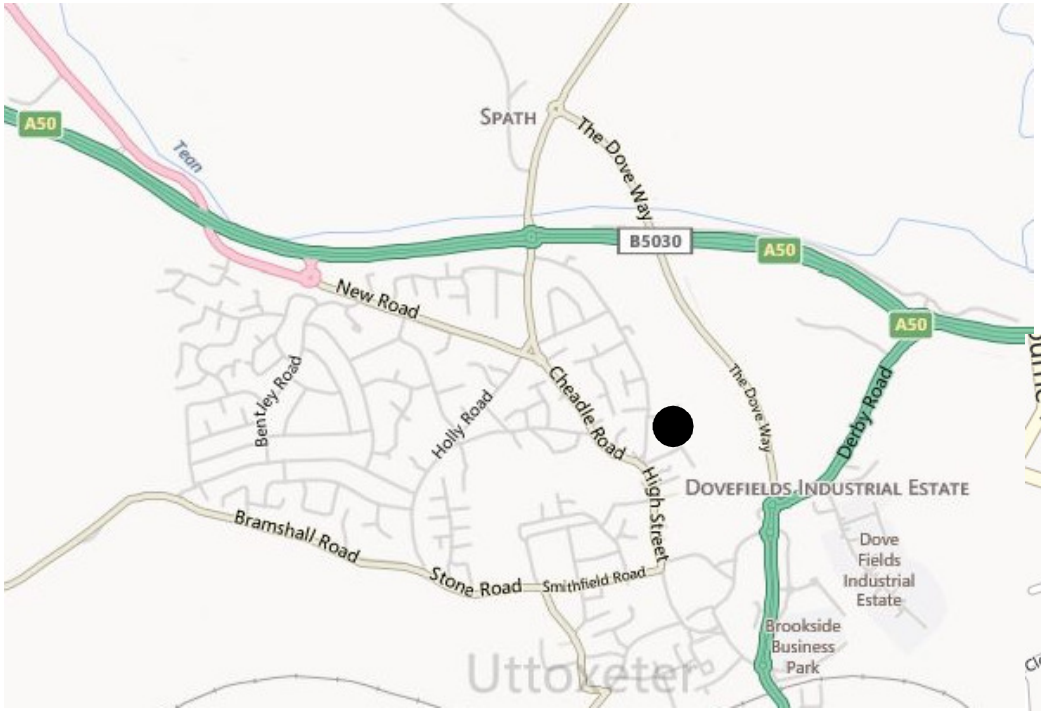
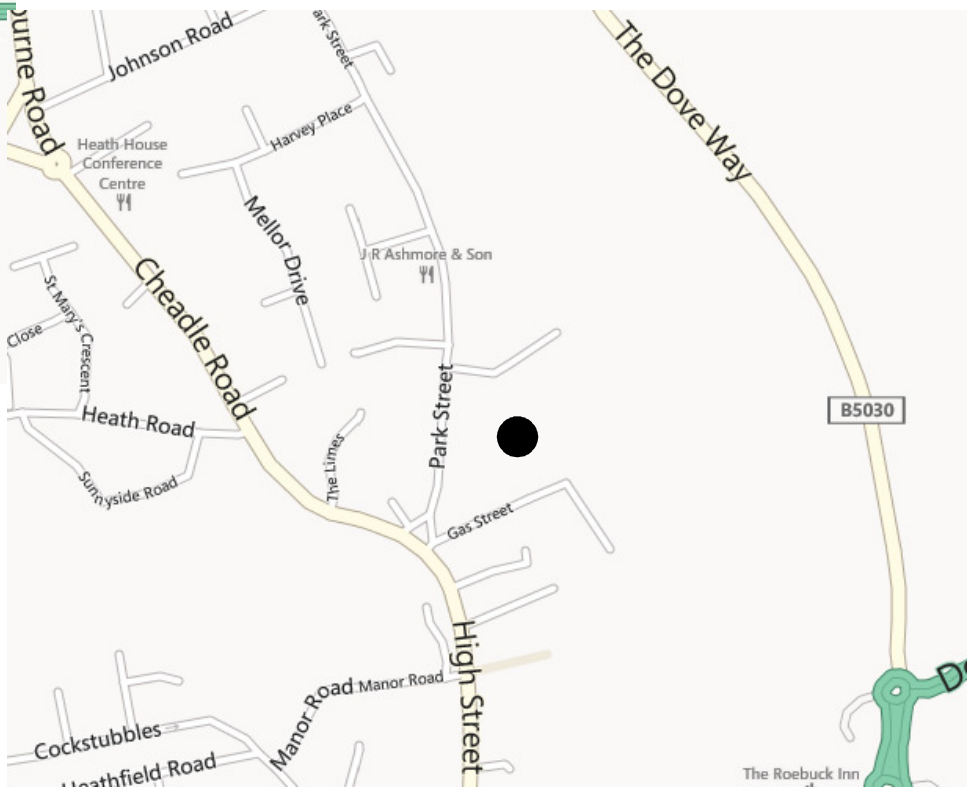
APPENDIX A

