2	D PID	5.7ppm			. . . from 2.10m becoming very stiff.		
2.00 - 3.00 (78mm dia) 100% rec							. . . from 2.30m grey with absence of orange laminae.		
	2.70 2.70	3	D PID	3.9ppm			. . . from 2.80m occasional mudstone lithorelicts and blocky mudstone.		
	3.00-3.45	3	SPT	N=51*				3.45	
							Window sample hole terminated at 3.45m depth on refusal.		

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Hand dug inspection pit to 1.20m depth.
2. No groundwater encountered.
3. Installation installed to 3.00m depth. 1.00m plain with bentonite seal and 2.00m slotted with gravel filter and concrete steel lockable cover.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Premier 110**	**S Murphy**	**MSweeney**	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
White Post Road, Banbury	**Gladman Developments Ltd.**	**WS6**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**06.12.16**	**---**	**---**	**1** of **1**
	End: **06.12.16**			

Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.00-0.20	1	ES	1xT,1xJ+1xV			Dark red brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets (AGRICULTURAL TOPSOIL).	(0.30)	
	0.20-0.80	1	B					0.30	
	0.20		PID	0.7ppm			Firm light grey brown very sandy very gravelly CLAY with occasional cobbles of limestone and mudstone. (MARLSTONE ROCK FORMATION)	(0.30)	
								0.60	
							Stiff light brown orange very gravelly sandy CLAY recovered with angular cobbles of sandstone and limestone. (MARLSTONE ROCK FORMATION)	(0.95)	
1.20 - 2.00 (87mm dia) 100% rec	1.20-1.65	1	SPT	N=40				1.55	
	1.70-1.85	1	D				Stiff light grey orange sandy very gravelly silty CLAY. (DYRHAM FORMATION) . . . from 1.80m blocky sandstone and mudstone lithorelicts.	(0.90)	
	2.00-2.45	2	SPT	N=51*				2.45	
							Window sample hole terminated at 2.45m depth on refusal.		

Drilling Progress and Water Observations					
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Hand dug inspection pit to 1.20m depth.
2. No groundwater encountered.
3. Installation installed to 2.00m depth. 1.00m plain with bentonite seal and 1.00m slotted with gravel filter and concrete steel lockable cover.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Premier 110**	**S Murphy**	**MSweeney**	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
White Post Road, Banbury	**Gladman Developments Ltd.**	**WS7**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**06.12.16**	**---**	**---**	**1** of **1**
	End: **06.12.16**			

Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.00-0.20	1	ES	1xT,1xJ+1xV			Dark red brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets (AGRICULTURAL TOPSOIL).	0.20	
	0.20-0.80 0.20	1	B PID	4.6ppm			Firm dark brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is subangular to rounded fine to coarse sandstone and limestone with occasional limestone cobble content. (MARLSTONE ROCK FORMATION)	(1.30)	
1.20 - 1.90 (86mm dia) 70% rec	1.20-1.65 1.20-1.90 1.20	1 1	SPT B PID	N=40 8.8ppm				1.50	
	1.90-2.13	2	SPT	N=97*			Stiff dark orange brown very sandy gravelly CLAY with sandstone lithorelicts. Sand is fine to medium. Gravel is angular sandstone and limestone. (MARLSTONE ROCK FORMATION)	(0.63)	
							Window sample hole terminated at 2.13m depth on refusal.	2.13	

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Hand dug inspection pit to 1.20m depth.
2. No groundwater encountered.
3. Poor recovery from 1.20m to 1.50m depth due to granular cobble nature.
4. Installation installed to 1.90m depth. 1.00m plain with bentonite seal and 0.90m slotted with gravel filter and concrete steel lockable cover.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Premier 110**	**S Murphy**	**MSweeney**	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
White Post Road, Banbury	**Gladman Developments Ltd.**	**WS8**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**06.12.16**	**---**	**---**	**1** of **1**
	End: **06.12.16**			

Progress	Samples / Tests				Water	Backfill & Instru-mentation	Description of Strata	Depth (Thick ness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.20-0.60	1	ES	1xT,1xJ+1xV			Dark red brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets (AGRICULTURAL TOPSOIL).	0.20 (0.30)	
	0.60-0.80 0.60	1	D PID	2.8ppm			Firm dark brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is subangular to rounded fine to coarse sandstone and limestone with occasional limestone cobble content. (MARLSTONE ROCK FORMATION)	0.50	
1.20 - 2.00 (86mm dia) 100% rec	1.20-1.65	1	SPT	N=37			Stiff dark orange brown very sandy gravelly CLAY with sandstone lithorelicts. Sand is fine to medium. Gravel is angular sandstone and limestone. (MARLSTONE ROCK FORMATION)	(1.61)	
	1.50-2.00 1.50	2	D PID	4.9ppm					
	1.80-2.11	2	SPT	N=88*					
							Window sample hole terminated at 2.11m depth on refusal.	2.11	

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Hand dug inspection pit to 1.20m depth.
2. No groundwater encountered.
3. Installation installed to 1.80m depth. 1.00m plain with bentonite seal and 0.80m slotted with gravel filter and concrete steel lockable cover.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Premier 110**	**S Murphy**	**MSweeney**	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
White Post Road, Banbury	**Gladman Developments Ltd.**	**WS9**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**05.12.16**	**---**	**---**	**1** of **1**
	End: **05.12.16**			

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.00-0.20	1	ES	1xT,1xJ+1xV			Dark red brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets (AGRICULTURAL TOPSOIL).	(0.30) 0.30	
							Firm dark brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is subangular to rounded fine to coarse sandstone and limestone. (MARLSTONE ROCK FORMATION)	(0.40) 0.70	
							Firm orange brown sandy slightly gravelly silty CLAY. Sand is fine to medium. Gravel is angular to rounded fine to coarse sandstone. (MARLSTONE ROCK FORMATION)	(0.85) 1.55	
1.20 - 2.00 (86mm dia) 100% rec	1.20-1.65	1	SPT	N=11					
	2.00-2.45	2	SPT	N=11			Firm to stiff light grey with brown and orange mottled very silty CLAY with occasional sandy laminations. (DYRHAM FORMATION)	(2.65)	
2.00 - 3.00 (78mm dia) 100% rec	2.00-2.10	2	ES	1xT,1xJ+1xV	1				
	3.00-3.45	3	SPT	N=15			. . . from 3.30m blocky structure with strong sandy laminations up to 5mm.		
3.00 - 4.00 (64mm dia) 100% rec					1		. . . from 3.70m completely weathered mudstone lithorelicts present with clay matrix.		
	4.00-4.17	4	SPT	N=214*				4.20	
							Window sample hole terminated at 4.20m depth.		

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Hand dug inspection pit to 1.20m depth.
2. Groundwater strike encountered at 3.50m depth, rising to 2.20m depth after 40 minutes.
3. Hole backfilled with bentonite on completion.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Premier 110**	**S Murphy**	**MSweeney**	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
White Post Road, Banbury	**Gladman Developments Ltd.**	**WS10**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**05.12.16** End: **05.12.16**	**---**	**---**	**1** of **1**

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.20-0.40	1	ES	1xT,1xJ+1xV			Dark red brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets (AGRICULTURAL TOPSOIL).	(0.30) 0.30	
	0.40-1.10 0.40	1	B PID	3.2ppm			Firm dark brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is subangular to rounded fine to coarse sandstone and limestone. (MARLSTONE ROCK FORMATION)	(0.90) 1.20	
1.20 - 2.00 (86mm dia) 100% rec	1.20-1.65	1	SPT	N=24			Firm to stiff light brown very sandy slightly gravelly CLAY. Gravel is subangular to angular fine to coarse limestone and sandstone. (MARLSTONE ROCK FORMATION) . . . from 1.50m sandstone lithorelicts.	(1.12) 2.32	
	1.50-1.90 1.50	1	D PID	4.1ppm					
	2.00-2.32	2	SPT	N=88*					
							Window sample hole terminated at 2.32m depth on refusal.		

Drilling Progress and Water Observations					
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Hand dug inspection pit to 1.20m depth.
2. No groundwater encountered.
3. Hole backfilled with bentonite on completion.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Premier 110**	**S Murphy**	**MSweeney**	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
White Post Road, Banbury	**Gladman Developments Ltd.**	**WS11**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**05.12.16**	**---**	**---**	**1** of **1**
	End: **05.12.16**			

Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.10-0.40	1	ES	1xT,1xJ+1xV			Dark red brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets (AGRICULTURAL TOPSOIL).	(0.30) 0.30	
	0.40-0.90 0.40 0.50	1	B PID V	1.1ppm c_u=70/75/80			Stiff dark brown very sandy gravelly silty CLAY with limestone lithorelicts. Gravel is angular to rounded fine to coarse sandstone. (MARLSTONE ROCK FORMATION)	(1.15) 1.45	
	1.20-1.65	1	SPT	N=9					
1.20 - 2.00 (87mm dia)	1.50-2.00 1.50	1	D PID	2.7ppm			Stiff to very stiff light grey mottled silty CLAY with mudstone lithorelicts. (DYRHAM FORMATION) . . . from 1.80m to 2.20m band of extremely weak sandstone and limestone lithorelicts.	(0.75) 2.20	
	2.00-2.45	2	SPT	N=38					
	2.50-3.00 2.50	2	D PID	0.8ppm			Stiff to very stiff light grey mottled silty CLAY with mudstone lithorelicts. (DYRHAM FORMATION) . . . from 2.70m becoming blocky and completely weathered mudstone.	(1.25) 3.45	
	3.00-3.45	3	SPT	N=50					
							Window sample hole terminated at 3.45m depth on refusal.		

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Hand dug inspection pit to 1.20m depth.
2. No groundwater encountered.
3. Installed installed to 3.00m depth. 1.00m plain with bentonite seal and 2.00m slotted with gravel filter and concrete steel lockable cover.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Premier 110**	**S Murphy**	**MSweeney**	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
White Post Road, Banbury	**Gladman Developments Ltd.**	**WS12**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	End: **05.12.16**	**---**	**---**	**1** of **1**

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.20-0.50	1	ES	1xT,1xJ+1xV			Dark red brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets (AGRICULTURAL TOPSOIL).	(0.40)	
	0.20-0.40	1	B					0.40	
	0.20		PID	1.0ppm					
	0.60		V	c_u=90/100/105/100			Firm dark brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is subangular to rounded fine to coarse sandstone and limestone. (MARLSTONE ROCK FORMATION)	(0.60)	
	0.70-0.90	1	D					1.00	
	0.70		PID	2.8ppm					
	1.20-1.65	1	SPT	N=3			Firm light brown orange very sandy gravelly silty CLAY with sandstone lithorelicts. (MARLSTONE ROCK FORMATION)		
	1.20-1.40	2	ES	1xT,1xJ+1xV					
1.20 - 2.00 (87mm dia)							. . . from 1.60m strong limestone and mudstone lithorelicts.	(1.40)	
	2.00-2.38	2	SPT	N=65*				2.40	
							Window sample hole terminated at 2.40m depth on refusal.		

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Hand dug inspection pit to 1.20m depth.
2. No groundwater encountered.
3. Hole backfilled with bentonite on completion.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Premier 110**	**S Murphy**	**MSweeney**	

WINDOW SAMPLE LOG

Contract:	Client:	Window Sample:
White Post Road, Banbury	**Gladman Developments Ltd.**	**WS13**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
313498	**06.12.16**	**---**	**---**	**1** of **1**
	End: **06.12.16**			

Progress	Samples / Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
							Dark red brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse sandstone with many rootlets (AGRICULTURAL TOPSOIL).	(0.30)	
								0.30	
							Firm dark brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is subangular to rounded fine to coarse sandstone and limestone. (MARLSTONE ROCK FORMATION)	(1.31)	
1.20 - 1.60 (87mm dia) 100% rec	1.20-1.61	1	SPT	N=58*			. . . from 1.40m strong limestone and sandstone cobbles.	1.61	
							Window sample hole terminated at 1.61m depth on refusal.		

Drilling Progress and Water Observations

Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

1. Hand dug inspection pit to 1.20m depth.
2. No groundwater encountered.
3. Hole backfilled with bentonite on completion.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Tracked window sampling	**Premier 110**	**S Murphy**	**MSweeney**	

STRUCTURAL SOILS LTD

INSITU TESTING REPORT

1774

Report No. 747008R.01(00)

Date	16-December-2016	Contract	Whiteost Road, Banbury

Client RSK Environment Ltd
Address Spring Lodge
172 Chester Road
Helsby
Cheshire
WA6 0AR
For the Attention of Matthew Sweeney

Order received	29-November-2016	Client Reference	313498
Testing Started	07-December-2016	Client Order No.	PO263681
Testing Completed	07-December-2016	Instruction Type	Written

Tests marked 'Not UKAS Accredited' in this report are not included in the UKAS Accreditation Schedule for our Laboratory.

UKAS Accredited Tests

Not UKAS Accredited Tests

3no. Insitu soakaway tests carried out at locations requested by client.

The results represent the ground conditions at the specified locations and depths at the time of testing.

Please Note: Remaining samples will be retained for a period of one month from today and will then be disposed of.
Test were undertaken on samples 'as received' unless otherwise stated.
Opinions and interpretations expressed in this report are outside the scope of accreditation for this laboratory.

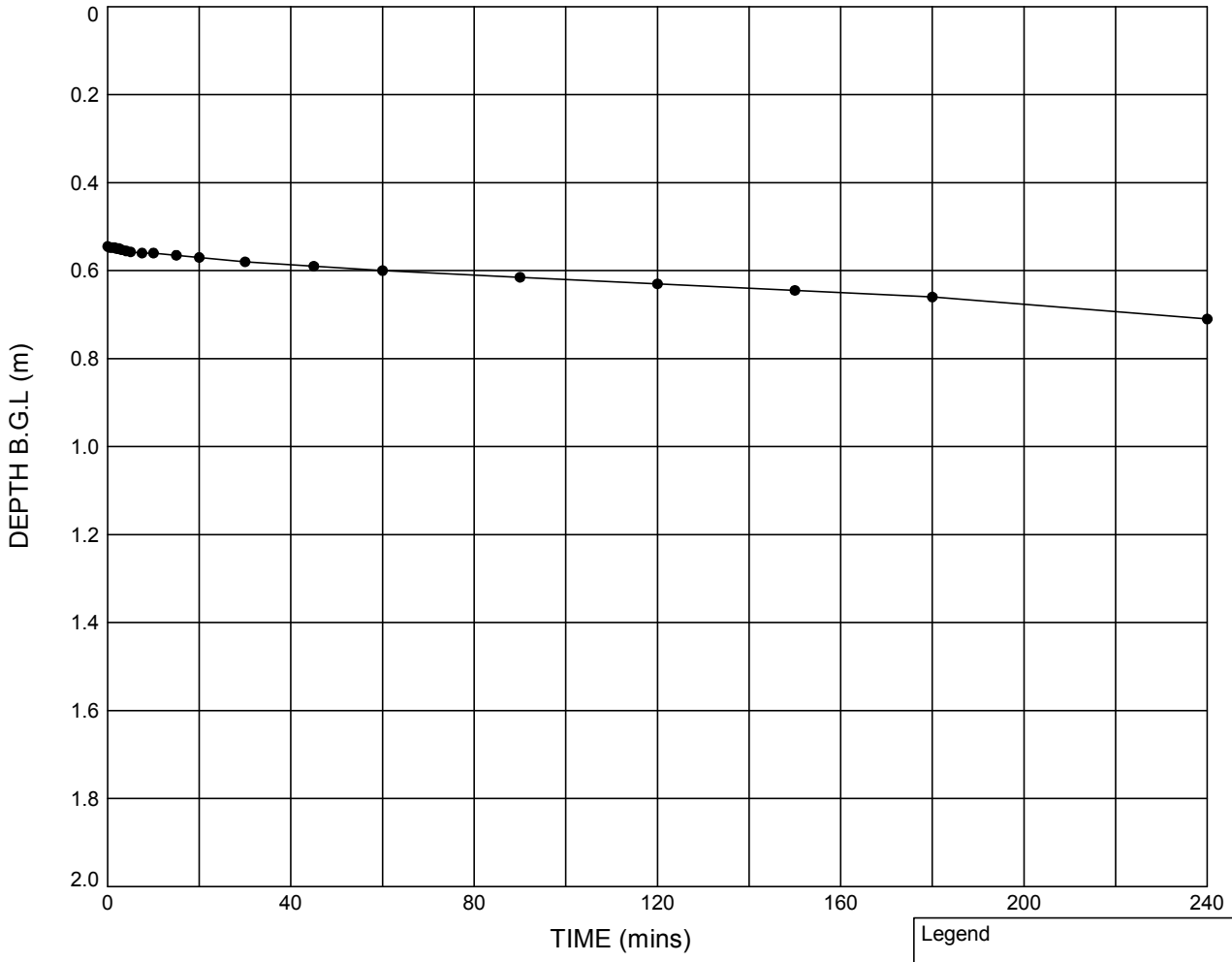
Structural Soils Ltd 1a Princess Street Bedminster Bristol BS3 4AG Tel.0117 9471000. e-mail dimitris.xirouchakis@soils.co.uk

FULL SCALE SOAKAWAY TEST

Non-standard test

Soakaway Test - Position ID : **TP08**

PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME



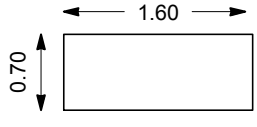
Legend

● Test 1 (07.12.16)

Pit start depth:	=	**1.90**	m
Pit final depth:	=	**1.85**	m
Effective depth, De	=	**1.31**	m
Effective storage volume, V_{p75-25}	=	**0.7308**	m^3
Surface area, a_{p50}	=	**4.1215**	m^2
Time, t_{p75-25}	=	**64063**	secs
Infiltration rate, f	=	**2.77x10^{-6}**	m/s

Please note test data was extrapolated to obtain tp75-tp25.

Plan (Not to scale)



No Bearing Taken

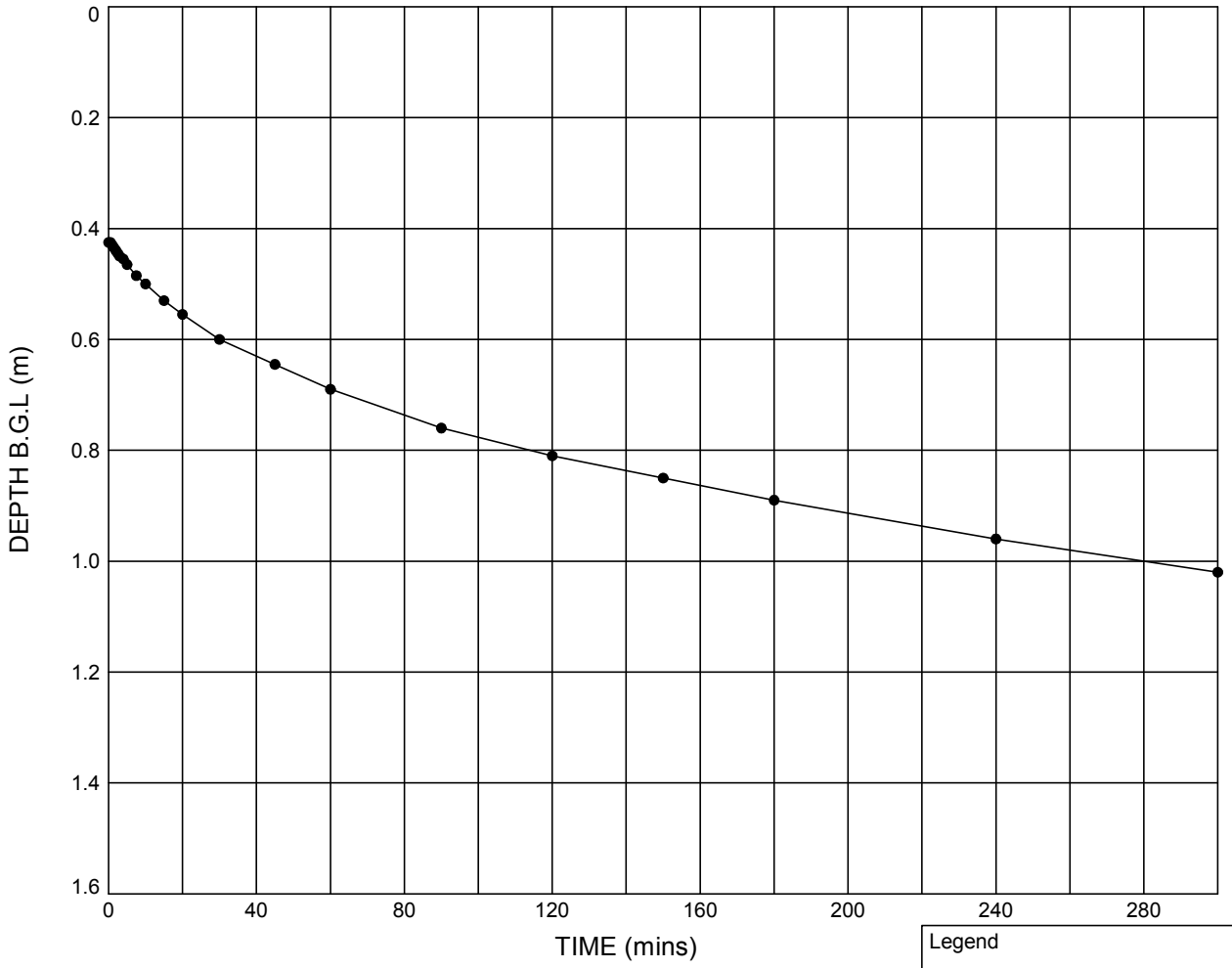
STRUCTURAL SOILS 1a Princess Street Bedminster Bristol BS3 4AG	Compiled By	Date	Checked By	Date
	MDStrawson	**16/12/16**	S. Phillips	**16/12/16**
	Contract **Whitepost Road, Banbury**		Contract Ref: **747008**	

FULL SCALE SOAKAWAY TEST

Non-standard test

Soakaway Test - Position ID : **TP27**

PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME



Test 1

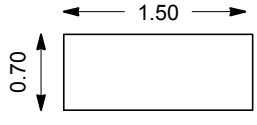
Legend

● Test 1 (07.12.16)

Pit start depth:	=	**1.60**	m
Pit final depth:	=	**1.53**	m
Effective depth, De	=	**1.11**	m
Effective storage volume, V_{p75-25}	=	**0.5801**	m^3
Surface area, a_{p50}	=	**3.4810**	m^2
Time, t_{p75-25}	=	**28136**	secs
Infiltration rate, f	=	**5.92x10^{-6}**	m/s

Please note test data was extrapolated to obtain tp75-tp25.

Plan (Not to scale)



No Bearing Taken

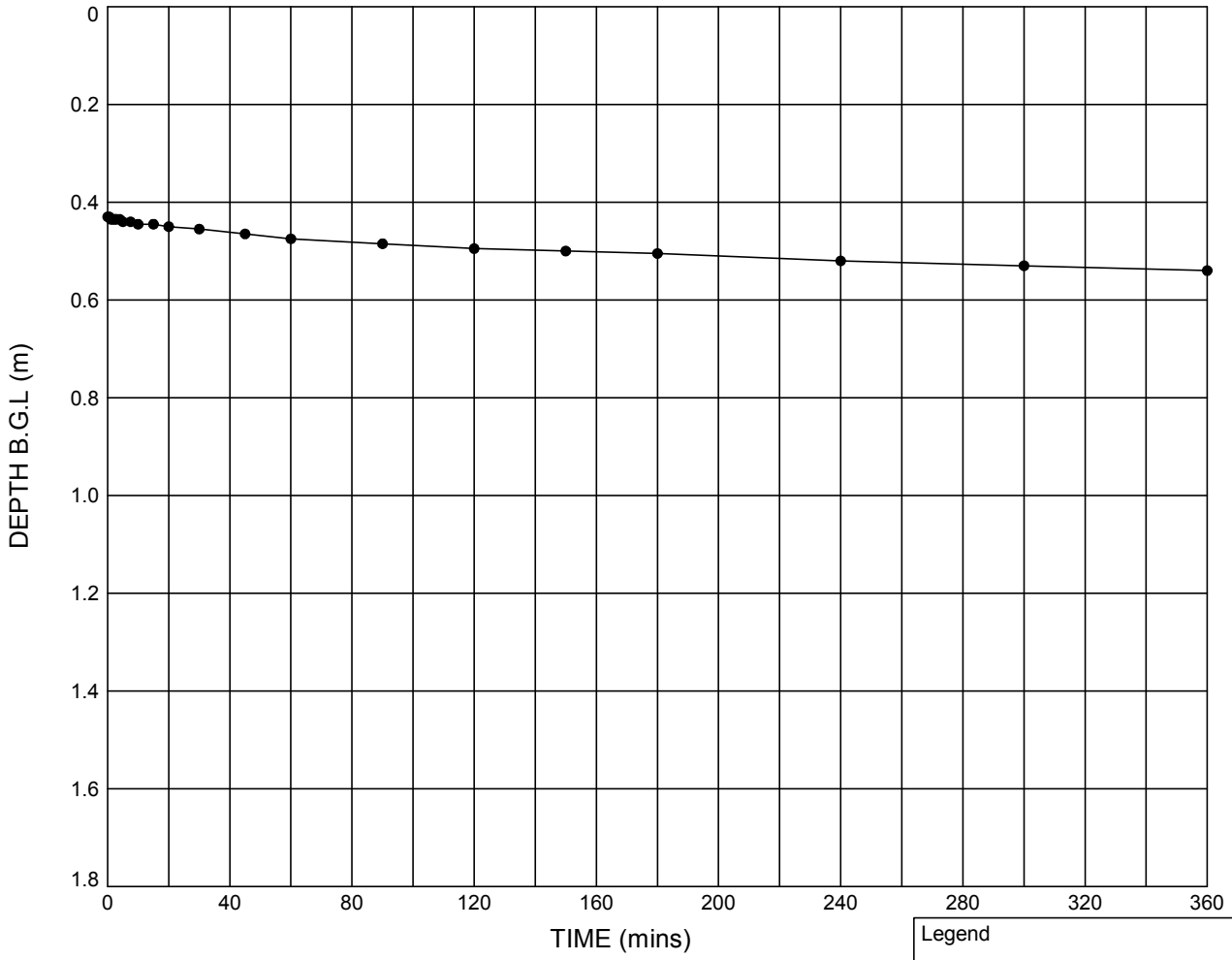
STRUCTURAL SOILS 1a Princess Street Bedminster Bristol BS3 4AG	Compiled By	Date	Checked By	Date
	MDStrawson	**16/12/16**	S. Phillips	**16/12/16**
	Contract **Whitepost Road, Banbury**		Contract Ref: **747008**	

FULL SCALE SOAKAWAY TEST

Non-standard test

Soakaway Test - Position ID : **TP28**

PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME



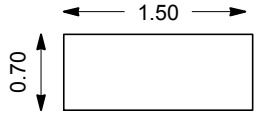
Legend

● Test 1 (07.12.16)

Pit start depth:	=	**1.70**	m
Pit final depth:	=	**1.66**	m
Effective depth, De	=	**1.23**	m
Effective storage volume, V_{p75-25}	=	**0.6458**	m^3
Surface area, a_{p50}	=	**3.7560**	m^2
Time, t_{p75-25}	=	**221400**	secs
Infiltration rate, f	=	**7.77x10^{-7}**	m/s

Please note test data was extrapolated to obtain tp75-tp25.

Plan (Not to scale)



No Bearing Taken

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By	Date	Checked By	Date
MDStrawson	**16/12/16**	S. Phillips	**16/12/16**

Contract: **Whitepost Road, Banbury**

Contract Ref: **747008**

APPENDIX E
GROUND GAS AND GROUNDWATER MONITORING DATA

IN-SITU GAS MONITORING RESULTS

[Pressures]	Previous	During	Start	End	Equipment Used & Remarks
Round 1	Fluctuating	Falling	1007	1006	Ground: Damp + Wind: None + Air Temp: 4DegC
Round 2	Fluctuating	Constant	1012	1012	Ground: Frost + Wind: None + Air Temp: 5DegC
Round 3	Fluctuating	Constant	1020	1020	Ground: Frost + Wind: Light + Air Temp: 1DegC
Round 4	Fluctuating	Rising	993	994	Ground: Snow + Wind: Strong + Air Temp: 1DegC
Round 5	Fluctuating	Falling	1012	1011	Ground: Damp + Wind: Light + Air Temp: 2DegC
Round 6	Fluctuating	Constant	980	980	Wind: Light + Air Temp: 9DegC

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS1	1	50	1	2.00	---	1.00 to 2.00	12/12/2016 09:02:00	1006	1006	$0.0_{(I)}$	-	-	-	-	-	-	-
WS1	1	50	1		---	1.00 to 2.00	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-
WS1	1	50	1	2.00	---	1.00 to 2.00	12/12/2016 09:03:00	-	-	-	-	0.1	0.0	20.9	0.0	0.0	0.0
WS1	1	50	1		---	1.00 to 2.00	15 secs	-	-	-	-	0.7	0.0	20.7	0.0	0.0	0.0
WS1	1	50	1		---	1.00 to 2.00	30 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS1	1	50	1		---	1.00 to 2.00	60 secs	-	-	-	-	0.7	0.0	20.3	0.0	0.0	0.0
WS1	1	50	1		---	1.00 to 2.00	90 secs	-	-	-	-	0.7	0.0	20.3	0.0	0.0	0.0
WS1	1	50	1		---	1.00 to 2.00	120 secs	-	-	-	-	0.7	0.0	20.3	0.0	0.0	0.0
WS1	1	50	1		---	1.00 to 2.00	180 secs	-	-	-	-	0.7	0.0	20.3	0.0	0.0	0.0
WS1	1	50	1		---	1.00 to 2.00	240 secs	-	-	-	-	0.7	0.0	20.2	0.0	0.0	0.0
WS1	1	50	1		---	1.00 to 2.00	300 secs	-	-	-	-	0.8	0.0	20.2	0.0	0.0	0.0
WS1	1	50	1		2.19	1.00 to 2.00	360 secs	-	-	-	DRY	-	-	-	-	-	-
WS1	1	50	2	2.00	---	1.00 to 2.00	19/12/2016 08:46:00	1012	1012	$0.0_{(I)}$	-	-	-	-	-	-	-
WS1	1	50	2		---	1.00 to 2.00	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-
WS1	1	50	2	2.00	---	1.00 to 2.00	19/12/2016 08:47:00	-	-	-	-	0.1	0.0	20.8	0.0	0.0	0.0
WS1	1	50	2		---	1.00 to 2.00	15 secs	-	-	-	-	0.8	0.0	20.7	0.0	0.0	0.0
WS1	1	50	2		---	1.00 to 2.00	30 secs	-	-	-	-	0.8	0.0	20.1	0.0	0.0	0.0
WS1	1	50	2		---	1.00 to 2.00	60 secs	-	-	-	-	0.8	0.0	20.0	0.0	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

RSK Environment Ltd
Abbey Park
Humber Road
Coventry
CV3 4AQ

Compiled By	Date	Checked By	Date	Contract Ref:
[redacted]	07/02/17			313498

Contract: **White Post Road, Banbury**

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS1	1	50	2		---	1.00 to 2.00	90 secs	-	-	-	-	0.8	0.0	20.0	0.0	0.0	0.0
WS1	1	50	2		---	1.00 to 2.00	120 secs	-	-	-	-	0.8	0.0	20.0	0.0	0.0	0.0
WS1	1	50	2		---	1.00 to 2.00	180 secs	-	-	-	-	0.8	0.0	20.0	0.0	0.0	0.0
WS1	1	50	2		---	1.00 to 2.00	240 secs	-	-	-	-	0.9	0.0	20.0	0.0	0.0	0.0
WS1	1	50	2		---	1.00 to 2.00	300 secs	-	-	-	-	0.9	0.0	20.0	0.0	0.0	0.0
WS1	1	50	2		2.18	1.00 to 2.00	360 secs	-	-	-	DRY	-	-	-	-	-	-
WS1	1	50	3	2.00	---	1.00 to 2.00	06/01/2017 09:15:00	1020	1020	$0.1_{(I)}$	-	-	-	-	-	-	-
WS1	1	50	3		---	1.00 to 2.00	30 secs	-	-	$0.1_{(SS)}$	-	-	-	-	-	-	-
WS1	1	50	3	2.00	---	1.00 to 2.00	06/01/2017 09:16:00	-	-	-	-	0.1	0.0	20.4	0.0	0.0	0.0
WS1	1	50	3		---	1.00 to 2.00	15 secs	-	-	-	-	0.6	0.1	20.5	-	0.0	0.0
WS1	1	50	3		---	1.00 to 2.00	30 secs	-	-	-	-	0.7	0.0	20.5	-	0.0	0.0
WS1	1	50	3		---	1.00 to 2.00	60 secs	-	-	-	-	0.8	0.0	20.5	-	0.0	0.0
WS1	1	50	3		---	1.00 to 2.00	90 secs	-	-	-	-	0.8	0.0	20.6	-	0.0	0.0
WS1	1	50	3		---	1.00 to 2.00	120 secs	-	-	-	-	0.8	0.0	20.6	-	0.0	0.0
WS1	1	50	3		---	1.00 to 2.00	180 secs	-	-	-	-	0.8	0.0	20.6	-	0.0	0.0
WS1	1	50	3		---	1.00 to 2.00	240 secs	-	-	-	-	0.9	0.0	20.7	-	0.0	0.0
WS1	1	50	3		---	1.00 to 2.00	300 secs	-	-	-	-	1.0	0.0	20.7	-	0.0	0.0
WS1	1	50	3		2.22	1.00 to 2.00	330 secs	-	-	-	DRY	-	-	-	-	-	-

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS1	1	50	4	2.00	---	1.00 to 2.00	13/01/2017 10:39:00	993	993	0.0$_{(I)}$	-	-	-	-	-	-	-
WS1	1	50	4		---	1.00 to 2.00	30 secs	-	-	0.0$_{(SS)}$	-	-	-	-	-	-	-
WS1	1	50	4	2.00	---	1.00 to 2.00	13/01/2017 10:40:00	-	-	-	-	0.2	0.0	20.9	0.0	0.0	0.0
WS1	1	50	4		---	1.00 to 2.00	15 secs	-	-	-	-	0.7	0.0	20.7	0.0	0.0	0.0
WS1	1	50	4		---	1.00 to 2.00	30 secs	-	-	-	-	0.7	0.0	20.5	0.0	0.0	0.0
WS1	1	50	4		---	1.00 to 2.00	60 secs	-	-	-	-	0.7	0.0	20.5	0.0	0.0	0.0
WS1	1	50	4		---	1.00 to 2.00	90 secs	-	-	-	-	0.7	0.0	20.5	0.0	0.0	0.0
WS1	1	50	4		---	1.00 to 2.00	120 secs	-	-	-	-	0.7	0.0	20.5	0.0	0.0	0.0
WS1	1	50	4		---	1.00 to 2.00	180 secs	-	-	-	-	0.7	0.0	20.5	0.0	0.0	0.0
WS1	1	50	4		---	1.00 to 2.00	240 secs	-	-	-	-	0.8	0.0	20.5	0.0	0.0	0.0
WS1	1	50	4		---	1.00 to 2.00	300 secs	-	-	-	-	0.9	0.0	20.4	0.0	0.0	0.0
WS1	1	50	4		2.21	1.00 to 2.00	330 secs	-	-	-	DRY	-	-	-	-	-	-
WS1	1	50	5	2.00	---	1.00 to 2.00	23/01/2017 11:08:00	1012	1012	-0.2$_{(I)}$	-	-	-	-	-	-	-
WS1	1	50	5		---	1.00 to 2.00	30 secs	-	-	0.0$_{(SS)}$	-	-	-	-	-	-	-
WS1	1	50	5	2.00	---	1.00 to 2.00	23/01/2017 11:09:00	-	-	-	-	0.1	0.0	20.8	0.0	0.0	0.0
WS1	1	50	5		---	1.00 to 2.00	15 secs	-	-	-	-	1.0	0.0	20.7	0.0	0.0	0.0
WS1	1	50	5		---	1.00 to 2.00	30 secs	-	-	-	-	1.0	0.0	20.4	0.0	0.0	0.0
WS1	1	50	5		---	1.00 to 2.00	60 secs	-	-	-	-	1.0	0.0	20.4	0.0	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

RSK Environment Ltd
Abbey Park
Humber Road
Coventry
CV3 4AQ

Compiled By	Date	Checked By	Date	Contract Ref:
[redacted]	07/02/17			313498

Contract: **White Post Road, Banbury**

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS1	1	50	5		---	1.00 to 2.00	90 secs	-	-	-	-	1.0	0.0	20.4	0.0	0.0	0.0
WS1	1	50	5		---	1.00 to 2.00	120 secs	-	-	-	-	1.0	0.0	20.4	0.0	0.0	0.0
WS1	1	50	5		---	1.00 to 2.00	180 secs	-	-	-	-	1.1	0.0	20.5	0.0	0.0	0.0
WS1	1	50	5		---	1.00 to 2.00	240 secs	-	-	-	-	1.1	0.0	20.5	0.0	0.0	0.0
WS1	1	50	5		---	1.00 to 2.00	300 secs	-	-	-	-	1.1	0.0	20.5	0.0	0.0	0.0
WS1	1	50	5		2.17	1.00 to 2.00	360 secs	-	-	-	DRY	-	-	-	-	-	-
WS1	1	50	6	2.00	---	1.00 to 2.00	03/02/2017	980	980	$0.0_{(I)}$	-	-	-	-	-	-	-
WS1	1	50	6		---	1.00 to 2.00	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-
WS1	1	50	6	2.00	---	1.00 to 2.00	03/02/2017 00:01:00	-	-	-	-	0.0	0.0	20.9	0.0	0.0	0.0
WS1	1	50	6		---	1.00 to 2.00	15 secs	-	-	-	-	0.7	0.0	20.7	0.0	0.0	0.0
WS1	1	50	6		---	1.00 to 2.00	30 secs	-	-	-	-	0.7	0.0	20.5	0.0	0.0	0.0
WS1	1	50	6		---	1.00 to 2.00	60 secs	-	-	-	-	0.7	0.0	20.5	0.0	0.0	0.0
WS1	1	50	6		---	1.00 to 2.00	90 secs	-	-	-	-	0.7	0.0	20.5	0.0	0.0	0.0
WS1	1	50	6		---	1.00 to 2.00	120 secs	-	-	-	-	0.7	0.0	20.5	0.0	0.0	0.0
WS1	1	50	6		---	1.00 to 2.00	180 secs	-	-	-	-	0.7	0.0	20.5	0.0	0.0	0.0
WS1	1	50	6		---	1.00 to 2.00	240 secs	-	-	-	-	0.7	0.0	20.5	0.0	0.0	0.0
WS1	1	50	6		---	1.00 to 2.00	300 secs	-	-	-	-	0.7	0.0	20.5	0.0	0.0	0.0
WS1	1	50	6		2.18	1.00 to 2.00	360 secs	-	-	-	DRY	-	-	-	-	-	-