P/2014/01663
APPENDICES PHASE
11A Environmental
Assessment





N

KEY:

● Approximate Site Location

DO NOT SCALE

IVY HOUSE environmental
Scotland Farm, Ockbrook, Derby, DE72 3RX
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TITLE: Site Location Plan

PROJECT: Pennycroft Lane, Uttoxeter

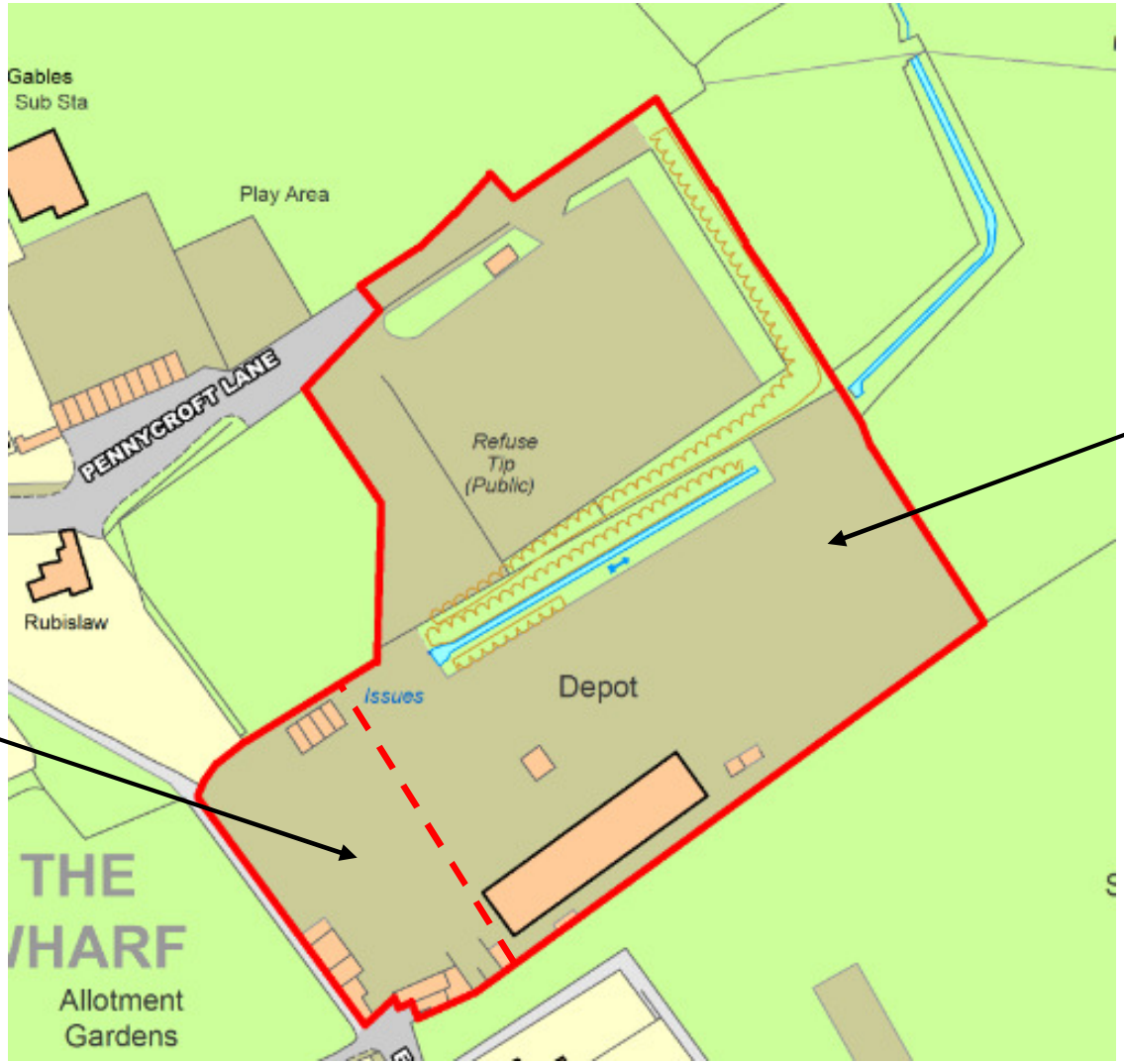
PROJECT No: IV.58.13

DATE: 11/2013

SCALE: NTS

DRAWN: RPS

DWG No: Figure 1



KEY:

Site Boundary

Boundary between Phase B and additional parcel of land

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TITLE:	Site Layout
PROJECT:	Pennycroft Lane, Uttoxeter
PROJECT No:	IV.58.13
DATE:	11/2013
SCALE:	NTS
DRAWN:	RPS
DWG No:	Figure 2

APPENDIX B

KEY:

CP/WS Borehole

Trial Pit

DO NOT SCALE

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TITLE: 2010 BWB Exploratory Hole Location Plan

PROJECT: Pennycroft Lane, Uttoxeter

PROJECT No: IV.58.13

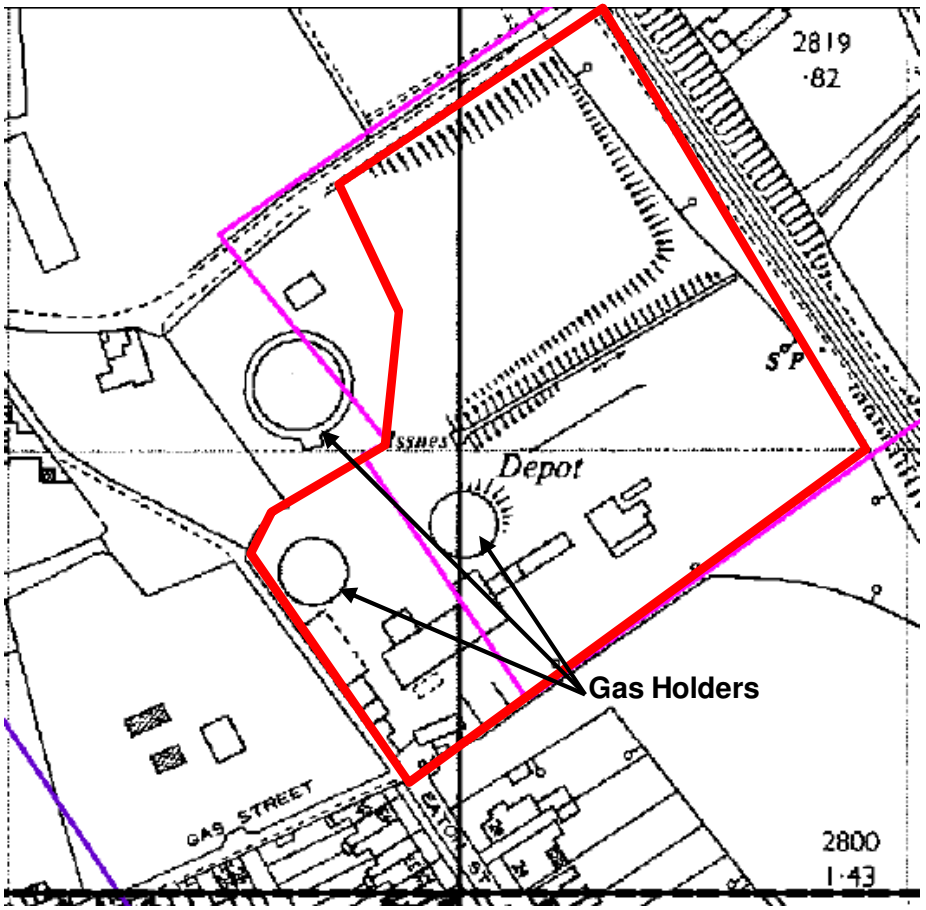
DATE: 11/2013

SCALE: NTS