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures]	Previous	During	Start	End	Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS2	1	50	1	3.00	---	1.00 to 3.00	12/12/2016 09:14:00	1006	1006	$0.0_{(I)}$	-	-	-	-	-	-	-
WS2	1	50	1		---	1.00 to 3.00	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-
WS2	1	50	1	3.00	---	1.00 to 3.00	12/12/2016 09:15:00	-	-	-	-	0.1	0.0	20.9	0.0	0.0	0.0
WS2	1	50	1		---	1.00 to 3.00	15 secs	-	-	-	-	0.7	0.0	20.6	0.0	0.0	0.0
WS2	1	50	1		---	1.00 to 3.00	30 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS2	1	50	1		---	1.00 to 3.00	60 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS2	1	50	1		---	1.00 to 3.00	90 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS2	1	50	1		---	1.00 to 3.00	120 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS2	1	50	1		---	1.00 to 3.00	180 secs	-	-	-	-	0.8	0.0	20.4	0.0	0.0	0.0
WS2	1	50	1		---	1.00 to 3.00	240 secs	-	-	-	-	0.8	0.0	20.3	0.0	0.0	0.0
WS2	1	50	1		---	1.00 to 3.00	300 secs	-	-	-	-	0.8	0.0	20.3	0.0	0.0	0.0
WS2	1	50	1		3.12	1.00 to 3.00	360 secs	-	-	-	2.69	-	-	-	-	-	-
WS2	1	50	2	3.00	---	1.00 to 3.00	19/12/2016 08:59:00	-	-	$0.0_{(I)}$	-	-	-	-	-	-	-
WS2	1	50	2		---	1.00 to 3.00	30 secs	-	-	$0.1_{(SS)}$	-	-	-	-	-	-	-
WS2	1	50	2	3.00	---	1.00 to 3.00	19/12/2016 09:00:00	-	-	-	-	0.1	0.0	20.8	0.0	0.0	0.0
WS2	1	50	2		---	1.00 to 3.00	15 secs	-	-	-	-	0.8	0.0	20.7	0.0	0.0	0.0
WS2	1	50	2		---	1.00 to 3.00	30 secs	-	-	-	-	0.8	0.0	20.1	0.0	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS2	1	50	2		---	1.00 to 3.00	60 secs	-	-	-	-	0.8	0.0	20.0	0.0	0.0	0.0
WS2	1	50	2		---	1.00 to 3.00	90 secs	-	-	-	-	0.8	0.0	20.0	0.0	0.0	0.0
WS2	1	50	2		---	1.00 to 3.00	120 secs	-	-	-	-	0.8	0.0	20.0	0.0	0.0	0.0
WS2	1	50	2		---	1.00 to 3.00	180 secs	-	-	-	-	0.8	0.0	20.0	0.0	0.0	0.0
WS2	1	50	2		---	1.00 to 3.00	240 secs	-	-	-	-	0.8	0.0	20.0	0.0	0.0	0.0
WS2	1	50	2		---	1.00 to 3.00	300 secs	-	-	-	-	0.8	0.0	20.0	0.0	0.0	0.0
WS2	1	50	2		3.11	1.00 to 3.00	360 secs	-	-	-	2.51	-	-	-	-	-	-
WS2	1	50	3	3.00	---	1.00 to 3.00	06/01/2017 09:30:00	1020	1020	$0.0_{(I)}$	-	-	-	-	-	-	-
WS2	1	50	3		---	1.00 to 3.00	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-
WS2	1	50	3	3.00	---	1.00 to 3.00	06/01/2017 09:31:00	-	-	-	-	0.1	0.0	20.9	-	0.0	0.0
WS2	1	50	3		---	1.00 to 3.00	15 secs	-	-	-	-	0.9	0.1	21.2	-	0.0	0.0
WS2	1	50	3		---	1.00 to 3.00	30 secs	-	-	-	-	1.0	0.1	21.2	-	0.0	0.0
WS2	1	50	3		---	1.00 to 3.00	60 secs	-	-	-	-	1.0	0.1	21.2	-	0.0	0.0
WS2	1	50	3		---	1.00 to 3.00	90 secs	-	-	-	-	1.0	0.1	21.2	-	0.0	0.0
WS2	1	50	3		---	1.00 to 3.00	120 secs	-	-	-	-	1.0	0.0	21.2	-	0.0	0.0
WS2	1	50	3		---	1.00 to 3.00	180 secs	-	-	-	-	1.0	0.1	21.2	-	0.0	0.0
WS2	1	50	3		---	1.00 to 3.00	240 secs	-	-	-	-	0.9	0.1	21.2	-	0.0	0.0
WS2	1	50	3		---	1.00 to 3.00	300 secs	-	-	-	-	0.9	0.1	21.3	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS2	1	50	3		3.10	1.00 to 3.00	330 secs	-	-	-	2.54	-	-	-	-	-	-
WS2	1	50	4	3.00	---	1.00 to 3.00	13/01/2017 10:53:00	993	993	$0.0_{(I)}$	-	-	-	-	-	-	-
WS2	1	50	4		---	1.00 to 3.00	30 secs	-	-	$0.1_{(SS)}$	-	-	-	-	-	-	-
WS2	1	50	4	3.00	---	1.00 to 3.00	13/01/2017 10:54:00	-	-	-	-	0.2	0.0	20.8	0.0	0.0	0.0
WS2	1	50	4		---	1.00 to 3.00	15 secs	-	-	-	-	1.0	0.0	20.5	0.0	0.0	0.0
WS2	1	50	4		---	1.00 to 3.00	30 secs	-	-	-	-	1.0	0.0	20.1	0.0	0.0	0.0
WS2	1	50	4		---	1.00 to 3.00	60 secs	-	-	-	-	1.0	0.0	20.0	0.0	0.0	0.0
WS2	1	50	4		---	1.00 to 3.00	90 secs	-	-	-	-	1.0	0.0	20.0	0.0	0.0	0.0
WS2	1	50	4		---	1.00 to 3.00	120 secs	-	-	-	-	1.0	0.0	20.0	0.0	0.0	0.0
WS2	1	50	4		---	1.00 to 3.00	180 secs	-	-	-	-	1.0	0.0	20.0	0.0	0.0	0.0
WS2	1	50	4		---	1.00 to 3.00	240 secs	-	-	-	-	1.0	0.0	20.0	0.0	0.0	0.0
WS2	1	50	4		---	1.00 to 3.00	300 secs	-	-	-	-	1.0	0.0	20.1	0.0	0.0	0.0
WS2	1	50	4		3.10	1.00 to 3.00	330 secs	-	-	-	2.45	-	-	-	-	-	-
WS2	1	50	5	3.00	---	1.00 to 3.00	23/01/2017 11:19:00	1012	1012	$0.0_{(I)}$	-	-	-	-	-	-	-
WS2	1	50	5		---	1.00 to 3.00	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-
WS2	1	50	5	3.00	---	1.00 to 3.00	23/01/2017 11:20:00	-	-	-	-	0.1	0.0	20.8	0.0	0.0	0.0
WS2	1	50	5		---	1.00 to 3.00	15 secs	-	-	-	-	1.0	0.0	20.7	0.0	0.0	0.0
WS2	1	50	5		---	1.00 to 3.00	30 secs	-	-	-	-	1.0	0.0	20.4	0.0	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS2	1	50	5		---	1.00 to 3.00	60 secs	-	-	-	-	1.0	0.0	20.3	0.0	0.0	0.0
WS2	1	50	5		---	1.00 to 3.00	90 secs	-	-	-	-	1.0	0.0	20.3	0.0	0.0	0.0
WS2	1	50	5		---	1.00 to 3.00	120 secs	-	-	-	-	1.0	0.0	20.4	0.0	0.0	0.0
WS2	1	50	5		---	1.00 to 3.00	180 secs	-	-	-	-	0.9	0.0	20.4	0.0	0.0	0.0
WS2	1	50	5		---	1.00 to 3.00	240 secs	-	-	-	-	0.9	0.0	20.4	0.0	0.0	0.0
WS2	1	50	5		---	1.00 to 3.00	300 secs	-	-	-	-	0.9	0.0	20.4	0.0	0.0	0.0
WS2	1	50	5		3.09	1.00 to 3.00	360 secs	-	-	-	1.38	-	-	-	-	-	-
WS2	1	50	6	3.00	---	1.00 to 3.00	03/02/2017	980	980	$0.0_{(I)}$	-	-	-	-	-	-	-
WS2	1	50	6		---	1.00 to 3.00	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-
WS2	1	50	6		---	1.00 to 3.00	60 secs	-	-	-	-	0.0	0.0	20.9	0.0	0.0	0.0
WS2	1	50	6		---	1.00 to 3.00	75 secs	-	-	-	-	0.6	0.0	20.4	0.0	0.0	0.0
WS2	1	50	6		---	1.00 to 3.00	90 secs	-	-	-	-	0.6	0.0	20.1	0.0	0.0	0.0
WS2	1	50	6		---	1.00 to 3.00	120 secs	-	-	-	-	0.6	0.0	20.1	0.0	0.0	0.0
WS2	1	50	6		---	1.00 to 3.00	150 secs	-	-	-	-	0.6	0.0	20.1	0.0	0.0	0.0
WS2	1	50	6		---	1.00 to 3.00	180 secs	-	-	-	-	0.6	0.0	20.1	0.0	0.0	0.0
WS2	1	50	6		---	1.00 to 3.00	240 secs	-	-	-	-	0.7	0.0	20.1	0.0	0.0	0.0
WS2	1	50	6		---	1.00 to 3.00	300 secs	-	-	-	-	0.7	0.0	20.1	0.0	0.0	0.0
WS2	1	50	6		---	1.00 to 3.00	360 secs	-	-	-	-	0.7	0.0	20.0	0.0	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures]	Previous	During	Start	End	Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS2	1	50	6		3.10	1.00 to 3.00	420 secs	-	-	-	1.14	-	-	-	-	-	-
WS4	1	50	1	1.70	---	1.00 to 1.70	12/12/2016 08:46:00	1006	1006	$0.0_{(I)}$	-	-	-	-	-	-	-
WS4	1	50	1		---	1.00 to 1.70	30 secs	-	-	$0.1_{(SS)}$	-	-	-	-	-	-	-
WS4	1	50	1	1.70	---	1.00 to 1.70	12/12/2016 08:47:00	-	-	-	-	0.1	0.0	20.9	0.0	0.0	0.0
WS4	1	50	1		---	1.00 to 1.70	15 secs	-	-	-	-	0.7	0.0	20.8	0.0	0.0	0.0
WS4	1	50	1		---	1.00 to 1.70	30 secs	-	-	-	-	0.7	0.0	20.3	0.0	0.0	0.0
WS4	1	50	1		---	1.00 to 1.70	60 secs	-	-	-	-	0.7	0.0	20.3	0.0	0.0	0.0
WS4	1	50	1		---	1.00 to 1.70	90 secs	-	-	-	-	0.7	0.0	20.3	0.0	0.0	0.0
WS4	1	50	1		---	1.00 to 1.70	120 secs	-	-	-	-	0.7	0.0	20.3	0.0	0.0	0.0
WS4	1	50	1		---	1.00 to 1.70	180 secs	-	-	-	-	0.7	0.0	20.3	0.0	0.0	0.0
WS4	1	50	1		---	1.00 to 1.70	240 secs	-	-	-	-	0.7	0.0	20.2	0.0	0.0	0.0
WS4	1	50	1		---	1.00 to 1.70	300 secs	-	-	-	-	0.7	0.0	20.2	0.0	0.0	0.0
WS4	1	50	1		1.75	1.00 to 1.70	360 secs	-	-	-	DRY	-	-	-	-	-	-
WS4	1	50	2	1.70	---	1.00 to 1.70	19/12/2016 08:34:00	1012	1012	$0.0_{(I)}$	-	-	-	-	-	-	-
WS4	1	50	2		---	1.00 to 1.70	30 secs	-	-	$0.1_{(SS)}$	-	-	-	-	-	-	-
WS4	1	50	2	1.70	---	1.00 to 1.70	19/12/2016 08:35:00	-	-	-	-	0.1	0.0	20.8	0.0	0.0	0.0
WS4	1	50	2		---	1.00 to 1.70	15 secs	-	-	-	-	0.7	0.0	20.6	0.0	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS4	1	50	2		---	1.00 to 1.70	30 secs	-	-	-	-	0.7	0.0	20.1	0.0	0.0	0.0
WS4	1	50	2		---	1.00 to 1.70	60 secs	-	-	-	-	0.7	0.0	20.0	0.0	0.0	0.0
WS4	1	50	2		---	1.00 to 1.70	90 secs	-	-	-	-	0.7	0.0	20.0	0.0	0.0	0.0
WS4	1	50	2		---	1.00 to 1.70	120 secs	-	-	-	-	0.7	0.0	20.0	0.0	0.0	0.0
WS4	1	50	2		---	1.00 to 1.70	180 secs	-	-	-	-	0.7	0.0	20.0	0.0	0.0	0.0
WS4	1	50	2		---	1.00 to 1.70	240 secs	-	-	-	-	0.7	0.0	20.0	0.0	0.0	0.0
WS4	1	50	2		---	1.00 to 1.70	300 secs	-	-	-	-	0.7	0.0	20.0	0.0	0.0	0.0
WS4	1	50	2		1.75	1.00 to 1.70	360 secs	-	-	-	DRY	-	-	-	-	-	-
WS4	1	50	3	1.70	---	1.00 to 1.70	06/01/2017 09:58:00	1020	1020	$0.0_{(I)}$	-	-	-	-	-	-	-
WS4	1	50	3		---	1.00 to 1.70	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-
WS4	1	50	3	1.70	---	1.00 to 1.70	06/01/2017 09:59:00	-	-	-	-	0.1	0.0	20.9	-	0.0	0.0
WS4	1	50	3		---	1.00 to 1.70	15 secs	-	-	-	-	0.7	0.1	21.8	-	0.0	0.0
WS4	1	50	3		---	1.00 to 1.70	30 secs	-	-	-	-	0.7	0.1	21.8	-	0.0	0.0
WS4	1	50	3		---	1.00 to 1.70	60 secs	-	-	-	-	0.7	0.1	21.8	-	0.0	0.0
WS4	1	50	3		---	1.00 to 1.70	90 secs	-	-	-	-	0.7	0.1	21.8	-	0.0	0.0
WS4	1	50	3		---	1.00 to 1.70	120 secs	-	-	-	-	0.7	0.1	21.8	-	0.0	0.0
WS4	1	50	3		---	1.00 to 1.70	180 secs	-	-	-	-	0.7	0.1	21.8	-	0.0	0.0
WS4	1	50	3		---	1.00 to 1.70	240 secs	-	-	-	-	0.7	0.1	21.8	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS4	1	50	3		---	1.00 to 1.70	300 secs	-	-	-	-	0.7	0.1	21.8	-	0.0	0.0
WS4	1	50	3		1.75	1.00 to 1.70	330 secs	-	-	-	DRY	-	-	-	-	-	-
WS4	1	50	4	1.70	---	1.00 to 1.70	13/01/2017 10:23:00	-	-0.03	$0.0_{(I)}$	-	-	-	-	-	-	-
WS4	1	50	4		---	1.00 to 1.70	30 secs	-	-	$0.1_{(SS)}$	-	-	-	-	-	-	-
WS4	1	50	4	1.70	---	1.00 to 1.70	13/01/2017 10:24:00	-	-	-	-	0.2	0.0	20.9	0.0	0.0	0.0
WS4	1	50	4		---	1.00 to 1.70	15 secs	-	-	-	-	0.5	0.0	20.8	0.0	0.0	0.0
WS4	1	50	4		---	1.00 to 1.70	30 secs	-	-	-	-	0.5	0.0	20.8	0.0	0.0	0.0
WS4	1	50	4		---	1.00 to 1.70	60 secs	-	-	-	-	0.5	0.0	20.8	0.0	0.0	0.0
WS4	1	50	4		---	1.00 to 1.70	90 secs	-	-	-	-	0.5	0.0	20.8	0.0	0.0	0.0
WS4	1	50	4		---	1.00 to 1.70	120 secs	-	-	-	-	0.5	0.0	20.8	0.0	0.0	0.0
WS4	1	50	4		---	1.00 to 1.70	180 secs	-	-	-	-	0.5	0.0	20.8	0.0	0.0	0.0
WS4	1	50	4		---	1.00 to 1.70	240 secs	-	-	-	-	0.5	0.0	20.8	0.0	0.0	0.0
WS4	1	50	4		---	1.00 to 1.70	300 secs	-	-	-	-	0.5	0.0	20.8	0.0	0.0	0.0
WS4	1	50	4		1.75	1.00 to 1.70	330 secs	-	-	-	DRY	-	-	-	-	-	-
WS4	1	50	5	1.70	---	1.00 to 1.70	23/01/2017 10:53:00	1012	1012	$0.0_{(I)}$	-	-	-	-	-	-	-
WS4	1	50	5		---	1.00 to 1.70	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-
WS4	1	50	5	1.70	---	1.00 to 1.70	23/01/2017 10:54:00	-	-	-	-	0.1	0.0	20.8	0.0	0.0	0.0
WS4	1	50	5		---	1.00 to 1.70	15 secs	-	-	-	-	0.7	0.0	20.6	0.0	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS4	1	50	5		---	1.00 to 1.70	30 secs	-	-	-	-	0.7	0.0	20.3	0.0	0.0	0.0
WS4	1	50	5		---	1.00 to 1.70	60 secs	-	-	-	-	0.7	0.0	20.3	0.0	0.0	0.0
WS4	1	50	5		---	1.00 to 1.70	90 secs	-	-	-	-	0.7	0.0	20.3	0.0	0.0	0.0
WS4	1	50	5		---	1.00 to 1.70	120 secs	-	-	-	-	0.7	0.0	20.3	0.0	0.0	0.0
WS4	1	50	5		---	1.00 to 1.70	180 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS4	1	50	5		---	1.00 to 1.70	240 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS4	1	50	5		---	1.00 to 1.70	300 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS4	1	50	5		1.71	1.00 to 1.70	360 secs	-	-	-	DRY	-	-	-	-	-	-
WS4	1	50	6	1.70	---	1.00 to 1.70	03/02/2017	980	980	$0.1_{(I)}$	-	-	-	-	-	-	-
WS4	1	50	6		---	1.00 to 1.70	30 secs	-	-	$0.1_{(SS)}$	-	-	-	-	-	-	-
WS4	1	50	6		---	1.00 to 1.70	60 secs	-	-	-	-	0.0	0.0	20.9	0.0	0.0	0.0
WS4	1	50	6		---	1.00 to 1.70	75 secs	-	-	-	-	0.5	0.0	20.7	0.0	0.0	0.0
WS4	1	50	6		---	1.00 to 1.70	90 secs	-	-	-	-	0.5	0.0	20.6	0.0	0.0	0.0
WS4	1	50	6		---	1.00 to 1.70	120 secs	-	-	-	-	0.5	0.0	20.6	0.0	0.0	0.0
WS4	1	50	6		---	1.00 to 1.70	150 secs	-	-	-	-	0.5	0.0	20.6	0.0	0.0	0.0
WS4	1	50	6		---	1.00 to 1.70	180 secs	-	-	-	-	0.5	0.0	20.6	0.0	0.0	0.0
WS4	1	50	6		---	1.00 to 1.70	240 secs	-	-	-	-	0.5	0.0	20.6	0.0	0.0	0.0
WS4	1	50	6		---	1.00 to 1.70	300 secs	-	-	-	-	0.5	0.0	20.7	0.0	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

RSK Environment Ltd
Abbey Park
Humber Road
Coventry
CV3 4AQ

Compiled By	Date	Checked By	Date	Contract Ref:
[redacted]	07/02/17			313498

Contract: **White Post Road, Banbury**

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS4	1	50	6		---	1.00 to 1.70	360 secs	-	-	-	-	0.5	0.0	20.7	0.0	0.0	0.0
WS4	1	50	6		1.75	1.00 to 1.70	420 secs	-	-	-	DRY	-	-	-	-	-	-
WS5	1	50	1	3.00	---	1.00 to 3.00	12/12/2016 09:37:00	1006	1006	$0.1_{(I)}$	-	-	-	-	-	-	-
WS5	1	50	1		---	1.00 to 3.00	30 secs	-	-	$0.2_{(SS)}$	-	-	-	-	-	-	-
WS5	1	50	1	3.00	---	1.00 to 3.00	12/12/2016 09:38:00	-	-	-	-	0.1	0.0	20.9	0.0	0.0	0.0
WS5	1	50	1		---	1.00 to 3.00	15 secs	-	-	-	-	0.8	0.0	20.7	0.0	1.0	0.0
WS5	1	50	1		---	1.00 to 3.00	30 secs	-	-	-	-	0.8	0.0	20.5	0.0	0.0	0.0
WS5	1	50	1		---	1.00 to 3.00	60 secs	-	-	-	-	0.8	0.0	20.3	0.0	0.0	0.0
WS5	1	50	1		---	1.00 to 3.00	90 secs	-	-	-	-	0.8	0.0	20.3	0.0	0.0	0.0
WS5	1	50	1		---	1.00 to 3.00	120 secs	-	-	-	-	0.8	0.0	20.3	0.0	0.0	0.0
WS5	1	50	1		---	1.00 to 3.00	180 secs	-	-	-	-	0.8	0.0	20.3	0.0	0.0	0.0
WS5	1	50	1		---	1.00 to 3.00	240 secs	-	-	-	-	0.7	0.0	20.3	0.0	0.0	0.0
WS5	1	50	1		---	1.00 to 3.00	300 secs	-	-	-	-	0.6	0.0	20.3	0.0	0.0	0.0
WS5	1	50	1		3.02	1.00 to 3.00	360 secs	-	-	-	2.02	-	-	-	-	-	-
WS5	1	50	2	3.00	---	1.00 to 3.00	19/12/2016 09:11:00	1012	1012	$0.0_{(I)}$	-	-	-	-	-	-	-
WS5	1	50	2		---	1.00 to 3.00	30 secs	-	-	$0.1_{(SS)}$	-	-	-	-	-	-	-
WS5	1	50	2	3.00	---	1.00 to 3.00	19/12/2016 09:12:00	-	-	-	-	0.1	0.0	20.8	0.0	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS5	1	50	2		---	1.00 to 3.00	15 secs	-	-	-	-	0.7	0.0	20.8	0.0	0.0	0.0
WS5	1	50	2		---	1.00 to 3.00	30 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS5	1	50	2		---	1.00 to 3.00	60 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS5	1	50	2		---	1.00 to 3.00	90 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS5	1	50	2		---	1.00 to 3.00	120 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS5	1	50	2		---	1.00 to 3.00	180 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS5	1	50	2		---	1.00 to 3.00	240 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS5	1	50	2		---	1.00 to 3.00	300 secs	-	-	-	-	0.6	0.0	20.5	0.0	0.0	0.0
WS5	1	50	2		3.06	1.00 to 3.00	360 secs	-	-	-	2.00	-	-	-	-	-	-
WS5	1	50	3	3.00	---	1.00 to 3.00	06/01/2017 09:44:00	1020	1020	$0.0_{(I)}$	-	-	-	-	-	-	-
WS5	1	50	3		---	1.00 to 3.00	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-
WS5	1	50	3	3.00	---	1.00 to 3.00	06/01/2017 09:45:00	-	-	-	-	0.1	0.0	20.9	-	0.0	0.0
WS5	1	50	3		---	1.00 to 3.00	15 secs	-	-	-	-	0.7	0.1	22.1	-	0.0	0.0
WS5	1	50	3		---	1.00 to 3.00	30 secs	-	-	-	-	0.7	0.1	22.1	-	0.0	0.0
WS5	1	50	3		---	1.00 to 3.00	60 secs	-	-	-	-	0.7	0.1	22.0	-	0.0	0.0
WS5	1	50	3		---	1.00 to 3.00	90 secs	-	-	-	-	0.7	0.1	22.0	-	0.0	0.0
WS5	1	50	3		---	1.00 to 3.00	120 secs	-	-	-	-	0.7	0.1	22.0	-	0.0	0.0
WS5	1	50	3		---	1.00 to 3.00	180 secs	-	-	-	-	0.6	0.1	22.0	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS5	1	50	3		---	1.00 to 3.00	240 secs	-	-	-	-	0.6	0.1	22.0	-	0.0	0.0
WS5	1	50	3		---	1.00 to 3.00	300 secs	-	-	-	-	0.6	0.1	22.0	-	0.0	0.0
WS5	1	50	3		3.09	1.00 to 3.00	330 secs	-	-	-	1.90	-	-	-	-	-	-
WS5	1	50	4	3.00	---	1.00 to 3.00	13/01/2017 11:08:00	994	994	$0.0_{(I)}$	-	-	-	-	-	-	-
WS5	1	50	4		---	1.00 to 3.00	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-
WS5	1	50	4	3.00	---	1.00 to 3.00	13/01/2017 11:09:00	-	-	-	-	0.2	0.0	20.8	0.0	0.0	0.0
WS5	1	50	4		---	1.00 to 3.00	15 secs	-	-	-	-	0.7	0.0	20.6	0.0	0.0	0.0
WS5	1	50	4		---	1.00 to 3.00	30 secs	-	-	-	-	0.7	0.0	20.5	0.0	0.0	0.0
WS5	1	50	4		---	1.00 to 3.00	60 secs	-	-	-	-	0.7	0.0	20.5	0.0	0.0	0.0
WS5	1	50	4		---	1.00 to 3.00	90 secs	-	-	-	-	0.7	0.0	20.5	0.0	0.0	0.0
WS5	1	50	4		---	1.00 to 3.00	120 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS5	1	50	4		---	1.00 to 3.00	180 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS5	1	50	4		---	1.00 to 3.00	240 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS5	1	50	4		---	1.00 to 3.00	300 secs	-	-	-	-	0.6	0.0	20.4	0.0	0.0	0.0
WS5	1	50	4		3.06	1.00 to 3.00	330 secs	-	-	-	1.71	-	-	-	-	-	-
WS5	1	50	5	3.00	---	1.00 to 3.00	23/01/2017 11:32:00	1009	1012	$-0.2_{(I)}$	-	-	-	-	-	-	-
WS5	1	50	5		---	1.00 to 3.00	30 secs	-	-	$-1.2_{(SS)}$	-	-	-	-	-	-	-
WS5	1	50	5	3.00	---	1.00 to 3.00	23/01/2017 11:33:00	-	-	-	-	0.1	0.0	20.8	0.0	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS5	1	50	5		---	1.00 to 3.00	15 secs	-	-	-	-	0.6	0.0	20.2	0.0	0.0	0.0
WS5	1	50	5		---	1.00 to 3.00	30 secs	-	-	-	-	0.4	0.0	20.7	0.0	0.0	0.0
WS5	1	50	5		---	1.00 to 3.00	60 secs	-	-	-	-	0.7	0.0	20.8	0.0	0.0	0.0
WS5	1	50	5		---	1.00 to 3.00	90 secs	-	-	-	-	0.7	0.0	20.6	0.0	0.0	0.0
WS5	1	50	5		---	1.00 to 3.00	120 secs	-	-	-	-	0.5	0.0	20.7	0.0	0.0	0.0
WS5	1	50	5		---	1.00 to 3.00	180 secs	-	-	-	-	0.5	0.0	20.8	0.0	0.0	0.0
WS5	1	50	5		---	1.00 to 3.00	240 secs	-	-	-	-	0.4	0.0	20.8	0.0	0.0	0.0
WS5	1	50	5		---	1.00 to 3.00	300 secs	-	-	-	-	0.3	0.0	20.9	0.0	0.0	0.0
WS5	1	50	5		---	1.00 to 3.00	360 secs	-	-	-	-	0.3	0.0	21.0	0.0	0.0	0.0
WS5	1	50	5		---	1.00 to 3.00	420 secs	-	-	-	-	0.3	0.0	21.1	0.0	0.0	0.0
WS5	1	50	5		3.03	1.00 to 3.00	480 secs	-	-	-	0.90	-	-	-	-	-	-
WS5	1	50	6	3.00	---	1.00 to 3.00	03/02/2017	-	-	$12.3_{(I)}$	-	-	-	-	-	-	-
WS5	1	50	6		---	1.00 to 3.00	240 secs	-	-	$1.4_{(SS)}$	-	-	-	-	-	-	-
WS5	1	50	6	3.00	---	1.00 to 3.00	03/02/2017 00:05:00	-	-	-	-	0.0	0.0	20.9	0.0	0.0	0.0
WS5	1	50	6		---	1.00 to 3.00	15 secs	-	-	-	-	0.7	0.0	19.9	0.0	1.0	0.0
WS5	1	50	6		---	1.00 to 3.00	30 secs	-	-	-	-	0.7	0.0	19.7	0.0	2.0	0.0
WS5	1	50	6		---	1.00 to 3.00	60 secs	-	-	-	-	0.7	0.0	19.7	0.0	2.0	0.0
WS5	1	50	6		---	1.00 to 3.00	90 secs	-	-	-	-	0.7	0.0	19.7	0.0	2.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS5	1	50	6		3.02	1.00 to 3.00	120 secs	-	-	-	0.67	-	-	-	-	-	-
	Remarks: Pump flow failure.																
WS6	1	50	1	2.00	---	1.00 to 2.00	12/12/2016 09:53:00	1006	1006	$0.0_{(I)}$	-	-	-	-	-	-	-
WS6	1	50	1		---	1.00 to 2.00	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-
WS6	1	50	1	2.00	---	1.00 to 2.00	12/12/2016 09:54:00	-	-	-	-	0.1	0.0	20.9	0.0	0.0	0.0
WS6	1	50	1		---	1.00 to 2.00	15 secs	-	-	-	-	0.8	0.0	20.7	0.0	0.0	0.0
WS6	1	50	1		---	1.00 to 2.00	30 secs	-	-	-	-	0.8	0.0	20.3	0.0	0.0	0.0
WS6	1	50	1		---	1.00 to 2.00	60 secs	-	-	-	-	0.8	0.0	20.2	0.0	0.0	0.0
WS6	1	50	1		---	1.00 to 2.00	90 secs	-	-	-	-	0.8	0.0	20.2	0.0	0.0	0.0
WS6	1	50	1		---	1.00 to 2.00	120 secs	-	-	-	-	0.8	0.0	20.2	0.0	0.0	0.0
WS6	1	50	1		---	1.00 to 2.00	180 secs	-	-	-	-	0.8	0.0	20.1	0.0	0.0	0.0
WS6	1	50	1		---	1.00 to 2.00	240 secs	-	-	-	-	0.8	0.0	20.1	0.0	0.0	0.0
WS6	1	50	1		---	1.00 to 2.00	300 secs	-	-	-	-	0.8	0.0	20.1	0.0	0.0	0.0
WS6	1	50	1		2.52	1.00 to 2.00	360 secs	-	-	-	DRY	-	-	-	-	-	-
WS6	1	50	2	2.00	---	1.00 to 2.00	19/12/2016 09:40:00	1012	1012	$0.1_{(I)}$	-	-	-	-	-	-	-
WS6	1	50	2		---	1.00 to 2.00	30 secs	-	-	$0.1_{(SS)}$	-	-	-	-	-	-	-
WS6	1	50	2	2.00	---	1.00 to 2.00	19/12/2016 09:41:00	-	-	-	-	0.1	0.0	20.9	0.0	0.0	0.0
WS6	1	50	2		---	1.00 to 2.00	15 secs	-	-	-	-	0.7	0.0	20.6	0.0	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS6	1	50	2		---	1.00 to 2.00	30 secs	-	-	-	-	0.7	0.0	20.2	0.0	0.0	0.0
WS6	1	50	2		---	1.00 to 2.00	60 secs	-	-	-	-	0.7	0.0	20.1	0.0	0.0	0.0
WS6	1	50	2		---	1.00 to 2.00	90 secs	-	-	-	-	0.7	0.0	20.1	0.0	0.0	0.0
WS6	1	50	2		---	1.00 to 2.00	120 secs	-	-	-	-	0.7	0.0	20.1	0.0	0.0	0.0
WS6	1	50	2		---	1.00 to 2.00	180 secs	-	-	-	-	0.7	0.0	20.1	0.0	0.0	0.0
WS6	1	50	2		---	1.00 to 2.00	240 secs	-	-	-	-	0.8	0.0	20.1	0.0	0.0	0.0
WS6	1	50	2		---	1.00 to 2.00	300 secs	-	-	-	-	0.8	0.0	20.1	0.0	0.0	0.0
WS6	1	50	2		2.52	1.00 to 2.00	360 secs	-	-	-	DRY	-	-	-	-	-	-
WS6	1	50	3	2.00	---	1.00 to 2.00	06/01/2017 10:27:00	1020	1020	$0.0_{(I)}$	-	-	-	-	-	-	-
WS6	1	50	3		---	1.00 to 2.00	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-
WS6	1	50	3	2.00	---	1.00 to 2.00	06/01/2017 10:28:00	-	-	-	-	0.1	0.0	20.9	-	0.0	0.0
WS6	1	50	3		---	1.00 to 2.00	15 secs	-	-	-	-	0.7	0.1	21.9	-	0.0	0.0
WS6	1	50	3		---	1.00 to 2.00	30 secs	-	-	-	-	0.7	0.1	21.6	-	0.0	0.0
WS6	1	50	3		---	1.00 to 2.00	60 secs	-	-	-	-	0.7	0.1	21.6	-	0.0	0.0
WS6	1	50	3		---	1.00 to 2.00	90 secs	-	-	-	-	0.7	0.1	21.5	-	0.0	0.0
WS6	1	50	3		---	1.00 to 2.00	120 secs	-	-	-	-	0.7	0.1	21.5	-	0.0	0.0
WS6	1	50	3		---	1.00 to 2.00	180 secs	-	-	-	-	0.7	0.1	21.5	-	0.0	0.0
WS6	1	50	3		---	1.00 to 2.00	240 secs	-	-	-	-	0.7	0.1	21.5	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures]	Previous	During	Start	End	Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS6	1	50	3		---	1.00 to 2.00	300 secs	-	-	-	-	0.7	0.1	21.5	-	0.0	0.0
WS6	1	50	3		2.40	1.00 to 2.00	330 secs	-	-	-	2.25	-	-	-	-	-	-
WS6	1	50	4	2.00	---	1.00 to 2.00	13/01/2017 11:25:00	994	994	$0.0_{(I)}$	-	-	-	-	-	-	-
WS6	1	50	4		---	1.00 to 2.00	30 secs	-	-	$0.1_{(SS)}$	-	-	-	-	-	-	-
WS6	1	50	4	2.00	---	1.00 to 2.00	13/01/2017 11:26:00	-	-	-	-	0.2	0.0	20.9	0.0	0.0	0.0
WS6	1	50	4		---	1.00 to 2.00	15 secs	-	-	-	-	0.3	0.0	20.8	0.0	0.0	0.0
WS6	1	50	4		---	1.00 to 2.00	30 secs	-	-	-	-	0.3	0.0	20.8	0.0	0.0	0.0
WS6	1	50	4		---	1.00 to 2.00	60 secs	-	-	-	-	0.3	0.0	20.8	0.0	0.0	0.0
WS6	1	50	4		---	1.00 to 2.00	90 secs	-	-	-	-	0.3	0.0	20.8	0.0	0.0	0.0
WS6	1	50	4		---	1.00 to 2.00	120 secs	-	-	-	-	0.3	0.0	20.8	0.0	0.0	0.0
WS6	1	50	4		---	1.00 to 2.00	180 secs	-	-	-	-	0.3	0.0	20.8	0.0	0.0	0.0
WS6	1	50	4		---	1.00 to 2.00	240 secs	-	-	-	-	0.4	0.0	20.7	0.0	0.0	0.0
WS6	1	50	4		---	1.00 to 2.00	300 secs	-	-	-	-	0.4	0.0	20.7	0.0	0.0	0.0
WS6	1	50	4		2.36	1.00 to 2.00	330 secs	-	-	-	DRY	-	-	-	-	-	-
WS6	1	50	5	2.00	---	1.00 to 2.00	23/01/2017 11:58:00	1011	1011	$0.0_{(I)}$	-	-	-	-	-	-	-
WS6	1	50	5		---	1.00 to 2.00	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-
WS6	1	50	5	2.00	---	1.00 to 2.00	23/01/2017 11:59:00	-	-	-	-	0.1	0.0	20.8	0.0	0.0	0.0
WS6	1	50	5		---	1.00 to 2.00	15 secs	-	-	-	-	0.7	0.0	20.7	0.0	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS6	1	50	5		---	1.00 to 2.00	30 secs	-	-	-	-	0.7	0.0	20.5	0.0	0.0	0.0
WS6	1	50	5		---	1.00 to 2.00	60 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS6	1	50	5		---	1.00 to 2.00	90 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS6	1	50	5		---	1.00 to 2.00	120 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS6	1	50	5		---	1.00 to 2.00	180 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS6	1	50	5		---	1.00 to 2.00	240 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS6	1	50	5		---	1.00 to 2.00	300 secs	-	-	-	-	0.7	0.0	20.4	0.0	0.0	0.0
WS6	1	50	5		2.17	1.00 to 2.00	360 secs	-	-	-	2.17	-	-	-	-	-	-
WS6	1	50	6	2.00	---	1.00 to 2.00	03/02/2017	980	980	$0.1_{(I)}$	-	-	-	-	-	-	-
WS6	1	50	6		---	1.00 to 2.00	30 secs	-	-	$0.1_{(SS)}$	-	-	-	-	-	-	-
WS6	1	50	6		---	1.00 to 2.00	60 secs	-	-	-	-	0.0	0.0	20.9	0.0	0.0	0.0
WS6	1	50	6		---	1.00 to 2.00	75 secs	-	-	-	-	0.4	0.0	20.4	0.0	0.0	0.0
WS6	1	50	6		---	1.00 to 2.00	90 secs	-	-	-	-	0.4	0.0	20.2	0.0	0.0	0.0
WS6	1	50	6		---	1.00 to 2.00	120 secs	-	-	-	-	0.4	0.0	20.2	0.0	0.0	0.0
WS6	1	50	6		---	1.00 to 2.00	150 secs	-	-	-	-	0.4	0.0	20.3	0.0	0.0	0.0
WS6	1	50	6		---	1.00 to 2.00	180 secs	-	-	-	-	0.4	0.0	20.3	0.0	0.0	0.0
WS6	1	50	6		---	1.00 to 2.00	240 secs	-	-	-	-	0.4	0.0	20.3	0.0	0.0	0.0
WS6	1	50	6		---	1.00 to 2.00	300 secs	-	-	-	-	0.4	0.0	20.3	0.0	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS6	1	50	6		---	1.00 to 2.00	360 secs	-	-	-	-	0.4	0.0	20.3	0.0	0.0	0.0
WS6	1	50	6		2.00	1.00 to 2.00	420 secs	-	-	-	1.56	-	-	-	-	-	-
WS7	1	50	1	1.90	---	1.00 to 1.90	12/12/2016 10:05:00	1006	1006	$0.0_{(I)}$	-	-	-	-	-	-	-
WS7	1	50	1		---	1.00 to 1.90	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-
WS7	1	50	1	1.90	---	1.00 to 1.90	12/12/2016 10:06:00	-	-	-	-	0.1	0.0	20.8	0.0	0.0	0.0
WS7	1	50	1		---	1.00 to 1.90	15 secs	-	-	-	-	1.1	0.0	20.4	0.0	0.0	0.0
WS7	1	50	1		---	1.00 to 1.90	30 secs	-	-	-	-	1.1	0.0	19.8	0.0	0.0	0.0
WS7	1	50	1		---	1.00 to 1.90	60 secs	-	-	-	-	1.1	0.0	19.6	0.0	0.0	0.0
WS7	1	50	1		---	1.00 to 1.90	90 secs	-	-	-	-	1.1	0.0	19.6	0.0	0.0	0.0
WS7	1	50	1		---	1.00 to 1.90	120 secs	-	-	-	-	1.1	0.0	19.6	0.0	0.0	0.0
WS7	1	50	1		---	1.00 to 1.90	180 secs	-	-	-	-	1.1	0.0	19.6	0.0	0.0	0.0
WS7	1	50	1		---	1.00 to 1.90	240 secs	-	-	-	-	1.1	0.0	19.6	0.0	0.0	0.0
WS7	1	50	1		---	1.00 to 1.90	300 secs	-	-	-	-	1.1	0.0	19.6	0.0	0.0	0.0
WS7	1	50	1		1.88	1.00 to 1.90	360 secs	-	-	-	DRY	-	-	-	-	-	-
WS7	1	50	2	1.90	---	1.00 to 1.90	19/12/2016 09:52:00	1012	1012	$0.0_{(I)}$	-	-	-	-	-	-	-
WS7	1	50	2		---	1.00 to 1.90	30 secs	-	-	$0.1_{(SS)}$	-	-	-	-	-	-	-
WS7	1	50	2		---	1.00 to 1.90	60 secs	-	-	-	-	0.1	0.0	20.8	0.0	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS7	1	50	2	1.90	---	1.00 to 1.90	19/12/2016 09:54:00	-	-	-	-	1.1	0.0	20.3	0.0	0.0	0.0
WS7	1	50	2		---	1.00 to 1.90	15 secs	-	-	-	-	1.1	0.0	19.3	0.0	0.0	0.0
WS7	1	50	2		---	1.00 to 1.90	30 secs	-	-	-	-	1.1	0.0	19.2	0.0	0.0	0.0
WS7	1	50	2		---	1.00 to 1.90	60 secs	-	-	-	-	1.1	0.0	19.2	0.0	0.0	0.0
WS7	1	50	2		---	1.00 to 1.90	90 secs	-	-	-	-	1.1	0.0	19.2	0.0	0.0	0.0
WS7	1	50	2		---	1.00 to 1.90	120 secs	-	-	-	-	1.1	0.0	19.2	0.0	0.0	0.0
WS7	1	50	2		---	1.00 to 1.90	180 secs	-	-	-	-	1.2	0.0	19.1	0.0	0.0	0.0
WS7	1	50	2		---	1.00 to 1.90	240 secs	-	-	-	-	1.2	0.0	19.1	0.0	0.0	0.0
WS7	1	50	2		---	1.00 to 1.90	300 secs	-	-	-	-	1.2	0.0	19.1	0.0	0.0	0.0
WS7	1	50	2		1.87	1.00 to 1.90	360 secs	-	-	-	DRY	-	-	-	-	-	-
WS7	1	50	3	1.90	---	1.00 to 1.90	06/01/2017 10:40:00	1020	1020	$0.0_{(I)}$	-	-	-	-	-	-	-
WS7	1	50	3		---	1.00 to 1.90	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-
WS7	1	50	3	1.90	---	1.00 to 1.90	06/01/2017 10:41:00	-	-	-	-	0.1	0.0	20.9	-	0.0	0.0
WS7	1	50	3		---	1.00 to 1.90	15 secs	-	-	-	-	1.0	0.1	21.2	-	0.0	0.0
WS7	1	50	3		---	1.00 to 1.90	30 secs	-	-	-	-	1.1	0.1	20.9	-	0.0	0.0
WS7	1	50	3		---	1.00 to 1.90	60 secs	-	-	-	-	1.1	0.1	20.9	-	0.0	0.0
WS7	1	50	3		---	1.00 to 1.90	90 secs	-	-	-	-	1.1	0.1	20.8	-	0.0	0.0
WS7	1	50	3		---	1.00 to 1.90	120 secs	-	-	-	-	1.1	0.1	20.8	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS7	1	50	3		---	1.00 to 1.90	180 secs	-	-	-	-	1.1	0.1	20.8	-	0.0	0.0
WS7	1	50	3		---	1.00 to 1.90	240 secs	-	-	-	-	1.2	0.1	20.8	-	0.0	0.0
WS7	1	50	3		---	1.00 to 1.90	300 secs	-	-	-	-	1.1	0.1	20.8	-	0.0	0.0
WS7	1	50	3		1.90	1.00 to 1.90	330 secs	-	-	-	DRY	-	-	-	-	-	-
WS7	1	50	4	1.90	---	1.00 to 1.90	13/01/2017 11:40:00	994	994	$0.0_{(I)}$	-	-	-	-	-	-	-
WS7	1	50	4		---	1.00 to 1.90	30 secs	-	-	$0.1_{(SS)}$	-	-	-	-	-	-	-
WS7	1	50	4	1.90	---	1.00 to 1.90	13/01/2017 11:41:00	-	-	-	-	0.1	0.0	20.9	0.0	0.0	0.0
WS7	1	50	4		---	1.00 to 1.90	15 secs	-	-	-	-	1.4	0.0	20.6	0.0	0.0	0.0
WS7	1	50	4		---	1.00 to 1.90	30 secs	-	-	-	-	1.4	0.0	20.3	0.0	0.0	0.0
WS7	1	50	4		---	1.00 to 1.90	60 secs	-	-	-	-	1.4	0.0	20.3	0.0	0.0	1.0
WS7	1	50	4		---	1.00 to 1.90	90 secs	-	-	-	-	1.4	0.0	20.3	0.0	0.0	1.0
WS7	1	50	4		---	1.00 to 1.90	120 secs	-	-	-	-	1.4	0.0	20.3	0.0	0.0	1.0
WS7	1	50	4		---	1.00 to 1.90	180 secs	-	-	-	-	1.4	0.0	20.4	0.0	0.0	1.0
WS7	1	50	4		---	1.00 to 1.90	240 secs	-	-	-	-	1.4	0.0	20.4	0.0	0.0	1.0
WS7	1	50	4		---	1.00 to 1.90	300 secs	-	-	-	-	1.4	0.0	20.4	0.0	0.0	1.0
WS7	1	50	4		1.88	1.00 to 1.90	330 secs	-	-	-	DRY	-	-	-	-	-	-
WS7	1	50	5	1.90	---	1.00 to 1.90	23/01/2017 12:10:00	1011	1011	$0.0_{(I)}$	-	-	-	-	-	-	-
WS7	1	50	5		---	1.00 to 1.90	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS7	1	50	5	1.90	---	1.00 to 1.90	23/01/2017 12:11:00	-	-	-	-	0.1	0.0	20.8	0.0	0.0	0.0
WS7	1	50	5		---	1.00 to 1.90	15 secs	-	-	-	-	1.4	0.0	20.4	0.0	0.0	0.0
WS7	1	50	5		---	1.00 to 1.90	30 secs	-	-	-	-	1.4	0.0	19.8	0.0	0.0	0.0
WS7	1	50	5		---	1.00 to 1.90	60 secs	-	-	-	-	1.4	0.0	19.7	0.0	0.0	0.0
WS7	1	50	5		---	1.00 to 1.90	90 secs	-	-	-	-	1.4	0.0	19.7	0.0	0.0	0.0
WS7	1	50	5		---	1.00 to 1.90	120 secs	-	-	-	-	1.4	0.0	19.7	0.0	0.0	0.0
WS7	1	50	5		---	1.00 to 1.90	180 secs	-	-	-	-	1.4	0.0	19.7	0.0	0.0	0.0
WS7	1	50	5		---	1.00 to 1.90	240 secs	-	-	-	-	1.4	0.0	19.7	0.0	0.0	0.0
WS7	1	50	5		---	1.00 to 1.90	300 secs	-	-	-	-	1.4	0.0	19.7	0.0	0.0	0.0
WS7	1	50	5		1.85	1.00 to 1.90	360 secs	-	-	-	DRY	-	-	-	-	-	-
WS7	1	50	6	1.90	---	1.00 to 1.90	03/02/2017	980	980	$0.1_{(I)}$	-	-	-	-	-	-	-
WS7	1	50	6		---	1.00 to 1.90	30 secs	-	-	$0.1_{(SS)}$	-	-	-	-	-	-	-
WS7	1	50	6		---	1.00 to 1.90	60 secs	-	-	-	-	0.0	0.0	20.9	0.0	0.0	0.0
WS7	1	50	6		---	1.00 to 1.90	75 secs	-	-	-	-	1.2	0.0	20.1	0.0	0.0	0.0
WS7	1	50	6		---	1.00 to 1.90	90 secs	-	-	-	-	1.2	0.0	20.0	0.0	0.0	0.0
WS7	1	50	6		---	1.00 to 1.90	120 secs	-	-	-	-	1.2	0.0	20.0	0.0	0.0	0.0
WS7	1	50	6		---	1.00 to 1.90	150 secs	-	-	-	-	1.2	0.0	20.0	0.0	0.0	0.0
WS7	1	50	6		---	1.00 to 1.90	180 secs	-	-	-	-	1.2	0.0	20.0	0.0	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS7	1	50	6		---	1.00 to 1.90	240 secs	-	-	-	-	1.2	0.0	20.1	0.0	0.0	0.0
WS7	1	50	6		---	1.00 to 1.90	300 secs	-	-	-	-	1.2	0.0	20.1	0.0	0.0	0.0
WS7	1	50	6		---	1.00 to 1.90	360 secs	-	-	-	-	1.2	0.0	20.1	0.0	0.0	0.0
WS7	1	50	6		1.86	1.00 to 1.90	420 secs	-	-	-	DRY	-	-	-	-	-	-
WS8	1	50	1	1.80	---	1.00 to 1.80	12/12/2016 10:25:00	1006	1006	$0.0_{(I)}$	-	-	-	-	-	-	-
WS8	1	50	1		---	1.00 to 1.80	30 secs	-	-	$0.1_{(SS)}$	-	-	-	-	-	-	-
WS8	1	50	1	1.80	---	1.00 to 1.80	12/12/2016 10:26:00	-	-	-	-	0.1	0.0	20.9	0.0	0.0	0.0
WS8	1	50	1		---	1.00 to 1.80	15 secs	-	-	-	-	1.3	0.0	20.6	0.0	0.0	0.0
WS8	1	50	1		---	1.00 to 1.80	30 secs	-	-	-	-	1.3	0.0	19.8	0.0	0.0	0.0
WS8	1	50	1		---	1.00 to 1.80	60 secs	-	-	-	-	1.3	0.0	19.7	0.0	0.0	0.0
WS8	1	50	1		---	1.00 to 1.80	90 secs	-	-	-	-	1.3	0.0	19.7	0.0	0.0	0.0
WS8	1	50	1		---	1.00 to 1.80	120 secs	-	-	-	-	1.3	0.0	19.7	0.0	0.0	0.0
WS8	1	50	1		---	1.00 to 1.80	180 secs	-	-	-	-	1.3	0.0	19.7	0.0	0.0	0.0
WS8	1	50	1		---	1.00 to 1.80	240 secs	-	-	-	-	1.3	0.0	19.7	0.0	0.0	0.0
WS8	1	50	1		---	1.00 to 1.80	300 secs	-	-	-	-	1.3	0.0	19.7	0.0	0.0	0.0
WS8	1	50	1		2.13	1.00 to 1.80	360 secs	-	-	-	DRY	-	-	-	-	-	-
WS8	1	50	2	1.80	---	1.00 to 1.80	19/12/2016 09:25:00	1012	1012	0.1	-	-	-	-	-	-	-

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures]	Previous	During	Start	End	Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS8	1	50	2		---	1.00 to 1.80	30 secs	-	-	0.2	-	-	-	-	-	-	-
WS8	1	50	2	1.80	---	1.00 to 1.80	19/12/2016 09:26:00	-	-	-	-	0.1	0.0	20.9	0.0	0.0	0.0
WS8	1	50	2		---	1.00 to 1.80	15 secs	-	-	-	-	1.2	0.0	20.5	0.0	0.0	0.0
WS8	1	50	2		---	1.00 to 1.80	30 secs	-	-	-	-	1.3	0.0	19.4	0.0	0.0	0.0
WS8	1	50	2		---	1.00 to 1.80	60 secs	-	-	-	-	1.3	0.0	19.2	0.0	0.0	0.0
WS8	1	50	2		---	1.00 to 1.80	90 secs	-	-	-	-	1.3	0.0	19.2	0.0	0.0	0.0
WS8	1	50	2		---	1.00 to 1.80	120 secs	-	-	-	-	1.3	0.0	19.2	0.0	0.0	0.0
WS8	1	50	2		---	1.00 to 1.80	180 secs	-	-	-	-	1.3	0.0	19.3	0.0	0.0	0.0
WS8	1	50	2		---	1.00 to 1.80	240 secs	-	-	-	-	1.3	0.0	19.3	0.0	0.0	0.0
WS8	1	50	2		---	1.00 to 1.80	300 secs	-	-	-	-	1.3	0.0	19.3	0.0	0.0	0.0
WS8	1	50	2		2.13	1.00 to 1.80	360 secs	-	-	-	DRY	-	-	-	-	-	-
WS8	1	50	3	1.80	---	1.00 to 1.80	06/01/2017 10:51:00	1020	1020	$0.0_{(I)}$	-	-	-	-	-	-	-
WS8	1	50	3		---	1.00 to 1.80	30 secs	-	-	$0.0_{(SS)}$	-	-	-	-	-	-	-
WS8	1	50	3	1.80	---	1.00 to 1.80	06/01/2017 10:52:00	-	-	-	-	0.1	0.0	20.9	-	0.0	0.0
WS8	1	50	3		---	1.00 to 1.80	15 secs	-	-	-	-	1.3	0.1	21.2	-	0.0	0.0
WS8	1	50	3		---	1.00 to 1.80	30 secs	-	-	-	-	1.3	0.1	20.8	-	0.0	0.0
WS8	1	50	3		---	1.00 to 1.80	60 secs	-	-	-	-	1.3	0.1	20.4	-	0.0	0.0
WS8	1	50	3		---	1.00 to 1.80	90 secs	-	-	-	-	1.3	0.1	20.4	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures]	Previous	During	Start	End	Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS8	1	50	3		---	1.00 to 1.80	120 secs	-	-	-	-	1.3	0.1	20.4	-	0.0	0.0
WS8	1	50	3		---	1.00 to 1.80	180 secs	-	-	-	-	1.3	0.1	20.4	-	0.0	0.0
WS8	1	50	3		---	1.00 to 1.80	240 secs	-	-	-	-	1.3	0.1	20.4	-	0.0	0.0
WS8	1	50	3		---	1.00 to 1.80	300 secs	-	-	-	-	1.3	0.1	20.4	-	0.0	0.0
WS8	1	50	3		2.15	1.00 to 1.80	330 secs	-	-	-	DRY	-	-	-	-	-	-
WS8	1	50	4	1.80	---	1.00 to 1.80	13/01/2017 11:55:00	994	994	$0.0_{(I)}$	-	-	-	-	-	-	-
WS8	1	50	4		---	1.00 to 1.80	30 secs	-	-	$0.1_{(SS)}$	-	-	-	-	-	-	-
WS8	1	50	4	1.80	---	1.00 to 1.80	13/01/2017 11:56:00	-	-	-	-	0.2	0.0	20.9	0.0	0.0	0.0
WS8	1	50	4		---	1.00 to 1.80	15 secs	-	-	-	-	1.3	0.0	20.4	0.0	0.0	0.0
WS8	1	50	4		---	1.00 to 1.80	30 secs	-	-	-	-	1.3	0.0	19.5	0.0	0.0	0.0
WS8	1	50	4		---	1.00 to 1.80	60 secs	-	-	-	-	1.3	0.0	19.4	0.0	0.0	0.0
WS8	1	50	4		---	1.00 to 1.80	90 secs	-	-	-	-	1.3	0.0	19.4	0.0	0.0	0.0
WS8	1	50	4		---	1.00 to 1.80	120 secs	-	-	-	-	1.3	0.0	19.4	0.0	0.0	0.0
WS8	1	50	4		---	1.00 to 1.80	180 secs	-	-	-	-	1.3	0.0	19.4	0.0	0.0	0.0
WS8	1	50	4		---	1.00 to 1.80	240 secs	-	-	-	-	1.3	0.0	19.4	0.0	0.0	0.0
WS8	1	50	4		---	1.00 to 1.80	300 secs	-	-	-	-	1.3	0.0	19.3	0.0	0.0	0.0
WS8	1	50	4		2.14	1.00 to 1.80	330 secs	-	-	-	DRY	-	-	-	-	-	-
WS8	1	50	5	1.80	---	1.00 to 1.80	23/01/2017 12:23:00	1011	1011	$0.1_{(I)}$	-	-	-	-	-	-	-

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

RSK Environment Ltd
Abbey Park
Humber Road
Coventry
CV3 4AQ

Compiled By	Date	Checked By	Date	Contract Ref:
[redacted]	07/02/17			313498

Contract: **White Post Road, Banbury**

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS8	1	50	5		---	1.00 to 1.80	30 secs	-	-	0.0 (SS)	-	-	-	-	-	-	-
WS8	1	50	5	1.80	---	1.00 to 1.80	23/01/2017 12:24:00	-	-	-	-	0.1	0.0	20.8	0.0	0.0	0.0
WS8	1	50	5		---	1.00 to 1.80	15 secs	-	-	-	-	1.4	0.0	20.4	0.0	0.0	0.0
WS8	1	50	5		---	1.00 to 1.80	30 secs	-	-	-	-	1.4	0.0	19.7	0.0	0.0	0.0
WS8	1	50	5		---	1.00 to 1.80	60 secs	-	-	-	-	1.4	0.0	19.5	0.0	0.0	0.0
WS8	1	50	5		---	1.00 to 1.80	90 secs	-	-	-	-	1.4	0.0	19.5	0.0	0.0	0.0
WS8	1	50	5		---	1.00 to 1.80	120 secs	-	-	-	-	1.4	0.0	19.5	0.0	0.0	0.0
WS8	1	50	5		---	1.00 to 1.80	180 secs	-	-	-	-	1.5	0.0	19.5	0.0	0.0	0.0
WS8	1	50	5		---	1.00 to 1.80	240 secs	-	-	-	-	1.5	0.0	19.6	0.0	0.0	0.0
WS8	1	50	5		---	1.00 to 1.80	300 secs	-	-	-	-	1.5	0.0	19.6	0.0	0.0	0.0
WS8	1	50	5		2.10	1.00 to 1.80	360 secs	-	-	-	DRY	-	-	-	-	-	-
WS8	1	50	6	1.80	---	1.00 to 1.80	03/02/2017	980	980	0.0 (I)	-	-	-	-	-	-	-
WS8	1	50	6		---	1.00 to 1.80	30 secs	-	-	0.0 (SS)	-	-	-	-	-	-	-
WS8	1	50	6		---	1.00 to 1.80	60 secs	-	-	-	-	0.0	0.0	20.9	0.0	0.0	0.0
WS8	1	50	6		---	1.00 to 1.80	75 secs	-	-	-	-	1.3	0.0	19.7	0.0	0.0	0.0
WS8	1	50	6		---	1.00 to 1.80	90 secs	-	-	-	-	1.3	0.0	19.6	0.0	0.0	0.0
WS8	1	50	6		---	1.00 to 1.80	120 secs	-	-	-	-	1.3	0.0	19.6	0.0	0.0	0.0
WS8	1	50	6		---	1.00 to 1.80	150 secs	-	-	-	-	1.3	0.0	19.5	0.0	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS8	1	50	6		---	1.00 to 1.80	180 secs	-	-	-	-	1.3	0.0	19.5	0.0	0.0	0.0
WS8	1	50	6		---	1.00 to 1.80	240 secs	-	-	-	-	1.3	0.0	19.5	0.0	0.0	0.0
WS8	1	50	6		---	1.00 to 1.80	300 secs	-	-	-	-	1.3	0.0	19.5	0.0	0.0	0.0
WS8	1	50	6		---	1.00 to 1.80	360 secs	-	-	-	-	1.3	0.0	19.5	0.0	0.0	0.0
WS8	1	50	6		2.14	1.00 to 1.80	420 secs	-	-	-	DRY	-	-	-	-	-	-
WS11	1	50	1	3.00	---	1.00 to 3.00	12/12/2016 08:30:00	1007	1007	$0.0_{(I)}$	-	-	-	-	-	-	-
WS11	1	50	1		---	1.00 to 3.00	30 secs	-	-	$0.1_{(SS)}$	-	-	-	-	-	-	-
WS11	1	50	1	3.00	---	1.00 to 3.00	12/12/2016 08:31:00	-	-	-	-	0.1	0.0	20.9	0.0	0.0	0.0
WS11	1	50	1		---	1.00 to 3.00	15 secs	-	-	-	-	0.9	0.0	20.7	0.0	1.0	0.0
WS11	1	50	1		---	1.00 to 3.00	30 secs	-	-	-	-	0.9	0.0	20.3	0.0	0.0	0.0
WS11	1	50	1		---	1.00 to 3.00	60 secs	-	-	-	-	0.9	0.0	20.2	0.0	0.0	0.0
WS11	1	50	1		---	1.00 to 3.00	90 secs	-	-	-	-	0.9	0.0	20.1	0.0	0.0	0.0
WS11	1	50	1		---	1.00 to 3.00	120 secs	-	-	-	-	0.9	0.0	20.1	0.0	0.0	0.0
WS11	1	50	1		---	1.00 to 3.00	180 secs	-	-	-	-	0.9	0.0	20.1	0.0	0.0	0.0
WS11	1	50	1		---	1.00 to 3.00	240 secs	-	-	-	-	1.0	0.0	20.1	0.0	0.0	0.0
WS11	1	50	1		---	1.00 to 3.00	300 secs	-	-	-	-	1.0	0.0	20.1	0.0	0.0	0.0
WS11	1	50	1		3.22	1.00 to 3.00	360 secs	-	-	-	2.86	-	-	-	-	-	-

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS11	1	50	2	3.00	---	1.00 to 3.00	19/12/2016 08:21:00	1012	1012	0.1 (I)	-	-	-	-	-	-	-
WS11	1	50	2		---	1.00 to 3.00	30 secs	-	-	0.2 (SS)	-	-	-	-	-	-	-
WS11	1	50	2	3.00	---	1.00 to 3.00	19/12/2016 08:22:00	-	-	-	-	0.1	0.0	20.9	0.0	0.0	0.0
WS11	1	50	2		---	1.00 to 3.00	15 secs	-	-	-	-	1.0	0.0	20.7	0.0	0.0	0.0
WS11	1	50	2		---	1.00 to 3.00	30 secs	-	-	-	-	1.0	0.0	20.1	0.0	0.0	0.0
WS11	1	50	2		---	1.00 to 3.00	60 secs	-	-	-	-	1.0	0.0	20.0	0.0	0.0	0.0
WS11	1	50	2		---	1.00 to 3.00	90 secs	-	-	-	-	1.0	0.0	20.0	0.0	0.0	0.0
WS11	1	50	2		---	1.00 to 3.00	120 secs	-	-	-	-	1.0	0.0	20.0	0.0	0.0	0.0
WS11	1	50	2		---	1.00 to 3.00	180 secs	-	-	-	-	1.0	0.0	19.9	0.0	0.0	0.0
WS11	1	50	2		---	1.00 to 3.00	240 secs	-	-	-	-	1.0	0.0	19.9	0.0	0.0	0.0
WS11	1	50	2		---	1.00 to 3.00	300 secs	-	-	-	-	1.0	0.0	19.9	0.0	0.0	0.0
WS11	1	50	2		3.21	1.00 to 3.00	360 secs	-	-	-	2.60	-	-	-	-	-	-
WS11	1	50	3	3.00	---	1.00 to 3.00	06/01/2017 10:13:00	-	-	0.0 (I)	-	-	-	-	-	-	-
WS11	1	50	3		---	1.00 to 3.00	30 secs	-	-	0.0 (SS)	-	-	-	-	-	-	-
WS11	1	50	3	3.00	---	1.00 to 3.00	06/01/2017 10:14:00	-	-	-	-	0.1	0.0	20.9	-	0.0	0.0
WS11	1	50	3		---	1.00 to 3.00	15 secs	-	-	-	-	0.9	0.1	21.7	-	0.0	0.0
WS11	1	50	3		---	1.00 to 3.00	30 secs	-	-	-	-	0.9	0.1	21.7	-	0.0	0.0
WS11	1	50	3		---	1.00 to 3.00	60 secs	-	-	-	-	1.0	0.1	21.6	-	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS11	1	50	3		---	1.00 to 3.00	90 secs	-	-	-	-	1.0	0.1	21.6	-	0.0	0.0
WS11	1	50	3		---	1.00 to 3.00	120 secs	-	-	-	-	1.0	0.1	21.6	-	0.0	0.0
WS11	1	50	3		---	1.00 to 3.00	180 secs	-	-	-	-	1.0	0.1	21.6	-	0.0	0.0
WS11	1	50	3		---	1.00 to 3.00	240 secs	-	-	-	-	0.9	0.1	21.6	-	0.0	0.0
WS11	1	50	3		---	1.00 to 3.00	300 secs	-	-	-	-	0.9	0.1	21.6	-	0.0	0.0
WS11	1	50	3		3.18	1.00 to 3.00	330 secs	-	-	-	2.34	-	-	-	-	-	-
WS11	1	50	4	3.00	---	1.00 to 3.00	13/01/2017 10:03:00	993	993	$0.1_{(I)}$	-	-	-	-	-	-	-
WS11	1	50	4		---	1.00 to 3.00	30 secs	-	-	$0.2_{(SS)}$	-	-	-	-	-	-	-
WS11	1	50	4	3.00	---	1.00 to 3.00	13/01/2017 10:04:00	-	-	-	-	0.2	0.0	20.8	0.0	0.0	0.0
WS11	1	50	4		---	1.00 to 3.00	15 secs	-	-	-	-	1.0	0.0	20.8	0.0	0.0	0.0
WS11	1	50	4		---	1.00 to 3.00	30 secs	-	-	-	-	1.0	0.0	20.7	0.0	0.0	0.0
WS11	1	50	4		---	1.00 to 3.00	60 secs	-	-	-	-	1.0	0.0	20.7	0.0	0.0	0.0
WS11	1	50	4		---	1.00 to 3.00	90 secs	-	-	-	-	1.0	0.0	20.7	0.0	0.0	0.0
WS11	1	50	4		---	1.00 to 3.00	120 secs	-	-	-	-	1.0	0.0	20.7	0.0	0.0	0.0
WS11	1	50	4		---	1.00 to 3.00	180 secs	-	-	-	-	1.0	0.0	20.7	0.0	0.0	0.0
WS11	1	50	4		---	1.00 to 3.00	240 secs	-	-	-	-	1.0	0.0	20.8	0.0	0.0	0.0
WS11	1	50	4		---	1.00 to 3.00	300 secs	-	-	-	-	0.9	0.0	20.8	0.0	0.0	0.0
WS11	1	50	4		3.16	1.00 to 3.00	330 secs	-	-	-	2.21	-	-	-	-	-	-

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS11	1	50	5		---	1.00 to 3.00	-30 secs	1011	1011	-0.3$_{(I)}$	-	-	-	-	-	-	-
WS11	1	50	5	3.00	---	1.00 to 3.00	23/01/2017 12:38:30	-	-	-0.9$_{(SS)}$	-	-	-	-	-	-	-
WS11	1	50	5	3.00	---	1.00 to 3.00	23/01/2017 12:39:00	-	-	-	-	0.1	0.0	20.8	0.0	0.0	0.0
WS11	1	50	5		---	1.00 to 3.00	15 secs	-	-	-	-	1.1	0.0	20.3	0.0	0.0	0.0
WS11	1	50	5		---	1.00 to 3.00	30 secs	-	-	-	-	0.9	0.0	20.4	0.0	0.0	0.0
WS11	1	50	5		---	1.00 to 3.00	60 secs	-	-	-	-	0.6	0.0	20.6	0.0	0.0	0.0
WS11	1	50	5		---	1.00 to 3.00	90 secs	-	-	-	-	0.4	0.0	20.7	0.0	0.0	0.0
WS11	1	50	5		---	1.00 to 3.00	120 secs	-	-	-	-	0.3	0.0	20.8	0.0	0.0	0.0
WS11	1	50	5		---	1.00 to 3.00	180 secs	-	-	-	-	0.3	0.0	20.9	0.0	0.0	0.0
WS11	1	50	5		---	1.00 to 3.00	240 secs	-	-	-	-	0.2	0.0	20.9	0.0	0.0	0.0
WS11	1	50	5		---	1.00 to 3.00	300 secs	-	-	-	-	0.2	0.0	20.9	0.0	0.0	0.0
WS11	1	50	5		---	1.00 to 3.00	360 secs	-	-	-	-	0.2	0.0	20.9	0.0	0.0	0.0
WS11	1	50	5		3.13	1.00 to 3.00	420 secs	-	-	-	1.09	-	-	-	-	-	-
WS11	1	50	6	3.00	---	1.00 to 3.00	03/02/2017	-	-	11.5$_{(I)}$	-	-	-	-	-	-	-
WS11	1	50	6		---	1.00 to 3.00	420 secs	-	-	0.7$_{(SS)}$	-	-	-	-	-	-	-
WS11	1	50	6	3.00	---	1.00 to 3.00	03/02/2017 00:08:00	-	-	-	-	0.0	0.0	20.9	0.0	0.0	0.0
WS11	1	50	6		---	1.00 to 3.00	15 secs	-	-	-	-	0.8	0.0	20.7	0.0	0.0	0.0
WS11	1	50	6		---	1.00 to 3.00	30 secs	-	-	-	-	0.8	0.0	20.5	0.0	0.0	0.0

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

RSK Environment Ltd
Abbey Park
Humber Road
Coventry
CV3 4AQ

Compiled By	Date	Checked By	Date	Contract Ref:
[redacted]	07/02/17			313498

Contract: **White Post Road, Banbury**

IN-SITU GAS MONITORING RESULTS

[Pressures] Previous During Start End Equipment Used & Remarks

Exploratory Position ID	Pipe ref	Pipe diameter (mm)	Monitoring Round	Reported Installation Depth (m)	Measured Installation Depth (mbgl)	Response Zone	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS11	1	50	6		---	1.00 to 3.00	60 secs	-	-	-	-	0.8	0.0	20.5	0.0	0.0	0.0
WS11	1	50	6		---	1.00 to 3.00	90 secs	-	-	-	-	0.8	0.0	20.5	0.0	0.0	0.0
WS11	1	50	6		---	1.00 to 3.00	120 secs	-	-	-	-	0.8	0.0	20.6	0.0	0.0	0.0
WS11	1	50	6		---	1.00 to 3.00	180 secs	-	-	-	-	0.8	0.0	20.6	0.0	0.0	0.0
WS11	1	50	6		---	1.00 to 3.00	240 secs	-	-	-	-	0.7	0.0	20.8	0.0	0.0	0.0
WS11	1	50	6		---	1.00 to 3.00	300 secs	-	-	-	-	0.7	0.0	21.1	0.0	0.0	0.0
WS11	1	50	6		3.10	1.00 to 3.00	360 secs	-	-	-	0.90	-	-	-	-	-	-

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

RSK Environment Ltd
Abbey Park
Humber Road
Coventry
CV3 4AQ

Compiled By	Date	Checked By	Date	Contract Ref:
[redacted]	07/02/17			313498

Contract: **White Post Road, Banbury**

Page: **33** of **33**

APPENDIX F
LABORATORY CERTIFICATES OF ANALYSIS

Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 16/08135
Issue Number: 1 **Date:** 09 January, 2017

Client:
RSK Environment Ltd Bristol
The Old School
Stillhouse Lane
Bedminster
Bristol
UK
BS3 4EB

Project Manager: Marc Dixon/Matthew Sweeney
Project Name: White Post Road, Banbury
Project Ref: 313498
Order No: N/A
Date Samples Received: 20/12/16
Date Instructions Received: 20/12/16
Date Analysis Completed: 09/01/17

Prepared by:	**Approved by:**
[redacted]	[redacted]
Danielle Brierley	Lianne Bromiley
Administrative Assistant	Senior Client Manager

Envirolab Job Number: 16/08135

Client Project Name: White Post Road, Banbury

Client Project Ref: 313498

Lab Sample ID	16/08135/1	16/08135/2	16/08135/3	16/08135/4	16/08135/5	16/08135/6	16/08135/7	16/08135/8	Units	Method ref
Client Sample No										
Client Sample ID	TP15	TP17	TP18	TP20	TP25	TP26	TP27	TP28		
Depth to Top	0.60	2.20	0.75	2.10	3.30	3.30	0.60	0.45		
Depth To Bottom										
Date Sampled		06-Dec-16	08-Dec-16				07-Dec-16			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4A	6A	6	5	6	5	6E	6E		
% Stones >10mm$_A^{\#}$	15.7	1.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	% w/w	A-T-044
pH BRE$_D^{M\#}$	7.79	7.10	7.05	5.53	7.44	7.76	6.93	6.99	pH	A-T-031s
Sulphate BRE (water sol 2:1)$_D^{M\#}$	13	<10	<10	18	<10	<10	<10	<10	mg/l	A-T-026s
Sulphate BRE (acid sol)$_D^{M\#}$	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	% w/w	A-T-028s
Sulphur BRE (total)$_D$	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.01	% w/w	A-T-024s

Envirolab Job Number: 16/08135

Client Project Name: White Post Road, Banbury

Client Project Ref: 313498

Lab Sample ID	16/08135/9	16/08135/10	16/08135/11	16/08135/12	16/08135/13	16/08135/14			Units	Method ref
Client Sample No										
Client Sample ID	TP28	TP4	TP5	TP6	TP6	TP7				
Depth to Top	1.60	0.40	2.50	4.40	1.35	2.00				
Depth To Bottom										
Date Sampled	06-Dec-16	07-Dec-16								
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES				
Sample Matrix Code	1	6E	6	3	6A	5				
% Stones >10mm$_A^{\#}$	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			% w/w	A-T-044
pH BRE$_D^{M\#}$	7.55	6.86	7.45	6.50	7.57	6.52			pH	A-T-031s
Sulphate BRE (water sol 2:1)$_D^{M\#}$	<10	<10	<10	344	<10	28			mg/l	A-T-026s
Sulphate BRE (acid sol)$_D^{M\#}$	<0.02	<0.02	<0.02	0.13	<0.02	<0.02			% w/w	A-T-028s
Sulphur BRE (total)$_D$	<0.01	0.02	<0.01	1.31	<0.01	<0.01			% w/w	A-T-024s

REPORT NOTES

General:
This report shall not be reproduced, except in full, without written approval from Envirolab.
All samples contained within this report, and any received with the same delivery, will be disposed of one month after the date of this report.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.
If results are in italic font they are associated with an AQC failure. These are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Soil chemical analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Asbestos:
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.
Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.
Secondary Matrix Codes:
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

Key:
IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Superscript "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 16/07988
Issue Number: 1 **Date:** 26 January, 2017

Client:
RSK Environment Ltd Bristol
The Old School
Stillhouse Lane
Bedminster
Bristol
UK
BS3 4EB

Project Manager: Marc Dixon/Matthew Sweeney
Project Name: White Post Road, Banbury
Project Ref: 313498
Order No: N/A
Date Samples Received: 08/12/16
Date Instructions Received: 14/12/16
Date Analysis Completed: 25/01/17

Prepared by:

[redacted]

Kate Keningale
Administrative Assistant

Approved by:

[redacted]

Lianne Bromiley
Senior Client Manager

Envirolab Job Number: 16/07988

Client Project Name: White Post Road, Banbury

Client Project Ref: 313498

Lab Sample ID	16/07988/1	16/07988/2	16/07988/3	16/07988/4	16/07988/5	16/07988/6	16/07988/7	16/07988/8	Units	Method ref
Client Sample No										
Client Sample ID	WS1	WS1	WS2	WS3	WS4	WS5	WS6	WS7		
Depth to Top	0.20	1.00	0.20	0.70	0.20	0.10	0.00	0.00		
Depth To Bottom	0.40	1.20	0.50	0.90		0.40	0.20	0.20		
Date Sampled	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	06-Dec-16	06-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4AE	4E	4A	4A	4AE	6E	4AE	4E		
% Stones >10mm$_A$#	<0.1	<0.1	5.8	<0.1	1.0	<0.1	8.2	<0.1	% w/w	A-T-044
pH$_D$M#	6.46	-	7.89	6.91	7.82	7.17	7.86	6.60	pH	A-T-031s
pH BRE$_D$M#	-	6.64	-	6.91	-	-	-	-	pH	A-T-031s
Sulphate BRE (water sol 2:1)$_D$M#	-	<10	-	<10	-	-	-	-	mg/l	A-T-026s
Sulphate BRE (acid sol)$_D$M#	-	<0.02	-	0.03	-	-	-	-	% w/w	A-T-028s
Sulphur BRE (total)$_D$	-	0.02	-	0.03	-	-	-	-	% w/w	A-T-024s
Total Organic Carbon$_D$M#	1.39	-	0.73	-	0.94	-	2.20	-	% w/w	A-T-032s
Arsenic$_D$M#	168	-	51	66	105	58	84	123	mg/kg	A-T-024s
Boron (water soluble)$_D$M#	<1.0	-	<1.0	1.1	<1.0	<1.0	1.0	1.1	mg/kg	A-T-027s
Cadmium$_D$M#	8.7	-	7.1	5.1	8.3	5.8	8.1	7.8	mg/kg	A-T-024s
Copper$_D$M#	<1	-	<1	4	<1	2	<1	<1	mg/kg	A-T-024s
Chromium$_D$M#	233	-	198	137	255	176	218	230	mg/kg	A-T-024s
Chromium (hexavalent)$_D$	<1	-	<1	<1	<1	<1	<1	<1	mg/kg	A-T-040s
Lead$_D$M#	46	-	22	37	26	27	35	29	mg/kg	A-T-024s
Mercury$_D$	<0.17	-	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	mg/kg	A-T-024s
Nickel$_D$M#	106	-	80	64	106	87	91	92	mg/kg	A-T-024s
Selenium$_D$	2	-	2	<1	<1	1	2	1	mg/kg	A-T-024s
Zinc$_D$M#	241	-	114	135	171	147	129	183	mg/kg	A-T-024s
Leachate Prep BS EN 12457-1 (2:1) (per 250ml prepared leachate)$_A$	-	-	-	-	-	-	*	-		A-T-001
Arsenic (leachable)$_A$#	-	-	-	-	-	-	<1	-	µg/l	A-T-025w
Boron (leachable)$_A$#	-	-	-	-	-	-	24	-	µg/l	A-T-025w
Cadmium (leachable)$_A$#	-	-	-	-	-	-	<1	-	µg/l	A-T-025w
Copper (leachable)$_A$#	-	-	-	-	-	-	<1	-	µg/l	A-T-025w
Chromium (leachable)$_A$#	-	-	-	-	-	-	<1	-	µg/l	A-T-025w
Chromium (hexavalent) (leachable)$_A$	-	-	-	-	-	-	<0.05	-	mg/l	A-T-040w
Lead (leachable)$_A$#	-	-	-	-	-	-	<1	-	µg/l	A-T-025w
Mercury (leachable)$_A$#	-	-	-	-	-	-	<0.1	-	µg/l	A-T-025w
Nickel (leachable)$_A$#	-	-	-	-	-	-	<1	-	µg/l	A-T-025w
Selenium (leachable)$_A$#	-	-	-	-	-	-	<1	-	µg/l	A-T-025w
Zinc (leachable)$_A$#	-	-	-	-	-	-	7	-	µg/l	A-T-025w
Bioaccessibility - BARGE$_A$	Appended	-	-	Appended	Appended	-	-	Appended		Subcon

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Client Project Name: White Post Road, Banbury

Client Project Ref: 313498

Lab Sample ID	16/07988/1	16/07988/2	16/07988/3	16/07988/4	16/07988/5	16/07988/6	16/07988/7	16/07988/8	Units	Method ref
Client Sample No										
Client Sample ID	WS1	WS1	WS2	WS3	WS4	WS5	WS6	WS7		
Depth to Top	0.20	1.00	0.20	0.70	0.20	0.10	0.00	0.00		
Depth To Bottom	0.40	1.20	0.50	0.90		0.40	0.20	0.20		
Date Sampled	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	06-Dec-16	06-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4AE	4E	4A	4A	4AE	6E	4AE	4E		
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_A^{\#}$	NAD	-	NAD	-	NAD	-	NAD	NAD		A-T-045
Asbestos ACM - Suitable for Water Absorption Test?	N/A	-	N/A	-	N/A	-	N/A	N/A		

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Client Project Name: White Post Road, Banbury

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Lab Sample ID	16/07988/1	16/07988/2	16/07988/3	16/07988/4	16/07988/5	16/07988/6	16/07988/7	16/07988/8	Units	Method ref
Client Sample No										
Client Sample ID	WS1	WS1	WS2	WS3	WS4	WS5	WS6	WS7		
Depth to Top	0.20	1.00	0.20	0.70	0.20	0.10	0.00	0.00		
Depth To Bottom	0.40	1.20	0.50	0.90		0.40	0.20	0.20		
Date Sampled	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	06-Dec-16	06-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4AE	4E	4A	4A	4AE	6E	4AE	4E		
Nitrogen Pesticides										
Ametryn$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Atraton$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Atrazine$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Prometon$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Prometryn$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Propazine$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Simazine$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Simetryn$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Terbuthylazine$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Terbutryn$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon

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Client Project Name: White Post Road, Banbury

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Lab Sample ID	16/07988/1	16/07988/2	16/07988/3	16/07988/4	16/07988/5	16/07988/6	16/07988/7	16/07988/8	Units	Method ref
Client Sample No										
Client Sample ID	WS1	WS1	WS2	WS3	WS4	WS5	WS6	WS7		
Depth to Top	0.20	1.00	0.20	0.70	0.20	0.10	0.00	0.00		
Depth To Bottom	0.40	1.20	0.50	0.90		0.40	0.20	0.20		
Date Sampled	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	06-Dec-16	06-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4AE	4E	4A	4A	4AE	6E	4AE	4E		
Pest-c										
Mevinphos$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Dichlorvos$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
alpha-Hexachlorocyclohexane (HCH)$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Diazinon$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
gamma-Hexachlorocyclohexane (HCH / Lindane)$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Heptachlor$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Aldrin$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
beta-Hexachlorocyclohexane (HCH)$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Methyl Parathion$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Malathion$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Fenitrothion$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Heptachlor Epoxide$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Parathion (Ethyl Parathion)$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
p,p-DDE$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
p,p-DDT$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
p,p-Methoxychlor$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
p,p-TDE (DDD)$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
o,p-DDE$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
o,p-DDT$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
o,p-Methoxychlor$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
o,p-TDE (DDD)$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Endosulphan I$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Endosulphan II$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Endosulphan Sulphate$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Endrin$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Ethion$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Dieldrin$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon
Azinphos-methyl$_A$	-	-	-	-	-	-	<50	-	µg/kg	Subcon

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Lab Sample ID	16/07988/1	16/07988/2	16/07988/3	16/07988/4	16/07988/5	16/07988/6	16/07988/7	16/07988/8	Units	Method ref
Client Sample No										
Client Sample ID	WS1	WS1	WS2	WS3	WS4	WS5	WS6	WS7		
Depth to Top	0.20	1.00	0.20	0.70	0.20	0.10	0.00	0.00		
Depth To Bottom	0.40	1.20	0.50	0.90		0.40	0.20	0.20		
Date Sampled	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	06-Dec-16	06-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4AE	4E	4A	4A	4AE	6E	4AE	4E		
PAH 16										
Acenaphthene$_A^{M\#}$	<0.01	-	<0.01	-	<0.01	-	<0.01	-	mg/kg	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	-	<0.01	-	<0.01	-	<0.01	-	mg/kg	A-T-019s
Anthracene$_A^{M\#}$	<0.02	-	<0.02	-	<0.02	-	<0.02	-	mg/kg	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	<0.04	-	<0.04	-	<0.04	-	<0.04	-	mg/kg	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	<0.04	-	<0.04	-	<0.04	-	<0.04	-	mg/kg	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	<0.05	-	<0.05	-	<0.05	-	<0.05	-	mg/kg	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	<0.05	-	<0.05	-	<0.05	-	<0.05	-	mg/kg	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	<0.07	-	<0.07	-	<0.07	-	<0.07	-	mg/kg	A-T-019s
Chrysene$_A^{M\#}$	<0.06	-	<0.06	-	<0.06	-	<0.06	-	mg/kg	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	-	<0.04	-	<0.04	-	<0.04	-	mg/kg	A-T-019s
Fluoranthene$_A^{M\#}$	<0.08	-	<0.08	-	<0.08	-	<0.08	-	mg/kg	A-T-019s
Fluorene$_A^{M\#}$	<0.01	-	<0.01	-	<0.01	-	<0.01	-	mg/kg	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	<0.03	-	<0.03	-	<0.03	-	<0.03	-	mg/kg	A-T-019s
Naphthalene$_A^{M\#}$	<0.03	-	<0.03	-	<0.03	-	<0.03	-	mg/kg	A-T-019s
Phenanthrene$_A^{M\#}$	<0.03	-	<0.03	-	<0.03	-	<0.03	-	mg/kg	A-T-019s
Pyrene$_A^{M\#}$	<0.07	-	<0.07	-	<0.07	-	<0.07	-	mg/kg	A-T-019s
PAH (total 16)$_A^{M\#}$	<0.08	-	<0.08	-	<0.08	-	<0.08	-	mg/kg	A-T-019s

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Client Project Name: White Post Road, Banbury

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Lab Sample ID	16/07988/1	16/07988/2	16/07988/3	16/07988/4	16/07988/5	16/07988/6	16/07988/7	16/07988/8	Units	Method ref
Client Sample No										
Client Sample ID	WS1	WS1	WS2	WS3	WS4	WS5	WS6	WS7		
Depth to Top	0.20	1.00	0.20	0.70	0.20	0.10	0.00	0.00		
Depth To Bottom	0.40	1.20	0.50	0.90		0.40	0.20	0.20		
Date Sampled	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	05-Dec-16	06-Dec-16	06-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4AE	4E	4A	4A	4AE	6E	4AE	4E		
TPH CWG										
Ali >C5-C6$_A^\#$	<0.01	-	<0.01	-	<0.01	-	<0.01	-	mg/kg	A-T-022s
Ali >C6-C8$_A^\#$	<0.01	-	<0.01	-	<0.01	-	<0.01	-	mg/kg	A-T-022s
Ali >C8-C10$_A^\#$	<0.01	-	<0.01	-	<0.01	-	<0.01	-	mg/kg	A-T-022s
Ali >C10-C12$_A^\#$	<0.1	-	<0.1	-	<0.1	-	<0.1	-	mg/kg	A-T-023s
Ali >C12-C16$_A^\#$	<0.1	-	<0.1	-	<0.1	-	<0.1	-	mg/kg	A-T-023s
Ali >C16-C21$_A^\#$	<0.1	-	<0.1	-	<0.1	-	<0.1	-	mg/kg	A-T-023s
Ali >C21-C35$_A^\#$	<0.1	-	<0.1	-	<0.1	-	<0.1	-	mg/kg	A-T-023s
Total Aliphatics$_A$	<0.1	-	<0.1	-	<0.1	-	<0.1	-	mg/kg	A-T-023s
Aro >C5-C7$_A^\#$	<0.01	-	<0.01	-	<0.01	-	<0.01	-	mg/kg	A-T-022s
Aro >C7-C8$_A^\#$	<0.01	-	<0.01	-	<0.01	-	<0.01	-	mg/kg	A-T-022s
Aro >C8-C9$_A^\#$	<0.01	-	<0.01	-	<0.01	-	<0.01	-	mg/kg	A-T-022s
Aro >C9-C10$_A^\#$	<0.01	-	0.25	-	0.22	-	0.04	-	mg/kg	A-T-022s
Aro >C10-C12$_A^\#$	<0.1	-	<0.1	-	<0.1	-	<0.1	-	mg/kg	A-T-023s
Aro >C12-C16$_A^\#$	<0.1	-	<0.1	-	<0.1	-	<0.1	-	mg/kg	A-T-023s
Aro >C16-C21$_A^\#$	<0.1	-	<0.1	-	<0.1	-	<0.1	-	mg/kg	A-T-023s
Aro >C21-C35$_A^\#$	<0.1	-	<0.1	-	<0.1	-	<0.1	-	mg/kg	A-T-023s
Total Aromatics$_A$	<0.1	-	0.2	-	0.2	-	<0.1	-	mg/kg	A-T-023s
TPH (Ali & Aro)$_A$	<0.1	-	0.2	-	0.2	-	<0.1	-	mg/kg	A-T-023s
BTEX - Benzene$_A^\#$	<0.01	-	<0.01	-	<0.01	-	<0.01	-	mg/kg	A-T-022s
BTEX - Toluene$_A^\#$	<0.01	-	<0.01	-	<0.01	-	<0.01	-	mg/kg	A-T-022s
BTEX - Ethyl Benzene$_A^\#$	<0.01	-	<0.01	-	<0.01	-	<0.01	-	mg/kg	A-T-022s
BTEX - m & p Xylene$_A^\#$	<0.01	-	<0.01	-	<0.01	-	<0.01	-	mg/kg	A-T-022s
BTEX - o Xylene$_A^\#$	<0.01	-	<0.01	-	<0.01	-	<0.01	-	mg/kg	A-T-022s
MTBE$_A^\#$	<0.01	-	<0.01	-	<0.01	-	<0.01	-	mg/kg	A-T-022s

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Lab Sample ID	16/07988/9	16/07988/10	16/07988/11	16/07988/12	16/07988/13	16/07988/14	16/07988/15	16/07988/16	Units	Method ref
Client Sample No										
Client Sample ID	WS8	WS9	WS9	WS10	WS11	WS12	TP1	TP3		
Depth to Top	0.20	0.00	2.00	0.20	0.10	1.20	0.50	0.20		
Depth To Bottom	0.60	0.20	2.10	0.40	0.40	1.40		0.40		
Date Sampled	06-Dec-16	05-Dec-16	05-Dec-16			05-Dec-16	07-Dec-16	07-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4AE	4AE	5	4E	4E	6A	4AE	4AE		
% Stones >10mm$_A$#	3.6	1.1	<0.1	<0.1	<0.1	<0.1	<0.1	2.0	% w/w	A-T-044
pH$_D$M#	6.70	7.03	-	-	6.88	-	6.79	6.71	pH	A-T-031s
pH BRE$_D$M#	-	-	7.64	-	-	7.14	-	-	pH	A-T-031s
Sulphate BRE (water sol 2:1)$_D$M#	-	-	10	-	-	14	-	-	mg/l	A-T-026s
Sulphate BRE (acid sol)$_D$M#	-	-	<0.02	-	-	<0.02	-	-	% w/w	A-T-028s
Sulphur BRE (total)$_D$	-	-	<0.01	-	-	<0.01	-	-	% w/w	A-T-024s
Total Organic Carbon$_D$M#	1.77	-	-	-	1.13	-	-	-	% w/w	A-T-032s
Arsenic$_D$M#	106	58	-	-	84	-	148	139	mg/kg	A-T-024s
Boron (water soluble)$_D$M#	<1.0	1.5	-	-	1.3	-	1.5	1.3	mg/kg	A-T-027s
Cadmium$_D$M#	8.2	4.9	-	-	6.7	-	8.9	7.7	mg/kg	A-T-024s
Copper$_D$M#	<1	5	-	-	<1	-	<1	<1	mg/kg	A-T-024s
Chromium$_D$M#	225	129	-	-	166	-	245	205	mg/kg	A-T-024s
Chromium (hexavalent)$_D$	<1	<1	-	-	<1	-	<1	<1	mg/kg	A-T-040s
Lead$_D$M#	35	34	-	-	34	-	38	45	mg/kg	A-T-024s
Mercury$_D$	<0.17	<0.17	-	-	<0.17	-	<0.17	<0.17	mg/kg	A-T-024s
Nickel$_D$M#	94	60	-	-	78	-	108	88	mg/kg	A-T-024s
Selenium$_D$	2	<1	-	-	1	-	2	<1	mg/kg	A-T-024s
Zinc$_D$M#	162	115	-	-	142	-	217	181	mg/kg	A-T-024s
Leachate Prep BS EN 12457-1 (2:1) (per 250ml prepared leachate)$_A$	-	*	-	*	-	-	-	-		A-T-001
Arsenic (leachable)$_A$#	-	<1	-	2	-	-	-	-	µg/l	A-T-025w
Boron (leachable)$_A$#	-	45	-	41	-	-	-	-	µg/l	A-T-025w
Cadmium (leachable)$_A$#	-	<1	-	<1	-	-	-	-	µg/l	A-T-025w
Copper (leachable)$_A$#	-	2	-	7	-	-	-	-	µg/l	A-T-025w
Chromium (leachable)$_A$#	-	<1	-	2	-	-	-	-	µg/l	A-T-025w
Chromium (hexavalent) (leachable)$_A$	-	<0.05	-	<0.05	-	-	-	-	mg/l	A-T-040w
Lead (leachable)$_A$#	-	2	-	8	-	-	-	-	µg/l	A-T-025w
Mercury (leachable)$_A$#	-	<0.1	-	<0.1	-	-	-	-	µg/l	A-T-025w
Nickel (leachable)$_A$#	-	1	-	5	-	-	-	-	µg/l	A-T-025w
Selenium (leachable)$_A$#	-	<1	-	2	-	-	-	-	µg/l	A-T-025w
Zinc (leachable)$_A$#	-	17	-	28	-	-	-	-	µg/l	A-T-025w
Bioaccessibility - BARGE$_A$	Appended	-	-	-	Appended	-	Appended	Appended		Subcon

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Client Project Name: White Post Road, Banbury

Client Project Ref: 313498

Lab Sample ID	16/07988/9	16/07988/10	16/07988/11	16/07988/12	16/07988/13	16/07988/14	16/07988/15	16/07988/16	Units	Method ref
Client Sample No										
Client Sample ID	WS8	WS9	WS9	WS10	WS11	WS12	TP1	TP3		
Depth to Top	0.20	0.00	2.00	0.20	0.10	1.20	0.50	0.20		
Depth To Bottom	0.60	0.20	2.10	0.40	0.40	1.40		0.40		
Date Sampled	06-Dec-16	05-Dec-16	05-Dec-16			05-Dec-16	07-Dec-16	07-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4AE	4AE	5	4E	4E	6A	4AE	4AE		
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_A^{\#}$	NAD	NAD	-	-	-	-	-	NAD		A-T-045
Asbestos ACM - Suitable for Water Absorption Test?	N/A	N/A	-	-	-	-	-	N/A		

Envirolab Job Number: 16/07988

Client Project Name: White Post Road, Banbury

Client Project Ref: 313498

Lab Sample ID	16/07988/9	16/07988/10	16/07988/11	16/07988/12	16/07988/13	16/07988/14	16/07988/15	16/07988/16	Units	Method ref
Client Sample No										
Client Sample ID	WS8	WS9	WS9	WS10	WS11	WS12	TP1	TP3		
Depth to Top	0.20	0.00	2.00	0.20	0.10	1.20	0.50	0.20		
Depth To Bottom	0.60	0.20	2.10	0.40	0.40	1.40		0.40		
Date Sampled	06-Dec-16	05-Dec-16	05-Dec-16			05-Dec-16	07-Dec-16	07-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4AE	4AE	5	4E	4E	6A	4AE	4AE		
Nitrogen Pesticides										
Ametryn$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Atraton$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Atrazine$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Prometon$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Prometryn$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Propazine$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Simazine$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Simetryn$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Terbuthylazine$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Terbutryn$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon

Envirolab Job Number: 16/07988

Client Project Name: White Post Road, Banbury

Client Project Ref: 313498

Lab Sample ID	16/07988/9	16/07988/10	16/07988/11	16/07988/12	16/07988/13	16/07988/14	16/07988/15	16/07988/16	Units	Method ref
Client Sample No										
Client Sample ID	WS8	WS9	WS9	WS10	WS11	WS12	TP1	TP3		
Depth to Top	0.20	0.00	2.00	0.20	0.10	1.20	0.50	0.20		
Depth To Bottom	0.60	0.20	2.10	0.40	0.40	1.40		0.40		
Date Sampled	06-Dec-16	05-Dec-16	05-Dec-16			05-Dec-16	07-Dec-16	07-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4AE	4AE	5	4E	4E	6A	4AE	4AE		
Pest-c										
Mevinphos$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Dichlorvos$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
alpha-Hexachlorocyclohexane (HCH)$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Diazinon$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
gamma-Hexachlorocyclohexane (HCH / Lindane)$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Heptachlor$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Aldrin$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
beta-Hexachlorocyclohexane (HCH)$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Methyl Parathion$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Malathion$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Fenitrothion$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Heptachlor Epoxide$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Parathion (Ethyl Parathion)$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
p,p-DDE$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
p,p-DDT$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
p,p-Methoxychlor$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
p,p-TDE (DDD)$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
o,p-DDE$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
o,p-DDT$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
o,p-Methoxychlor$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
o,p-TDE (DDD)$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Endosulphan I$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Endosulphan II$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Endosulphan Sulphate$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Endrin$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Ethion$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Dieldrin$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon
Azinphos-methyl$_A$	-	<50	-	<50	-	-	-	-	µg/kg	Subcon

Envirolab Job Number: 16/07988

Client Project Name: White Post Road, Banbury

Client Project Ref: 313498

Lab Sample ID	16/07988/9	16/07988/10	16/07988/11	16/07988/12	16/07988/13	16/07988/14	16/07988/15	16/07988/16	Units	Method ref
Client Sample No										
Client Sample ID	WS8	WS9	WS9	WS10	WS11	WS12	TP1	TP3		
Depth to Top	0.20	0.00	2.00	0.20	0.10	1.20	0.50	0.20		
Depth To Bottom	0.60	0.20	2.10	0.40	0.40	1.40		0.40		
Date Sampled	06-Dec-16	05-Dec-16	05-Dec-16			05-Dec-16	07-Dec-16	07-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4AE	4AE	5	4E	4E	6A	4AE	4AE		
PAH 16										
Acenaphthene$_A^{M\#}$	<0.01	<0.01	-	-	-	-	-	-	mg/kg	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	<0.01	-	-	-	-	-	-	mg/kg	A-T-019s
Anthracene$_A^{M\#}$	<0.02	<0.02	-	-	-	-	-	-	mg/kg	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	<0.04	0.07	-	-	-	-	-	-	mg/kg	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	<0.04	0.08	-	-	-	-	-	-	mg/kg	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	<0.05	0.11	-	-	-	-	-	-	mg/kg	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	<0.05	<0.05	-	-	-	-	-	-	mg/kg	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	<0.07	<0.07	-	-	-	-	-	-	mg/kg	A-T-019s
Chrysene$_A^{M\#}$	<0.06	0.08	-	-	-	-	-	-	mg/kg	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	<0.04	-	-	-	-	-	-	mg/kg	A-T-019s
Fluoranthene$_A^{M\#}$	<0.08	0.12	-	-	-	-	-	-	mg/kg	A-T-019s
Fluorene$_A^{M\#}$	<0.01	<0.01	-	-	-	-	-	-	mg/kg	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	<0.03	0.06	-	-	-	-	-	-	mg/kg	A-T-019s
Naphthalene$_A^{M\#}$	<0.03	<0.03	-	-	-	-	-	-	mg/kg	A-T-019s
Phenanthrene$_A^{M\#}$	<0.03	0.05	-	-	-	-	-	-	mg/kg	A-T-019s
Pyrene$_A^{M\#}$	<0.07	0.10	-	-	-	-	-	-	mg/kg	A-T-019s
PAH (total 16)$_A^{M\#}$	<0.08	0.67	-	-	-	-	-	-	mg/kg	A-T-019s