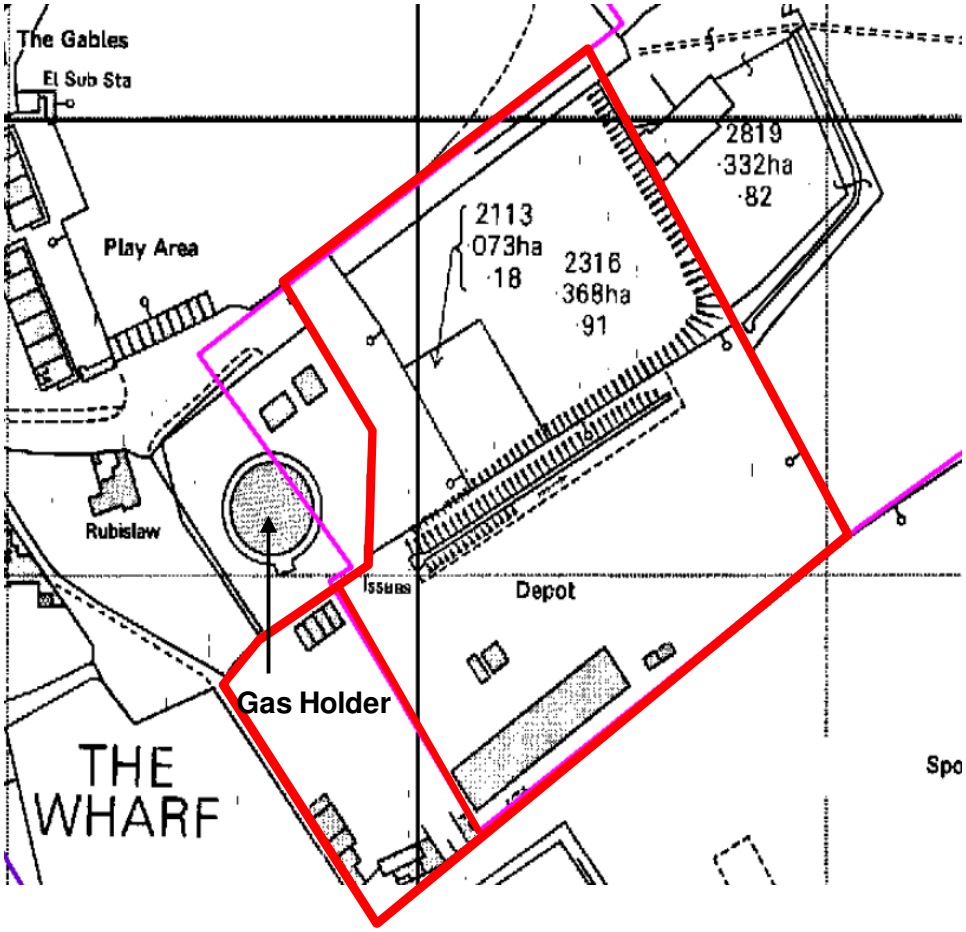
DRAWN: RPS

DWG No: Figure 3

1964 – 73 Historical Map



1973 – 83 Historical Map



KEY:

Site Boundary

DO NOT SCALE

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TITLE: Historical Mapping – Gas Holders

PROJECT: Pennycroft Lane, Uttoxeter

PROJECT No: IV.58.13

DATE: 11/2013

SCALE: NTS

DRAWN: RPS

DWG No: Figure 4

APPENDIX C

18 November 2013

To: Jon Imber/Joanne Roebuck

PROPOSAL: Outline application to develop land by the erection of up to 49 dwellings

REF: P/2013/00206

OUR REF: 3256048

Location: Land at Pennycroft Lane Uttoxeter Staffordshire

SUBMITTED REPORTS

Site appraisal and intrusive investigation reports were submitted with the application in relation to contamination issues on the site. Details as follows:
-The Dove Way (Areas A & B). Phase 1 Geo-Environmental Assessment Report. NTE285/01/V1. July 2010.
-The Dove Way (Areas A & B). Phase 2 Geo-Environmental Factual Report. NTE285/03/V1. August 2010.
-The Dove Way (Areas A & B). Phase 2 Geo-Environmental Assessment Report. NTE285/05/V1. August 2010.
- Addendum Gas Monitoring Assessment DRW/RTR/NTE285. October 2010. (refers to Area C but includes two additional monitoring periods for BH7-BH9. There is no updated risk assessment for Area B which takes the additional data into account.

The following comments should be communicated back to the developer if planning permission is to be granted:

SUMMARY OF REPORTS
Area B, Phase 1:
This report noted that some of Area B was not accessible during the site walkover. The inaccessible area contained a 3000 litre AST with a small steel bund (not adequately investigated for leaks/staining due to lack of access).

Other relevant features identified included other ASTs and potentially Japanese Knotweed.

The need for gas monitoring was indicated, and the possibility of using a soil capping layer was mooted.

Area B, Phase 2, Factual:
This report confirmed which samples locations were contained within Areas B, as follows –
Trial Pits x 3 (TP135 – TP137). Benzo(a)pyrene contamination noted. Example concentration of PAHs (cumulative total of 16 PAHs of concern) was 1g/kg. Typical values for residential gardens would be less than <50mg/kg,

i.e. the level of contamination at this site is twenty times that considered to be a minimal risk.

Window Samples x 7 (WS1 – WS7). Total Aromatic Hydrocarbons elevated, e.g. 2g/kg).

Boreholes x 3 (BH7 – BH9). Four monitoring events were carried out to monitor for ground gases (no borehole damage so complete datasets obtained). Some moderately elevated carbon dioxide was detected, risk assessment the site to be classified as Characteristic Situation 1 (i.e. no gas protection measures required), however further monitoring was to provide additional refinement to the risk assessment (see below). A further concern is due to vapours from volatile contaminants in the ground.

The report also states that appropriate service ducting/pipes should be utilised, e.g. chemically-resistant water pipes with clean surrounding backfill. It recommended that relevant service providers should be contacted for their requirements in light of the prevailing site conditions. Such details should be included in a Remediation Method Statement.

Generally, metal contamination across Area B was not excessive (compared with the scale of exceedance caused by hydrocarbons), albeit there a few sample locations which were elevated when compared against the relevant residential with gardens assessment criteria.