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Client Project Name: White Post Road, Banbury

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Lab Sample ID	16/07988/9	16/07988/10	16/07988/11	16/07988/12	16/07988/13	16/07988/14	16/07988/15	16/07988/16	Units	Method ref
Client Sample No										
Client Sample ID	WS8	WS9	WS9	WS10	WS11	WS12	TP1	TP3		
Depth to Top	0.20	0.00	2.00	0.20	0.10	1.20	0.50	0.20		
Depth To Bottom	0.60	0.20	2.10	0.40	0.40	1.40		0.40		
Date Sampled	06-Dec-16	05-Dec-16	05-Dec-16			05-Dec-16	07-Dec-16	07-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4AE	4AE	5	4E	4E	6A	4AE	4AE		
TPH CWG										
Ali >C5-C6$_A^\#$	<0.01	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Ali >C6-C8$_A^\#$	<0.01	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Ali >C8-C10$_A^\#$	<0.01	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Ali >C10-C12$_A^\#$	<0.1	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Ali >C12-C16$_A^\#$	<0.1	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Ali >C16-C21$_A^\#$	<0.1	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Ali >C21-C35$_A^\#$	<0.1	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Total Aliphatics$_A$	<0.1	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Aro >C5-C7$_A^\#$	<0.01	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Aro >C7-C8$_A^\#$	<0.01	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Aro >C8-C9$_A^\#$	<0.01	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Aro >C9-C10$_A^\#$	<0.01	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
Aro >C10-C12$_A^\#$	<0.1	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Aro >C12-C16$_A^\#$	<0.1	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Aro >C16-C21$_A^\#$	<0.1	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Aro >C21-C35$_A^\#$	<0.1	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
Total Aromatics$_A$	<0.1	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
TPH (Ali & Aro)$_A$	<0.1	<0.1	-	-	-	-	-	-	mg/kg	A-T-023s
BTEX - Benzene$_A^\#$	<0.01	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
BTEX - Toluene$_A^\#$	<0.01	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
BTEX - Ethyl Benzene$_A^\#$	<0.01	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
BTEX - m & p Xylene$_A^\#$	<0.01	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
BTEX - o Xylene$_A^\#$	<0.01	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s
MTBE$_A^\#$	<0.01	<0.01	-	-	-	-	-	-	mg/kg	A-T-022s

Envirolab Job Number: 16/07988

Client Project Name: White Post Road, Banbury

Client Project Ref: 313498

Lab Sample ID	16/07988/17	16/07988/18	16/07988/19	16/07988/20	16/07988/21	16/07988/22	16/07988/23	16/07988/24	Units	Method ref
Client Sample No										
Client Sample ID	TP4	TP5	TP6	TP7	TP27	TP18	TP13	TP14		
Depth to Top	0.20	0.00	1.10	0.10	0.20	0.40	0.35	0.40		
Depth To Bottom	0.40	0.20	1.30							
Date Sampled		07-Dec-16	07-Dec-16		07-Dec-16			09-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4E	4E	4E	4E	4E	6E	4AE	4AE		
% Stones >10mm$_A$ #	<0.1	<0.1	1.8	<0.1	<0.1	<0.1	<0.1	<0.1	% w/w	A-T-044
pH$_D$ M#	7.23	6.77	-	7.09	7.22	-	6.78	6.16	pH	A-T-031s
pH BRE$_D$ M#	-	-	6.70	-	-	6.21	-	6.16	pH	A-T-031s
Sulphate BRE (water sol 2:1)$_D$ M#	-	-	<10	-	-	15	-	<10	mg/l	A-T-026s
Sulphate BRE (acid sol)$_D$ M#	-	-	0.03	-	-	0.04	-	0.05	% w/w	A-T-028s
Sulphur BRE (total)$_D$	-	-	0.02	-	-	0.02	-	0.04	% w/w	A-T-024s
Total Organic Carbon$_D$ M#	1.13	-	-	-	-	-	-	-	% w/w	A-T-032s
Arsenic$_D$ M#	124	77	-	141	44	-	87	125	mg/kg	A-T-024s
Boron (water soluble)$_D$ M#	1.0	1.2	-	1.2	<1.0	-	<1.0	1.2	mg/kg	A-T-027s
Cadmium$_D$ M#	8.9	6.2	-	8.4	4.3	-	8.2	8.0	mg/kg	A-T-024s
Copper$_D$ M#	<1	3	-	<1	<1	-	<1	<1	mg/kg	A-T-024s
Chromium$_D$ M#	272	162	-	222	104	-	195	207	mg/kg	A-T-024s
Chromium (hexavalent)$_D$	<1	<1	-	<1	<1	-	<1	<1	mg/kg	A-T-040s
Lead$_D$ M#	29	41	-	42	16	-	38	49	mg/kg	A-T-024s
Mercury$_D$	<0.17	<0.17	-	<0.17	<0.17	-	<0.17	<0.17	mg/kg	A-T-024s
Nickel$_D$ M#	107	74	-	102	53	-	92	93	mg/kg	A-T-024s
Selenium$_D$	1	<1	-	2	1	-	2	1	mg/kg	A-T-024s
Zinc$_D$ M#	188	141	-	200	91	-	144	190	mg/kg	A-T-024s
Leachate Prep BS EN 12457-1 (2:1) (per 250ml prepared leachate)$_A$	*	-	-	-	*	-	-	-		A-T-001
Arsenic (leachable)$_A$ #	<1	-	-	-	<1	-	-	-	µg/l	A-T-025w
Boron (leachable)$_A$ #	35	-	-	-	37	-	-	-	µg/l	A-T-025w
Cadmium (leachable)$_A$ #	<1	-	-	-	<1	-	-	-	µg/l	A-T-025w
Copper (leachable)$_A$ #	1	-	-	-	1	-	-	-	µg/l	A-T-025w
Chromium (leachable)$_A$ #	<1	-	-	-	<1	-	-	-	µg/l	A-T-025w
Chromium (hexavalent) (leachable)$_A$	<0.05	-	-	-	<0.05	-	-	-	mg/l	A-T-040w
Lead (leachable)$_A$ #	<1	-	-	-	<1	-	-	-	µg/l	A-T-025w
Mercury (leachable)$_A$ #	<0.1	-	-	-	<0.1	-	-	-	µg/l	A-T-025w
Nickel (leachable)$_A$ #	<1	-	-	-	1	-	-	-	µg/l	A-T-025w
Selenium (leachable)$_A$ #	<1	-	-	-	<1	-	-	-	µg/l	A-T-025w
Zinc (leachable)$_A$ #	3	-	-	-	24	-	-	-	µg/l	A-T-025w
Bioaccessibility - BARGE$_A$	-	-	-	Appended	-	-	-	-		Subcon

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Lab Sample ID	16/07988/17	16/07988/18	16/07988/19	16/07988/20	16/07988/21	16/07988/22	16/07988/23	16/07988/24	Units	Method ref
Client Sample No										
Client Sample ID	TP4	TP5	TP6	TP7	TP27	TP18	TP13	TP14		
Depth to Top	0.20	0.00	1.10	0.10	0.20	0.40	0.35	0.40		
Depth To Bottom	0.40	0.20	1.30							
Date Sampled		07-Dec-16	07-Dec-16		07-Dec-16			09-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4E	4E	4E	4E	4E	6E	4AE	4AE		
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_A^{\#}$	-	-	-	-	-	NAD	-	-		A-T-045
Asbestos ACM - Suitable for Water Absorption Test?	-	-	-	-	-	N/A	-	-		

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Lab Sample ID	16/07988/17	16/07988/18	16/07988/19	16/07988/20	16/07988/21	16/07988/22	16/07988/23	16/07988/24	Units	Method ref
Client Sample No										
Client Sample ID	TP4	TP5	TP6	TP7	TP27	TP18	TP13	TP14		
Depth to Top	0.20	0.00	1.10	0.10	0.20	0.40	0.35	0.40		
Depth To Bottom	0.40	0.20	1.30							
Date Sampled		07-Dec-16	07-Dec-16		07-Dec-16			09-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4E	4E	4E	4E	4E	6E	4AE	4AE		
Nitrogen Pesticides										
Ametryn$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Atraton$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Atrazine$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Prometon$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Prometryn$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Propazine$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Simazine$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Simetryn$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Terbuthylazine$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Terbutryn$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon

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Lab Sample ID	16/07988/17	16/07988/18	16/07988/19	16/07988/20	16/07988/21	16/07988/22	16/07988/23	16/07988/24	Units	Method ref
Client Sample No										
Client Sample ID	TP4	TP5	TP6	TP7	TP27	TP18	TP13	TP14		
Depth to Top	0.20	0.00	1.10	0.10	0.20	0.40	0.35	0.40		
Depth To Bottom	0.40	0.20	1.30							
Date Sampled		07-Dec-16	07-Dec-16		07-Dec-16			09-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4E	4E	4E	4E	4E	6E	4AE	4AE		
Pest-c										
Mevinphos$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Dichlorvos$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
alpha-Hexachlorocyclohexane (HCH)$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Diazinon$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
gamma-Hexachlorocyclohexane (HCH / Lindane)$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Heptachlor$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Aldrin$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
beta-Hexachlorocyclohexane (HCH)$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Methyl Parathion$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Malathion$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Fenitrothion$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Heptachlor Epoxide$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Parathion (Ethyl Parathion)$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
p,p-DDE$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
p,p-DDT$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
p,p-Methoxychlor$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
p,p-TDE (DDD)$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
o,p-DDE$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
o,p-DDT$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
o,p-Methoxychlor$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
o,p-TDE (DDD)$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Endosulphan I$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Endosulphan II$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Endosulphan Sulphate$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Endrin$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Ethion$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Dieldrin$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon
Azinphos-methyl$_A$	<50	-	-	-	<50	-	-	-	µg/kg	Subcon

Envirolab Job Number: 16/07988

Client Project Name: White Post Road, Banbury

Client Project Ref: 313498

Lab Sample ID	16/07988/25	16/07988/26	16/07988/27	16/07988/28	16/07988/29	16/07988/30	16/07988/31	16/07988/32	Units	Method ref
Client Sample No										
Client Sample ID	TP25	TP21	TP26	TP10	TP23	TP5	TP20	TP29		
Depth to Top	0.25	0.35	0.30	0.20	0.40	0.20	0.50	0.20		
Depth To Bottom										
Date Sampled	08-Dec-16	08-Dec-16		06-Dec-16	06-Dec-16			08-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	6E	6E	6E	4E	4E	4E	6A	6AE		
% Stones >10mm$_A^{\#}$	<0.1	<0.1	7.9	<0.1	-	<0.1	5.3	<0.1	% w/w	A-T-044
pH$_D^{M\#}$	6.68	6.26	7.60	5.65	-	6.54	7.00	6.56	pH	A-T-031s
Total Organic Carbon$_D^{M\#}$	-	1.68	-	2.64	-	-	0.58	1.61	% w/w	A-T-032s
Arsenic$_D^{M\#}$	81	54	76	129	-	99	89	80	mg/kg	A-T-024s
Boron (water soluble)$_D^{M\#}$	1.7	1.4	1.7	1.3	-	1.4	1.0	1.4	mg/kg	A-T-027s
Cadmium$_D^{M\#}$	8.2	4.7	7.6	9.4	-	8.1	6.9	5.1	mg/kg	A-T-024s
Copper$_D^{M\#}$	<1	10	<1	<1	-	<1	<1	7	mg/kg	A-T-024s
Chromium$_D^{M\#}$	213	111	202	252	-	205	191	124	mg/kg	A-T-024s
Chromium (hexavalent)$_D$	<1	<1	<1	<1	-	<1	<1	<1	mg/kg	A-T-040s
Lead$_D^{M\#}$	36	44	46	43	-	36	22	48	mg/kg	A-T-024s
Mercury$_D$	<0.17	<0.17	<0.17	<0.17	-	<0.17	<0.17	<0.17	mg/kg	A-T-024s
Nickel$_D^{M\#}$	95	55	87	104	-	95	96	65	mg/kg	A-T-024s
Selenium$_D$	1	1	<1	1	-	2	<1	1	mg/kg	A-T-024s
Zinc$_D^{M\#}$	132	111	125	186	-	149	129	126	mg/kg	A-T-024s
Bioaccessibility - BARGE$_A$	-	-	-	-	-	-	-	Appended		Subcon

Envirolab Job Number: 16/07988

Client Project Name: White Post Road, Banbury

Client Project Ref: 313498

Lab Sample ID	16/07988/25	16/07988/26	16/07988/27	16/07988/28	16/07988/29	16/07988/30	16/07988/31	16/07988/32	Units	Method ref
Client Sample No										
Client Sample ID	TP25	TP21	TP26	TP10	TP23	TP5	TP20	TP29		
Depth to Top	0.25	0.35	0.30	0.20	0.40	0.20	0.50	0.20		
Depth To Bottom										
Date Sampled	08-Dec-16	08-Dec-16		06-Dec-16	06-Dec-16			08-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	6E	6E	6E	4E	4E	4E	6A	6AE		
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_A^{\#}$	-	-	-	-	NAD	-	-	-		A-T-045
Asbestos ACM - Suitable for Water Absorption Test?	-	-	-	-	N/A	-	-	-		

Envirolab Job Number: 16/07988

Client Project Name: White Post Road, Banbury

Client Project Ref: 313498

Lab Sample ID	16/07988/25	16/07988/26	16/07988/27	16/07988/28	16/07988/29	16/07988/30	16/07988/31	16/07988/32	Units	Method ref
Client Sample No										
Client Sample ID	TP25	TP21	TP26	TP10	TP23	TP5	TP20	TP29		
Depth to Top	0.25	0.35	0.30	0.20	0.40	0.20	0.50	0.20		
Depth To Bottom										
Date Sampled	08-Dec-16	08-Dec-16		06-Dec-16	06-Dec-16			08-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	6E	6E	6E	4E	4E	4E	6A	6AE		
PAH 16										
Acenaphthene$_A^{M\#}$	<0.01	<0.01	<0.01	-	-	<0.01	-	<0.01	mg/kg	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	<0.01	<0.01	-	-	<0.01	-	<0.01	mg/kg	A-T-019s
Anthracene$_A^{M\#}$	<0.02	<0.02	<0.02	-	-	<0.02	-	<0.02	mg/kg	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	<0.04	0.07	0.11	-	-	<0.04	-	0.07	mg/kg	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	<0.04	0.07	0.13	-	-	<0.04	-	0.07	mg/kg	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	<0.05	0.10	0.16	-	-	<0.05	-	0.10	mg/kg	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	<0.05	<0.05	0.08	-	-	<0.05	-	<0.05	mg/kg	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	<0.07	<0.07	<0.07	-	-	<0.07	-	<0.07	mg/kg	A-T-019s
Chrysene$_A^{M\#}$	<0.06	0.10	0.13	-	-	<0.06	-	0.08	mg/kg	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	<0.04	<0.04	-	-	<0.04	-	<0.04	mg/kg	A-T-019s
Fluoranthene$_A^{M\#}$	<0.08	0.13	0.16	-	-	<0.08	-	0.10	mg/kg	A-T-019s
Fluorene$_A^{M\#}$	<0.01	<0.01	<0.01	-	-	<0.01	-	<0.01	mg/kg	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	<0.03	0.05	0.10	-	-	<0.03	-	0.05	mg/kg	A-T-019s
Naphthalene$_A^{M\#}$	<0.03	<0.03	<0.03	-	-	<0.03	-	<0.03	mg/kg	A-T-019s
Phenanthrene$_A^{M\#}$	<0.03	0.07	0.06	-	-	<0.03	-	0.04	mg/kg	A-T-019s
Pyrene$_A^{M\#}$	<0.07	0.11	0.14	-	-	<0.07	-	0.08	mg/kg	A-T-019s
PAH (total 16)$_A^{M\#}$	<0.08	0.72	1.05	-	-	<0.08	-	0.61	mg/kg	A-T-019s

Envirolab Job Number: 16/07988

Client Project Name: White Post Road, Banbury

Client Project Ref: 313498

Lab Sample ID	16/07988/25	16/07988/26	16/07988/27	16/07988/28	16/07988/29	16/07988/30	16/07988/31	16/07988/32	Units	Method ref
Client Sample No										
Client Sample ID	TP25	TP21	TP26	TP10	TP23	TP5	TP20	TP29		
Depth to Top	0.25	0.35	0.30	0.20	0.40	0.20	0.50	0.20		
Depth To Bottom										
Date Sampled	08-Dec-16	08-Dec-16		06-Dec-16	06-Dec-16			08-Dec-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	6E	6E	6E	4E	4E	4E	6A	6AE		
TPH CWG										
Ali >C5-C6$_A^\#$	-	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	A-T-022s
Ali >C6-C8$_A^\#$	-	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	A-T-022s
Ali >C8-C10$_A^\#$	-	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	A-T-022s
Ali >C10-C12$_A^\#$	-	-	<0.1	<0.1	-	<0.1	-	-	mg/kg	A-T-023s
Ali >C12-C16$_A^\#$	-	-	<0.1	<0.1	-	<0.1	-	-	mg/kg	A-T-023s
Ali >C16-C21$_A^\#$	-	-	<0.1	<0.1	-	<0.1	-	-	mg/kg	A-T-023s
Ali >C21-C35$_A^\#$	-	-	<0.1	<0.1	-	<0.1	-	-	mg/kg	A-T-023s
Total Aliphatics$_A$	-	-	<0.1	<0.1	-	<0.1	-	-	mg/kg	A-T-023s
Aro >C5-C7$_A^\#$	-	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	A-T-022s
Aro >C7-C8$_A^\#$	-	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	A-T-022s
Aro >C8-C9$_A^\#$	-	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	A-T-022s
Aro >C9-C10$_A^\#$	-	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	A-T-022s
Aro >C10-C12$_A^\#$	-	-	<0.1	<0.1	-	<0.1	-	-	mg/kg	A-T-023s
Aro >C12-C16$_A^\#$	-	-	<0.1	<0.1	-	<0.1	-	-	mg/kg	A-T-023s
Aro >C16-C21$_A^\#$	-	-	<0.1	<0.1	-	<0.1	-	-	mg/kg	A-T-023s
Aro >C21-C35$_A^\#$	-	-	<0.1	<0.1	-	<0.1	-	-	mg/kg	A-T-023s
Total Aromatics$_A$	-	-	<0.1	<0.1	-	<0.1	-	-	mg/kg	A-T-023s
TPH (Ali & Aro)$_A$	-	-	<0.1	<0.1	-	<0.1	-	-	mg/kg	A-T-023s
BTEX - Benzene$_A^\#$	-	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	A-T-022s
BTEX - Toluene$_A^\#$	-	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	A-T-022s
BTEX - Ethyl Benzene$_A^\#$	-	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	A-T-022s
BTEX - m & p Xylene$_A^\#$	-	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	A-T-022s
BTEX - o Xylene$_A^\#$	-	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	A-T-022s
MTBE$_A^\#$	-	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	A-T-022s

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Client Project Name: White Post Road, Banbury

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Lab Sample ID	16/07988/33	16/07988/34	16/07988/35	16/07988/36	16/07988/39	16/07988/40			Units	Method ref
Client Sample No										
Client Sample ID	TP9	TP11	TP9	TP22	WS12	TP2				
Depth to Top	0.10	0.20	0.40	0.10	0.20	0.40				
Depth To Bottom					0.50					
Date Sampled	06-Dec-16	06-Dec-16	06-Dec-16	06-Dec-16		07-Dec-16				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil	Soil				
Sample Matrix Code	4E	4AE	4E	4E	4A	4AE				
% Stones >10mm$_A^{\#}$	-	2.9	-	<0.1	0.3	15.5			% w/w	A-T-044
pH$_D^{M\#}$	-	6.05	-	6.90	-	6.64			pH	A-T-031s
Total Organic Carbon$_D^{M\#}$	-	1.43	-	-	-	-			% w/w	A-T-032s
Arsenic$_D^{M\#}$	-	134	-	101	-	129			mg/kg	A-T-024s
Boron (water soluble)$_D^{M\#}$	-	1.2	-	1.8	-	1.4			mg/kg	A-T-027s
Cadmium$_D^{M\#}$	-	8.4	-	8.9	-	6.8			mg/kg	A-T-024s
Copper$_D^{M\#}$	-	<1	-	<1	-	2			mg/kg	A-T-024s
Chromium$_D^{M\#}$	-	225	-	222	-	186			mg/kg	A-T-024s
Chromium (hexavalent)$_D$	-	<1	-	<1	-	<1			mg/kg	A-T-040s
Lead$_D^{M\#}$	-	49	-	40	-	44			mg/kg	A-T-024s
Mercury$_D$	-	<0.17	-	<0.17	-	<0.17			mg/kg	A-T-024s
Nickel$_D^{M\#}$	-	101	-	105	-	83			mg/kg	A-T-024s
Selenium$_D$	-	2	-	3	-	2			mg/kg	A-T-024s
Zinc$_D^{M\#}$	-	187	-	143	-	192			mg/kg	A-T-024s

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Client Project Name: White Post Road, Banbury

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Lab Sample ID	16/07988/33	16/07988/34	16/07988/35	16/07988/36	16/07988/39	16/07988/40			Units	Method ref
Client Sample No										
Client Sample ID	TP9	TP11	TP9	TP22	WS12	TP2				
Depth to Top	0.10	0.20	0.40	0.10	0.20	0.40				
Depth To Bottom					0.50					
Date Sampled	06-Dec-16	06-Dec-16	06-Dec-16	06-Dec-16		07-Dec-16				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil	Soil				
Sample Matrix Code	4E	4AE	4E	4E	4A	4AE				
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_A^{\#}$	NAD	-	NAD	-	NAD	-				A-T-045
Asbestos ACM - Suitable for Water Absorption Test?	N/A	-	N/A	-	N/A	-				

Envirolab Job Number: 16/07988 **Client Project Name: White Post Road, Banbury**

Client Project Ref: 313498

Lab Sample ID	16/07988/33	16/07988/34	16/07988/35	16/07988/36	16/07988/39	16/07988/40			Units	Method ref
Client Sample No										
Client Sample ID	TP9	TP11	TP9	TP22	WS12	TP2				
Depth to Top	0.10	0.20	0.40	0.10	0.20	0.40				
Depth To Bottom					0.50					
Date Sampled	06-Dec-16	06-Dec-16	06-Dec-16	06-Dec-16		07-Dec-16				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil	Soil				
Sample Matrix Code	4E	4AE	4E	4E	4A	4AE				
Nitrogen Pesticides										
Ametryn$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Atraton$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Atrazine$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Prometon$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Prometryn$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Propazine$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Simazine$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Simetryn$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Terbuthylazine$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Terbutryn$_A$	-	-	-	-	<50	-			µg/kg	Subcon

Lab Sample ID	16/07988/33	16/07988/34	16/07988/35	16/07988/36	16/07988/39	16/07988/40			Units	Method ref
Client Sample No										
Client Sample ID	TP9	TP11	TP9	TP22	WS12	TP2				
Depth to Top	0.10	0.20	0.40	0.10	0.20	0.40				
Depth To Bottom					0.50					
Date Sampled	06-Dec-16	06-Dec-16	06-Dec-16	06-Dec-16		07-Dec-16				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil	Soil				
Sample Matrix Code	4E	4AE	4E	4E	4A	4AE				
Pest-c										
Mevinphos$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Dichlorvos$_A$	-	-	-	-	<50	-			µg/kg	Subcon
alpha-Hexachlorocyclohexane (HCH)$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Diazinon$_A$	-	-	-	-	<50	-			µg/kg	Subcon
gamma-Hexachlorocyclohexane (HCH / Lindane)$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Heptachlor$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Aldrin$_A$	-	-	-	-	<50	-			µg/kg	Subcon
beta-Hexachlorocyclohexane (HCH)$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Methyl Parathion$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Malathion$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Fenitrothion$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Heptachlor Epoxide$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Parathion (Ethyl Parathion)$_A$	-	-	-	-	<50	-			µg/kg	Subcon
p,p-DDE$_A$	-	-	-	-	<50	-			µg/kg	Subcon
p,p-DDT$_A$	-	-	-	-	<50	-			µg/kg	Subcon
p,p-Methoxychlor$_A$	-	-	-	-	<50	-			µg/kg	Subcon
p,p-TDE (DDD)$_A$	-	-	-	-	<50	-			µg/kg	Subcon
o,p-DDE$_A$	-	-	-	-	<50	-			µg/kg	Subcon
o,p-DDT$_A$	-	-	-	-	<50	-			µg/kg	Subcon
o,p-Methoxychlor$_A$	-	-	-	-	<50	-			µg/kg	Subcon
o,p-TDE (DDD)$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Endosulphan I$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Endosulphan II$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Endosulphan Sulphate$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Endrin$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Ethion$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Dieldrin$_A$	-	-	-	-	<50	-			µg/kg	Subcon
Azinphos-methyl$_A$	-	-	-	-	<50	-			µg/kg	Subcon

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Client Project Name: White Post Road, Banbury

Client Project Ref: 313498

Lab Sample ID	16/07988/33	16/07988/34	16/07988/35	16/07988/36	16/07988/39	16/07988/40			Units	Method ref
Client Sample No										
Client Sample ID	TP9	TP11	TP9	TP22	WS12	TP2				
Depth to Top	0.10	0.20	0.40	0.10	0.20	0.40				
Depth To Bottom					0.50					
Date Sampled	06-Dec-16	06-Dec-16	06-Dec-16	06-Dec-16		07-Dec-16				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil	Soil				
Sample Matrix Code	4E	4AE	4E	4E	4A	4AE				
PAH 16										
Acenaphthene$_A^{M\#}$	-	-	-	-	-	<0.01			mg/kg	A-T-019s
Acenaphthylene$_A^{M\#}$	-	-	-	-	-	<0.01			mg/kg	A-T-019s
Anthracene$_A^{M\#}$	-	-	-	-	-	<0.02			mg/kg	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	-	-	-	-	-	<0.04			mg/kg	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	-	-	-	-	-	<0.04			mg/kg	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	-	-	-	-	-	0.06			mg/kg	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	-	-	-	-	-	<0.05			mg/kg	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	-	-	-	-	-	<0.07			mg/kg	A-T-019s
Chrysene$_A^{M\#}$	-	-	-	-	-	<0.06			mg/kg	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	-	-	-	-	-	<0.04			mg/kg	A-T-019s
Fluoranthene$_A^{M\#}$	-	-	-	-	-	<0.08			mg/kg	A-T-019s
Fluorene$_A^{M\#}$	-	-	-	-	-	<0.01			mg/kg	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	-	-	-	-	-	<0.03			mg/kg	A-T-019s
Naphthalene$_A^{M\#}$	-	-	-	-	-	<0.03			mg/kg	A-T-019s
Phenanthrene$_A^{M\#}$	-	-	-	-	-	<0.03			mg/kg	A-T-019s
Pyrene$_A^{M\#}$	-	-	-	-	-	<0.07			mg/kg	A-T-019s
PAH (total 16)$_A^{M\#}$	-	-	-	-	-	<0.08			mg/kg	A-T-019s

Envirolab Job Number: 16/07988

Client Project Name: White Post Road, Banbury

Client Project Ref: 313498

Lab Sample ID	16/07988/33	16/07988/34	16/07988/35	16/07988/36	16/07988/39	16/07988/40			Units	Method ref
Client Sample No										
Client Sample ID	TP9	TP11	TP9	TP22	WS12	TP2				
Depth to Top	0.10	0.20	0.40	0.10	0.20	0.40				
Depth To Bottom					0.50					
Date Sampled	06-Dec-16	06-Dec-16	06-Dec-16	06-Dec-16		07-Dec-16				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil	Soil				
Sample Matrix Code	4E	4AE	4E	4E	4A	4AE				
TPH CWG										
Ali >C5-C6$_A^\#$	-	-	-	<0.01	-	<0.01			mg/kg	A-T-022s
Ali >C6-C8$_A^\#$	-	-	-	<0.01	-	<0.01			mg/kg	A-T-022s
Ali >C8-C10$_A^\#$	-	-	-	<0.01	-	<0.01			mg/kg	A-T-022s
Ali >C10-C12$_A^\#$	-	-	-	<0.1	-	<0.1			mg/kg	A-T-023s
Ali >C12-C16$_A^\#$	-	-	-	<0.1	-	<0.1			mg/kg	A-T-023s
Ali >C16-C21$_A^\#$	-	-	-	<0.1	-	<0.1			mg/kg	A-T-023s
Ali >C21-C35$_A^\#$	-	-	-	<0.1	-	<0.1			mg/kg	A-T-023s
Total Aliphatics$_A$	-	-	-	<0.1	-	<0.1			mg/kg	A-T-023s
Aro >C5-C7$_A^\#$	-	-	-	<0.01	-	<0.01			mg/kg	A-T-022s
Aro >C7-C8$_A^\#$	-	-	-	<0.01	-	<0.01			mg/kg	A-T-022s
Aro >C8-C9$_A^\#$	-	-	-	<0.01	-	<0.01			mg/kg	A-T-022s
Aro >C9-C10$_A^\#$	-	-	-	<0.01	-	<0.01			mg/kg	A-T-022s
Aro >C10-C12$_A^\#$	-	-	-	<0.1	-	<0.1			mg/kg	A-T-023s
Aro >C12-C16$_A^\#$	-	-	-	<0.1	-	<0.1			mg/kg	A-T-023s
Aro >C16-C21$_A^\#$	-	-	-	<0.1	-	<0.1			mg/kg	A-T-023s
Aro >C21-C35$_A^\#$	-	-	-	<0.1	-	<0.1			mg/kg	A-T-023s
Total Aromatics$_A$	-	-	-	<0.1	-	<0.1			mg/kg	A-T-023s
TPH (Ali & Aro)$_A$	-	-	-	<0.1	-	<0.1			mg/kg	A-T-023s
BTEX - Benzene$_A^\#$	-	-	-	<0.01	-	<0.01			mg/kg	A-T-022s
BTEX - Toluene$_A^\#$	-	-	-	<0.01	-	<0.01			mg/kg	A-T-022s
BTEX - Ethyl Benzene$_A^\#$	-	-	-	<0.01	-	<0.01			mg/kg	A-T-022s
BTEX - m & p Xylene$_A^\#$	-	-	-	<0.01	-	<0.01			mg/kg	A-T-022s
BTEX - o Xylene$_A^\#$	-	-	-	<0.01	-	<0.01			mg/kg	A-T-022s
MTBE$_A^\#$	-	-	-	<0.01	-	<0.01			mg/kg	A-T-022s

REPORT NOTES

General:
This report shall not be reproduced, except in full, without written approval from Envirolab.
All samples contained within this report, and any received with the same delivery, will be disposed of one month after the date of this report.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.
If results are in italic font they are associated with an AQC failure. These are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Soil chemical analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Asbestos:
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.
Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.
Secondary Matrix Codes:
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

Key:
IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Superscript "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

SUMMARY OF MOISTURE CONTENT TESTS

In accordance with clause 3.2 of BS1377:Part 2

Exploratory Position ID	Sample Ref	Depth (m)	Sample Type	Moisture Content %	Lab
TP05		**1.40**	**B**	**20**	**B**
TP08		**0.95**	**D**	**23**	**B**
TP08		**2.00**	**D**	**21**	**B**
TP09		**1.00**	**D**	**23**	**B**
TP11		**0.90**	**D**	**38**	**B**
TP12		**2.80**	**D**	**23**	**B**
TP21		**1.10**	**D**	**19**	**B**
TP21		**2.00**	**DSPT**	**23**	**B**
TP21		**3.10**	**D**	**42**	**B**
TP26		**0.40**	**B**	**22**	**B**
TP26		**0.50**	**D**	**31**	**B**
TP26		**1.50**	**B**	**24**	**B**
TP28		**0.80**	**D**	**29**	**B**
WS02		**1.20**	**D**	**23**	**B**
WS02		**1.60**	**D**	**22**	**B**
WS02		**2.00**	**DSPT**	**21**	**B**
WS02		**2.85**	**D**	**34**	**B**
WS03		**1.20**	**DSPT**	**21**	**B**
WS04		**0.40**	**D**	**35**	**B**
WS04		**1.25**	**D**	**25**	**B**
WS05		**2.00**	**DSPT**	**23**	**B**
WS06		**1.70**	**D**	**22**	**B**
WS07		**0.20**	**B**	**29**	**B**
WS07		**1.20**	**B**	**25**	**B**
WS08		**1.50**	**D**	**27**	**B**
WS10		**0.40**	**B**	**36**	**B**
WS12		**1.70**	**D**	**34**	**B**

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

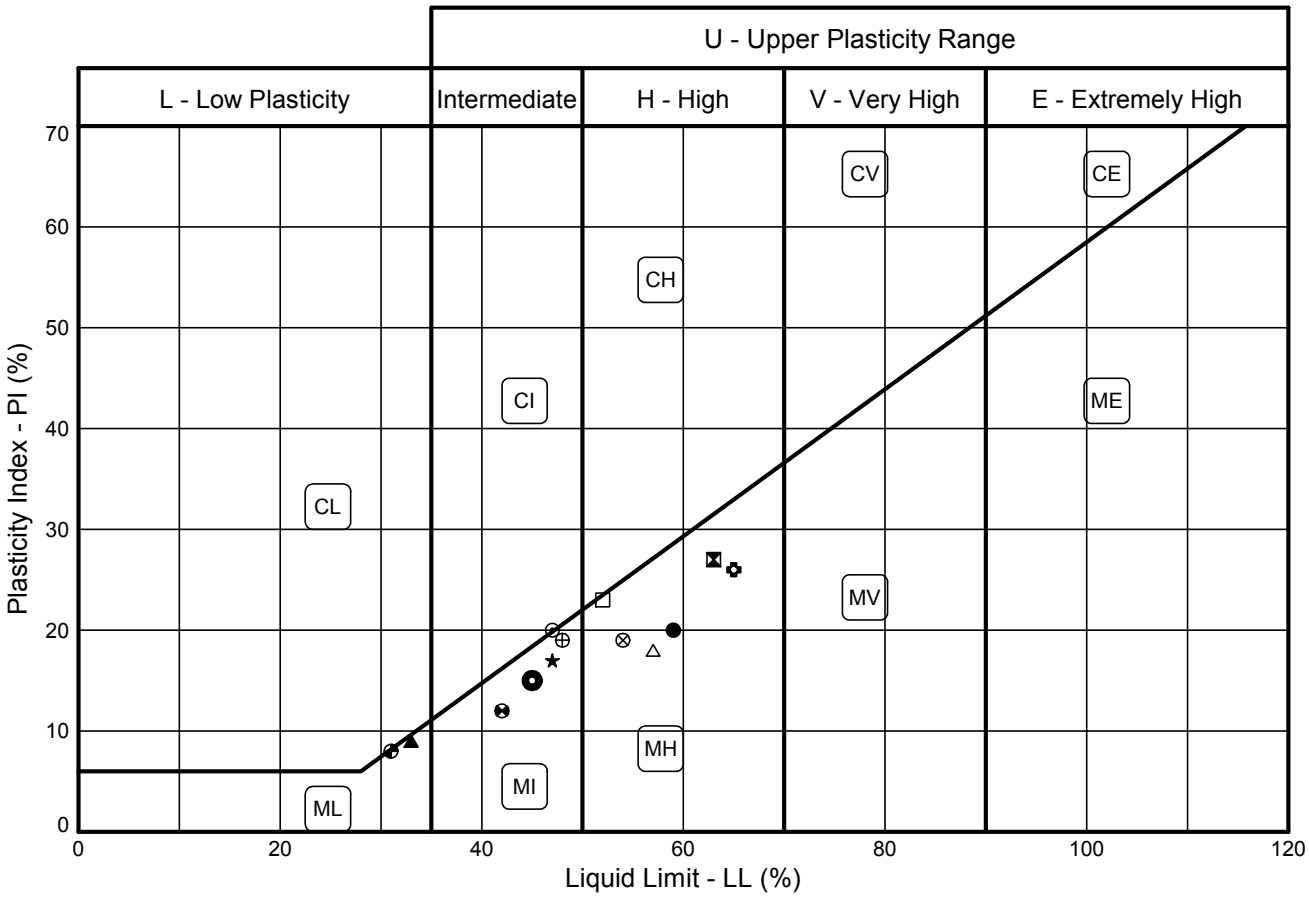
STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By	Date
[redacted] **ALAN FROST**	**03/02/17**

Contract:	Contract Ref:
White Post Lane, Banbury	**747038**

PLASTICITY CHART - PI Vs LL

In accordance with clause 42.3 of BS5930:1999
Testing in accordance with BS1377-2:1990



Sample Identification				BS Test Method #	Preparation Method +	MC	LL	PL	PI	<425um	Lab location
	Exploratory Position ID	Sample	Depth (m)			%	%	%	%	%	
●	TP01	D	0.30	3.2/4.4/5.3/5.4	4.2.4	35	59	39	20	70	B
⊠	TP03	D	1.20	3.2/4.4/5.3/5.4	4.2.3	42	63	36	27	82	B
▲	TP05	D	1.20	3.2/4.4/5.3/5.4	4.2.3	24	33	24	9	90	B
★	TP06	D	2.40	3.2/4.4/5.3/5.4	4.2.3	27	47	30	17	98	B
⊙	TP06	D	3.30	3.2/4.4/5.3/5.4	4.2.3	21	47	27	20	100	B
✿	TP07	B	1.10	3.2/4.4/5.3/5.4	4.2.4	46	65	39	26	60	B
◉	TP11	D	0.40	3.2/4.4/5.3/5.4	4.2.4	28	45	30	15	79	B
△	TP11	D	1.30	3.2/4.4/5.3/5.4	4.2.4	34	57	39	18	60	B
⊗	TP11	D	1.80	3.2/4.4/5.3/5.4	4.2.4	33	54	35	19	59	B
⊕	TP13	D	0.40	3.2/4.4/5.3/5.4	4.2.3	27	48	29	19	98	B
□	TP16	D	0.40	3.2/4.4/5.3/5.4	4.2.3	28	52	29	23	97	B
⊛	TP16	D	1.20	3.2/4.4/5.3/5.4	4.2.3	24	42	30	12	91	B
◍	TP16	D	2.10	3.2/4.4/5.3/5.4	4.2.3	21	31	23	8	97	B

Tested in accordance with the following clauses of BS1377-2:1990.

3.2 - Moisture Content
4.3 - Cone Penetrometer Method
4.4 - One Point Cone Penetrometer Method
4.6 - One Point Casagrande Method
5.3 - Plastic Limit Method
5.4 - Plasticity Index

+ Tested in accordance with the following clauses of BS1377-2:1990.

4.2.3 - Natural State
4.2.4 - Wet Sieved

Key: * = Non-standard test, NP = Non plastic.

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

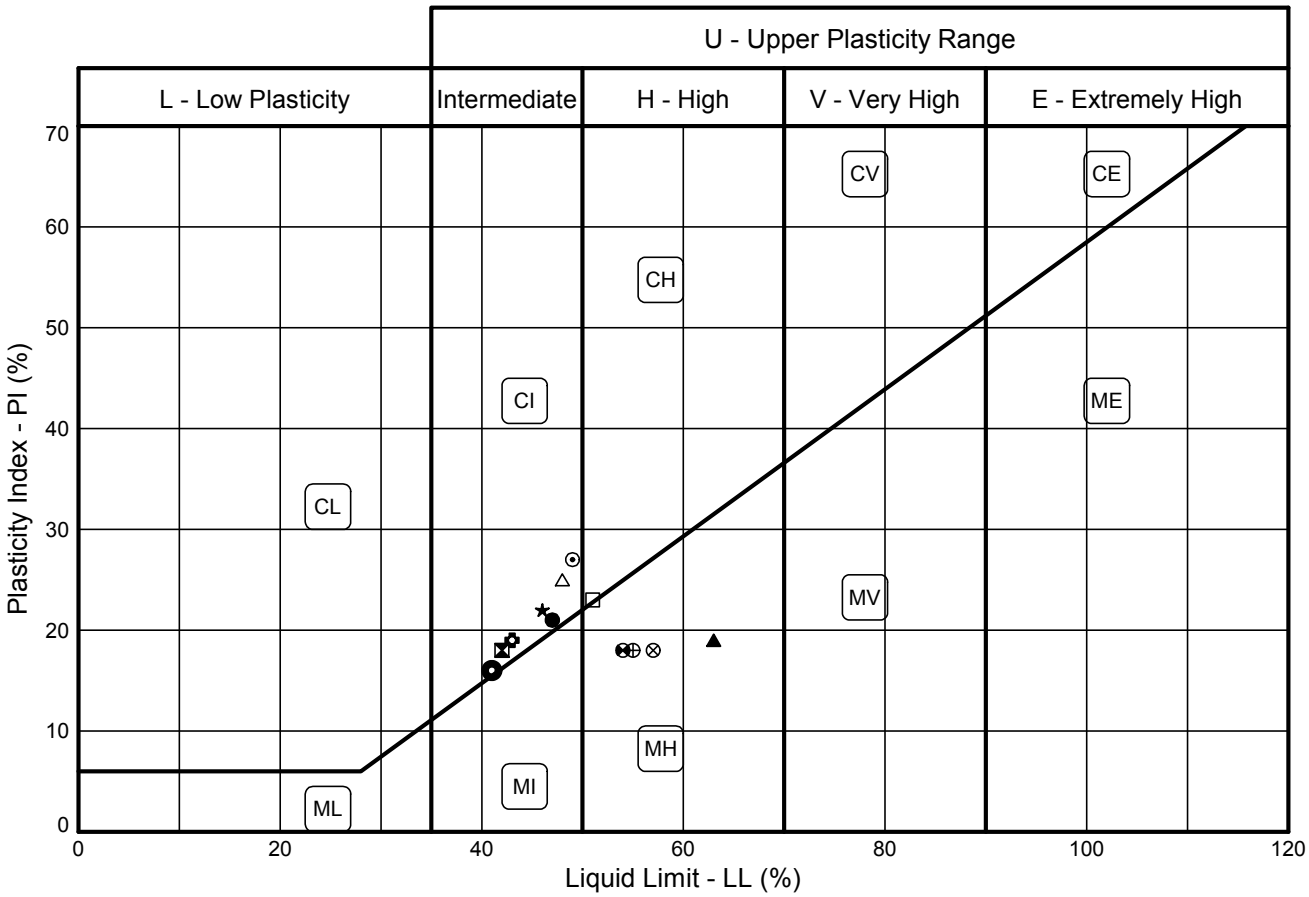
Compiled By		Date
[redacted]	ALAN FROST	24/01/17

Contract	Contract Ref:
White Post Lane, Banbury	**747038**

AGS

PLASTICITY CHART - PI Vs LL

In accordance with clause 42.3 of BS5930:1999
Testing in accordance with BS1377-2:1990



Sample Identification				BS Test Method #	Preparation Method +	MC	LL	PL	PI	<425um	Lab location	
	Exploratory Position ID	Sample	Depth (m)			%	%	%	%	%		
●	TP18	D	1.40	3.2/4.4/5.3/5.4	4.2.3	24	47	26	21	97	B	
⊠	TP18	D	2.40	3.2/4.4/5.3/5.4	4.2.3	23	42	24	18	97	B	
▲	TP19	D	0.80	3.2/4.4/5.3/5.4	4.2.4	48	63	44	19	72	B	
★	TP20	D	1.10	3.2/4.4/5.3/5.4	4.2.3	23	46	24	22	97	B	
⊙	TP25	D	1.20	3.2/4.4/5.3/5.4	4.2.3	22	49	22	27	99	B	
✿	TP29	D	0.70	3.2/4.4/5.3/5.4	4.2.3	23	43	24	19	98	B	
◉	TP29	D	2.80	3.2/4.4/5.3/5.4	4.2.3	23	41	25	16	93	B	
△	TP29	D	3.60	3.2/4.4/5.3/5.4	4.2.3	21	48	23	25	100	B	
⊗	TP30	B	0.70	3.2/4.4/5.3/5.4	4.2.4	29	57	39	18	50	B	
⊕	WS01	D	0.40	3.2/4.4/5.3/5.4	4.2.4	34	55	37	18	59	B	
□	WS03	D	0.70	3.2/4.4/5.3/5.4	4.2.3	27	51	28	23	95	B	
⊛	WS08	D	0.60	3.2/4.4/5.3/5.4	4.2.4	31	54	36	18	64	B	

Tested in accordance with the following clauses of BS1377-2:1990.

3.2 - Moisture Content
4.3 - Cone Penetrometer Method
4.4 - One Point Cone Penetrometer Method
4.6 - One Point Casagrande Method
5.3 - Plastic Limit Method
5.4 - Plasticity Index

+ Tested in accordance with the following clauses of BS1377-2:1990.