Area B, Phase 2, Assessment:
The executive summary states the following –

Site assessment has noted the ground contains elevated levels of complex cyanides ('blue billy', a residue from gasworks operations); Total Petroleum Hydrocarbons (TPH); Polycyclic Aromatic Hydrocarbons (PAHs); Benzene, Toluene, Ethylene and Xylene (BTEX); Arsenic; Chromium (this was not speciated during investigation and can be present in two forms, Cr III and/or Cr VI, the latter of which has a higher toxicity). A vapour risk was also identified from the relevant volatile contaminants (e.g. BTEX).

Groundwater at the site was found to contain elevated TPH, PAH and cyanide. The groundwater gradient determined the direction of flow to be eastwards, with a contaminant plume therefore migrating in that direction to the adjacent site.

BWB recommendations stated that DQRA (Detailed Quantitative Risk Assessment) should be carried out to determine the risk to controlled waters (including ground waters and surface waters).

Remedial options considered at this stage include the use of a 700mm – 900mm soil capping layer, including either a separation membrane or hard to dig layer at the lower interface with the existing ground material. The installation of vapour membranes in the new dwellings was also recommended.

The report identified the risk to human health as HIGH, and the risk to controlled waters as MODERATE. This assumes no remedial works are to be carried out.

Finer detail on contamination levels is available in the bulk of the report:

Soils – There is a Chromium hotspot in the area of TP137. The value of 82.2 mg/kg is in excess of a typical assessment criteria value of 4mg/kg (Cr VI). Complex cyanides are noted to peak at the same location, with a value of 22,500mg/kg found (hugely excessive when compared to human health risk criteria). At TP 137 and WS 6, there are varying exceedances of ALL analysis parameters. All other sample points show some exceedances of one or more parameters.

Groundwater – BH8 and BH9 displayed elevated levels of cyanide. BH7 – BH9 showed elevated levels of PAHs. There is a possibility of PAH contamination within the Wharf Brook (which bisects the site).

A conceptual model was included with the report (Table 11) which summarises the established risks.

Addendum Gas Monitoring Report:
Report relates to Area C, but it includes the two additional monitoring events for Area B. The ground gas risk assessment for Area B has not been updated with this additional data.

Officer Statement and Recommendations

Following the above investigations and reports, the following concerns remain:

GROUND GASES
There are six monitoring results submitted for Area B, however the original risk assessment has not been updated to take into account the full data set. Conclusions should be updated to include all data.

It is worth noting that suitably hydrocarbon vapour-resistant membranes are recommended as part of the detailed design of gas protection measures.

GROUND CONTAMINATION
SAMPLING DENSITY - Given the previous uses of the site, and nature and scale of the intended development, the current sampling points do not adequately characterise the site in terms of ground contamination. Considerable levels of contamination affect this site, and the extent of such areas or plumes (in the near-surface soils and at depth) have not been sufficiently delineated, leaving a lack of confidence in the data.

PROPOSED MITIGATION - Some measures have been proposed, which involve the use of a soil capping layer and a hard to dig layer in garden and landscaped areas. The use of capping layers is not appropriate where gross contamination exists, a characteristic of this site. No discussion is made of hotspot/plume excavation prior to the placement of any capping.

As the sole proposal, an additional concern is how long the above capping layer is expected to remain effective for. There is no discussion of this in the submitted reports. Typically, the proposed land use would be in place for at least 25+ years (more likely at least 50). An assurance is required that the intended mitigation will not degrade, and will remain effective over the whole period of intended use.

Remedial works as a whole are not well-defined.

GROUNDWATER CONTAMINATION

The report notes that groundwater contamination appears to be migrating from the site to the east, and may also represent a risk to the surface waters (Wharf Brook).

Therefore, the report recommends a DQRA to quantify the risk to controlled waters, and such a report has not been submitted for consideration. The proposed removal of the upper 700-900mm of material at the site will not necessarily remove the risk to groundwater.

The Environment Agency comments should be sought in relation to the impact on controlled waters at and near the site.