4.2.3 - Natural State
4.2.4 - Wet Sieved

Key: * = Non-standard test, NP = Non plastic.

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By		Date
[redacted]	ALAN FROST	24/01/17

Contract	Contract Ref:
White Post Lane, Banbury	**747038**

AGS

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
TP01		D	0.30	35	59	39	20	70	Brown slightly sandy slightly gravelly SILT
TP03		D	1.20	42	63	36	27	82	Brown slightly sandy slightly gravelly SILT
TP05		D	1.20	24	33	24	9	90	Brown slightly sandy slightly gravelly clayey SILT
TP05		B	1.40	20					Brown mottled grey clayey SILT
TP06		D	2.40	27	47	30	17	98	Brown slightly gravelly clayey SILT
TP06		D	3.30	21	47	27	20	100	Grey silty CLAY
TP07		B	1.10	46	65	39	26	60	Brown slightly sandy gravelly SILT
TP08		D	0.95	23					Brown slightly gravelly silty CLAY

STRUCTURAL SOILS LTD

Contract:

White Post Lane, Banbury

Contract Ref:

747038

AGS

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
TP08		D	2.00	21					Brown silty CLAY
TP09		D	1.00	23					Grey mottled brown slightly gravelly silty CLAY
TP11		D	0.40	28	45	30	15	79	Brown slightly sandy slightly gravelly SILT
TP11		D	0.90	38					Brown slightly sandy slightly gravelly SILT
TP11		D	1.30	34	57	39	18	60	Brown slightly sandy gravelly SILT
TP11		D	1.80	33	54	35	19	59	Brown slightly sandy gravelly SILT
TP12		D	2.80	23					Brown slightly gravelly silty CLAY
TP13		D	0.40	27	48	29	19	98	Reddish brown slightly gravelly clayey SILT

STRUCTURAL SOILS LTD

Contract:

White Post Lane, Banbury

Contract Ref:

747038

AGS

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
TP16		D	0.40	28	52	29	23	97	Brown slightly gravelly clayey SILT
TP16		D	1.20	24	42	30	12	91	Grey mottled brown slightly gravelly SILT
TP16		D	2.10	21	31	23	8	97	Brown slightly gravelly silty CLAY
TP18		D	1.40	24	47	26	21	97	Brown slightly gravelly silty CLAY
TP18		D	2.40	23	42	24	18	97	Brown slightly gravelly silty CLAY
TP19		D	0.80	48	63	44	19	72	Brown slightly sandy slightly gravelly SILT
TP20		D	1.10	23	46	24	22	97	Brown mottled grey slightly gravelly silty CLAY
TP21		D	1.10	19					Brown slightly gravelly silty CLAY

STRUCTURAL SOILS LTD

Contract:

White Post Lane, Banbury

Contract Ref:

747038

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SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
TP21		DSPT	2.00	23					Brown slightly gravelly silty CLAY
TP21		D	3.10	42					Grey mottled brown slightly gravelly SILT
TP25		D	1.20	22	49	22	27	99	Brown mottled grey slightly gravelly CLAY
TP26		B	0.40	22					Brown slightly sandy slightly gravelly SILT
TP26		D	0.50	31					Brown slightly gravelly SILT
TP26		B	1.50	24					Brown slightly gravelly SILT
TP28		D	0.80	29					Brown slightly gravelly SILT
TP29		D	0.70	23	43	24	19	98	Brown slightly gravelly silty CLAY

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
TP29		D	2.80	23	41	25	16	93	Brown mottled grey slightly gravelly silty CLAY
TP29		D	3.60	21	48	23	25	100	Grey mottled brown CLAY
TP30		B	0.70	29	57	39	18	50	Brown slightly sandy gravelly SILT
WS01		D	0.40	34	55	37	18	59	Brown slightly sandy gravelly SILT
WS02		D	1.20	23					Grey mottled brown CLAY
WS02		D	1.60	22					Grey mottled brown CLAY
WS02		DSPT	2.00	21					Brown mottld grey slilghtly gravelly SILT
WS02		D	2.85	34					Brown mottled grey slightly sandy slightly gravelly SILT

STRUCTURAL SOILS LTD

Contract:

White Post Lane, Banbury

Contract Ref:

747038

AGS

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
WS03		D	0.70	27	51	28	23	95	Brown slightly gravelly silty CLAY
WS03		DSPT	1.20	21					Brown slightly gravelly silty CLAY
WS04		D	0.40	35					Brown slightly sandy slightly gravelly SILT
WS04		D	1.25	25					Brown slightly sandy slightly gravelly SILT
WS05		DSPT	2.00	23					Yellowish brown SILT
WS06		D	1.70	22					Grey mottled brown slightly gravelly SILT
WS07		B	0.20	29					Brown slightly sandy slightly gravelly SILT
WS07		B	1.20	25					Brown slightly sandy slightly gravelly SILT

STRUCTURAL SOILS LTD

Contract:

White Post Lane, Banbury

Contract Ref:

747038

AGS

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
WS08		D	0.60	31	54	36	18	64	Brown slightly sandy slightly gravelly SILT
WS08		D	1.50	27					Brown slightly sandy slightly gravelly SILT
WS10		B	0.40	36					Brown slightly gravelly SILT
WS12		D	1.70	34					Orangish brown slightly sandy gravelly SILT

STRUCTURAL SOILS LTD

Contract:

White Post Lane, Banbury

Contract Ref:

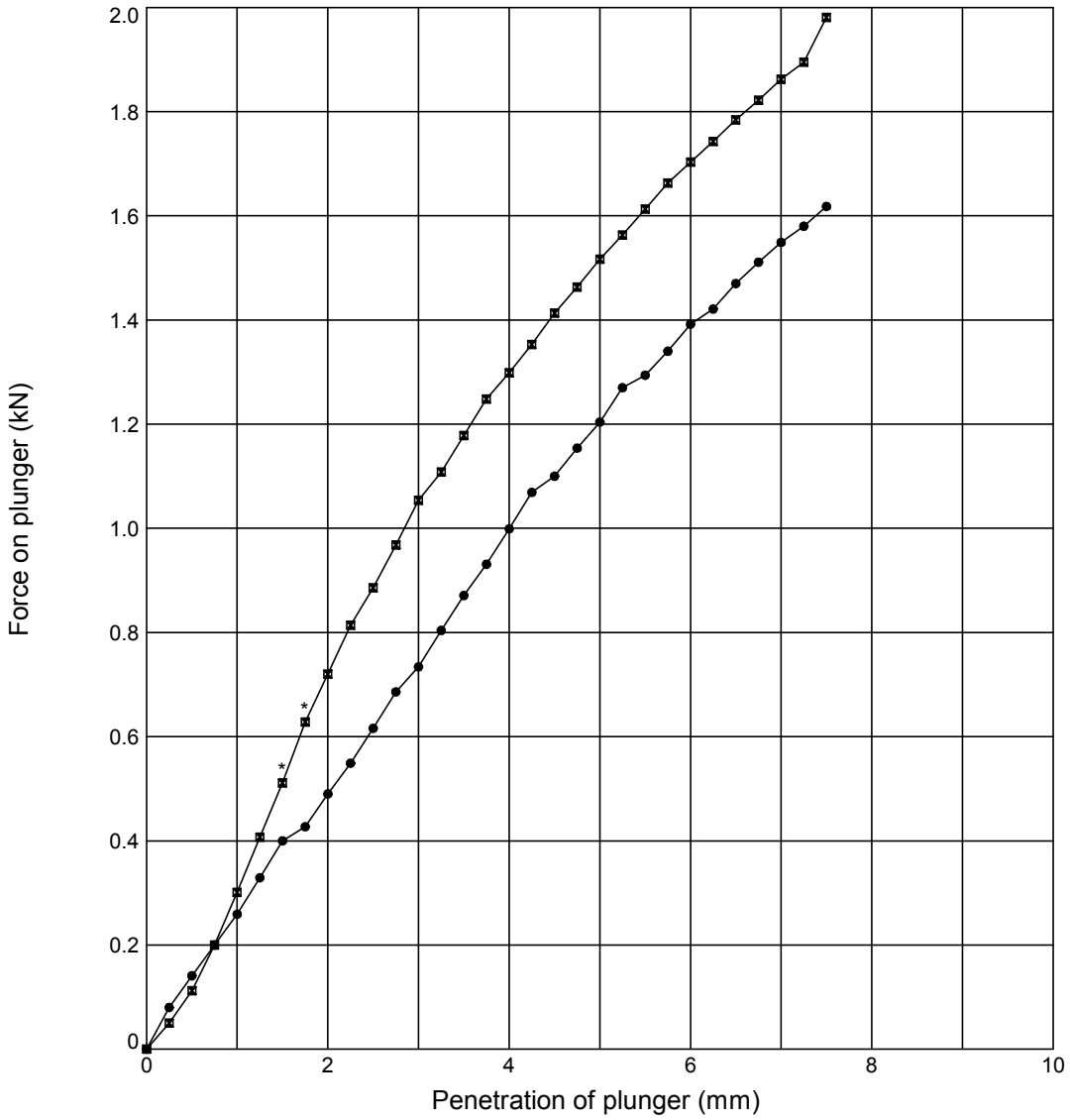
747038

AGS

LABORATORY CALIFORNIA BEARING RATIO TEST

In accordance with clause 7 of BS1377:Part 4:1990

Trial Pit: **TP03** Sample Ref: **-** Sample Type: **LB** Depth (m): **0.30**



Initial Sample Conditions			Test Details			Test Results	Top	Base
Initial Moisture Content (%)	:	**29**	Compaction Type	:	**2.5 kg Dynamic**	Moisture Content (%)	**28**	**29**
Initial Bulk Density (Mg/m^3)	:	**2.05**	Surcharge (kg)	:	**4.0**	CBR value (%)	**6.0**	**8.0**
Initial Dry Density (Mg/m^3)	:	**1.59**	Soaking Time (hrs)	:	**-**	Remarks: **None**		
% retained on 20mm sieve	:	**17**	Swelling (mm)	:	**-**			

Sample Description	Key
Brown slightly sandy slightly gravelly SILT	● **Top** ⊠ **Base**

Origin correction:

CBR calculations from new origin due to shape of the curve. X-axis corrected origin(s): Top dataset ● = 0mm. Base dataset ⊠ = 0.41mm. * denotes the data point has been used in generation of the line of best fit to determine origin intercept with the x-axis.

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By	Date
[redacted] **ALAN FROST**	**24/01/17**

Contract	Contract Ref:
White Post Lane, Banbury	**747038**

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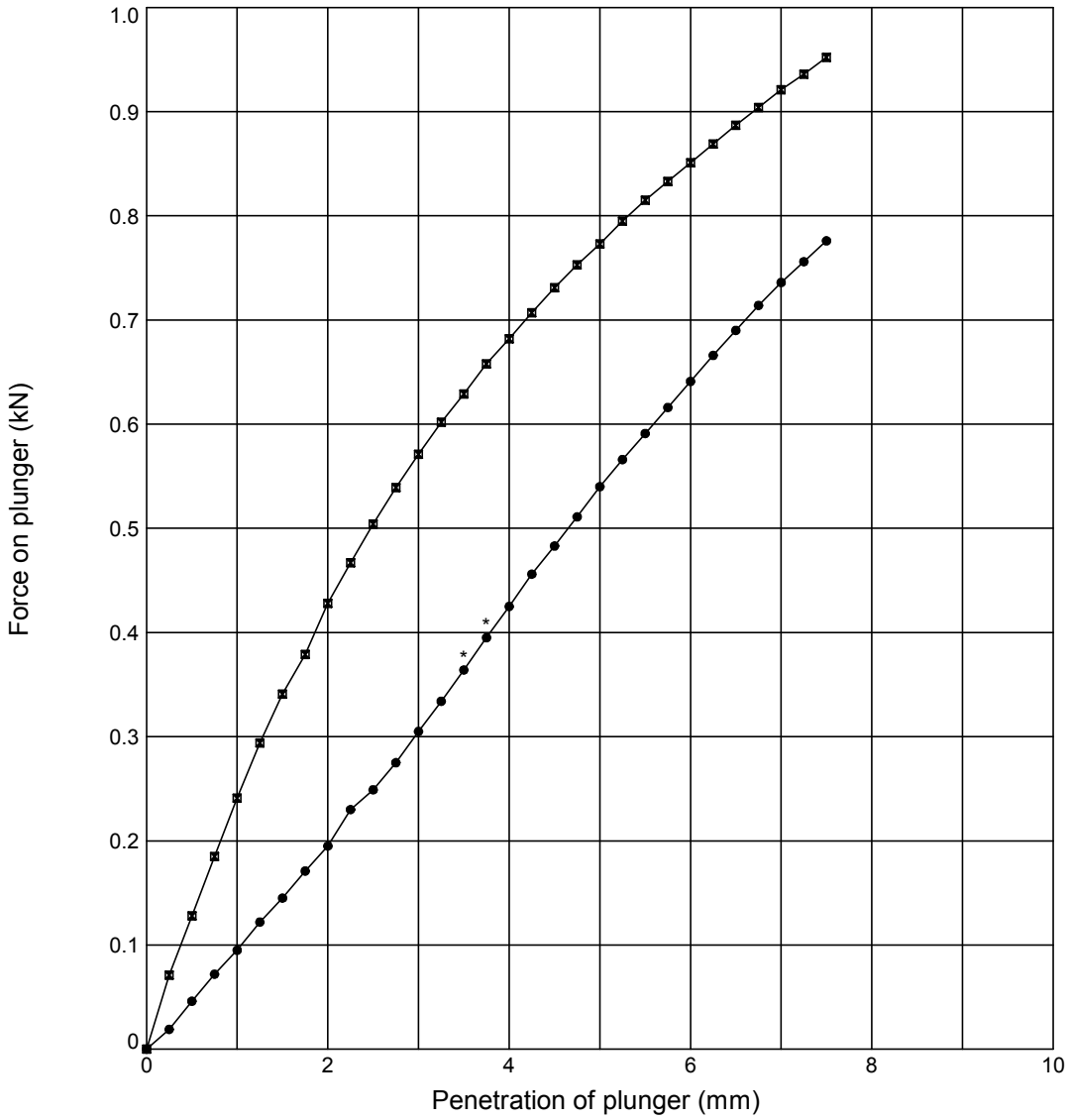
LABORATORY CALIFORNIA BEARING RATIO TEST

In accordance with clause 7 of BS1377:Part 4:1990

Trial Pit: **TP09** Sample Ref: **-** Sample Type: **LB** Depth (m): **0.40**



Initial Sample Conditions			Test Details			Test Results	Top	Base
Initial Moisture Content (%)	:	**42**	Compaction Type	:	**2.5 kg Dynamic**	Moisture Content (%)	**42**	**42**
Initial Bulk Density (Mg/m^3)	:	**1.82**	Surcharge (kg)	:	**4.7**	CBR value (%)	**3.0**	**3.9**
Initial Dry Density (Mg/m^3)	:	**1.28**	Soaking Time (hrs)	:	**-**	Remarks: **None**		
% retained on 20mm sieve	:	**7**	Swelling (mm)	:	**-**			

Sample Description	Key
Brown slightly sandy slightly gravelly SILT	● **Top** ⊠ **Base**

Origin correction:

CBR calculations from new origin due to shape of the curve. X-axis corrected origin(s): Top dataset ● = 0.56mm. Base dataset ⊠ = 0mm. * denotes the data point has been used in generation of the line of best fit to determine origin intercept with the x-axis.

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Compiled By	Date
[redacted] ALAN FROST	24/01/17

Contract	Contract Ref:
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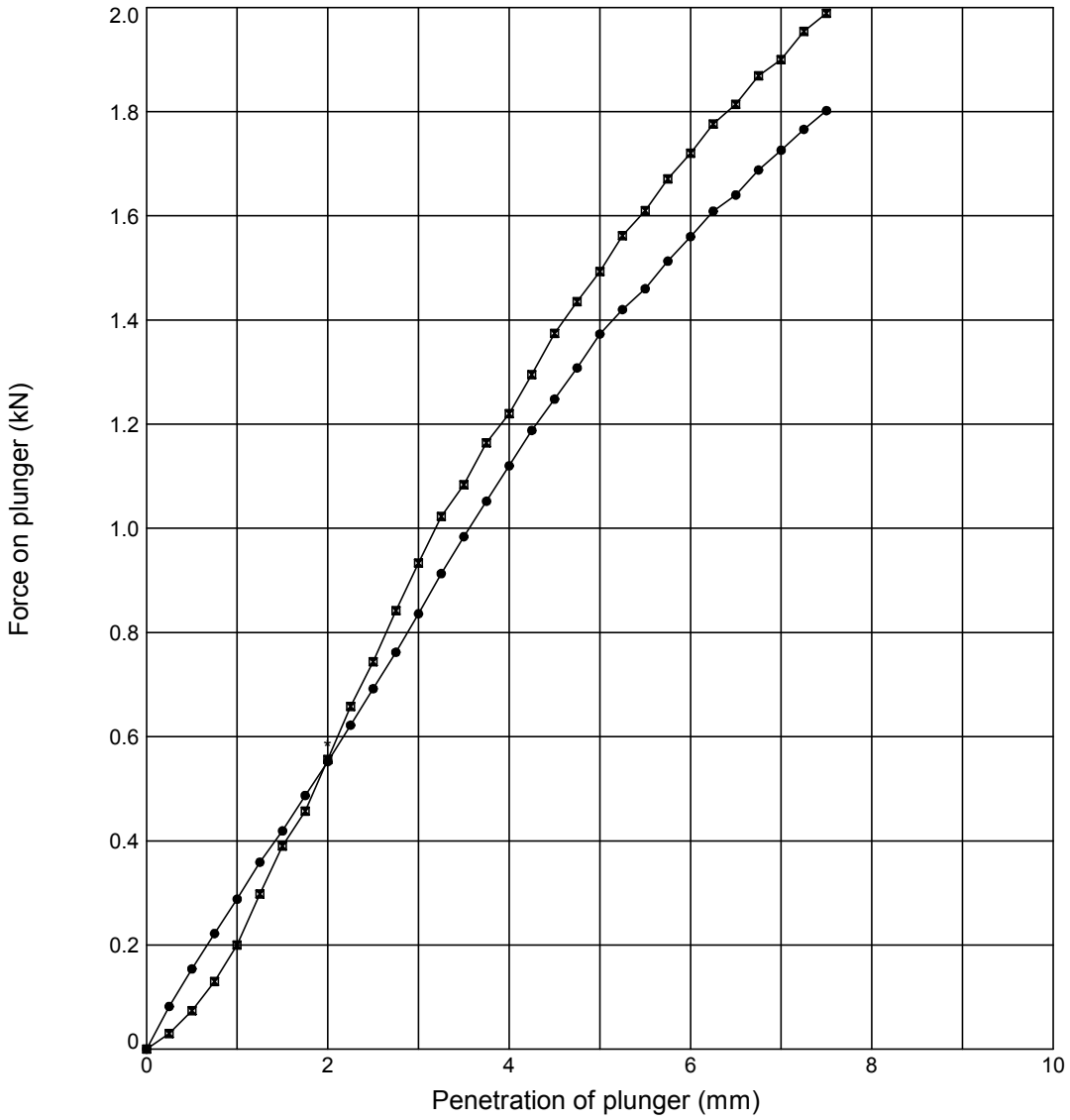
LABORATORY CALIFORNIA BEARING RATIO TEST

In accordance with clause 7 of BS1377:Part 4:1990

Trial Pit: **TP13** Sample Ref: **-** Sample Type: **LB** Depth (m): **0.30**



Initial Sample Conditions			Test Details			Test Results	Top	Base
Initial Moisture Content (%)	:	**26**	Compaction Type	:	**2.5 kg Dynamic**	Moisture Content (%)	**26**	**26**
Initial Bulk Density (Mg/m^3)	:	**1.99**	Surcharge (kg)	:	**4.0**	CBR value (%)	**6.9**	**8.2**
Initial Dry Density (Mg/m^3)	:	**1.58**	Soaking Time (hrs)	:	**-**	Remarks: **None**		
% retained on 20mm sieve	:	**0**	Swelling (mm)	:	**-**			

Sample Description	Key
Brown slightly sandy SILT	● **Top** ⊠ **Base**

Origin correction:

CBR calculations from new origin due to shape of the curve. X-axis corrected origin(s): Top dataset ● = 0mm. Base dataset ⊠ = 0.6mm. * denotes the data point has been used in generation of the line of best fit to determine origin intercept with the x-axis.

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APPENDIX G
HUMAN HEALTH GENERIC ASSESSMENT CRITERIA

Generic assessment criteria for human health: residential scenario with home-grown produce

Background

RSK's generic assessment criteria (GAC) were initially prepared following the publication by the Environment Agency (EA) of soil guideline value (SGV) and toxicological (TOX) reports, and associated publications in 2009[1]. RSK GAC were updated following the publication of GAC by LQM/CIEH in 2009[2]. RSK GAC are periodically revised when updated information on toxicological, land use or receptor parameters is published.

Updates to the RSK GAC

In 2014, the publication of Category 4 Screening Levels (C4SL)[3,4], as part of the Defra-funded research project SP1010, included modifications to certain exposure assumptions documented within EA Science Report SC050221/SR3 (herein after referred to as SR3)[5] used in the generation of SGVs.

C4SL were published for six substances (cadmium, arsenic, benzene, benzo(a)pyrene, chromium VI and lead) for a sandy loam soil type with 6% soil organic matter, based on a low level of toxicological concern (LLTC; see Section 2.3 of research project report SP1010[3]). Where a C4SL has been published, the RSK GAC duplicates the C4SL published values using all input parameters within the SP1010 final project report[3] and associated appendices[6], and adopts them as GAC for these six substances.

For all other substances the C4SL exposure modifications, with the exception of the "top two" produce type approach taken in the C4SL, have been applied to the current RSK GAC. These include alterations to daily inhalation rates for residential and commercial scenarios, reducing soil adherence factors in children (age classes 1 to 12 only) for residential land use, reducing exposure frequency for dermal contact outdoors for residential land use, and updated produce type consumption rates (90th percentile) based on recent data from the National Diet and Nutrition Survey.

The RSK GAC have also been revised with updated toxicology published by LQM/CIEH in 2015[7] or by the USEPA[14], where a C4SL has not been published.

RSK GAC derivation for metals and organic compounds

Model selection

Soil assessment criteria (SAC) were calculated using the Contaminated Land Exposure Assessment (CLEA) tool v1.071, supporting EA guidance[5,8,9] and revised exposure scenarios published for the C4SL[3]. Groundwater assessment criteria (GrAC) protective of human health via the inhalation pathway were derived using the RBCA 2.51 model with the Johnson and Ettinger model for soil and groundwater volatilisation. RSK has updated the inputs within RBCA to reflect EA guidance[1,5,8,9]. The SAC and GrAC collectively are termed GAC.

Conceptual model

In accordance with SR3[5], the residential with home-grown produce scenario considers risks to a female child between the ages of 0 and 6 years old as the highest risk scenario. In accordance

with Box 3.1 of SR3[5], the pathways considered for production of the SAC in the residential with home-grown produce scenario are

- direct soil and dust ingestion
- consumption of home-grown produce
- consumption of soil attached to home-grown produce
- dermal contact with soil and indoor dust
- inhalation of indoor and outdoor dust and vapours.

Figure 1 is a conceptual model illustrating these linkages.

In line with guidance in the EA SGV report for cadmium[1], the RSK GAC for cadmium has been derived based on estimates representative of lifetime exposure. Although young children are generally more likely to have higher exposures to soil contaminants, the renal toxicity of cadmium, and the derivation of the TDI_{oral} and TDI_{inh}, are based on considerations of the kidney burden accumulated over 50 years or so. It is therefore reasonable to consider exposure not just in childhood but averaged over a longer period.

The pathway considered in production of the GrAC is the volatilisation of compounds from groundwater and subsequent vapour inhalation by residents while indoors. Figure 2 illustrates this linkage. Although the outdoor air inhalation pathway is also valid, this contributes little to the overall risks owing to the dilution in outdoor air. Within RBCA, the solubility limit of the chemical restricts the extent of volatilisation, which in turn drives the indoor air inhalation pathway. While the same restriction is not built into the CLEA model, the CLEA model output cells are flagged red where the soil saturation limit has been exceeded.

With respect to volatilisation, the CLEA model assumes a simple linear partitioning of a chemical in the soil between the sorbed, dissolved and vapour phase[9]. The upper boundaries of this partitioning are represented by the maximum aqueous solubility and pure saturated vapour concentration of the chemical. The CLEA model estimates saturated soil concentrations where these limits are reached[9]. The CLEA software uses a traffic light system to identify when individual and/or combined assessment criteria exceed the lower of either the aqueous- or vapour-based soil saturation limits. Model output cells are flagged red where the saturated soil concentration has been exceeded and the contribution of the indoor and outdoor vapour pathway to total exposure is greater than 10%. In this case, further consideration of the following is required[9]:

- Free phase contamination may be present.
- Exposure from the vapour pathways will be over-predicted by the model, as in reality the vapour phase concentration will not increase at concentrations above saturation limits
- Where the vapour pathway contribution is greater than 90%, it is unlikely the relevant health criteria value (HCV) will be exceeded at soil concentrations at least a factor of ten higher than the relevant HCV.

Where the vapour pathway is the predominant pathway (contributes greater than 90% of exposure) or the only exposure route considered and the cell is highlighted red (SAC exceeds saturation limit), the risk based on the assumed conceptual model is likely to be negligible as the vapour risk is assumed to be tolerable at maximum possible soil concentrations. In such circumstances, the vapour pathway exposure should be considered based on the presence of free phase or non-aqueous phase liquid sources and the measured concentrations of volatile organic compounds (VOC) in the vapour phase. Screening could be considered based on setting

the SAC as the modelled soil saturation limits. However, as stated within the CLEA handbook[9], this is likely to not be practical in many cases because of the very low saturation limits and, in any case, is highly conservative.

It should also be noted that for mixtures of compounds, free phase may be present where soil (or groundwater) concentrations are well below saturation limits for individual compounds.

Where the vapour pathway is only one of the exposure pathways considered, an additional approach can then be utilised as detailed within Section 4.12 of the CLEA model handbook[9], which explains how to calculate an effective assessment criterion manually.

SR3[5] states that, as a general rule of thumb, it is recognised that estimating vapour phase concentrations from dissolved and sorbed phase contamination by petroleum hydrocarbons are at least a factor of ten higher than those likely to be measured on-site. RSK has therefore applied an empirical subsurface to indoor air correction factor of 10 into the CLEA model chemical database and to outputs from the RBCA model for all petroleum hydrocarbon fractions (including BTEX, trimethylbenzenes and the polycyclic aromatic hydrocarbons (PAH) naphthalene, acenaphthene and acenaphthylene) to reduce this conservatism.

Input selection

The most up-to-date published chemical and toxicological data was obtained from EA Report SC050021/SR7[10], the EA TOX[1] reports, the C4SL SP1010 project report and associated appendices[3,6], the 2015 LQM/CIEH report[7] or the USEPA IRIS database[14]. Where a C4SL has been published, the RSK GAC have duplicated the C4SL published values using all input parameters within the SP1010 final project report[3] and associated appendices[6], and has adopted them as GAC for these six substances. Toxicological and specific chemical parameters for aromatic hydrocarbon C_8–C_9 (styrene), 1,2,4-trimethylbenzene and methyl tertiary-butyl ether (MTBE) were obtained from the CL:AIRE Soil Generic Assessment Criteria report[11].

For TPH, aromatic hydrocarbons C_5–C_8 were not modelled, as this range comprises benzene and toluene, which are modelled separately. The aromatic C_8–C_9 hydrocarbon fraction comprises ethylbenzene, xylene and styrene. As ethylbenzene and xylene are being modelled separately, the physical, chemical and toxicological data for aromatic C_8–C_9 have been taken from styrene.

For the GrAC, the HCV used in the modelling were derived using the toxicological data for the SAC amended as follows:

- A child weighing 13.3kg (average of 0-6 year old female in accordance with Table 4.6 of SR3[5]) and breathing 8.77m^3 (average daily inhalation rate for a 0-6yr old female in accordance with SP1010 final project report for the C4SL (Table 3.2[3]) and USEPA data(14)
- Background inhalation (mean daily intake (MDI)) for a child (Age Classes 1-6)
- Residential amendments to the MDI for younger age groups following Table 3.4 and Section 3.4.1 of SR2[8],; amended to reflect average daily inhalation rates in accordance with SP1010 final project report for the C4SL (Table 3.2[3]) and USEPA data[12].

Physical parameters

For the residential with home-grown produce scenario, the CLEA default building is a small, two-storey terrace house with a concrete ground-bearing slab. The house is assumed to have a 100m^2 private garden consisting of lawn and flowerbeds, incorporating a 20m^2 plot for growing fruit and vegetables consumed by the residents. SR3[5] notes this residential building type to be

the most conservative in terms of potential for vapour intrusion. The building parameters used in the production of the RSK GACs are the default CLEA v1.06 inputs presented in Table 3.3 of SR3[3], with a dust loading factor detailed in Section 9.3 of SR3[5]. The parameters for a sandy loam soil type were used in line with Table 4.4 of SR3[5]. This includes a value of 6% for the percentage of soil organic matter (SOM) within the soil. In RSK's experience, this is rather high for many sites. To avoid undertaking site-specific risk assessments for SOM, RSK has produced an additional set of GAC for SOM of 1% and 2.5% for all substances using the CLEA tool.

For the GrAC, the depth to groundwater was taken as 2.5m based on RSK's experience of assessing the volatilisation pathway from groundwater. The GrAC were produced using the input parameters in Table 4.

Summary of modifications to the default CLEA SR3[5] input parameters for residential with home-grown produce land-use scenario

In summary, the RSK GAC were produced using the default input parameters for soil properties, the air dispersion model, building properties and the vapour model detailed in SR3[5]. Modifications to the default SR3[5] exposure scenarios based on the C4SL exposure scenarios[3] are presented in Tables 2 and 3 below.

The final selected GAC are presented by pathway in Table 5 and the combined GAC in Table 6.

Figure 1: Conceptual model for residential scenario with home-grown produce

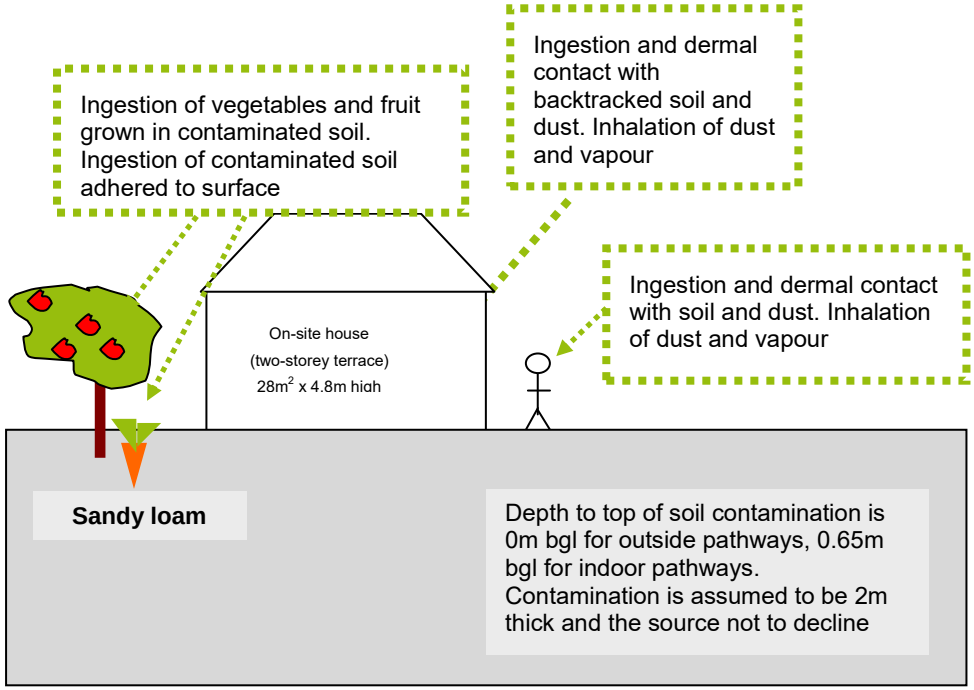

Table 1: Exposure assessment parameters for residential scenario with home-grown produce – inputs for CLEA model

Parameter	Value	Justification
Land use	Residential with homegrown produce	Chosen land use
Receptor	Female child age 1 to 6	Key generic assumption given in Box 3.1, SR3[5]
Building	Small terraced house	Key generic assumption given in Box 3.1, SR3. Small, two-storey terraced house chosen, as it is the most conservative residential building type in terms of protection from vapor intrusion (Section 3.4.6, SR3)[5]
Soil type	Sandy Loam	Most common UK soil type (Section 4.3.1, from Table 3.1, SR3)[5]
Start AC (age class)	1	Range of age classes corresponding to key generic assumption that the critical receptor is a young female child aged 0–6. From Box 3.1, SR3[5]
End AC (age class)	6	
SOM (%)	6	Representative of sandy loamy soil according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents'[13]
	1	To provide SAC for sites where SOM <6% as often observed by RSK
	2.5	
pH	7	Model default

Table 2: Residential with home-grown produce – modified home-grown produce data

Name	Consumption rate 90th percentile (g FW kg^{-1} BW day^{-1}) by age class						Dry weight conversion factor (g DW g^{-1} FW)	Home-grown fraction (average)	Home-grown fraction (high end)	Soil loading factor (g g^{-1} DW)	Preparation correction factor
	1	2	3	4	5	6					
Green vegetables	7.12	5.87	5.87	5.87	4.53	4.53	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	10.7	2.83	2.83	2.83	2.14	2.14	0.103	0.06	0.4	1.00E-03	1.00E+00
Tuber vegetables	16	6.6	6.6	6.6	4.95	4.95	0.21	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	1.83	3.39	3.39	3.39	2.24	2.24	0.058	0.06	0.4	1.00E-03	6.00E-01
Shrub fruit	2.23	0.46	0.46	0.46	0.19	0.19	0.166	0.09	0.6	1.00E-03	6.00E-01
Tree fruit	3.82	10.3	10.3	10.3	5.16	5.16	0.157	0.04	0.27	1.00E-03	6.00E-01
Justification	Table 3.4, SP1010 [3]						Table 6.3, SR3[5]	Table 4.19, SR3[5]		Table 6.3, SR3[5]	

Table 3: Residential with home-grown produce – modified and use and receptor data

Parameter	Unit	Age class					
		1	2	3	4	5	6
EF (soil and dust ingestion)	day yr^{-1}	180	365	365	365	365	365
EF (consumption of home-grown produce)	day yr^{-1}	180	365	365	365	365	365
EF (skin contact, indoor)	day yr^{-1}	180	365	365	365	365	365
EF (skin contact, outdoor)	day yr^{-1}	170	170	170	170	170	170
EF (inhalation of dust and vapour, indoor)	day yr^{-1}	365	365	365	365	365	365
EF (inhalation of dust and vapour, outdoor)	day yr^{-1}	365	365	365	365	365	365
Justification		Table 3.5, SP1010[3]; Table 3.1, SR3[5]					
Soil to skin adherence factor (outdoor)	mg cm^{-2} day^{-1}	0.1	0.1	0.1	0.1	0.1	0.1
Justification		Table 3.5, SP1010[3]					
Inhalation rate	m^3 day^{-1}	5.4	8.0	8.9/f	10.1	10.1	10.1
Justification		Mean value USEPA, 2011[12]; Table 3.2, SP1010[3]					
Notes: For **cadmium**, the exposure assessment for a residential land use is based on estimates representative of lifetime exposure AC1-18. This is because the TDI_{oral} and TDI_{inh} are based on considerations of the kidney burden accumulated over 50 years. It is therefore reasonable to consider exposure not just in childhood but averaged over a longer period. See the Environment Agency Science Report SC05002/ TOX 3[1], Science Report SC050021/Cadmium SGV[1] and the project report SP1010[3] for more information.							

Figure 2: GrAC conceptual model for RBCA residential with home-grown produce scenario

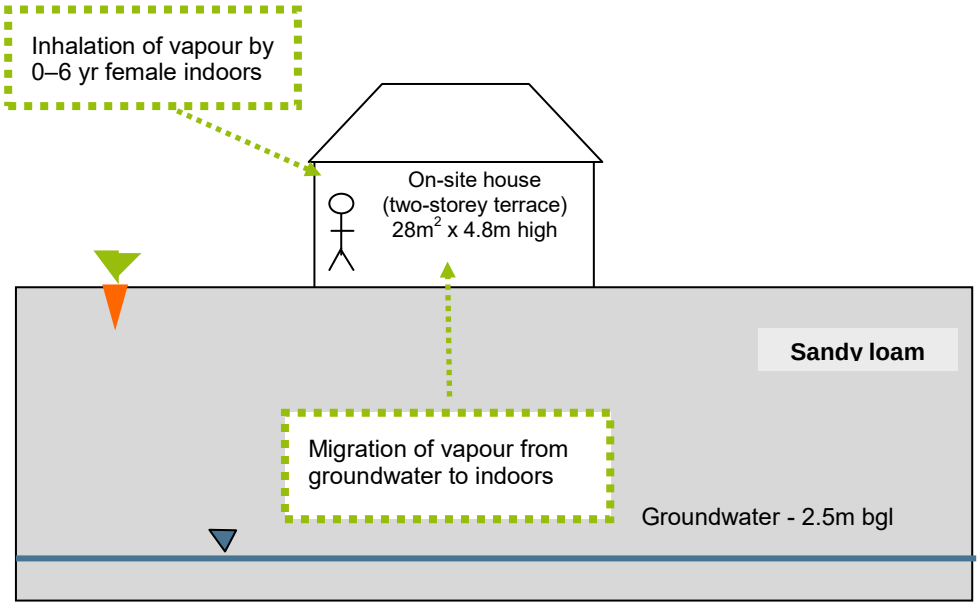

Table 4: Residential with home-grown produce – RBCA inputs

Parameter	Unit	Value	Justification
Receptor			
Averaging time	Years	6	From Box 3.1, SR3[5]
Receptor weight	kg	13.3	Average of CLEA 0–6 year old female data, Table 4.6, SR3[5]
Exposure duration	Years	6	From Box 3.1, report, SR3[5]
Exposure frequency	Days/yr	350	Weighted using occupancy period of 23 hours per day for 365 days of the year
Soil type – sandy loam			
Total porosity	-	0.53	CLEA value for sandy loam. Parameters for sandy loam from Table 4.4, SR3[5]
Volumetric water content	-	0.33	
Volumetric air content	-	0.20	
Dry bulk density	g cm^{-3} or kg/L	1.21	
Vertical hydraulic conductivity	cm s^{-1}	3.56E-3	CLEA value for saturated conductivity of sandy loam, Table 4.4, SR3[5] equivalent to 307 cm/day
Vapour permeability	m^2	3.05E-12	Calculated for sandy loam using equations in Appendix 1, SR3[5]
Capillary zone thickness	m	0.1	Professional judgement
Fraction organic carbon	%	0.0348	Representative of sandy loam according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents'[13]
Building			
Building volume/area ratio	m	4.8	Table 3.3, SR3[5]
Foundation area	m^2	28	
Foundation perimeter	m	22	Calculated assuming building measures 7m x 4m to give 28m^2 foundation area
Building air exchange rate	d^{-1}	12	Table 3.3, SR3[5] Building air exchange rate equivalent to 1.4E-04 s^{-1}
Depth to bottom of foundation slab	m	0.15	
Foundation thickness	m	0.15	
Foundation crack fraction	-	0.0151	Calculated from floor crack area of 423 cm^2 and building footprint of 28m^2 in Table 4.21, SR3[5]
Volumetric water content of cracks	-	0.33	Assumed equal to underlying soil type in assumption that cracks become filled with soil over time. Parameters for sandy loam from Table 4.4, SR3[5]
Volumetric air content of cracks	-	0.2	
Indoor/outdoor differential pressure	Pa	3.1	From Table 3.3, SR3[5 Equivalent to 31 g/cm/s^2

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14. USEPA (2010). Hydrogen cyanide and cyanide salts. Integrated Risk Information Systems (IRIS) Chemical Assessment Summary. September 2010. https://www.epa.gov/iris (accessed 9 December 2015)

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH HOME-GROWN PRODUCE

Table 5

Human Health Generic Assessment Criteria by Pathway for Residential With Home-Grown Produce Scenario

Compound	Notes	GrAC (µg/l)	SAC Appropriate to Pathway SOM 1% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 2.5% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 6% (mg/kg)			Soil Saturation Limit (mg/kg)
			Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Metals														
Arsenic	(a,b)	-	3.71E+01	5.26E+02	NR	NR	3.71E+01	5.26E+02	NR	NR	3.71E+01	5.26E+02	NR	NR
Cadmium	(a)	-	2.30E+01	4.88E+02	2.21E+01	NR	2.30E+01	4.88E+02	2.21E+01	NR	2.30E+01	4.88E+02	2.21E+01	NR
Chromium (III) - trivalent	(c)	-	1.84E+04	9.07E+02	NR	NR	1.84E+04	9.07E+02	NR	NR	1.84E+04	9.07E+02	NR	NR
Chromium (VI) - hexavalent	(a,d)	-	5.85E+01	2.06E+01	NR	NR	5.85E+01	2.06E+01	NR	NR	5.85E+01	2.06E+01	NR	NR
Copper		-	2.72E+03	1.41E+04	2.47E+03	NR	2.72E+03	1.41E+04	2.47E+03	NR	2.72E+03	1.41E+04	2.47E+03	NR
Lead	(a)	-	2.01E+02	NR	NR	NR	2.01E+02	NR	NR	NR	2.01E+02	NR	NR	NR
Elemental Mercury (Hg^0)	(d)	1.29E+01	NR	2.35E-01	NR	4.31E+00	NR	5.60E-01	NR	1.07E+01	NR	1.22E+00	NR	2.58E+01
Inorganic Mercury (Hg^{2+})		-	3.95E+01	3.63E+03	3.91E+01	NR	3.95E+01	3.63E+03	3.91E+01	NR	3.95E+01	3.63E+03	3.91E+01	NR
Methyl Mercury (Hg^{4+})		2.22E+04	1.26E+01	1.87E+01	7.52E+00	7.33E+01	1.26E+01	3.62E+01	9.34E+00	1.42E+02	1.26E+01	7.68E+01	1.08E+01	3.04E+02
Nickel	(d)	-	1.27E+02	1.81E+02	NR	NR	1.27E+02	1.81E+02	NR	NR	1.27E+02	1.81E+02	NR	NR
Selenium	(b)	-	2.58E+02	NR	NR	NR	2.58E+02	NR	NR	NR	2.58E+02	NR	NR	NR
Zinc	(b)	-	3.86E+03	3.63E+07	NR	NR	3.86E+03	3.63E+07	NR	NR	3.86E+03	3.63E+07	NR	NR
Cyanide (free)		-	1.37E+00	1.37E+04	1.37E+00	NR	1.37E+00	1.37E+04	1.37E+00	NR	1.37E+00	1.37E+04	1.37E+00	NR
Volatile Organic Compounds														
Benzene	(a)	2.30E+04	2.62E-01	9.01E-01	2.03E-01	1.22E+03	5.39E-01	1.68E+00	4.08E-01	2.26E+03	1.16E+00	3.48E+00	8.72E-01	4.71E+03
Toluene		5.90E+05	1.53E+02	9.08E+02	1.31E+02	8.69E+02	3.49E+02	2.00E+03	2.97E+02	1.92E+03	7.95E+02	4.55E+03	6.77E+02	4.36E+03
Ethylbenzene		1.25E+05	1.10E+02	8.34E+01	4.74E+01	5.18E+02	2.61E+02	1.96E+02	1.12E+02	1.22E+03	6.00E+02	4.58E+02	2.60E+02	2.84E+03
Xylene - m		1.16E+05	2.10E+02	8.25E+01	5.92E+01	6.25E+02	5.01E+02	1.95E+02	1.40E+02	1.47E+03	1.15E+03	4.56E+02	3.27E+02	3.46E+03
Xylene - o		1.41E+05	1.92E+02	8.87E+01	6.07E+01	4.78E+02	4.56E+02	2.08E+02	1.43E+02	1.12E+03	1.05E+03	4.86E+02	3.32E+02	2.62E+03
Xylene - p		1.21E+05	1.98E+02	7.93E+01	5.66E+01	5.76E+02	4.70E+02	1.86E+02	1.33E+02	1.35E+03	1.08E+03	4.36E+02	3.10E+02	3.17E+03
Total xylene		1.16E+05	1.92E+02	7.93E+01	5.66E+01	6.25E+02	4.56E+02	1.86E+02	1.33E+02	1.47E+03	1.05E+03	4.36E+02	3.10E+02	3.46E+03
Methyl tertiary-Butyl ether (MTBE)		9.32E+06	1.54E+02	1.04E+03	1.34E+02	2.04E+04	2.97E+02	1.69E+03	2.53E+02	3.31E+04	6.03E+02	3.21E+03	5.08E+02	6.27E+04
Trichloroethene		6.44E+01	2.83E-01	1.72E-02	1.62E-02	1.54E+03	6.26E-01	3.59E-02	3.40E-02	3.22E+03	1.41E+00	7.98E-02	7.55E-02	7.14E+03
Tetrachloroethene		4.08E+02	4.49E+00	1.79E-01	1.76E-01	4.24E+02	1.04E+01	4.02E-01	3.94E-01	9.51E+02	2.38E+01	9.21E-01	9.04E-01	2.18E+03
1,1,1-Trichloroethane		3.59E+04	3.33E+02	9.01E+00	8.77E+00	1.43E+03	7.26E+02	1.84E+01	1.80E+01	2.92E+03	1.62E+03	4.04E+01	3.94E+01	6.39E+03
1,1,1,2 Tetrachloroethane		2.84E+03	5.39E+00	1.54E+00	1.20E+00	2.60E+03	1.27E+01	3.56E+00	2.78E+00	6.02E+03	2.92E+01	8.29E+00	6.46E+00	1.40E+04
1,1,2,2-Tetrachloroethane		1.85E+04	2.81E+00	3.92E+00	1.64E+00	2.67E+03	6.10E+00	8.04E+00	3.47E+00	5.46E+03	1.36E+01	1.76E+01	7.67E+00	1.20E+04
Carbon Tetrachloride		6.10E+01	3.10E+00	2.58E-02	2.57E-02	1.52E+03	7.11E+00	5.65E-02	5.62E-02	3.32E+03	1.62E+01	1.28E-01	1.27E-01	7.54E+03
1,2-Dichloroethane		9.70E+01	3.17E-02	9.20E-03	7.13E-03	3.41E+03	5.73E-02	1.33E-02	1.08E-02	4.91E+03	1.09E-01	2.28E-02	1.88E-02	8.43E+03
Vinyl Chloride		6.20E+00	3.82E-03	7.73E-04	6.43E-04	1.36E+03	6.87E-03	1.00E-03	8.73E-04	1.76E+03	1.25E-02	1.53E-03	1.36E-03	2.69E+03
1,2,4-Trimethylbenzene		5.10E+03	NR	1.76E+00	NR	4.74E+02	NR	4.26E+00	NR	1.16E+03	NR	9.72E+00	NR	2.76E+03
1,3,5-Trimethylbenzene	(e)	-	NR	NR	NR	2.30E+02	NR	NR	NR	5.52E+02	NR	NR	NR	1.30E+03
Semi-Volatile Organic Compounds														
Acenaphthene		4.11E+03	2.27E+02	4.86E+04	2.26E+02	5.70E+01	5.41E+02	1.18E+05	5.38E+02	1.41E+02	1.18E+03	2.68E+05	1.17E+03	3.36E+02
Acenaphthylene		7.95E+03	1.85E+02	4.59E+04	1.84E+02	8.61E+01	4.42E+02	1.11E+05	4.40E+02	2.12E+02	9.78E+02	2.53E+05	9.74E+02	5.06E+02
Anthracene		-	2.43E+03	1.53E+05	2.39E+03	1.17E+00	5.53E+03	3.77E+05	5.45E+03	2.91E+00	1.10E+04	8.76E+05	1.09E+04	6.96E+00
Benzo(a)anthracene		-	1.01E+01	2.47E+01	7.18E+00	1.71E+00	1.42E+01	4.37E+01	1.07E+01	4.28E+00	1.69E+01	6.26E+01	1.33E+01	1.03E+01
Benzo(b)fluoranthene		-	2.96E+00	1.93E+01	2.56E+00	1.22E+00	3.89E+00	2.13E+01	3.29E+00	3.04E+00	4.43E+00	2.22E+01	3.69E+00	7.29E+00
Benzo(g,h,i)perylene		-	3.77E+02	1.87E+03	3.14E+02	1.54E-02	4.09E+02	1.94E+03	3.38E+02	3.85E-02	4.23E+02	1.97E+03	3.48E+02	9.23E-02
Benzo(k)fluoranthene		-	8.92E+01	5.41E+02	7.66E+01	6.87E-01	1.10E+02	5.76E+02	9.22E+01	1.72E+00	1.21E+02	5.91E+02	1.00E+02	4.12E+00
Chrysene		-	1.66E+01	1.19E+02	1.46E+01	4.40E-01	2.54E+01	1.49E+02	2.17E+01	1.10E+00	3.19E+01	1.66E+02	2.67E+01	2.64E+00
Dibenzo(a,h)anthracene		-	2.90E-01	1.45E+00	2.41E-01	3.93E-03	3.43E-01	1.64E+00	2.84E-01	9.82E-03	3.69E-01	1.74E+00	3.04E-01	2.36E-02
Fluoranthene		-	2.87E+02	3.83E+04	2.85E+02	1.89E+01	5.63E+02	8.87E+04	5.60E+02	4.73E+01	9.00E+02	1.83E+05	8.96E+02	1.13E+02
Fluorene		-	1.77E+02	6.20E+03	1.72E+02	3.09E+01	4.19E+02	1.53E+04	4.07E+02	7.65E+01	8.98E+02	3.62E+04	8.77E+02	1.83E+02
Indeno(1,2,3-cd)pyrene		-	3.09E+01	2.12E+02	2.70E+01	6.13E-02	4.22E+01	2.38E+02	3.59E+01	1.53E-01	4.92E+01	2.50E+02	4.11E+01	3.68E-01
Phenanthrene		-	9.85E+01	7.17E+03	9.72E+01	3.60E+01	2.24E+02	1.76E+04	2.22E+02	8.96E+01	4.48E+02	4.07E+04	4.43E+02	2.14E+02
Pyrene		-	6.25E+02	8.79E+04	6.20E+02	2.20E+00	1.25E+03	2.04E+05	1.24E+03	5.49E+00	2.05E+03	4.23E+05	2.04E+03	1.32E+01
Benzo(a)pyrene	(a)	-	4.96E+00	3.51E+01	NR	9.11E-01	4.96E+00	3.77E+01	NR	2.28E+00	4.96E+00	3.89E+01	NR	5.46E+00
Naphthalene		1.90E+04	2.78E+01	2.33E+01	1.27E+01	7.64E+01	6.66E+01	5.58E+01	3.04E+01	1.83E+02	1.53E+02	1.31E+02	7.06E+01	4.32E+02
Phenol		-	1.60E+02	4.58E+02	1.20E+02	2.42E+04	2.96E+02	6.95E+02	2.09E+02	3.81E+04	5.86E+02	1.19E+03	3.93E+02	7.03E+04

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH HOME-GROWN PRODUCE

Table 5

Human Health Generic Assessment Criteria by Pathway for Residential With Home-Grown Produce Scenario

Compound	Notes	GrAC (µg/l)	SAC Appropriate to Pathway SOM 1% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 2.5% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 6% (mg/kg)			Soil Saturation Limit (mg/kg)
			Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Total Petroleum Hydrocarbons														
Aliphatic hydrocarbons EC_5-EC_6		2.00E+04	4.99E+03	4.24E+01	4.23E+01	3.04E+02	1.13E+04	7.79E+01	7.78E+01	5.58E+02	2.50E+04	1.61E+02	1.60E+02	1.15E+03
Aliphatic hydrocarbons >EC_6-EC_8		5.37E+03	1.49E+04	1.04E+02	1.03E+02	1.44E+02	3.43E+04	2.31E+02	2.31E+02	3.22E+02	7.11E+04	5.29E+02	5.28E+02	7.36E+02
Aliphatic hydrocarbons >EC_8-EC_{10}		4.27E+02	1.61E+03	2.68E+01	2.67E+01	7.77E+01	2.91E+03	6.55E+01	6.51E+01	1.90E+02	4.26E+03	1.56E+02	1.54E+02	4.51E+02
Aliphatic hydrocarbons >EC_{10}-EC_{12}		3.39E+01	4.57E+03	1.33E+02	1.32E+02	4.75E+01	5.51E+03	3.31E+02	3.26E+02	1.18E+02	5.98E+03	7.93E+02	7.65E+02	2.83E+02
Aliphatic hydrocarbons >EC_{12}-EC_{16}		7.59E-01	6.27E+03	1.11E+03	1.06E+03	2.37E+01	6.34E+03	2.78E+03	2.41E+03	5.91E+01	6.36E+03	6.67E+03	4.34E+03	1.42E+02
Aliphatic hydrocarbons >EC_{16}-EC_{35}	(b)	-	6.46E+04	NR	NR	8.48E+00	9.17E+04	NR	NR	2.12E+01	1.10E+05	NR	NR	5.09E+01
Aliphatic hydrocarbons >EC_{35}-EC_{44}	(b)	-	6.46E+04	NR	NR	8.48E+00	9.17E+04	NR	NR	2.12E+01	1.10E+05	NR	NR	5.09E+01
Aromatic hydrocarbons >EC_8-EC_9 (styrene)		2.90E+05	1.08E+01	5.22E+02	1.06E+01	6.26E+02	2.53E+01	1.20E+03	2.48E+01	1.44E+03	5.81E+01	2.79E+03	5.69E+01	3.35E+03
Aromatic hydrocarbons >EC_9-EC_{10}		2.00E+04	5.76E+01	4.74E+01	3.45E+01	6.13E+02	1.38E+02	1.16E+02	8.38E+01	1.50E+03	3.07E+02	2.77E+02	1.94E+02	3.58E+02
Aromatic hydrocarbons >EC_{10}-EC_{12}		2.45E+04	8.29E+01	2.58E+02	7.52E+01	3.64E+02	1.96E+02	6.39E+02	1.79E+02	8.99E+02	4.25E+02	1.52E+03	3.91E+02	2.15E+03
Aromatic hydrocarbons >EC_{12}-EC_{16}		5.75E+03	1.47E+02	2.85E+03	1.45E+02	1.69E+02	3.36E+02	7.07E+03	3.32E+02	4.19E+02	6.81E+02	1.68E+04	6.74E+02	1.00E+03
Aromatic hydrocarbons >EC_{16}-EC_{21}	(b)	-	2.63E+02	NR	NR	5.37E+01	5.45E+02	NR	NR	1.34E+02	9.34E+02	NR	NR	3.21E+02
Aromatic hydrocarbons >EC_{21}-EC_{35}	(b)	-	1.09E+03	NR	NR	4.83E+00	1.47E+03	NR	NR	1.21E+01	1.70E+03	NR	NR	2.90E+01
Aromatic hydrocarbons >EC_{35}-EC_{44}	(b)	-	1.09E+03	NR	NR	4.83E+00	1.47E+03	NR	NR	1.21E+01	1.70E+03	NR	NR	2.90E+01

Notes:

EC - equivalent carbon. GrAC - groundwater assessment criteria. SAC - soil assessment criteria.

The CLEA model output is colour coded depending upon whether the soil saturation limit has been exceeded.

Calculated SAC exceeds soil saturation limit and may significantly effect the interpretation of any exceedances since the contribution of the indoor and outdoor vapour pathway to total exposure is >10%. This shading has also been used for the RBCA output where the theoretical solubility limit has been exceeded.

Calculated SAC exceeds soil saturation limit but will not effect the SSV significantly since the contribution of the indoor and outdoor vapour pathway to total exposure is <10%.

Calculated SAC does not exceed the soil saturation limit.

For consistency where the theoretical solubility limit within RBCA has been exceeded in production of the GrAC, these cellls have also been hatched red.

The SAC for organic compounds are dependant upon soil organic matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, PAHs napthalene, acenaphthene and acenaphthylene, MTBE, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway (Section 10.1.1, SR3)

(a) SAC for arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI and lead are derived using the C4SL toxicology data.

(b) SAC for selenium should not include the inhalation pathway as no expert group HCV has been derived; aliphatic and aromatic hydrocarbons >EC16 should not include inhalation pathway due to their non-volatile nature and inhalation exposure being minimal (oral, dermal and inhalation exposure is compared to the oral HCV); arsenic should only be based on oral contribution (rather than combined) owing to the relative small contribution from inhalation in accordance with the SGV report. The Oral SAC should be adopted for zinc and benzo(a)pyrene.

(c) SAC for CrIII should be based on the lower of the oral and inhalation SAC (see LQM/CIEH 2015 Section 6.8)

(d) SAC for elemental mercury, chromium VI and nickel should be based on the inhalation pathway only.

(e) SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data, SAC for 1,2,4 trimethylbenzene may be used.

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH HOME-GROWN PRODUCE

Table 6
Human Health Generic Assessment Criteria for Residential with home-grown produce

Compound	GrAC for Groundwater (µg/l)	SAC for Soil SOM 1% (mg/kg)	SAC for Soil SOM 2.5% (mg/kg)	SAC for Soil SOM 6% (mg/kg)
Metals				
Arsenic	-	37	37	37
Cadmium	-	22	22	22
Chromium (III) - trivalent	-	910	910	910
Chromium (VI) - hexavalent	-	21	21	21
Copper	-	2,500	2,500	2,500
Lead	-	200	200	200
Elemental Mercury (Hg^0)	12.90	0.2	0.6	1.2
Inorganic Mercury (Hg^{2+})	-	39	39	39
Methyl Mercury (Hg^{4+})	22180	10	10	10
Nickel	-	130	130	130
Selenium	-	258	258	258
Zinc	-	3,900	3,900	3,900
Cyanide (free)	-	1.4	1.4	1.4
Volatile Organic Compounds				
Benzene	23000	0.20	0.41	0.87
Toluene	590000	130	300	680
Ethylbenzene	124600	50	110	260
Xylene - m	115900	59	140	327
Xylene - o	141400	61	143	332
Xylene - p	121100	57	133	310
Total xylene	115900	57	133	310
Methyl tertiary-Butyl ether (MTBE)	9320000	130	250	510
Trichloroethene	64	0.02	0.03	0.08
Tetrachloroethene	408	0.2	0.4	0.9
1,1,1-Trichloroethane	35900	9	18	39
1,1,1,2 Tetrachloroethane	2800	1.2	2.8	6.5
1,1,2,2-Tetrachloroethane	18500	1.6	3.5	7.7
Carbon Tetrachloride	61	0.026	0.056	0.127
1,2-Dichloroethane	97	0.007	0.011	0.019
Vinyl Chloride	6	0.0006	0.0009	0.0014
1,2,4-Trimethylbenzene	5095	1.8	4.3	9.7
1,3,5-Trimethylbenzene	-	NR	NR	NR
Semi-Volatile Organic Compounds				
Acenaphthene	4110	230	540	1,170
Acenaphthylene	7950	180	440	970
Anthracene	-	2,400	5,500	10,900
Benzo(a)anthracene	-	7	11	13
Benzo(b)fluoranthene	-	2.6	3.3	3.7
Benzo(g,h,i)perylene	-	310	340	350
Benzo(k)fluoranthene	-	77	92	100
Chrysene	-	15	22	27
Dibenzo(a,h)anthracene	-	0.24	0.28	0.30
Fluoranthene	-	290	560	900
Fluorene	-	170	410	880
Indeno(1,2,3-cd)pyrene	-	27	36	41
Phenanthrene	-	100	220	440
Pyrene	-	620	1,240	2,040
Benzo(a)pyrene	-	5	5	5
Naphthalene	19000	13	30	71
Phenol	-	120	210	390
Total Petroleum Hydrocarbons				
Aliphatic hydrocarbons EC_5-EC_6	20000	42	78	160
Aliphatic hydrocarbons >EC_6-EC_8	5370	100	230	530
Aliphatic hydrocarbons >EC_8-EC_{10}	427	27	65	154
Aliphatic hydrocarbons >EC_{10}-EC_{12}	33.9	130 (48)	330 (118)	760 (283)
Aliphatic hydrocarbons >EC_{12}-EC_{16}	0.759	1,100 (24)	2,400 (59)	4,300 (142)
Aliphatic hydrocarbons >EC_{16}-EC_{35}	-	65,000 (8)	92,000 (21)	110,000
Aliphatic hydrocarbons >EC_{35}-EC_{44}	-	65,000 (8)	92,000 (21)	110,000
Aromatic hydrocarbons >EC_8-EC_9 (styrene)	290000	11	25	57
Aromatic hydrocarbons >EC_9-EC_{10}	20000	30	80	190
Aromatic hydrocarbons >EC_{10}-EC_{12}	24500	80	180	390
Aromatic hydrocarbons >EC_{12}-EC_{16}	5750	140	330	670
Aromatic hydrocarbons >EC_{16}-EC_{21}	-	260	540	930
Aromatic hydrocarbons >EC_{21}-EC_{35}	-	1,100	1,500	1,700
Aromatic hydrocarbons >EC_{35}-EC_{44}	-	1,100	1,500	1,700
Minerals				
Asbestos	-	No asbestos detected with ID or <0.001% dry weight[1]		

Notes:

'-' Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.

NR - SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data, SAC for 1,2,4 trimethylbenzene may be used

EC - equivalent carbon. GrAC - groundwater assessment criteria. SAC - soil assessment criteria.

[1] LOD for weight of asbestos per unit weight of soil calculated on a dry weight basis using PLM, handpicking and gravimetry.

The SAC for organic compounds are dependent on Soil Organic Matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58.
1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC and GrAC for TPH fractions, PAHs napthalene, acenaphthene and acenaphthylene, MTBE, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway, section 10.1.1, SR3.

(VALUE IN BRACKETS) The SAC has been set as the model calculated SAC with the saturation limit shown in brackets.
RSK has adopted an approach for petroleum hydrocarbons in accordance with LQM/CIEH whereby the concentration modelled for each petroleum hydrocarbon fraction has been tabulated as the SAC with the corresponding solubility or vapour saturation limits given in brackets.

For consistency where the GrAC exceeds the solubility limit, GrAC has been set at the solubility limit. The GrAC is conservative since concentrations of the chemical are very unlikely to be at sufficient concentration to result in an exceedance of the health criteria value at the point of exposure (i.e. indoor air) provided free-phase product is absent.

APPENDIX H
GENERIC ASSESSMENT CRITERIA FOR CONTROLLED WATERS

GENERIC ASSESSMENT CRITERIA FOR CONTROLLED WATERS

Protection of the water environment

The water environment in the United Kingdom is protected under a number of regulatory regimes. The relevant environmental regulator is consulted where there may be a risk that pollution of 'controlled waters' may occur or may have occurred in the past.

The term 'controlled waters' refers to coastal waters, inland freshwaters and groundwater. The EU Water Framework Directive (WFD) (2000/60/EC) is implemented via domestic regulations and guidance, covering aspects of groundwater and surface water protection as well as drinking water supply policy. Domestic legislation and guidance will vary across the United Kingdom. Therefore, the relevant legislation for England, Wales, Northern Ireland and Scotland should be reviewed, alongside guidance provided by the Environment Agency (EA), Natural Resource Wales (NRW), the Scottish Environmental Protection Agency (SEPA) or the Northern Ireland Environment Agency (NIEA), as appropriate.

The main objectives of the protection and remediation of groundwater under threat from land contamination are set out in the Environment Agency's Groundwater Protection: Principles and Practice (GP3) guidance document(1). When assessing risks to groundwater the following need to be taken into consideration:

- Where pollutants have not yet entered groundwater, all necessary and reasonable measures must be taken to:
    - ***prevent*** *the input of* ***hazardous*** *substances into groundwater (see description of hazardous substances below)*
    - ***limit*** *the entry of other (non-hazardous) pollutants into groundwater so as to avoid pollution, and to avoid deterioration of the status of groundwater bodies or sustained, upward trends in pollutant concentration.*
- Where hazardous substances or non-hazardous pollutants have already entered groundwater, the priority is to
    - ***minimise*** *further entry of* ***hazardous substances*** *and non-hazardous pollutants into groundwater*
    - *take* ***necessary and reasonable measures*** *to* ***limit the pollution*** *of groundwater or impact on the status of the groundwater body from the future expansion of a contaminant 'plume', if necessary by actively reducing its extent if the economic, social and environmental benefits of doing so outweigh the costs.*

DEFINITIONS AND SUBSTANCE CLASSIFICATIONS

Risks to surface waters:

When assessing risks to surface waters, the following list of definitions should be understood:

Priority substances (PS) are harmful substances originally identified under the Water Framework Directive (WFD) 2000/60/EC as substances 'presenting a significant risk to or via the aquatic environment' at a European level. Member States are required to incorporate the identified **PS** into their country-wide monitoring programmes. There are currently 33 **PS** defined within the Priority Substances Directive (2013/39/EU; Annex 1), with a further 12 additional substances due to come into force from 22 December 2018. Directive 2013/39/EU has been transposed into domestic legislation for England and Wales by The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

Under the umbrella of **PS**, there is a sub-set of substances identified as being "hazardous", and these are referred to as **Priority hazardous substances (PHS).** The list of **PHS** is defined at EU level within the Priority Substances Directive (2013/39/EU). The WFD defines hazardous substances as 'substances (or groups of substances) that are toxic, persistent and liable to bio-accumulate, and other substances or groups of substances that give rise to an equivalent level of concern.' There are currently 15 **PHS**, with a further 6 additional substances due to come into force from 22 December 2018.

There is also another group of substances defined at EU level and which are referred to as **other pollutants (OP)** in Directive 2013/39/EU**.** These are additional substances which although not **priority substances**, have EQS which are identical to those laid down in the legislation which applied prior to 13 January 2009 (Directive 2008/105/EU). The **OP** are listed along with the **priority substance (PS)** within the Priority Substances Directive (2013/39/EU),and their associated EQS are also listed therein. There are 6 **OP** defined within the Priority Substances Directive (2013/39/EU).

In addition to the EU level substances, there are also a group of pollutants defined at a Member State level, referred to as **Specific pollutants (SP)**. These substances are pollutants which are released in significant quantities into water bodies in each of the individual European Member States. Under the WFD, Member States are required to set their own EQS for these substances. An indicative list of **SP** is given in Annex VIII of the WFD. Many of the substances categorised as **SP** in the UK were formerly List 2 substances under the old Groundwater Directive (80/68/EEC). The **SP** are defined within Part 2 (Table 1) of The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

Risks to groundwater:

When assessing risks to groundwater, the following definitions should be understood:

Under the requirements of the Groundwater Daughter Directive (2006/118/EU), the UK has published a list of substances it considers to be **hazardous substances** with respect to groundwater. In their advisory capacity to the government, this list has been derived by the UK Joint Agencies Groundwater Directive Advisory Group (JAGDAG), of which the Environment Agency is a member. Although currently under review, the existing list of groundwater hazardous substances is largely based on the former List 1 substances which were defined under the (now repealed) Groundwater Directive (80/68/EEC), with the addition of radioactive substances which are also now classed as **hazardous substances**. The JAGDAG list of **hazardous substances** is extensive, and can be found in full at:
http://www.wfduk.org/sites/default/files/Media/Substances%20transferred%20from%20List%20I%20%26%20II%20to%20hazardous%20or%20non%20hazardous.pdf

Given the above classifications**,** any other pollutant which has not been classified as a hazardous substance by JAGDAG**,** is referred to as a **non-hazardous pollutant (NHP).**

Selecting the appropriate assessment criteria

When assessing the risks to controlled waters, various assessment criteria apply, depending on the nature of the assessment and the conceptual site model.

Where a surface water body is involved, then Environmental Quality Standards (EQS) are the relevant assessment criteria as they are designed to be protective of surface water ecology.

Where a public water supply or a Principal aquifer is involved, then the standards defined in The Water Supply (Water Quality) Regulations[2] are the primary source of assessment criteria. The Private Water Supplies Regulations[3] may also be applicable in some cases. For instances where there are no UK assessment criteria, then the World Health Organisation (WHO) drinking water guidelines[4] may be used.

This appendix presents the generic assessment criteria (GAC) that RSK considers suitable for assessing risks to controlled waters for our most commonly encountered determinants. A full list of EQS for England and Wales are included in The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

The RSK GAC for controlled waters are presented in **Table 1**. In line with the Environment Agency's Remedial Targets Methodology, the GAC for controlled waters are termed 'target concentrations'.

The appropriate target concentrations should be selected with consideration to:

- the site conceptual model (i.e. the receptor at potential risk);
- whether the substance is already present in groundwater at the site;
- whether or not the substance is classified as a priority hazardous substance under the Priority Substances Directive (2013/39/EC) (see above), or as a hazardous substance according to the current list of JAGDAG determinations[5]; and
- background concentrations in the aquifer (if applicable).

It is important to remember that the WFD and GP3[1] guidance allow a risk-based and a cost-benefit approach to be applied to groundwater contamination. Exceedance of any target concentration does not necessarily imply that an unacceptable risk exists or that remediation is required either on a technical or cost-benefit basis.

Table 1: Target concentrations for controlled waters

Target concentrations shaded in green are statutory values	Target concentrations shaded in orange are non-statutory values

Note: Units µg/l throughout

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
Metals & other inorganics						
-	Specific pollutant	Arsenic	-	10[2]	50[6a]	25[6a]
Hazardous substance	Priority substance	Cadmium	0.1[7]	5[2]	≤0.08, 0.08, 0.09, 0.15, 0.25 [6b]	0.2[6a]
-	-	Chromium (total)	-	50[2]	Sum values for chromium III and VI	
-	Specific pollutant	Chromium (III)	-	Use value for total chromium	4.7[6a]	-
-	Specific pollutant	Chromium (VI)			3.4[6a]	0.6[6a]
-	Specific pollutant	Copper	-	2,000[2]	1 bioavailable[6a]	3.76 dissolved, where DOC ≤1mg/l[6a]
						3.76µg/l + (2.677µg/l x ((DOC/2) – 0.5µg/l)) dissolved, where DOC >1mg/l[6a]

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
-	Priority substance	Lead	-	10[2]	1.2 bioavailable[6a]	1.3[6a]
Hazardous substance	**Priority hazardous substance**	Mercury	0.01[7]	1[2]	0.07[6c]	0.07[6c]
-	Priority substance	Nickel	-	20[2]	4.0 bioavailable[6a]	8.6[6a]
-	-	Selenium	-	10[2]	-	-
-	Specific pollutant	Zinc	-	3,000[8]	10.9 bioavailable[6a]	6.8 dissolved [6a]
-	Specific pollutant	Iron	-	200[2]	1000[6a]*1	1000[6a])*1
-	Specific pollutant	Manganese	-	50[2]	123 bioavailable[6a]	-
-	-	Aluminium	-	200[2]	-	-
Hazardous substance	**Priority hazardous substance**	Tributyltin compounds (Tributyltin-cation)	0.001[7]	-	0.0002[6a]	0.0002[6a]
-	-	Sodium	-	200,000[2]	-	-
-	Specific pollutant	Cyanide (Hydrogen cyanide)	-	50[2]	1[6a]	1[6a]
-	-	Total ammonia[$] (ammonium (as NH_4^+) plus ammonia (NH_3)	-	50[2]	300[6f]	-
-	Specific pollutant	Ammonia un-ionised (NH_3)	-	-	-	21[6a]
-	Specific pollutant	Chlorine	-	-	2[6a]	10[6d]
-	-	Chloride	-	250,000[2]	-	-

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
-	-	Sulphate	-	250,000[2]	-	-
-	-	Nitrate (as NO_3)	-	50,000[2]	-	-
-	-	Nitrite (as NO_2)	-	100[2]	10[9]	-
Volatile organic compounds (VOC)						
Hazardous substance	Other pollutant	Tetrachloroethene (tetrachloroethylene)	0.1[7]	10[2]	10[6a]	10[6a]
Hazardous substance	Other pollutant	Trichloroethene (trichloroethylene)	0.1[7]	10[2]	10[6a]	10[6a]
Hazardous substance	Specific pollutant	Tetrachloroethane	-	-	140[6a]	-
Hazardous substance	Other pollutant	Carbon tetrachloride (tetrachloromethane)	0.1[7]	3.0[2]	12[6a]	12[6a]
Hazardous substance	Priority substance	1,2-Dichloroethane	1.0[7]	3.0[2]	10[6a]	10[6a]
Hazardous substance	-	Vinyl chloride (chloroethene)	-	0.5[2]	-	-
Hazardous substance	Priority substance	Dichloromethane	-	20[4]	20[6a]	20[6a]
Hazardous substance	Priority substance	Trichlorobenzenes	0.01[7]	-	0.4[6a]	0.4[(6a)]
Hazardous substance	-	Trihalomethanes	-	100[2a]	-	-

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
Hazardous substance	Priority substance	Trichloromethane (Chloroform)	0.1[7]	(see "Trihalomethanes" above)	2.5[6a]	2.5[6a]
-	**Priority hazardous substance**	Di(2-ethylhexyl) phthalate (bis(2-ethylhexyl) phthalate, DEHP)	-	8[4]	1.3[6a]	1.3[6a]
-	Specific pollutant	Benzyl butyl phthalate	-	-	7.5[6a]	0.75[6e]
Hazardous substance	**Priority hazardous substance**	Hexachlorobutadiene	0.005[7]	0.6[4]	0.6[6c]	0.6[6c]
Semi-volatile organic compounds (SVOC)						
Hazardous substance	-	Acenaphthylene (C12-C16)	-	-	5.8[10]	
Hazardous substance	**Priority hazardous substance**	Anthracene (C16-C35)	-	-	0.1[6a]	0.1[6a]
Hazardous substance	Priority substance	Naphthalene (C10-C12)	-	-	2[6a]	2[6a]
Hazardous substance	Priority substance	Fluoranthene (C16-C35)	-	-	0.0063[6a]	0.0063[6a]

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
Hazardous substance	**Priority hazardous substance(s)**	Benzo(a)pyrene (C16-C35)	-	0.01[2]	0.00017[6a]	0.00017[6a]
Hazardous substance		Benzo(b)fluoranthene (C16-C35)	-	0.1[2]	No EQS for these substances. B(a)P should be used as the indicator compound instead.	
Hazardous substance		Benzo(k)fluoranthene (C16-C35)	-			
Hazardous substance		Benzo(g,h,i)perylene (C16-C35)	-			
Hazardous substance		Indeno(1,2,3-cd) pyrene (C16-C35)	-			
-	Specific pollutant	Phenol	0.5[7]	-	7.7[6a]	7.7[6a]
Hazardous substance	Specific pollutant	2,4-Dichlorophenol	0.1[7]	-	4.2[6a]	0.42[6a]
Hazardous substance	Priority substance	Pentachloro-phenol (PCP)	0.1[7]	9[4]	0.4[6a]	0.4[6a]
Petroleum hydrocarbons						
Hazardous substance	-	Total petroleum hydrocarbons	-	10[11]		
Hazardous substance	Priority substance	Benzene	1[7]	1[2]	10[6a]	8[6a]
Hazardous substance	Specific pollutant	Toluene	4[7]	700[4]	74[6a]	74[6a]

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
Hazardous substance	-	Ethylbenzene	-	300[4]	-	-
Hazardous substance	-	Xylene	3[7]	500[4]	-	-
-	-	Methyl tertiary butyl ether (MTBE)	-	15[12]	-	
Pesticides, fungicides, insecticides and herbicides						
Hazardous substance	Other pollutant (Cyclodiene pesticides)	Aldrin	0.003[7]	0.03[2]	0.01[6a]	0.005[6a]
Hazardous substance		Dieldrin	3[7]	0.03[2]		
Hazardous substance		Endrin	0.003[7]	0.1[2b]		
Hazardous substance		Isodrin*[2]	0.003[7]	0.1[2b]		
Hazardous substance	Other pollutant	DDT (total)	0.006[7]	1[4]	0.025[6a]	0.025[6a]
Hazardous substance	-	Total pesticides	-	0.5[2]	-	-
Hazardous substance	-	Other individual pesticides	-	0.1[2]		
Hazardous substance	Specific pollutant	Carbendazim	-	-	0.15[6a]	-

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
Hazardous substance	Specific pollutant	Chlorothalonil	-	-	0.035[6a]	-
Hazardous substance	Specific pollutant (until 22/12/18, after which it becomes a Priority substance)	Cypermethrin	-	-	0.0001[6a] From 22/12/18: 8.0E-5[6a]	0.0001[6a] From 22/12/18: 8.0E-6[6a]
Hazardous substance	Specific pollutant	Dimethoate	0.01[7]	-	0.48[6a]	0.48[6a]
-	Specific pollutant	Glyphosate	-	-	196[6a]	196[6a]
Hazardous substance	Specific pollutant	Linuron	0.1[7]	-	0.5[6a]	0.5[6a]
-	Specific pollutant	Mecoprop	0.04[7]	-	18[6a]	18[6a]
-	Specific pollutant	Methiocarb	-	-	0.01[6a]	-
-	Specific pollutant	Pendimethalin	-	20[4]	0.3[6a]	-
Hazardous substance	Specific pollutant	Permethrin	0.001[7]	-	0.001[6a]	0.0002[6a]
Hazardous substance	Priority substance	Alachlor	-	20[4]	0.3[6a]	0.3[6a]
Hazardous substance	Priority substance	Atrazine	0.03[7]	100[4]	0.6[6a]	0.6[6a]
Hazardous substance	Priority substance	Diuron	-	-	0.2[6a]	0.2[6a]

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
Hazardous substance	**Priority hazardous substance**	Endosulphan	0.005[7]	-	0.005[6a]	0.0005[6a]
-	Priority substance	Isoproturon	-	9[4]	0.3[6a]	0.3[6a]
Hazardous substance	Priority substance	Simazine	0.03[7]	2[4]	1[6a]	1 [6a]
Hazardous substance	**Priority hazardous substance**	Trifluralin	0.01[7]	20[4]	0.03[6a]	0.03[6a]
-	From 22/12/18: Priority substance	Dichlorovos	-	-	From 22/12/18: 6.0E-4[6a]	From 22/12/18: 6.0E-5[6a]
Hazardous substance	From 22/12/18: Priority substance	Heptachlor and heptachlor epoxide	-	0.03[2]	From 22/12/18: 2.0E-7[6a]	From 22/12/18: 1.0E-08[6a]
Miscellaneous						
-	Specific pollutant	Triclosan (antibacterial agent)	-	-	0.1[6a]	0.1[6a]
-	**From 22/12/18: Priority hazardous substance**	Perfluoro-octane sulfonic acid (and its derivatives) (PFOS)	-	-	From 22/12/18: 6.5E-4[6a]	From 22/12/18: 1.3E-4[6a]
-	**From 22/12/18: Priority hazardous substance**	Hexabromo cyclododecane (HBCDD)	-	-	From 22/12/18: 0.0016[6a]	From 22/12/18: 0.0016[6a]

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors[5]	Surface water receptors[6]		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters

Note: '-' A target concentration is not available.

$Please note that total ammonia (NH_4^+ and NH_3) is equivalent to ammoniacal nitrogen in laboratory reports

*1 Please note that although iron is listed in the 2015 Direction as 1.000 µg/l, the EQS remains at 1mg/l in Scotland and it is assumed this is a mistake and should read either 1,000 or 1000µg/l.

*2 Please note that although Isodrin is not listed in name within the group of "Cyclodiene pesticides" in Table 1 of Schedule 3 Part 3 of the 2015 Direction[6], the CAS number for Isodrin (465-73-6) **is** listed and therefore it is assumed that it has been missed off the named list of substances.

"Bioavailable" in relation to copper, zinc, nickel and manganese (but not lead) is the generic EQSbioavailable[6a] derived from the Metal Bioavailability Assessment Tool (M-BAT) developed by the Water Framework Directive UK Technical Advisory Group (WFDTAG). Exceedance of this value should prompt a site-specific assessment using the M-BAT with pH, DOC and Ca to derive a site-specific EQS termed the $PNEC_{dissolved}$. http://www.wfduk.org/resources/rivers-lakes-metal-bioavailability-assessment-tool-m-bat. For zinc, if there is an exceedance of the EQSbioavailable in an initial GQRA, Tier 2 required that the EQS for zinc should also have the ambient background concentration of zinc added as well (as listed by catchment in Table 2).

References

1. Environment Agency (2013), 'Groundwater Protection: Principles and Policy (GP3) v1.1'.
2. The Water Supply (Water Quality) Regulations 2016 (SI 2016/619)
    2a. Sum of chloroform, bromoform, dibromochloromethane and bromodichloromethane
    2b. Standard applies to individual pesticides except aldrin, dieldrin, heptachlor and heptachlor epoxide, for which a separate standard is defined.
3. The Private Water Supplies (England) Regulations 2016. SI 2016 / 618
4. WHO (2011), *Guidelines for drinking-water quality*, 4th edn
5. JAGDAG list of Substances transferred from List I & II to hazardous or non hazardous. Although currently under review, the existing list of groundwater hazardous substances and non-hazardous pollutants is largely based on the former List 1 and List 2 substances which were defined under the old (now repealed) Groundwater Directive (80/68/EEC). These have been taken to be hazardous substances and non-hazardous pollutants respectively, though these may be reviewed if new information is made available. JAGDAG has developed on a methodology for substance determination to fulfil the requirements of the WFD and the Groundwater Daughter Directive, which was finalised following consultation. The current list of substances can be found at: http://www.wfduk.org/sites/default/files/Media/Substances%20transferred%20from%20List%20I%20%26%20II%20to%20hazardous%20or%20non%20hazardous.pdf
6. The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.
    6a. The EQS for these substances are based on a "long term mean" or an "annual average (AA)" EQS.
    6b. For cadmium and its compounds the EQS values vary depending on the hardness of the water as specified in five class categories (Class 1: < 40 mg CaCO3/l, Class 2: 40 to < 50 mg CaCO3/l, Class 3: 50 to < 100 mg CaCO3/l, Class 4: 100 to < 200 mg CaCO3/l and Class 5: ≥ 200 mg CaCO3/l).
    6c. The EQS for Mercury and hexachlorobutadiene are based on a "maximum acceptable concentration (MAC)" EQS in absence of an "annual average (AA)" EQS.
    6d. The EQS for chlorine in saltwater is based on the 95th percentile concentration of total residual oxidant, which refers to the sum of all oxidising agents existing in water, expressed as available chlorine.
    6e. The recommended saltwater standard is derived using a safety factor of 100. Where the standard is failed, it is recommended that supporting evidence of ecological damage should be obtained before committing to expensive action.
    6f. EQS for total ammonia is as per Schedule 3, Part 1, Table 7 of of the above directions. EQS applies to river types 1, 2 and 4 and 6 (namely upland and low alkalinity). The EQS for a lowland and high alkalinity rivers (types 3, 5 and 7) is 600µg/l (0.6mg/l).

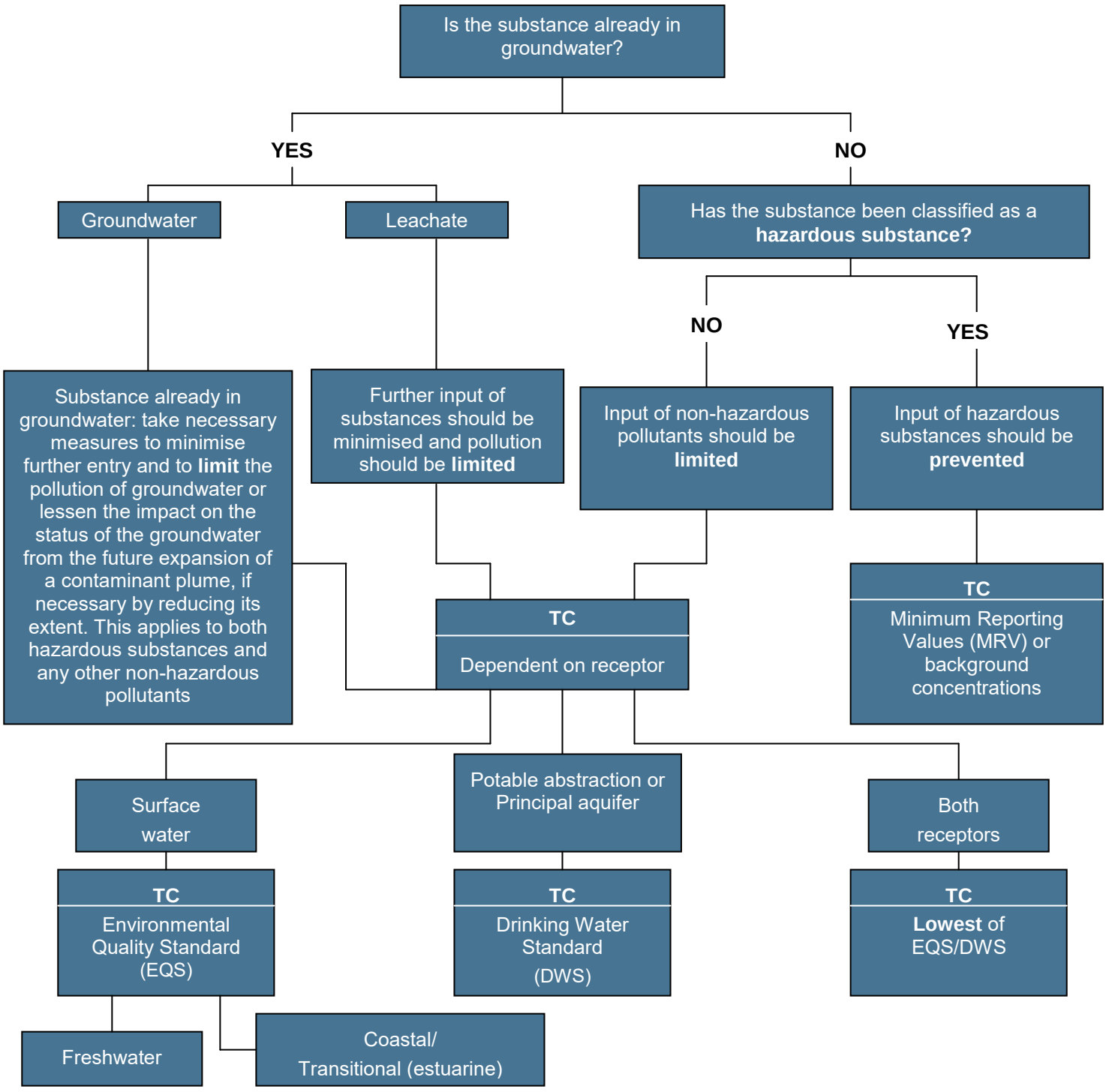
    Additional information on the Metal Bioavailability Assessment Tool (M-BAT) is available at http://www.wfduk.org/resources/rivers-lakes-metal-bioavailability-assessment-tool-m-bat
7. Minimum reporting values listed in Annex (J) of Horizontal Guidance Note H1 (H1 Environmental Risk Assessment Framework, Environment Agency, April 2010 v2.0). Note target concentration for xylenes is 0.003mg/l each for o-xylene and m/p xylene)
8. The Surface Waters (Abstraction for Drinking Water) (Classification) Regulations 1996 (as amended). SI 1996 / 3001

9. Council Directive on the Quality of Fresh Waters Needing Protection or Improvement in Order to Support Fish Life (Freshwater Fish Directive) (78/659/EEC)
10. WRc plc (2002), R&D Technical Report P45.
11. Environment Agency (2009), 'Petroleum hydrocarbons in groundwater: supplementary guidance for hydrogeological risk assessment'.

    NOTE: EA advice in the above document should be referred to with respect to risk rankings of TPH CWG fractions. It may be possible to eliminate low risk fractions and/or those not detected above LMDL from concern

12. Drinking Water Inspectorate (London, UK). Environmental Information Request on MTBE in drinking water. Ref. DWI 1/10/18; dated 28 November 2006. Value is based on the odour threshold for MTBE, which is lower than a health-based guideline value

FLOW CHART TO ASSIST WITH SELECTION OF TARGET CONCENTRATIONS



TC = Target concentration

When leachate is being assessed the 'compliance point' is the groundwater body. Therefore dilution within the groundwater body may be applied with caution before comparing with the TC.

When directly assessing a receptor, e.g., a river, the appropriate TC should be selected.

APPENDIX I
GENERIC ASSESSMENT CRITERIA FOR POTABLE WATER SUPPLY PIPES

A range of pipe materials is available and careful selection, design and installation is required to ensure that water supply pipes are satisfactorily installed and meet the requirements of the Water Supply (Water Fittings) Regulations 1999 in England and Wales, the Byelaws 2000 in Scotland and the Northern Ireland Water Regulations. The regulations include a requirement to use only suitable materials when laying water pipes and laying water pipes without protection is not permitted at contaminated sites. The water supply company has a statutory duty to enforce the regulations.

Contaminants in the ground can pose a risk to human health by permeating potable water supply pipes. To fulfil their statutory obligation, UK water supply companies require robust evidence from developers to demonstrate either that the ground in which new plastic supply pipes will be laid is free from specific contaminants, or that the proposed remedial strategy will mitigate any existing risk. If these requirements cannot be demonstrated to the satisfaction of the relevant water company, it becomes necessary to specify an alternative pipe material on the whole development or in specific zones.

In 2010, UK Water Industry Research (UKWIR) published *Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites* (Report Ref. No. 10/WM/03/21). This report reviewed previously published industry guidelines and threshold concentrations adopted by individual water supply companies.

The focus of the UKWIR research project was to develop clear and concise procedures, which provide consistency in the pipe selection decision process. It was intended to provide guidance that can be used to ensure compliance with current regulations and to prevent water supply pipe failing prematurely due to the presence of contamination.

The report concluded that in most circumstances only organic contaminants pose a potential risk to plastic pipe materials and Table 3.1 of the report provides threshold concentrations for polyethylene (PE) and polyvinyl chloride (PVC) pipes for the organic contaminants of concern. The report also makes recommendations for the procedures to be adopted in the design of site investigations and sampling strategies, and the assessment of data, to ensure that the ground through which water supply pipes will be laid is adequately characterised.

Risks to water supply pipes have therefore been assessed against the threshold concentrations for PE and PVC pipe specified in Table 3.1 of Report 10/WM/03/21, which have been adopted as the GAC for this linkage and are reproduced in Table A3 below.

Since water supply pipes are typically laid at a minimum depth of 0.75m below finished ground levels, sample results from depths between 0.5m and 1.5m below finished level are generally considered suitable for assessing risks to water supply. Samples outside these depths can be

used, providing the stratum is the same as that in which water supply pipes are likely to be located. The report specifies that sampling should characterise the ground conditions to a minimum of 0.5m below the proposed depth of the pipe.

It should be noted that the assessment provided in this report is a guide and the method of assessment and recommendations should be checked with the relevant water supply company.

Table A3: Generic assessment criteria for water supply pipes

		Pipe material	
		GAC (mg/kg)	
	Parameter group	**PE**	**PVC**
1	Extended VOC suite by purge and trap or head space and GC-MS with TIC (Not including compounds within group 1a)	0.5	0.125
1a	• BTEX + MTBE	0.1	0.03
2	SVOCs TIC by purge and trap or head space and GC-MS with TIC (aliphatic and aromatic C_5–C_{10}) (Not including compounds within group 2e and 2f)	2	1.4
2e	• Phenols	2	0.4
2f	• Cresols and chlorinated phenols	2	0.04
3	Mineral oil C_{11}–C_{20}	10	Suitable
4	Mineral oil C_{21}–C_{40}	500	Suitable
5	Corrosive (conductivity, redox and pH)	Suitable	Suitable
Specific suite identified as relevant following site investigation			
2a	Ethers	0.5	1
2b	Nitrobenzene	0.5	0.4
2c	Ketones	0.5	0.02
2d	Aldehydes	0.5	0.02
6	Amines	Not suitable	Suitable
Notes: where indicated as ‘suitable’, the material is considered resistant to permeation or degradation and no threshold concentration has been specified by UKWIR.			

APPENDIX J
COMPARISON OF SOIL DATA TO HUMAN HEALTH ASSESSMENT CRITERIA

313498, Whitepost Road, Banbury- Human Health Risk Assessment Soil Results Summary Table and Direct Comparison

Sample Identity		Residential with Plant Uptake (1% SOM)	WS1	WS1	WS2	WS3	WS4	WS5	WS6	WS7	WS8	WS9	WS9	WS10	WS11	WS12	TP1	TP3	TP4
Depth		**SGV/GACs**	**0.20**	**1.00**	**0.20**	**0.70**	**0.20**	**0.10**	**0.00**	**0.00**	**0.20**	**0.00**	**2.00**	**0.20**	**0.10**	**1.20**	**0.50**	**0.20**	**0.20**
Strata																			
Determinants	**Units**																		
Visual Fibre Screen			NAD		NAD		NAD		NAD	NAD	NAD	NAD						NAD	
pH	pH		6.46		7.89	6.91	7.82	7.17	7.86	6.6	6.7	7.03			6.88		6.79	6.71	7.23
Sulphate BRE (water sol 2:1)	g/l			<10		<10							10			14			
Total Organic Carbon	% w/w		1.39		0.73		0.94		2.2		1.77				1.13				1.13
Metals																			
Arsenic	mg/kg	37	168		51	66	105	58	84	123	106	58			84		148	139	124
Boron (water soluble)	mg/kg		<1.0		<1.0	1.1	<1.0	<1.0	1	1.1	<1.0	1.5			1.3		1.5	1.3	1
Cadmium	mg/kg	22	8.7		7.1	5.1	8.3	5.8	8.1	7.8	8.2	4.9			6.7		8.9	7.7	8.9
Copper	mg/kg	2500	<1		<1	4	<1	2	<1	<1	<1	5			<1		<1	<1	<1
Chromium	mg/kg	910	233		198	137	255	176	218	230	225	129			166		245	205	272
Chromium (hexavalent)	mg/kg	21	<1		<1	<1	<1	<1	<1	<1	<1	<1			<1		<1	<1	<1
lead (C4SL)	mg/kg	200	46		22	37	26	27	35	29	35	34			34		38	45	29
Mercury	mg/kg	39	<0.17		<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17			<0.17		<0.17	<0.17	<0.17
Nickel	mg/kg	130	106		80	64	106	87	91	92	94	60			78		108	88	107
Selenium	mg/kg	258	2		2	<1	<1	1	2	1	2	<1			1		2	<1	1
Zinc	mg/kg	3900	241		114	135	171	147	129	183	162	115			142		217	181	188
Total Petroleum Hydrocarbons Criteria Working Group (TPHCWG)																			
Ali >C5-C6	mg/kg	42	<0.01		<0.01		<0.01		<0.01		<0.01	<0.01							
Ali >C6-C8	mg/kg	100	<0.01		<0.01		<0.01		<0.01		<0.01	<0.01							
Ali >C8-C10	mg/kg	27	<0.01		<0.01		<0.01		<0.01		<0.01	<0.01							
Ali >C10-C12	mg/kg	130	<0.1		<0.1		<0.1		<0.1		<0.1	<0.1							
Ali >C12-C16	mg/kg	1100	<0.1		<0.1		<0.1		<0.1		<0.1	<0.1							
Ali >C16-C21	mg/kg	Assess as sum below	<0.1		<0.1		<0.1		<0.1		<0.1	<0.1							
Ali >C21-C35	mg/kg		<0.1		<0.1		<0.1		<0.1		<0.1	<0.1							
Ali >C16-C35	mg/kg	65,000	0.2		0.2		0.2		0.2		0.2	0.2							
Total Aliphatics	mg/kg		<0.1		<0.1		<0.1		<0.1		<0.1	<0.1							
Aro >C5-C7	mg/kg	0.2	<0.01		<0.01		<0.01		<0.01		<0.01	<0.01							
Aro >C7-C8	mg/kg	130	<0.01		<0.01		<0.01		<0.01		<0.01	<0.01							
Aro >C8-C9	mg/kg	11	<0.01		<0.01		<0.01		<0.01		<0.01	<0.01							
Aro >C9-C10	mg/kg	30	<0.01		0.25		0.22		0.04		<0.01	<0.01							
Aro >C10-C12	mg/kg	80	<0.1		<0.1		<0.1		<0.1		<0.1	<0.1							
Aro >C12-C16	mg/kg	140	<0.1		<0.1		<0.1		<0.1		<0.1	<0.1							
Aro >C16-C21	mg/kg	260	<0.1		<0.1		<0.1		<0.1		<0.1	<0.1							
Aro >C21-C35	mg/kg	1100	<0.1		<0.1		<0.1		<0.1		<0.1	<0.1							
Total Aromatics	mg/kg		<0.1		0.2		0.2		<0.1		<0.1	<0.1							
TPH (Ali & Aro)	mg/kg		<0.1		0.2		0.2		<0.1		<0.1	<0.1							
BTEX - Benzene	mg/kg	0.2	<0.01		<0.01		<0.01		<0.01		<0.01	<0.01							
BTEX - Toluene	mg/kg	130	<0.01		<0.01		<0.01		<0.01		<0.01	<0.01							
BTEX - Ethyl Benzene	mg/kg	50	<0.01		<0.01		<0.01		<0.01		<0.01	<0.01							
BTEX - m & p Xylene	mg/kg	57	<0.01		<0.01		<0.01		<0.01		<0.01	<0.01							
BTEX - o Xylene	mg/kg	61	<0.01		<0.01		<0.01		<0.01		<0.01	<0.01							
MTBE	mg/kg	130	<0.01		<0.01		<0.01		<0.01		<0.01	<0.01							
PAHs (Polycyclic Aromatic Hydrocarbons)																			
Acenapthene	mg/kg	230	<0.01		<0.01		<0.01		<0.01		<0.01	<0.01							
Acenapthylene	mg/kg	180	<0.01		<0.01		<0.01		<0.01		<0.01	<0.01							
Anthracene	mg/kg	2400	<0.02		<0.02		<0.02		<0.02		<0.02	<0.02							
Benzo(a)anthracene	mg/kg	7	<0.04		<0.04		<0.04		<0.04		<0.04	0.07							
Benzo(a)pyrene	mg/kg	5	<0.04		<0.04		<0.04		<0.04		<0.04	0.08							
Benzo(b)fluoranthene	mg/kg	2.6	<0.05		<0.05		<0.05		<0.05		<0.05	0.11							
Benzo(ghi)perylene	mg/kg	310	<0.05		<0.05		<0.05		<0.05		<0.05	<0.05							
Benzo(k)fluoranthene	mg/kg	77	<0.07		<0.07		<0.07		<0.07		<0.07	<0.07							
Chrysene	mg/kg	15	<0.06		<0.06		<0.06		<0.06		<0.06	0.08							
Dibenzo(ah)anthracene	mg/kg	0.24	<0.04		<0.04		<0.04		<0.04		<0.04	<0.04							
Fluoranthene	mg/kg	290	<0.08		<0.08		<0.08		<0.08		<0.08	0.12							
Fluorene	mg/kg	170	<0.01		<0.01		<0.01		<0.01		<0.01	<0.01							
Indeno(123-cd)pyrene	mg/kg	27	<0.03		<0.03		<0.03		<0.03		<0.03	0.06							
Napthalene	mg/kg	13	<0.03		<0.03		<0.03		<0.03		<0.03	<0.03							
Phenanthrene	mg/kg	100	<0.03		<0.03		<0.03		<0.03		<0.03	0.05							
Pyrene	mg/kg	620	<0.07		<0.07		<0.07		<0.07		<0.07	0.1							
Total PAH	mg/kg		<0.08		<0.08		<0.08		<0.08		<0.08	0.67							
Organo Chlorine Pesticides (OCP) and Organo Phosphorous Pesticides (OPP)																			
Mevinphos	ug/kg								<50			<50		<50					<50
Dichlorvos	ug/kg	32							<50			<50		<50					<50
alpha-Hexachlorocyclohexane (HCH)	ug/kg	230							<50			<50		<50					<50
Diazinon	ug/kg								<50			<50		<50					<50
gamma-Hexachlorocyclohexane (HCH / Lindane)	ug/kg	60							<50			<50		<50					<50
Heptachlor	ug/kg								<50			<50		<50					<50
Aldrin	ug/kg	5700							<50			<50		<50					<50
beta-Hexachlorocyclohexane (HCH)	ug/kg	85							<50			<50		<50					<50
Methyl Parathion	ug/kg								<50			<50		<50					<50
Malathion	ug/kg								<50			<50		<50					<50
Fenitrothion	ug/kg								<50			<50		<50					<50
Heptachlor Epoxide	ug/kg								<50			<50		<50					<50
Parathion (Ethyl Parathion)	ug/kg								<50			<50		<50					<50
p,p-DDE	ug/kg								<50			<50		<50					<50
p,p-DDT	ug/kg								<50			<50		<50					<50
p,p-Methoxychlor	ug/kg								<50			<50		<50					<50
p,p-TDE (DDD)	ug/kg								<50			<50		<50					<50
o,p-DDE	ug/kg								<50			<50		<50					<50
o,p-DDT	ug/kg								<50			<50		<50					<50
o,p-Methoxychlor	ug/kg								<50			<50		<50					<50
o,p-TDE (DDD)	ug/kg								<50			<50		<50					<50
Endosulphan I	ug/kg	7400							<50			<50		<50					<50
Endosulphan II	ug/kg	7000							<50			<50		<50					<50
Endosulphan Sulphate	ug/kg								<50			<50		<50					<50

313498, Whitepost Road, Banbury- Human Health Risk Assessment Soil Results Summary Table and Direct Comparison

Sample Identity		Residential with Plant Uptake (1% SOM)	WS1	WS1	WS2	WS3	WS4	WS5	WS6	WS7	WS8	WS9	WS9	WS10	WS11	WS12	TP1	TP3	TP4
Depth		SGV/GACs	0.20	1.00	0.20	0.70	0.20	0.10	0.00	0.00	0.20	0.00	2.00	0.20	0.10	1.20	0.50	0.20	0.20
Strata																			
Determinants	**Units**																		
Endrin	ug/kg								<50			<50		<50					<50
Ethion	ug/kg								<50			<50		<50					<50
Dieldrin	ug/kg	970							<50			<50		<50					<50
Azinphos-methyl	ug/kg								<50			<50		<50					<50
Nitrogen Pests																			
Ametryn	µg/kg								<50			<50		<50					<50
Atraton	µg/kg								<50			<50		<50					<50
Atrazine	µg/kg	3300							<50			<50		<50					<50
Prometon	µg/kg								<50			<50		<50					<50
Prometryn	µg/kg								<50			<50		<50					<50
Propazine	µg/kg								<50			<50		<50					<50
Simazine	µg/kg								<50			<50		<50					<50
Simetryn	µg/kg								<50			<50		<50					<50
Terbuthylazine	µg/kg								<50			<50		<50					<50
Terbutryn	µg/kg								<50			<50		<50					<50
= Exceedence of GAC for a residential (with plant uptake) end-																			
All GACs calculated by RSK or taken from EIC/AGS/CLAIRE Generic Assessment Criteria; and LQM/CIEH Generic Assessment Criteria																			

313498, Whitepost Road, Banbury- Human Health Risk Assessment Soil Results Summary Table and Direct Comparison

Sample Identity		Residential with Plant Uptake (1% SOM)	TP5	TP6	TP7	TP27	TP18	TP13	TP14	TP25	TP21	TP26	TP10	TP23	TP5	TP20	TP29	TP9	TP11
Depth		**SGV/GACs**	**0.00**	**1.10**	**0.10**	**0.20**	**0.40**	**0.35**	**0.40**	**0.25**	**0.35**	**0.30**	**0.20**	**0.40**	**0.20**	**0.50**	**0.20**	**0.10**	**0.20**
Strata																			
Determinants	**Units**																		
Visual Fibre Screen							NAD							NAD				NAD	
pH	pH		6.77		7.09	7.22		6.78	6.16	6.68	6.26	7.6	5.65		6.54	7	6.56		6.05
Sulphate BRE (water sol 2:1)	g/l			<10			15		<10										
Total Organic Carbon	% w/w										1.68		2.64			0.58	1.61		1.43
Metals																			
Arsenic	mg/kg	37	77		141	44		87	125	81	54	76	129		99	89	80		134
Boron (water soluble)	mg/kg		1.2		1.2	<1.0		<1.0	1.2	1.7	1.4	1.7	1.3		1.4	1	1.4		1.2
Cadmium	mg/kg	22	6.2		8.4	4.3		8.2	8	8.2	4.7	7.6	9.4		8.1	6.9	5.1		8.4
Copper	mg/kg	2500	3		<1	<1		<1	<1	<1	10	<1	<1		<1	<1	7		<1
Chromium	mg/kg	910	162		222	104		195	207	213	111	202	252		205	191	124		225
Chromium (hexavalent)	mg/kg	21	<1		<1	<1		<1	<1	<1	<1	<1	<1		<1	<1	<1		<1
lead (C4SL)	mg/kg	200	41		42	16		38	49	36	44	46	43		36	22	48		49
Mercury	mg/kg	39	<0.17		<0.17	<0.17		<0.17	<0.17	<0.17	<0.17	<0.17	<0.17		<0.17	<0.17	<0.17		<0.17
Nickel	mg/kg	130	74		102	53		92	93	95	55	87	104		95	96	65		101
Selenium	mg/kg	258	<1		2	1		2	1	1	1	<1	1		2	<1	1		2
Zinc	mg/kg	3900	141		200	91		144	190	132	111	125	186		149	129	126		187
Total Petroleum Hydrocarbons Criteria Working Group (TPHCWG)																			
Ali >C5-C6	mg/kg	42										<0.01	<0.01		<0.01				
Ali >C6-C8	mg/kg	100										<0.01	<0.01		<0.01				
Ali >C8-C10	mg/kg	27										<0.01	<0.01		<0.01				
Ali >C10-C12	mg/kg	130										<0.1	<0.1		<0.1				
Ali >C12-C16	mg/kg	1100										<0.1	<0.1		<0.1				
Ali >C16-C21	mg/kg	Assess as sum below										<0.1	<0.1		<0.1				
Ali >C21-C35	mg/kg											<0.1	<0.1		<0.1				
Ali >C16-C35	mg/kg	65,000										0.2	0.2		0.2				
Total Aliphatics	mg/kg											<0.1	<0.1		<0.1				
Aro >C5-C7	mg/kg	0.2										<0.01	<0.01		<0.01				
Aro >C7-C8	mg/kg	130										<0.01	<0.01		<0.01				
Aro >C8-C9	mg/kg	11										<0.01	<0.01		<0.01				
Aro >C9-C10	mg/kg	30										<0.01	<0.01		<0.01				
Aro >C10-C12	mg/kg	80										<0.1	<0.1		<0.1				
Aro >C12-C16	mg/kg	140										<0.1	<0.1		<0.1				
Aro >C16-C21	mg/kg	260										<0.1	<0.1		<0.1				
Aro >C21-C35	mg/kg	1100										<0.1	<0.1		<0.1				
Total Aromatics	mg/kg											<0.1	<0.1		<0.1				
TPH (Ali & Aro)	mg/kg											<0.1	<0.1		<0.1				
BTEX - Benzene	mg/kg	0.2										<0.01	<0.01		<0.01				
BTEX - Toluene	mg/kg	130										<0.01	<0.01		<0.01				
BTEX - Ethyl Benzene	mg/kg	50										<0.01	<0.01		<0.01				
BTEX - m & p Xylene	mg/kg	57										<0.01	<0.01		<0.01				
BTEX - o Xylene	mg/kg	61										<0.01	<0.01		<0.01				
MTBE	mg/kg	130										<0.01	<0.01		<0.01				
PAHs (Polycyclic Aromatic Hydrocarbons)																			
Acenapthene	mg/kg	230								<0.01	<0.01	<0.01			<0.01		<0.01		
Acenapthylene	mg/kg	180								<0.01	<0.01	<0.01			<0.01		<0.01		
Anthracene	mg/kg	2400								<0.02	<0.02	<0.02			<0.02		<0.02		
Benzo(a)anthracene	mg/kg	7								<0.04	0.07	0.11			<0.04		0.07		
Benzo(a)pyrene	mg/kg	5								<0.04	0.07	0.13			<0.04		0.07		
Benzo(b)fluoranthene	mg/kg	2.6								<0.05	0.1	0.16			<0.05		0.1		
Benzo(ghi)perylene	mg/kg	310								<0.05	<0.05	0.08			<0.05		<0.05		
Benzo(k)fluoranthene	mg/kg	77								<0.07	<0.07	<0.07			<0.07		<0.07		
Chrysene	mg/kg	15								<0.06	0.1	0.13			<0.06		0.08		
Dibenzo(ah)anthracene	mg/kg	0.24								<0.04	<0.04	<0.04			<0.04		<0.04		
Fluoranthene	mg/kg	290								<0.08	0.13	0.16			<0.08		0.1		
Fluorene	mg/kg	170								<0.01	<0.01	<0.01			<0.01		<0.01		
Indeno(123-cd)pyrene	mg/kg	27								<0.03	0.05	0.1			<0.03		0.05		
Napthalene	mg/kg	13								<0.03	<0.03	<0.03			<0.03		<0.03		
Phenanthrene	mg/kg	100								<0.03	0.07	0.06			<0.03		0.04		
Pyrene	mg/kg	620								<0.07	0.11	0.14			<0.07		0.08		
Total PAH	mg/kg									<0.08	0.72	1.05			<0.08		0.61		
Organo Chlorine Pesticides (OCP) and Organo Phosphorous Pesticides (OPP)																			
Mevinphos	ug/kg					<50													
Dichlorvos	ug/kg	32				<50													
alpha-Hexachlorocyclohexane (HCH)	ug/kg	230				<50													
Diazinon	ug/kg					<50													
gamma-Hexachlorocyclohexane (HCH / Lindane)	ug/kg	60				<50													
Heptachlor	ug/kg					<50													
Aldrin	ug/kg	5700				<50													
beta-Hexachlorocyclohexane (HCH)	ug/kg	85				<50													
Methyl Parathion	ug/kg					<50													
Malathion	ug/kg					<50													
Fenitrothion	ug/kg					<50													
Heptachlor Epoxide	ug/kg					<50													
Parathion (Ethyl Parathion)	ug/kg					<50													
p,p-DDE	ug/kg					<50													
p,p-DDT	ug/kg					<50													
p,p-Methoxychlor	ug/kg					<50													
p,p-TDE (DDD)	ug/kg					<50													
o,p-DDE	ug/kg					<50													
o,p-DDT	ug/kg					<50													
o,p-Methoxychlor	ug/kg					<50													
o,p-TDE (DDD)	ug/kg					<50													
Endosulphan I	ug/kg	7400				<50													
Endosulphan II	ug/kg	7000				<50													
Endosulphan Sulphate	ug/kg					<50													

313498, Whitepost Road, Banbury- Human Health Risk Assessment Soil Results Summary Table and Direct Comparison

Sample Identity		Residential with Plant Uptake (1% SOM)	TP5	TP6	TP7	TP27	TP18	TP13	TP14	TP25	TP21	TP26	TP10	TP23	TP5	TP20	TP29	TP9	TP11
Depth		**SGV/GACs**	**0.00**	**1.10**	**0.10**	**0.20**	**0.40**	**0.35**	**0.40**	**0.25**	**0.35**	**0.30**	**0.20**	**0.40**	**0.20**	**0.50**	**0.20**	**0.10**	**0.20**
Strata																			
Determinants	**Units**																		
Endrin	ug/kg					<50													
Ethion	ug/kg					<50													
Dieldrin	ug/kg	970				<50													
Azinphos-methyl	ug/kg					<50													
Nitrogen Pests																			
Ametryn	µg/kg					<50													
Atraton	µg/kg					<50													
Atrazine	µg/kg	3300				<50													
Prometon	µg/kg					<50													
Prometryn	µg/kg					<50													
Propazine	µg/kg					<50													
Simazine	µg/kg					<50													
Simetryn	µg/kg					<50													
Terbuthylazine	µg/kg					<50													
Terbutryn	µg/kg					<50													
= Exceedance of GAC for a residential (with plant uptake) end-																			
All GACs calculated by RSK or taken from EIC/AGS/CLAIRE Generic Assessment Criteria																			

313498, Whitepost Road, Banbury- Human Health Risk Assessment Soil Results Summary Table and Direct Comparison

Sample Identity		Residential with Plant Uptake (1% SOM)	TP9	TP22	WS12	TP2
Depth		SGV/GACs	0.40	0.10	0.20	0.40
Strata						
Determinants	Units					
Visual Fibre Screen			NAD		NAD	
pH	pH			6.9		6.64
Sulphate BRE (water sol 2:1)	g/l					
Total Organic Carbon	% w/w					
Metals						
Arsenic	mg/kg	37		101		129
Boron (water soluble)	mg/kg			1.8		1.4
Cadmium	mg/kg	22		8.9		6.8
Copper	mg/kg	2500		<1		2
Chromium	mg/kg	910		222		186
Chromium (hexavalent)	mg/kg	21		<1		<1
lead (C4SL)	mg/kg	200		40		44
Mercury	mg/kg	39		<0.17		<0.17
Nickel	mg/kg	130		105		83
Selenium	mg/kg	258		3		2
Zinc	mg/kg	3900		143		192
Total Petroleum Hydrocarbons Criteria Working Group (TPHCWG)						
Ali >C5-C6	mg/kg	42		<0.01		<0.01
Ali >C6-C8	mg/kg	100		<0.01		<0.01
Ali >C8-C10	mg/kg	27		<0.01		<0.01
Ali >C10-C12	mg/kg	130		<0.1		<0.1
Ali >C12-C16	mg/kg	1100		<0.1		<0.1
Ali >C16-C21	mg/kg	Assess as sum		<0.1		<0.1
Ali >C21-C35	mg/kg	below		<0.1		<0.1
Ali >C16-C35	mg/kg	65,000		0.2		0.2
Total Aliphatics	mg/kg			<0.1		<0.1
Aro >C5-C7	mg/kg	0.2		<0.01		<0.01
Aro >C7-C8	mg/kg	130		<0.01		<0.01
Aro >C8-C9	mg/kg	11		<0.01		<0.01
Aro >C9-C10	mg/kg	30		<0.01		<0.01
Aro >C10-C12	mg/kg	80		<0.1		<0.1
Aro >C12-C16	mg/kg	140		<0.1		<0.1
Aro >C16-C21	mg/kg	260		<0.1		<0.1
Aro >C21-C35	mg/kg	1100		<0.1		<0.1
Total Aromatics	mg/kg			<0.1		<0.1
TPH (Ali & Aro)	mg/kg			<0.1		<0.1
BTEX - Benzene	mg/kg	0.2		<0.01		<0.01
BTEX - Toluene	mg/kg	130		<0.01		<0.01
BTEX - Ethyl Benzene	mg/kg	50		<0.01		<0.01
BTEX - m & p Xylene	mg/kg	57		<0.01		<0.01
BTEX - o Xylene	mg/kg	61		<0.01		<0.01
MTBE	mg/kg	130		<0.01		<0.01
PAHs (Polycyclic Aromatic Hydrocarbons)						
Acenapthene	mg/kg	230				<0.01
Acenapthylene	mg/kg	180				<0.01
Anthracene	mg/kg	2400				<0.02
Benzo(a)anthracene	mg/kg	7				<0.04
Benzo(a)pyrene	mg/kg	5				<0.04
Benzo(b)fluoranthene	mg/kg	2.6				0.06
Benzo(ghi)perylene	mg/kg	310				<0.05
Benzo(k)fluoranthene	mg/kg	77				<0.07
Chrysene	mg/kg	15				<0.06
Dibenzo(ah)anthracene	mg/kg	0.24				<0.04
Fluoranthene	mg/kg	290				<0.08
Fluorene	mg/kg	170				<0.01
Indeno(123-cd)pyrene	mg/kg	27				<0.03
Napthalene	mg/kg	13				<0.03
Phenanthrene	mg/kg	100				<0.03
Pyrene	mg/kg	620				<0.07
Total PAH	mg/kg					<0.08
Organo Chlorine Pesticides (OCP) and Organo Phosphorous Pesticides (OPP)						
Mevinphos	ug/kg				<50	
Dichlorvos	ug/kg	32			<50	
alpha-Hexachlorocyclohexane (HCH)	ug/kg	230			<50	
Diazinon	ug/kg				<50	
gamma-Hexachlorocyclohexane (HCH / Lindane)	ug/kg	60			<50	
Heptachlor	ug/kg				<50	
Aldrin	ug/kg	5700			<50	
beta-Hexachlorocyclohexane (HCH)	ug/kg	85			<50	
Methyl Parathion	ug/kg				<50	
Malathion	ug/kg				<50	
Fenitrothion	ug/kg				<50	
Heptachlor Epoxide	ug/kg				<50	
Parathion (Ethyl Parathion)	ug/kg				<50	
p,p-DDE	ug/kg				<50	
p,p-DDT	ug/kg				<50	
p,p-Methoxychlor	ug/kg				<50	
p,p-TDE (DDD)	ug/kg				<50	
o,p-DDE	ug/kg				<50	
o,p-DDT	ug/kg				<50	
o,p-Methoxychlor	ug/kg				<50	
o,p-TDE (DDD)	ug/kg				<50	
Endosulphan I	ug/kg	7400			<50	
Endosulphan II	ug/kg	7000			<50	
Endosulphan Sulphate	ug/kg				<50	

313498, Whitepost Road, Banbury- Human Health Risk Assessment Soil Results Summary Table and Direct Comparison

Sample Identity		Residential with Plant Uptake (1% SOM)	TP9	TP22	WS12	TP2
Depth		**SGV/GACs**	**0.40**	**0.10**	**0.20**	**0.40**
Strata						
Determinants	**Units**					
Endrin	ug/kg				<50	
Ethion	ug/kg				<50	
Dieldrin	ug/kg	970			<50	
Azinphos-methyl	ug/kg				<50	
Nitrogen Pests						
Ametryn	µg/kg				<50	
Atraton	µg/kg				<50	
Atrazine	µg/kg	3300			<50	
Prometon	µg/kg				<50	
Prometryn	µg/kg				<50	
Propazine	µg/kg				<50	
Simazine	µg/kg				<50	
Simetryn	µg/kg				<50	
Terbuthylazine	µg/kg				<50	
Terbutryn	µg/kg				<50	
= Exceedance of GAC for a residential (with plant uptake) end -						
All GACs calculated by RSK or taken from EIC/AGS/CLAIRE Generic Assessment Criteria						

APPENDIX K
COMPARISON OF LEACHATE DATA TO CONTROLLED WATERS ASSESSMENT CRITERIA

313498, Whitepost Road, Banbury - Tier 1 Groundwater Risk Assessment - Soil Leachate Results

Sample Identity		Tier 2 Target Concentration (LTC2)	WS6	WS9	WS10	TP4	TP27
Depth			0.00	0.00	0.20	0.20	0.20
Determinand	**Units**	**UK DWS**					
Metals							
Arsenic (leachable)	ug/l	10	<1	<1	2	<1	<1
Boron (leachable)	ug/l	1000	24	45	41	35	37
Cadmium (leachable)	ug/l	5	<1	<1	<1	<1	<1
Copper (leachable)	ug/l	2000	<1	2	7	1	1
Chromium (leachable)	ug/l	50	<1	<1	2	<1	<1
Hexavalent Chromium (leachable)	mg/l	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (leachable)	ug/l	10	<1	2	8	<1	<1
Mercury (leachable)	ug/l	1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel (leachable)	ug/l	20	<1	1	5	<1	1
Selenium (leachable)	ug/l	10	<1	<1	2	<1	<1
Zinc (leachable)	ug/l	3000	7	17	28	3	24

= exceedance of Tier 1 Target Concentration

APPENDIX L
HASWASTE ASSESSMENT

envirolab

Haswaste, developed by Dr. Iain Haslock.

White Post Road, Banbury - 313498

TP/WS/BH		WS1	WS1	WS2	WS3	WS4	WS5	WS6	WS7	WS8	WS9	WS9	WS10	WS11	WS12	TP1	TP3	TP4	TP5	TP6	TP7	TP27	TP18	TP13	TP14	TP25	TP21	TP26	TP10
Depth (m)		0.20	1.00	0.20	0.70	0.20	0.10	0.00	0.00	0.20	0.00	2.00	0.20	0.10	1.20	0.50	0.20	0.20	0.00	1.10	0.10	0.20	0.40	0.35	0.40	0.25	0.35	0.30	0.20
Envirolab reference																													
% Moisture	%																												
pH (soil)		6.46		7.89	6.91	7.82	7.17	7.86	6.60	6.70	7.03			6.88		6.79	6.71	7.23	6.77		7.09	7.22		6.78	6.16	6.68	6.26	7.60	5.65
pH (leachate)																													
Arsenic	mg/kg	168		51	66	105	58	84	123	106	58			84		148	139	124	77		141	44		87	125	81	54	76	129
Cadmium	mg/kg	8.7		7.1	5.1	8.3	5.8	8.1	7.8	8.2	4.9			6.7		8.9	7.7	8.9	6.2		8.4	4.3		8.2	8.0	8.2	4.7	7.6	9.4
Copper	updated v5.4e mg/kg	1		1	4	1	2	1	1	1	5			1		1	1	1	3		1	1		1	1	1	10	1	1
CrVI or Chromium	mg/kg	233		198	137	255	176	218	230	225	129			166		245	205	272	162		222	104		195	207	213	111	202	252
Lead	mg/kg	46		22	37	26	27	35	29	35	34			34		38	45	29	41		42	16		38	49	36	44	46	43
Mercury	mg/kg	0.17		0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17			0.17		0.17	0.17	0.17	0.17		0.17	0.17		0.17	0.17	0.17	0.17	0.17	0.17
Nickel	mg/kg	106		80	64	106	87	91	92	94	60			78		108	88	107	74		102	53		92	93	95	55	87	104
Selenium	mg/kg	2		2	1	1	1	2	1	2	1			1		2	1	1	1		2	1		2	1	1	1	1	1
Zinc	mg/kg	241		114	135	171	147	129	183	162	115			142		217	181	188	141		200	91		144	190	132	111	125	186
Barium	mg/kg																												
Beryllium	mg/kg																												
Vanadium	mg/kg																												
Cobalt	mg/kg																												
Manganese	mg/kg																												
Molybdenum	mg/kg																												
Antimony	mg/kg																												
Aluminium	mg/kg																												
Bismuth	mg/kg																												
CrIII	mg/kg																												
Iron	mg/kg																												
Strontium	mg/kg																												
Tellurium	mg/kg																												
Thallium	mg/kg																												
Titanium	mg/kg																												
Tungsten	mg/kg																												
Ammoniacal N	mg/kg																												
ws Boron	mg/kg																												
PAH (Input Total PAH **OR** individual PAH results)																													
Acenaphthene	mg/kg	0.01		0.01		0.01		0.01		0.01	0.01															0.01	0.01	0.01	
Acenaphthylene	mg/kg	0.01		0.01		0.01		0.01		0.01	0.01															0.01	0.01	0.01	
Anthracene	mg/kg	0.02		0.02		0.02		0.02		0.02	0.02															0.02	0.02	0.02	
Benzo(a)anthracene	mg/kg	0.04		0.04		0.04		0.04		0.04	0.07															0.04	0.07	0.11	
Benzo(a)pyrene	mg/kg	0.04		0.04		0.04		0.04		0.04	0.08															0.04	0.07	0.13	
Benzo(b)fluoranthene	mg/kg	0.05		0.05		0.05		0.05		0.05	0.11															0.05	0.10	0.16	
Benzo(ghi)perylene	mg/kg	0.05		0.05		0.05		0.05		0.05	0.05															0.05	0.05	0.08	
Benzo(k)fluoranthene	mg/kg	0.07		0.07		0.07		0.07		0.07	0.07															0.07	0.07	0.07	
Chrysene	mg/kg	0.06		0.06		0.06		0.06		0.06	0.08															0.06	0.10	0.13	
Dibenzo(ah)anthracene	mg/kg	0.04		0.04		0.04		0.04		0.04	0.04															0.04	0.04	0.04	
Fluoranthene	mg/kg	0.08		0.08		0.08		0.08		0.08	0.12															0.08	0.13	0.16	
Fluorene	mg/kg	0.01		0.01		0.01		0.01		0.01	0.01															0.01	0.01	0.01	
Indeno(123cd)pyrene	mg/kg	0.03		0.03		0.03		0.03		0.03	0.06															0.03	0.05	0.10	
Naphthalene	mg/kg	0.03		0.03		0.03		0.03		0.03	0.03															0.03	0.03	0.03	
Phenanthrene	mg/kg	0.03		0.03		0.03		0.03		0.03	0.05															0.03	0.07	0.06	
Pyrene	mg/kg	0.07		0.07		0.07		0.07		0.07	0.10															0.07	0.11	0.14	
Coronene	mg/kg																												
Total PAHs (16 or 17)	mg/kg																												
TPH																													
Petrol	mg/kg																												
Diesel	mg/kg																												
Lube Oil	mg/kg																												
Crude Oil	new v5.4e mg/kg																												
White Spirit / Kerosene	mg/kg																												
Creosote	mg/kg																												
Unknown TPH with ID	mg/kg																												
Unknown TPHCWG	mg/kg	0.1		0.2		0.2		0.1		0.1	0.1																	0.1	0.1
Total Sulphide	mg/kg																												
Complex Cyanide	mg/kg																												
Free (or Total) Cyanide	mg/kg																												
Thiocyanate	mg/kg																												
Elemental Free Sulphur	mg/kg																												
Phenols Input Total Phenols HPLC **OR** individual Phenol results.																													
Phenol	mg/kg																												
Cresols	mg/kg																												
Xylenols	mg/kg																												
Resourcinol	mg/kg																												
Phenols Total by HPLC	mg/kg																												
BTEX Input Total BTEX **OR** individual BTEX results.																													
Benzene	mg/kg																												
Toluene	mg/kg																												
Ethylbenzene	mg/kg																												
Xylenes	mg/kg																												
Total BTEX	mg/kg																												
PCBs (POPs)																													
PCBs Total (eg EC7/WHO12)	mg/kg																												
PBBs (POPs)																													
Hexabromobiphenyl (Total or PBB153; 2,2',4,4',5,5'- if only available)	mg/kg																												

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Haswaste, developed by Dr. Iain Haslock.

White Post Road, Banbury - 313498

TP/WS/BH	WS1	WS1	WS2	WS3	WS4	WS5	WS6	WS7	WS8	WS9	WS9	WS10	WS11	WS12	TP1	TP3	TP4	TP5	TP6	TP7	TP27	TP18	TP13	TP14	TP25	TP21	TP26	TP10
Depth (m)	0.20	1.00	0.20	0.70	0.20	0.10	0.00	0.00	0.20	0.00	2.00	0.20	0.10	1.20	0.50	0.20	0.20	0.00	1.10	0.10	0.20	0.40	0.35	0.40	0.25	0.35	0.30	0.20
Envirolab reference																												
POPs Dioxins and Furans Input Total Dioxins and Furans **OR** individual Dioxin and Furan results.																												
2,3,7,8-TeCDD	mg/kg																											
1,2,3,7,8-PeCDD	mg/kg																											
1,2,3,4,7,8-HxCDD	mg/kg																											
1,2,3,6,7,8-HxCDD	mg/kg																											
1,2,3,7,8,9-HxCDD	mg/kg																											
1,2,3,4,6,7,8-HpCDD	mg/kg																											
OCDD	mg/kg																											
2,3,7,8-TeCDF	mg/kg																											
1,2,3,7,8-PeCDF	mg/kg																											
2,3,4,7,8-PeCDF	mg/kg																											
1,2,3,4,7,8-HxCDF	mg/kg																											
1,2,3,6,7,8-HxCDF	mg/kg																											
2,3,4,6,7,8-HxCDF	mg/kg																											
1,2,3,7,8,9-HxCDF	mg/kg																											
1,2,3,4,6,7,8-HpCDF	mg/kg																											
1,2,3,4,7,8,9-HpCDF	mg/kg																											
OCDF	mg/kg																											
Total Dioxins and Furans	mg/kg																											
Some Pesticides (POPs unless otherwise stated)																												
Aldrin	mg/kg																											
α Hexachlorocyclohexane (alpha-HCH) *(leave empty if total HCH results used)*	mg/kg																											
β Hexachlorocyclohexane (beta-HCH) *(leave empty if total HCH results used)*	mg/kg																											
α Cis-Chlordane (alpha) ***OR*** *Total Chlordane*	mg/kg																											
δ Hexachlorocyclohexane (delta-HCH) *(leave empty if total HCH results used)*	mg/kg																											
Dieldrin	mg/kg																											
Endrin	mg/kg																											
γ Hexachlorocyclohexane (gamma-HCH) (lindane) ***OR*** *Total HCH*	mg/kg																											
Heptachlor	mg/kg																											
Hexachlorobenzene	mg/kg																											
p,p'-DDT *(leave empty if total DDT results used)*	mg/kg																											
p,p'-DDT ***OR*** *Total DDT*	mg/kg																											
γ Trans-Chlordane (gamma) *(leave empty if total Chlordane results used)*	mg/kg																											
Chlordecone (kepone)	mg/kg																											
Pentachlorobenzene	mg/kg																											
Mirex	mg/kg																											
Toxaphene (camphechlor)	mg/kg																											
Tin																												
Tin *(leave empty if Organotin and Tin excl Organotin results used)*	mg/kg																											
Organotin																												
Dibutyltin; DBT	mg/kg																											
Tributyltin; TriBT	mg/kg																											
Triphenyltin; TriPT	mg/kg																											
Tetrabutyltin; TeBT	mg/kg																											
Tin excluding Organotin																												
Tin excl Organotin	mg/kg																											

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White Post Road, Banbury - 313498

TP/WS/BH	WS1	WS1	WS2	WS3	WS4	WS5	WS6	WS7	WS8	WS9	WS9	WS10	WS11	WS12	TP1	TP3	TP4	TP5	TP6	TP7	TP27	TP18	TP13	TP14	TP25	TP21	TP26	TP10
Depth (m)	0.20	1.00	0.20	0.70	0.20	0.10	0.00	0.00	0.20	0.00	2.00	0.20	0.10	1.20	0.50	0.20	0.20	0.00	1.10	0.10	0.20	0.40	0.35	0.40	0.25	0.35	0.30	0.20
Envirolab reference																												

Asbestos in Soil	Thresholds																												
Asbestos detected in Soil (enter Y or N)	Y	NAD		NAD		NAD		NAD	NAD	NAD	NAD					NAD						NAD							
		Asbestos in Soil above is "Y", the soil is Hazardous Waste HP5 and HP7										Asbestos in Soil above is "Y", the soil is Hazardous Waste HP5 and HP7										Asbestos in Soil above is "Y", the soil is Hazardous Waste HP5 and HP7							
Asbestos % Composition in Soil (Matrix Loose Fibres or Microscopic Identifiable Pieces only)	see "Carc HP7 % Asbestos in Soil (Fibres)" below	%																											
Carcinogenic HP7 % Asbestos in Soil (fibres or micro pieces)	≥0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		If Asbestos in Soil above is "Y", but Asbestos % above is "<0.1%", the soil is Non Hazardous Waste. You can only use Asbestos % results where loose fibres or micro pieces are only present. You cannot use Asbestos % results when visual identifiable pieces are present.										If Asbestos in Soil above is "Y", but Asbestos % above is "<0.1%", the soil is Non Hazardous Waste. You can only use Asbestos % results where loose fibres or micro pieces are only present. You cannot use Asbestos % results when visual identifiable pieces are present.										If Asbestos in Soil above is "Y", but Asbestos % above is "<0.1%", the soil is Non Hazardous Waste. You can only use Asbestos % results where loose fibres or micro pieces are only present. You cannot use Asbestos % results when visual identifiable pieces are present.							If Asbestos in Soil a
Asbestos Identifiable Pieces visible with the naked eye detected in the Soil (enter Y or N)	Y																												
		If visual identifiable pieces of asbestos are present, you cannot use Asbestos % results and the whole soil sample is Hazardous Waste HP5 and HP7 Construction material containing Asbestos 17 06 05. Therefore, if Asbestos in Soil above is "Y", the Asbestos % above is "<0.1%", but the Asbestos Identifiable Pieces visible with the naked eye is "Y", the soil is Hazardous Waste.										If visual identifiable pieces of asbestos are present, you cannot use Asbestos % results and the whole soil sample is Hazardous Waste HP5 and HP7 Construction material containing Asbestos 17 06 05. Therefore, if Asbestos in Soil above is "Y", the Asbestos % above is "<0.1%", but the Asbestos Identifiable Pieces visible with the naked eye is "Y", the soil is Hazardous Waste.										If visual identifiable pieces of asbestos are present, you cannot use Asbestos % results and the whole soil sample is Hazardous Waste HP5 and HP7 Construction material containing Asbestos 17 06 05. Therefore, if Asbestos in Soil above is "Y", the Asbestos % above is "<0.1%", but the Asbestos Identifiable Pieces visible with the naked eye is "Y", the soil is Hazardous Waste.							If visual identifiable p 05. Therefo
		Identifiable Pieces are Cement, Fragments, Board, Rope etc. ie anything ACM that is not Loose Fibres.										Identifiable Pieces are Cement, Fragments, Board, Rope etc. ie anything ACM that is not Loose Fibres.										Identifiable Pieces are Cement, Fragments, Board, Rope etc. ie anything ACM that is not Loose Fibres.							
		All visual asbestos pieces need to be removed leaving only fibres (or micro pieces) with an Asbestos % Composition in Soil result of <0.1% for the soil to become non-hazardous waste.										All visual asbestos pieces need to be removed leaving only fibres (or micro pieces) with an Asbestos % Composition in Soil result of <0.1% for the soil to become non-hazardous waste.										All visual asbestos pieces need to be removed leaving only fibres (or micro pieces) with an Asbestos % Composition in Soil result of <0.1% for the soil to become non-hazardous waste.							All visual asbe

Hazardous Property	Threshold	Cut Off Value																											
Corrosive HP8	≥5%	<1%	0.06891	0.00000	0.04475	0.03502	0.06282	0.04145	0.05294	0.06040	0.05719	0.03242	0.00000	0.00000	0.04296	0.00000	0.06658	0.05771	0.06859	0.04127	0.00000	0.06124	0.02578	0.00000	0.04892	0.05624	0.05159	0.02844	0.04882	0.06541
Irritant HP4	≥10%	<1%	0.02229	0.00000	0.00685	0.00916	0.01397	0.00788	0.01120	0.01635	0.01411	0.00822	0.00000	0.00000	0.01120	0.00000	0.01965	0.01846	0.01648	0.01050	0.00000	0.01873	0.00592	0.00000	0.01160	0.01661	0.01081	0.00826	0.01015	0.01714
Irritant HP4	≥20%	<1%	0.02154	0.00000	0.01629	0.01338	0.02154	0.01780	0.01851	0.01870	0.01912	0.01270	0.00000	0.00000	0.01587	0.00000	0.02193	0.01789	0.02173	0.01529	0.00000	0.02072	0.01082	0.00000	0.01870	0.01890	0.01932	0.01226	0.01771	0.02112
Specific Target Organ Toxicity HP5	≥1%		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Specific Target Organ Toxicity HP5	≥20%		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00001	0.00000
Specific Target Organ Toxicity HP5	≥1%		0.04474	0.00000	0.03802	0.02630	0.04896	0.03379	0.04186	0.04416	0.04320	0.02477	0.00000	0.00000	0.03187	0.00000	0.04704	0.03936	0.05222	0.03110	0.00000	0.04262	0.01997	0.00000	0.03744	0.03974	0.04090	0.02131	0.03878	0.04838
Specific Target Organ Toxicity HP5	≥10%		0.03013	0.00000	0.01425	0.01688	0.02138	0.01838	0.01613	0.02288	0.02025	0.01438	0.00000	0.00000	0.01775	0.00000	0.02713	0.02263	0.02350	0.01763	0.00000	0.02500	0.01138	0.00000	0.01800	0.02375	0.01650	0.01388	0.01563	0.02325
Aspiration Toxicity HP5	≥10%		0.00001	0.00000	0.00002	0.00000	0.00002	0.00000	0.00001	0.00000	0.00001	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00001
Acute Toxicity HP6	≥0.1%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.25%	<0.1%	0.02219	0.00000	0.00675	0.00873	0.01388	0.00767	0.01111	0.01625	0.01401	0.00767	0.00000	0.00000	0.01111	0.00000	0.01955	0.01837	0.01639	0.01018	0.00000	0.01863	0.00583	0.00000	0.01150	0.01652	0.01071	0.00715	0.01005	0.01705
Acute Toxicity HP6	≥5%	<0.1%	0.04502	0.00000	0.03830	0.02645	0.04910	0.03393	0.04214	0.04430	0.04348	0.02491	0.00000	0.00000	0.03201	0.00000	0.04732	0.03950	0.05237	0.03125	0.00000	0.04291	0.02011	0.00000	0.03772	0.03989	0.04104	0.02145	0.03893	0.04853
Acute Toxicity HP6	≥25%	<1%	0.05714	0.00000	0.03345	0.03447	0.04635	0.03946	0.03895	0.04525	0.04369	0.03097	0.00000	0.00000	0.03769	0.00000	0.05374	0.04578	0.04902	0.03763	0.00000	0.05076	0.02422	0.00000	0.04132	0.04835	0.04024	0.03101	0.03870	0.04961
Acute Toxicity HP6	≥0.25%	<0.1%	0.00002	0.00000	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00000	0.00000	0.00002	0.00000	0.00002	0.00002	0.00002	0.00002	0.00000	0.00002	0.00002	0.00000	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Acute Toxicity HP6	≥2.5%	<0.1%	0.04474	0.00000	0.03802	0.02630	0.04896	0.03379	0.04186	0.04416	0.04320	0.02477	0.00000	0.00000	0.03187	0.00000	0.04704	0.03936	0.05222	0.03110	0.00000	0.04262	0.01997	0.00000	0.03744	0.03974	0.04090	0.02131	0.03878	0.04838
Acute Toxicity HP6	≥15%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥50%	<1%	0.00087	0.00000	0.00071	0.00051	0.00083	0.00058	0.00081	0.00078	0.00082	0.00049	0.00000	0.00000	0.00067	0.00000	0.00089	0.00077	0.00089	0.00062	0.00000	0.00084	0.00043	0.00000	0.00082	0.00080	0.00082	0.00047	0.00076	0.00094
Acute Toxicity HP6	≥0.1%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.5%	<0.1%	0.04562	0.00000	0.03874	0.02683	0.04981	0.03439	0.04268	0.04496	0.04404	0.02528	0.00000	0.00000	0.03256	0.00000	0.04795	0.04015	0.05313	0.03174	0.00000	0.04348	0.02042	0.00000	0.03828	0.04056	0.04173	0.02180	0.03956	0.04934
Acute Toxicity HP6	≥3.5%	<0.1%	0.00028	0.00000	0.00028	0.00014	0.00014	0.00014	0.00028	0.00014	0.00028	0.00014	0.00000	0.00000	0.00014	0.00000	0.00028	0.00014	0.00014	0.00014	0.00000	0.00028	0.00014	0.00000	0.00028	0.00014	0.00014	0.00014	0.00014	0.00014
Acute Toxicity HP6	≥12.5%	<1%	0.05625	0.00000	0.03272	0.03396	0.04550	0.03888	0.03612	0.04447	0.04285	0.03046	0.00000	0.00000	0.03762	0.00000	0.05265	0.04501	0.04813	0.03701	0.00000	0.04992	0.02379	0.00000	0.04050	0.04755	0.03940	0.03052	0.03791	0.04867
Carcinogenic HP7	≥0.1%		0.04474	0.00000	0.03802	0.02630	0.04896	0.03379	0.04186	0.04416	0.04320	0.02477	0.00000	0.00000	0.03187	0.00000	0.04704	0.03936	0.05222	0.03110	0.00000	0.04262	0.01997	0.00000	0.03744	0.03974	0.04090	0.02131	0.03878	0.04838
Carcinogenic HP7	≥0.1%		0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
Carcinogenic HP7	≥1%		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00001	0.00000
Carcinogenic HP7 Unknown TPH with ID	≥1,000mg/kg		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carcinogenic HP7 b(a)p marker test (Unknown TPH with ID only)	≥0.01%		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
pH Corrosive HP8 pH (soil or leachate)	H8 ≥11.5		6.46	0.00	7.89	6.91	7.82	7.17	7.86	6.60	6.70	7.03	0.00	0.00	6.88	0.00	6.79	6.71	7.23	6.77	0.00	7.09	7.22	0.00	6.78	6.16	6.68	6.26	7.60	5.65
pH Corrosive HP8 pH (soil or leachate)	H8 ≤2		6.46	0.00	7.89	6.91	7.82	7.17	7.86	6.60	6.70	7.03	0.00	0.00	6.88	0.00	6.79	6.71	7.23	6.77	0.00	7.09	7.22	0.00	6.78	6.16	6.68	6.26	7.60	5.65
Toxic for Reproduction HP10	≥0.3%		0.03013	0.00000	0.01616	0.01688	0.02141	0.01838	0.01838	0.02288	0.02025	0.01438	0.00000	0.00000	0.01775	0.00000	0.02713	0.02263	0.02350	0.01763	0.00000	0.02500	0.01138	0.00000	0.01858	0.02375	0.01919	0.01388	0.01757	0.02325
Toxic for Reproduction HP10	≥3%		0.04474	0.00000	0.03802	0.02630	0.04896	0.03379	0.04186	0.04416	0.04320	0.02477	0.00000	0.00000	0.03187	0.00000	0.04704	0.03936	0.05222	0.03110	0.00000	0.04262	0.01997	0.00000	0.03744	0.03974	0.04090	0.02131	0.03878	0.04838
Mutagenic HP11	≥0.1%		0.04474	0.00000	0.03802	0.02630	0.04896	0.03379	0.04186	0.04416	0.04320	0.02477	0.00000	0.00000	0.03187	0.00000	0.04704	0.03936	0.05222	0.03110	0.00000	0.04262	0.01997	0.00000	0.03744	0.03974	0.04090	0.02131	0.03878	0.04838
Mutagenic HP11 Unknown TPH with ID	≥1,000mg/kg		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mutagenic HP11 b(a)p marker test (Unknown TPH with ID only)	≥0.01%		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Mutagenic HP11	≥1%		0.02141	0.00000	0.01616	0.01293	0.02141	0.01757	0.01838	0.01858	0.01899	0.01212	0.00000	0.00000	0.01576	0.00000	0.02182	0.01778	0.02161	0.01495	0.00000	0.02060	0.01071	0.00000	0.01858	0.01879	0.01919	0.01111	0.01757	0.02101
Produces Toxic Gases HP12 Sulphide	≥1,400mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Produces Toxic Gases HP12 Cyanide	≥1,200mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Produces Toxic Gases HP12 Thiocyanate	≥2,600mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HP13 Sensitising	≥10%		0.04474	0.00000	0.03802	0.02630	0.04896	0.03379	0.04186	0.04416	0.04320	0.02477	0.00000	0.00000	0.03187	0.00000	0.04704	0.03936	0.05222	0.03110	0.00000	0.04262	0.01997	0.00000	0.03744	0.03974	0.04090	0.02131	0.03878	0.04838
Ecotoxic HP14	≥1.0	<0.1% (except CompCN + Thiocyanate + Xylene + BTEX 1%)	0.49756	0.00000	0.31416	0.27856	0.43747	0.32424	0.36892	0.42322	0.40488	0.25445	0.00000	0.00000	0.32323	0.00000	0.48248	0.41460	0.47107	0.31623	0.00000	0.44917	0.20063	0.00000	0.36216	0.41900	0.36810	0.23866	0.35102	0.46073
Ecotoxic HP14	≥25%	<0.1%	0.12439	0.00000	0.07854	0.06964	0.10937	0.08106	0.09223	0.10581	0.10122	0.06362	0.00000	0.00000	0.08081	0.00000	0.12062	0.10365	0.11777	0.07906	0.00000	0.11229	0.05016	0.00000	0.09054	0.10475	0.09203	0.05967	0.08776	0.11518
Ecotoxic HP14	≥25%	<0.1% (except CompCN + Thiocyanate + Xylene + BTEX 1%)	0.12440	0.00000	0.07856	0.06964	0.10939	0.08106	0.09224	0.10581	0.10123	0.06362	0.00000	0.00000	0.08081	0.00000	0.12062	0.10365	0.11777	0.07906	0.00000	0.11229	0.05016	0.00000	0.09054	0.10475	0.09203	0.05966	0.08777	0.11519
Ecotoxic HP14 individual substance specific thresholds (Benzo(a)anthracene, Dibenz(ah)anthracene (or Total PAH if only used), Sn, TriPT)	≥0.0025%		0.000004	0.000000	0.000004	0.000000	0.000004	0.000000	0.000004	0.000000	0.000004	0.000007	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000004	0.000007	0.000011	0.000000
Ecotoxic HP14 individual substance specific thresholds (Cb, γ-HCH, DiBT, TriBT)	≥0.025%		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Persistent Organic Pollutant (PCB, PBB or POP Pesticides)	>0.003%		0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Persistent Organic Pollutant (Total Dioxins+Furans)	>0.000001%		0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000
Persistent Organic Pollutant (Individual Dioxins+Furans)	>0.000001%		0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000

If other contaminants need adding to Haswaste, please contact Envirolab.

Envirolab, Sandpits Business Park, Mottram Road, Hyde, Cheshire SK14 3AR.

envirolab

Haswaste, developed by Dr. Iain Haslock.

White Post Road, Banbury - 313498

TP/WS/BH		TP23	TP5	TP20	TP29	TP9	TP11	TP9	TP22	WS12	TP2							
Depth (m)		0.40	0.20	0.50	0.20	0.10	0.20	0.40	0.10	0.20	0.40							
Envirolab reference																		
% Moisture	%																	
pH (soil)			6.54	7.00	6.56		6.05		6.90		6.64							
pH (leachate)																		
Arsenic	mg/kg		99	89	80		134		101		129							
Cadmium	mg/kg		8.1	6.9	5.1		8.4		8.9		6.8							
Copper	updated v5.4e mg/kg		1	1	7		1		1		2							
CrVI or Chromium	mg/kg		205	191	124		225		222		186							
Lead	mg/kg		36	22	48		49		40		44							
Mercury	mg/kg		0.17	0.17	0.17		0.17		0.17		0.17							
Nickel	mg/kg		95	96	65		101		105		83							
Selenium	mg/kg		2	1	1		2		3		2							
Zinc	mg/kg		149	129	126		187		143		192							
Barium	mg/kg																	
Beryllium	mg/kg																	
Vanadium	mg/kg																	
Cobalt	mg/kg																	
Manganese	mg/kg																	
Molybdenum	mg/kg																	
Antimony	mg/kg																	
Aluminium	mg/kg																	
Bismuth	mg/kg																	
CrIII	mg/kg																	
Iron	mg/kg																	
Strontium	mg/kg																	
Tellurium	mg/kg																	
Thallium	mg/kg																	
Titanium	mg/kg																	
Tungsten	mg/kg																	
Ammoniacal N	mg/kg																	
ws Boron	mg/kg																	
PAH (Input Total PAH **OR** individual PAH results)																		
Acenaphthene	mg/kg		0.01		0.01						0.01							
Acenaphthylene	mg/kg		0.01		0.01						0.01							
Anthracene	mg/kg		0.02		0.02						0.02							
Benzo(a)anthracene	mg/kg		0.04		0.07						0.04							
Benzo(a)pyrene	mg/kg		0.04		0.07						0.04							
Benzo(b)fluoranthene	mg/kg		0.05		0.10						0.06							
Benzo(ghi)perylene	mg/kg		0.05		0.05						0.05							
Benzo(k)fluoranthene	mg/kg		0.07		0.07						0.07							
Chrysene	mg/kg		0.06		0.08						0.06							
Dibenzo(ah)anthracene	mg/kg		0.04		0.04						0.04							
Fluoranthene	mg/kg		0.08		0.10						0.08							
Fluorene	mg/kg		0.01		0.01						0.01							
Indeno(123cd)pyrene	mg/kg		0.03		0.05						0.03							
Naphthalene	mg/kg		0.03		0.03						0.03							
Phenanthrene	mg/kg		0.03		0.04						0.03							
Pyrene	mg/kg		0.07		0.08						0.07							
Coronene	mg/kg																	
Total PAHs (16 or 17)	mg/kg																	
TPH																		
Petrol	mg/kg																	
Diesel	mg/kg																	
Lube Oil	mg/kg																	
Crude Oil	new v5.4e mg/kg																	
White Spirit / Kerosene	mg/kg																	
Creosote	mg/kg																	
Unknown TPH with ID	mg/kg																	
Unknown TPHCWG	mg/kg		0.1						0.1		0.1							
Total Sulphide	mg/kg																	
Complex Cyanide	mg/kg																	
Free (or Total) Cyanide	mg/kg																	
Thiocyanate	mg/kg																	
Elemental/Free Sulphur	mg/kg																	
Phenols Input Total Phenols HPLC **OR** individual Phenol results.																		
Phenol	mg/kg																	
Cresols	mg/kg																	
Xylenols	mg/kg																	
Resourcinol	mg/kg																	
Phenols Total by HPLC	mg/kg																	
BTEX Input Total BTEX **OR** individual BTEX results.																		
Benzene	mg/kg																	
Toluene	mg/kg																	
Ethylbenzene	mg/kg																	
Xylenes	mg/kg																	
Total BTEX	mg/kg																	
PCBs (POPs)																		
PCBs Total (eg EC7/WHO12)	mg/kg																	
PBBs (POPs)																		
Hexabromobiphenyl (Total or PBB153) 2,2',4,4',5,5'- if only available)	mg/kg																	

Haswaste, developed by Dr. Iain Haslock.

White Post Road, Banbury - 313498

TP/WS/BH		TP23	TP5	TP20	TP29	TP9	TP11	TP9	TP22	WS12	TP2							
Depth (m)		0.40	0.20	0.50	0.20	0.10	0.20	0.40	0.10	0.20	0.40							
Envirolab reference																		
POPs Dioxins and Furans Input Total Dioxins and Furans **OR** individual Dioxin and Furan results.																		
2,3,7,8-TeCDD	mg/kg																	
1,2,3,7,8-PeCDD	mg/kg																	
1,2,3,4,7,8-HxCDD	mg/kg																	
1,2,3,6,7,8-HxCDD	mg/kg																	
1,2,3,7,8,9-HxCDD	mg/kg																	
1,2,3,4,6,7,8-HpCDD	mg/kg																	
OCDD	mg/kg																	
2,3,7,8-TeCDF	mg/kg																	
1,2,3,7,8-PeCDF	mg/kg																	
2,3,4,7,8-PeCDF	mg/kg																	
1,2,3,4,7,8-HxCDF	mg/kg																	
1,2,3,6,7,8-HxCDF	mg/kg																	
2,3,4,6,7,8-HxCDF	mg/kg																	
1,2,3,7,8,9-HxCDF	mg/kg																	
1,2,3,4,6,7,8-HpCDF	mg/kg																	
1,2,3,4,7,8,9-HpCDF	mg/kg																	
OCDF	mg/kg																	
Total Dioxins and Furans	mg/kg																	
Some Pesticides (POPs unless otherwise stated)																		
Aldrin	mg/kg																	
α Hexachlorocyclohexane (alpha-HCH) *(leave empty if total HCH results used)*	mg/kg																	
β Hexachlorocyclohexane (beta-HCH) *(leave empty if total HCH results used)*	mg/kg																	
α Cis-Chlordane (alpha) ***OR*** *Total Chlordane*	mg/kg																	
δ Hexachlorocyclohexane (delta-HCH) *(leave empty if total HCH results used)*	mg/kg																	
Dieldrin	mg/kg																	
Endrin	mg/kg																	
γ Hexachlorocyclohexane (gamma-HCH) (lindane) ***OR*** *Total HCH*	mg/kg																	
Heptachlor	mg/kg																	
Hexachlorobenzene	mg/kg																	
p,p'-DDT *(leave empty if total DDT results used)*	mg/kg																	
p,p'-DDT ***OR*** *Total DDT*	mg/kg																	
γ Trans-Chlordane (gamma) *(leave empty if total Chlordane results used)*	mg/kg																	
Chlordecone (kepone)	mg/kg																	
Pentachlorobenzene	mg/kg																	
Mirex	mg/kg																	
Toxaphene (camphechlor)	mg/kg																	
Tin																		
Tin *(leave empty if Organotin and Tin excl Organotin results used)*	mg/kg																	
Organotin																		
Dibutyltin; DBT	mg/kg																	
Tributyltin; TriBT	mg/kg																	
Triphenyltin; TriPT	mg/kg																	
Tetrabutyltin; TeBT	mg/kg																	
Tin excluding Organotin																		
Tin excl Organotin	mg/kg																	

envirolab

Haswaste, developed by Dr. Iain Haslock.

White Post Road, Banbury - 313498

TP/WS/BH	TP23	TP5	TP20	TP29	TP9	TP11	TP9	TP22	WS12	TP2							
Depth (m)	0.40	0.20	0.50	0.20	0.10	0.20	0.40	0.10	0.20	0.40							
Envirolab reference																	
Asbestos in Soil	Thresholds																
Asbestos detected in Soil (enter Y or N)	Y	NAD				NAD			NAD		NAD							
		Asbestos in Soil above is "Y", the soil is Hazardous Waste HP5 and HP7										Asbestos in Soil above is "Y", the soil is Hazardous Waste HP5 and HP7						
Asbestos % Composition in Soil (Matrix Loose Fibres or Microscopic Identifiable Pieces only)	see "Carc HP7 % Asbestos in Soil (Fibres)" below	%																
Carcinogenic HP7 % Asbestos in Soil (fibres or micro pieces)	≥0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		bove is "Y", but Asbestos % above is "<0.1%", the soil is Non Hazardous Waste. You can only use Asbestos % results where loose fibres or micro pieces are only present. You cannot use Asbestos % results when visual identifiable pieces are present.									If Asbestos in Soil above is "Y", but Asbestos % above is "<0.1%", the soil is Non Hazardous Waste. You can only use Asbestos % results where loose fibres or micro pieces are only present. You cannot use Asbestos % results when visual identifiable pieces are present.							
Asbestos Identifiable Pieces visible with the naked eye detected in the Soil (enter Y or N)	Y																	
		ieces of asbestos are present, you cannot use Asbestos % results and the whole soil sample is Hazardous Waste HP5 and HP7 Construction material containing Asbestos 17 06									If visual identifiable pieces of asbestos are present, you cannot use Asbestos % results and the whole soil sample is Hazardous Waste HP5 and HP7 Construction material containing Asbestos 17 06							
		re, if Asbestos in Soil above is "Y", the Asbestos % above is "<0.1%", but the Asbestos Identifiable Pieces visible with the naked eye is "Y", the soil is Hazardous Waste.									05. Therefore, if Asbestos in Soil above is "Y", the Asbestos % above is "<0.1%", but the Asbestos Identifiable Pieces visible with the naked eye is "Y", the soil is Hazardous Waste.							
		Identifiable Pieces are Cement, Fragments, Board, Rope etc. ie anything ACM that is not Loose Fibres.									Identifiable Pieces are Cement, Fragments, Board, Rope etc. ie anything ACM that is not Loose Fibres.							
		stos pieces need to be removed leaving only fibres (or micro pieces) with an Asbestos % Composition in Soil result of <0.1% for the soil to become non-hazardous waste.									All visual asbestos pieces need to be removed leaving only fibres (or micro pieces) with an Asbestos % Composition in Soil result of <0.1% for the soil to become non-hazardous waste.							
Hazardous Property	Thresholds	Cut Off/ Value																
Corrosive HP8	≥5%	<1%	0.00000	0.05243	0.04842	0.03437	0.00000	0.06089	0.00000	0.05596	0.00000	0.05274	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Irritant HP4	≥10%	<1%	0.00000	0.01318	0.01186	0.01135	0.00000	0.01780	0.00000	0.01545	0.00000	0.01725	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Irritant HP4	≥20%	<1%	0.00000	0.01932	0.01951	0.01394	0.00000	0.02052	0.00000	0.02132	0.00000	0.01701	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Specific Target Organ Toxicity HP5	≥1%		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Specific Target Organ Toxicity HP5	≥20%		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Specific Target Organ Toxicity HP5	≥1%		0.00000	0.03936	0.03667	0.02381	0.00000	0.04320	0.00000	0.04262	0.00000	0.03571	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Specific Target Organ Toxicity HP5	≥10%		0.00000	0.01863	0.01613	0.01575	0.00000	0.02338	0.00000	0.01788	0.00000	0.02400	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Aspiration Toxicity HP5	≥10%		0.00000	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00000	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.1%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.25%	<0.1%	0.00000	0.01309	0.01177	0.01058	0.00000	0.01771	0.00000	0.01335	0.00000	0.01705	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥5%	<0.1%	0.00000	0.03944	0.03681	0.02395	0.00000	0.04348	0.00000	0.04305	0.00000	0.03599	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥25%	<1%	0.00000	0.04235	0.03852	0.03500	0.00000	0.04983	0.00000	0.04409	0.00000	0.04609	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.25%	<0.1%	0.00000	0.00002	0.00002	0.00002	0.00000	0.00002	0.00000	0.00002	0.00000	0.00002	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥2.5%	<0.1%	0.00000	0.03936	0.03667	0.02381	0.00000	0.04320	0.00000	0.04262	0.00000	0.03571	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥15%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥50%	<1%	0.00000	0.00081	0.00069	0.00051	0.00000	0.00084	0.00000	0.00089	0.00000	0.00068	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.1%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.5%	<0.1%	0.00000	0.04019	0.03738	0.02434	0.00000	0.04406	0.00000	0.04353	0.00000	0.03641	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥3.5%	<0.1%	0.00000	0.00028	0.00014	0.00014	0.00000	0.00028	0.00000	0.00042	0.00000	0.00028	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥22.5%	<1%	0.00000	0.04153	0.03783	0.03447	0.00000	0.04879	0.00000	0.04320	0.00000	0.04539	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Carcinogenic HP7	≥0.1%		0.00000	0.03936	0.03667	0.02381	0.00000	0.04320	0.00000	0.04262	0.00000	0.03571	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Carcinogenic HP7	≥0.1%		0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
Carcinogenic HP7	≥1%		0.00000	0.00000	0.00000	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Carcinogenic HP7 Unknown TPH with ID	≥1,000mg/kg		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carcinogenic HP7 b(a)p marker test (Unknown TPH with ID only)	≥0.01%		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
pH Corrosive HP8 pH (soil or leachate)	H8 ≥11.5		0.00	6.54	7.00	6.56	0.00	6.05	0.00	6.90	0.00	6.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00
pH Corrosive HP8 pH (soil or leachate)	H8 ≤2		0.00	6.54	7.00	6.56	0.00	6.05	0.00	6.90	0.00	6.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Toxic for Reproduction HP10	≥0.3%		0.00000	0.01919	0.01939	0.01575	0.00000	0.02338	0.00000	0.02121	0.00000	0.02400	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Toxic for Reproduction HP10	≥3%		0.00000	0.03936	0.03667	0.02381	0.00000	0.04320	0.00000	0.04262	0.00000	0.03571	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Mutagenic HP11	≥0.1%		0.00000	0.03936	0.03667	0.02381	0.00000	0.04320	0.00000	0.04262	0.00000	0.03571	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Mutagenic HP11 Unknown TPH with ID	≥1,000mg/kg		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mutagenic HP11 b(a)p marker test (Unknown TPH with ID only)	≥0.01%		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Mutagenic HP11	≥1%		0.00000	0.01919	0.01939	0.01313	0.00000	0.02040	0.00000	0.02121	0.00000	0.01677	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Produces Toxic Gases HP12 Sulphide	≥1,400mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Produces Toxic Gases HP12 Cyanide	≥1,200mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Produces Toxic Gases HP12 Thiocyanate	≥2,600mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HP13 Sensitising	≥10%		0.00000	0.03936	0.03667	0.02381	0.00000	0.04320	0.00000	0.04262	0.00000	0.03571	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Ecotoxic HP14	≥1.0	<0.1% (except CompCN + Thiocyanate + Xylene + BTEX 1%)	0.00000	0.38049	0.34839	0.27832	0.00000	0.44327	0.00000	0.40194	0.00000	0.39668	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Ecotoxic HP14	≥25%	<0.1%	0.00000	0.09513	0.08710	0.06958	0.00000	0.11082	0.00000	0.10048	0.00000	0.09917	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Ecotoxic HP14	≥25%	<0.1% (except CompCN + Thiocyanate + Xylene + BTEX 1%)	0.00000	0.09513	0.08710	0.06958	0.00000	0.11082	0.00000	0.10049	0.00000	0.09918	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Ecotoxic HP14 individual substance specific thresholds (Benzo(a)anthracene, Dibenz(ah)anthracene (or Total PAH if only used), Sn, TriPT)	≥0.0025%		0.000000	0.000004	0.000000	0.000007	0.000000	0.000000	0.000000	0.000000	0.000000	0.000004	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Ecotoxic HP14 individual substance specific thresholds (Cb, γ-HCH, DiBT, TriBT)	≥0.025%		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Persistent Organic Pollutant (PCB, PBB or POP Pesticides)	>0.003%		0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
Persistent Organic Pollutant (Total Dioxins+Furans)	>0.000001%		0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000
Persistent Organic Pollutant (Individual Dioxins+Furans)	>0.000001%		0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000	0.00000000000

If other contaminants need adding to Haswaste, please cont

APPENDIX M
STATISTICS SUMMARY SHEET, CLEA MODEL AND PBET RESULTS

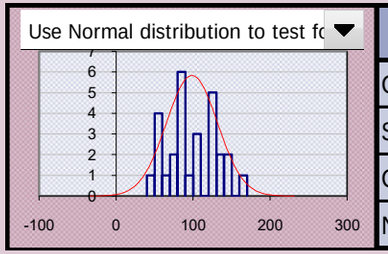
Test Results

Client/client ref: Gladmans
Project ref: 313498

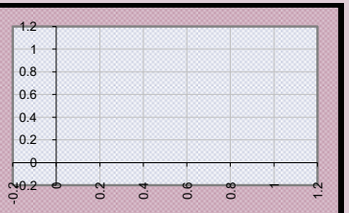
Site ref: White Post Road, Banbury
Data description:

Date: 03-Feb-2017
User details: MD

Dataset:	Arsenic (mg/kg)
Sample mean, $\overline{X}$(mg/kg)	98.571
Sample standard deviation, s	33.171
Sample size, n	28
Critical concentration, Cc (mg/kg)	154



Outliers & non-detects	
Outliers present?	NO
Significance level	5%
Outliers removed?	0
Non-detects	0

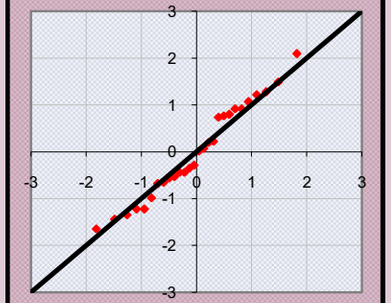


Normality test

Significance level: 5%

Normal distribution

Use: Auto: One-sample t-test

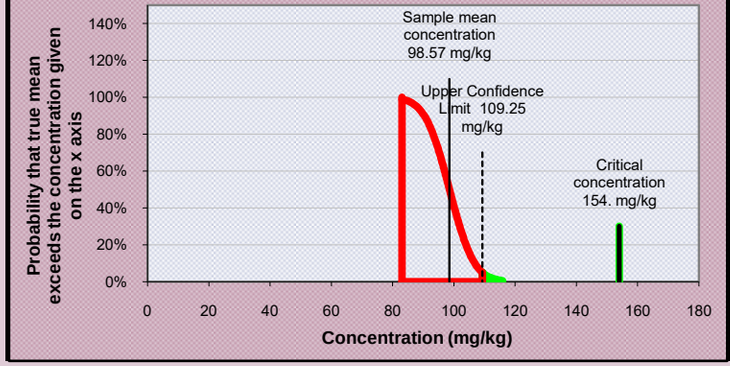


Test scenario:

Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis: The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc

Alternative hypothesis: The true mean concentration is less than the critical concentration: μ < Cc



Evidence against Null hypothesis:	100%
Base decision on:	evidence level
Evidence level required:	95%
Balance of probability?	N/A
Reject Null Hypothesis?	Yes

μ < Cc (re this dataset)

Back to data | Back to summary | Go to outlier test | Go to normality test

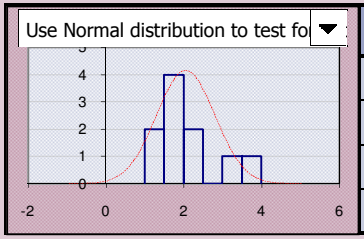
Test Results

Client/client ref: Gladmans
Project ref: 313498

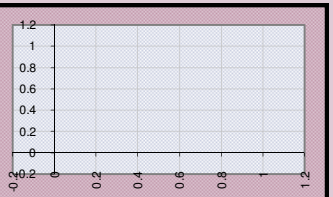
Site ref: White Post Road, Banbury
Data description:

Date: 03-Feb-2017
User details: MD

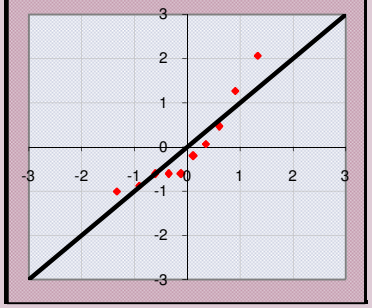
Dataset: Bioaccessible fraction	
Sample mean, $\bar{x}$	2.05
Sample standard deviation, s	0.7487
Sample size, n	10
Critical concentration, Cc	



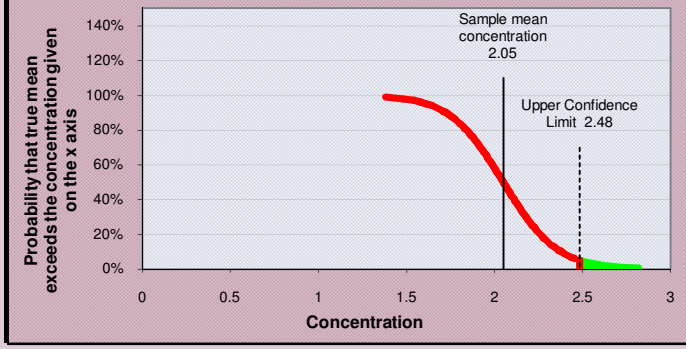
Outliers & non-detects	
Outliers present?	NO
Significance level	5%
Outliers removed?	0
Non-detects	0



Normality test	
Significance level:	5%
Normal distribution	
Use:	Auto: One-sample t-test



Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?
Null hypothesis:	The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc
Alternative hypothesis:	The true mean concentration is less than the critical concentration: μ < Cc



Evidence against Null hypothesis:	upper bound / lower bound	
Base decision on:	lower bound	
Evidence level required:		**95%**
Balance of probability?		N/A
Reject Null Hypothesis?		N/A

No Critical Concentration!

Back to data | **Back to summary** | **Go to outlier test** | **Go to normality test**

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The right chemistry to deliver results
Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.co.uk

Final Report

Report No.:	17-01548-1
Initial Date of Issue:	25-Jan-2017
Client	Envirolab
Client Address:	Sandpits Business Park Mottram Road Hyde Cheshire SK14 3AR
Contact(s):	Subcon
Project	16/07988 313498

Quotation No.:		**Date Received:**	23-Jan-2017
Order No.:	P0735172	**Date Instructed:**	23-Jan-2017
No. of Samples:	5		
Turnaround (Wkdays):	3	**Results Due:**	25-Jan-2017
Date Approved:	25-Jan-2017		

Approved By:

[redacted]

Details: Martin Dyer, Laboratory Manager

Chemtest
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Results - Soil

Project: 16/07988 313498

Client: Envirolab			**Chemtest Job No.:**		17-01548	17-01548	17-01548	17-01548	17-01548
Quotation No.:			**Chemtest Sample ID.:**		402268	402269	402270	402271	402272
Order No.: P0735172			Client Sample Ref.:		16/07988/1	16/07988/4	16/07988/5	16/07988/8	16/07988/9
			Client Sample ID.:		WS1	WS3	WS4	WS7	WS8
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.20	0.70	0.20	0.00	0.20
			Bottom Depth (m):		0.40	0.90		0.20	0.60
			Date Sampled:		05-Dec-2016	05-Dec-2016	05-Dec-2016	06-Dec-2016	06-Dec-2016
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Moisture	N	2030	%	0.020	19	17	18	20	20
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	NONE	NONE	NONE	Roots, Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Clay	Sand
Arsenic	M	2450	mg/kg	1.0	280	110	180	220	180
As Barge Stomach Phase	N	2630	mg/kg	N/A	1.600	0.8800	0.9700	0.5700	0.5700
As Barge Stomach + Intestinal Phase	N	2630	mg/kg	N/A	5.400	4.000	4.400	4.700	2.800
As Barge Bioaccessible Fraction	N	2630	%	N/A	1.900	3.600	2.400	2.100	1.600

Test Methods

SOP	Title	Parameters included	Method summary
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2630	PBET	PBET	Extraction at 37C / ICP-MS

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

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Email: info@chemtest.co.uk

Final Report

Report No.:	17-01549-1
Initial Date of Issue:	25-Jan-2017
Client	Envirolab
Client Address:	Sandpits Business Park Mottram Road Hyde Cheshire SK14 3AR
Contact(s):	Subcon
Project	16/07988 313498

Quotation No.:		**Date Received:**	23-Jan-2017
Order No.:	P0735172	**Date Instructed:**	23-Jan-2017
No. of Samples:	4		
Turnaround (Wkdays):	3	**Results Due:**	25-Jan-2017
Date Approved:	25-Jan-2017		

Approved By:

[redacted]

Details: Martin Dyer, Laboratory Manager

Chemtest
The right chemistry to deliver results

Results - Soil

Project: 16/07988 313498

Client: Envirolab			**Chemtest Job No.:**		17-01549	17-01549	17-01549	17-01549
Quotation No.:			**Chemtest Sample ID.:**		402273	402274	402275	402276
Order No.: P0735172			Client Sample Ref.:		16/07988/13	16/07988/15	16/07988/16	16/07988/20
			Client Sample ID.:		WS11	TP1	TP3	TP7
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.10	0.50	0.20	0.10
			Bottom Depth (m):		0.40		0.40	
			Date Sampled:			07-Dec-2016	07-Dec-2016	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
Moisture	N	2030	%	0.020	18	22	22	20
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	NONE	Stones	Stones, Roots	NONE
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand
Arsenic	M	2450	mg/kg	1.0	140	310	270	230
As Barge Stomach Phase	N	2630	mg/kg	N/A	0.5300	2.500	0.6900	0.4500
As Barge Stomach + Intestinal Phase	N	2630	mg/kg	N/A	4.200	4.500	4.200	3.700
As Barge Bioaccessible Fraction	N	2630	%	N/A	3.000	1.400	1.600	1.600

Test Methods

SOP	Title	Parameters included	Method summary
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2630	PBET	PBET	Extraction at 37C / ICP-MS

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Final Report

Report No.:	17-01550-1
Initial Date of Issue:	25-Jan-2017
Client	Envirolab
Client Address:	Sandpits Business Park Mottram Road Hyde Cheshire SK14 3AR
Contact(s):	Subcon
Project	16/07988 313498

Quotation No.:		**Date Received:**	23-Jan-2017
Order No.:	P0735172	**Date Instructed:**	23-Jan-2017
No. of Samples:	1		
Turnaround (Wkdays):	3	**Results Due:**	25-Jan-2017
Date Approved:	25-Jan-2017		

Approved By:

[redacted]

Details: Martin Dyer, Laboratory Manager

Chemtest
The right chemistry to deliver results

Results - Soil

Project: 16/07988 313498

Client: Envirolab			**Chemtest Job No.:**		17-01550
Quotation No.:			**Chemtest Sample ID.:**		402277
Order No.: P0735172			Client Sample Ref.:		16/07988/32
			Client Sample ID.:		TP29
			Sample Type:		SOIL
			Top Depth (m):		0.20
			Date Sampled:		08-Dec-2016
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Moisture	N	2030	%	0.020	19
Soil Colour	N	2040		N/A	Brown
Other Material	N	2040		N/A	NONE
Soil Texture	N	2040		N/A	Sand
Arsenic	M	2450	mg/kg	1.0	96
As Barge Stomach Phase	N	2630	mg/kg	N/A	0.7500
As Barge Stomach + Intestinal Phase	N	2630	mg/kg	N/A	4.100
As Barge Bioaccessible Fraction	N	2630	%	N/A	4.300

Test Methods

SOP	Title	Parameters included	Method summary
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2630	PBET	PBET	Extraction at 37C / ICP-MS

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CLEA Software Version 1.071

Report generated 03-Feb-17

Report title White Post Road, Banbury, PBET

Created by Marc Dixon at RSK

Environment Agency

RESULTS

CLEA Software Version 1.071 Report generated 3-Feb-17 Page 2 of 11

Environment Agency

		Assessment Criterion (mg kg $^{-1}$)			Ratio of ADE to HCV			Saturation Limit (mg kg $^{-1}$)	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group						
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
1	Arsenic (C4SL child)	1.54E+02	1.49E+04	NR	1.00	0.01	NR	NR	No	No	No	Yes	No	No	No	No	Yes
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Environment Agency

	Assessment Criterion (mg kg $^{-1}$)			Ratio of ADE to HCV			Saturation Limit (mg kg $^{-1}$)	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group						
	oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
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Environment Agency

		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
1	Arsenic (C4SL child)	99.9	0.1	0.0	100.0	1.54E+02	NR	7.72E+01	6.57E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.64E-02	6.17E-02	3.55E-02	5.09E-02	3.09E-02	1.70E-01
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Environment Agency

	Soil Distribution				Media Concentrations													
	Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
	%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
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Environment Agency

		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
1	Arsenic (C4SL child)	2.84E-05	9.52E-05	1.76E-04	9.01E-08	0.00E+00	0.00E+00	0.00E+00	9.46	31.73	58.81	0.00	0.00	0.00	0.00	0.00
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Environment Agency

	Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
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CLEA Software Version 1.071 Report generated 3-Feb-17 Page 8 of 11

Environment Agency

		Oral Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)		Inhalation Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)	Oral Mean Daily Intake ($\mu g\ day^{-1}$)	Inhalation Mean Daily Intake ($\mu g\ day^{-1}$)	Air-water partition coefficient (K_{aw}) ($cm^3\ cm^{-3}$)	Coefficient of Diffusion in Air ($m^2\ s^{-1}$)	Coefficient of Diffusion in Water ($m^2\ s^{-1}$)	log K_{oc} ($cm^3\ g^{-1}$)	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor ($g\ g^{-1}$ DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
1	Arsenic (C4SL child)	ID	0.3	ID	0.0087	NR	NR	NR	NR	NR	NR	NR	0.03	0.5	1	0.0248	0.0248
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3																	
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Environment Agency

	Oral Health Criteria Value (µg kg^{-1} BW day^{-1})		Inhalation Health Criteria Value (µg kg^{-1} BW day^{-1})		Oral Mean Daily Intake (µg day^{-1})	Inhalation Mean Daily Intake (µg day^{-1})	Air-water partition coefficient (K_{aw}) (cm^3 cm^{-3})	Coefficient of Diffusion in Air (m^2 s^{-1})	Coefficient of Diffusion in Water (m^2 s^{-1})	log K_{oc} (cm^3 g^{-1})	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
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Environment Agency

		Soil-to-water partition coefficient ($cm^3 g^{-1}$)	Vapour pressure (Pa)	Water solubility (mg L^{-1})	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
1	Arsenic (C4SL child)	5.00E+02	NR	1.25E+06	0.00043 fw	0.0004 fw	0.00023 fw	0.00033 fw	0.0002 fw	0.0011 fw
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Environment Agency

	Soil-to-water partition coefficient ($cm^3\ g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg\ L^{-1}$)	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
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CLEA Software Version 1.071

Report generated 03/02/2017

Report title White Post Road, Banbury, PBET

Created by Marc Dixon at RSK

Environment Agency

BASIC SETTINGS

Land Use Residential with produce

Building Small terraced house
Receptor Female (res) Start age class 1 End age class 6 Exposure Duration 6 years
Soil Clay

Exposure Pathways

Direct soil and dust ingestion	✓	Dermal contact with indoor dust	✓	Inhalation of indoor dust	✓
Consumption of homegrown produce	✓	Dermal contact with soil	✓	Inhalation of soil dust	✓
Soil attached to homegrown produce	✓			Inhalation of indoor vapour	✓
				Inhalation of outdoor vapour	✓

Environment Agency

Land Use Residential with produce **Receptor** Female (res)

Age Class	Exposure Frequencies (days yr^{-1})						Occupation Periods (hr day^{-1})		Soil to skin adherence factors (mg cm^{2})		Direct soil ingestion rate (g day^{-1})	Body weight (kg)	Body height (m)	Inhalation rate (m^3 day^{-1})	Max exposed skin factor		Total skin area (m^2)
	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Indoors	Outdoors	Indoor	Outdoor					Indoor (m^2 m^{-2})	Outdoor (m^2 m^{-2})	
1	180	180	180	180	365	365	23.0	1.0	0.06	1.00	0.10	5.60	0.7	8.5	0.32	0.26	3.43E-01
2	365	365	365	365	365	365	23.0	1.0	0.06	1.00	0.10	9.80	0.8	13.3	0.33	0.26	4.84E-01
3	365	365	365	365	365	365	23.0	1.0	0.06	1.00	0.10	12.70	0.9	12.7	0.32	0.25	5.82E-01
4	365	365	365	365	365	365	23.0	1.0	0.06	1.00	0.10	15.10	0.9	12.2	0.35	0.28	6.36E-01
5	365	365	365	365	365	365	19.0	1.0	0.06	1.00	0.10	16.90	1.0	12.2	0.35	0.28	7.04E-01
6	365	365	365	365	365	365	19.0	1.0	0.06	1.00	0.10	19.70	1.1	12.2	0.33	0.26	7.94E-01
7	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	22.10	1.2	12.4	0.22	0.15	8.73E-01
8	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	25.30	1.2	12.4	0.22	0.15	9.36E-01
9	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	27.50	1.3	12.4	0.22	0.15	1.01E+00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	31.40	1.3	12.4	0.22	0.15	1.08E+00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	35.70	1.4	12.4	0.22	0.14	1.19E+00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	41.30	1.4	13.4	0.22	0.14	1.29E+00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	47.20	1.5	13.4	0.22	0.14	1.42E+00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	51.20	1.6	13.4	0.22	0.14	1.52E+00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	56.70	1.6	13.4	0.21	0.14	1.60E+00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	59.00	1.6	13.4	0.21	0.14	1.63E+00
17	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.00	1.6	14.8	0.33	0.27	1.78E+00
18	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.90	1.6	12.0	0.33	0.27	1.80E+00

Consumption Rates

Environment Agency

Consumption rates (g FW kg^{-1} bodyweight day^{-1}) by Produce Group

Age Class	MEAN RATES						90TH PERCENTILE RATES					
	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit
1							7.12E+00	1.07E+01	1.60E+01	1.83E+00	2.23E+00	3.82E+00
2							6.85E+00	3.30E+00	5.46E+00	3.96E+00	5.40E-01	1.20E+01
3							6.85E+00	3.30E+00	5.46E+00	3.96E+00	5.40E-01	1.20E+01
4							6.85E+00	3.30E+00	5.46E+00	3.96E+00	5.40E-01	1.20E+01
5							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
6							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
7							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
8							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
9							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
10							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
11							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
12							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
13							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
14							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
15							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
16							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
17							2.94E+00	1.40E+00	1.79E+00	1.61E+00	2.20E-01	2.97E+00
18							2.94E+00	1.40E+00	1.79E+00	1.61E+00	2.20E-01	2.97E+00

Top 2 applied? No

Where top 2 method is applied, two produce categories use 90th percentile rates, while the remainder use the mean. Produce categories vary on a chemical-by-chemical basis. Where top 2 method is not used, all produce categories for all chemicals assume 90th percentile rates.

Building Small terraced house

Soil Clay

Environment Agency

Building footprint (m^2)	2.80E+01
Living space air exchange rate (hr^{-1})	5.00E-01
Living space height (above ground, m)	4.80E+00
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	3.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm^2)	4.23E+02
Dust loading factor ($\mu g\ m^{-3}$)	5.00E+01

Porosity, Total ($cm^3\ cm^{-3}$)	5.90E-01
Porosity, Air-Filled ($cm^3\ cm^{-3}$)	1.20E-01
Porosity, Water-Filled ($cm^3\ cm^{-3}$)	4.70E-01
Residual soil water content ($cm^3\ cm^{-3}$)	2.40E-01
Saturated hydraulic conductivity ($cm\ s^{-1}$)	9.93E-04
van Genuchten shape parameter *m* (dimensionless)	2.97E-01
Bulk density ($g\ cm^{-3}$)	1.07E+00
Threshold value of wind speed at 10m ($m\ s^{-1}$)	7.20E+00
Empirical function (F_x) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	6.85E+00
Soil Organic Matter content (%)	1.43E+00
Fraction of organic carbon ($g\ g^{-1}$)	8.29E-03
Effective total fluid saturation (unitless)	6.57E-01
Intrinsic soil permeability (cm^2)	1.33E-08
Relative soil air permeability (unitless)	4.96E-01
Effective air permeability (cm^2)	6.58E-09

Environment Agency

Soil - Vapour Model

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	Yes
Soil gas ingress rate ($cm^3 s^{-1}$)	2.50E+01
Building ventilation rate ($cm^3 s^{-1}$)	1.87E+04
Averaging time surface emissions (yr)	6
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m ($m s^{-1}$)	5.00
Air dispersion factor at height of 0.8m *	2400.00
Air dispersion factor at height of 1.6m *	0.00
Fraction of site cover ($m^2 m^{-2}$)	0.75

* Air dispersion factor in g $m^{-2} s^{-1}$ per kg m^{-3}

Soil - Plant Model

	Dry weight conversion factor	Homegrown fraction		Soil loading factor	Preparation correction factor
		Average	High		
	g DW g^{-1} FW	dimensionless		g g^{-1} DW	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type Average