REQUIREMENTS

A Remediation Method Statement (detailing all mitigating works) has not been submitted. It is the opinion of this officer that such a statement cannot be effectively produced and relied upon unless the information gaps detailed above are addressed first.

Given the sensitivity of the proposed use, and the considerations noted above, I am minded to recommend refusal of this application until work to progress the above gaps has been addressed.

If the LPA is minded to grant permission, I would recommend the following conditions, incorporating the foregoing comments as an informative in order that those points be addressed.

Based on the above comments, and previous correspondence with the developer's consultant, I recommend the conditions below:

CONTAMINATED LAND
Paragraph C1
CONDITION
This department is concerned that the proposed site may have soil and groundwater contamination, and the application does not include an assessment of levels of contamination or details of any proposed remediation works.

No development approved by this permission shall be commenced prior to submission (and subsequent approval in writing) of documents 1) and 2) to the Local Planning Authority (LPA), together with a timetable of works. Works can only proceed once written approval of the submissions has been obtained from the LPA.

Any contaminated land assessment must be carried out in accordance with current UK guidance and should include a conceptual site model.

In order to safeguard human health and the environment and identify potential contamination on-site and the potential for off-site migration, I request the following:

1) Continuing works as necessary to suitably characterise the site in terms of any contamination or potential for ground gas generation.

2) If remedial measures are required, a **Remediation Method Statement** shall also be submitted, detailing works to be carried out to mitigate or remove the contamination.

3) If any additional contamination is identified or discovered during works on site, which has not previously been considered in the Remediation Method Statement, then no further development (unless otherwise agreed in writing by the LPA) shall be carried out until the developer has submitted additional remediation proposals for approval. Any approved proposals shall thereafter form part of the Remediation Method Statement.

4) Upon completion of the works, a **Remediation Validation Report** (Phase 3) shall be submitted. This should include a signed declaration outlining the remediation works that have been carried out, and confirmation that remedial targets have been achieved to the satisfaction of the LPA. This shall be submitted prior to any occupation of any of the dwellings on site unless otherwise agreed in writing by the LPA.

It is recommended that all reports are submitted electronically where possible.

GROUND GASES
Paragraph L1
CONDITION

If it is deemed that ground gas protection measures are required, then buildings should be constructed to the standards specified within: **BRE Report 212, Construction of new buildings on gas-contaminated land (1991)** and **BRE 414, Protection Measures for housing on gas-contaminated land (2001). Selected membranes should be designed to be gas resistant and 500 microns in thickness (2000 gauge). The measures chosen must, as a minimum, fulfil the requirements of BS8485:2007, and be detailed and submitted to the Planning Authority for approval.**

Additionally, there is a requirement for hydrocarbon vapour-resistant membranes within constructions at the site. If measures are also required for methane and carbon dioxide (as referred to above), then combination measures are acceptable.

Any necessary works shall be carried out either before or during the course of development as appropriate.

Upon completion of the approved works, a signed declaration shall be submitted to the LPA, including confirmation that remedial targets have been achieved. This shall be submitted and approved prior to any occupation of any of the dwellings on site unless otherwise agreed in writing by the LPA.

IMPORTED SOIL MATERIALS
Paragraph SM1
CONDITION
Any material imported for landscaped areas or gardens should be analysed to ensure it is suitable for use, in terms of human health, and as a suitable growth medium.

For material certified under BS3882:2007, a copy of the analysis certificate (comprising of the specified requirements, plus an appropriate list of contaminants, including hydrocarbons) should be submitted to the Local Authority for approval before material is imported. After approval and placement of material, the chemical quality should be analysed, with the frequency of analysis being one sample per 100m^3. The depth of placement shall also be recorded in order to ensure remedial targets are met. The post-placement details shall be submitted as part of the validation report.

For material that has not been certified under BS3882:2007, full details of the location of material source(s), accompanied by representative chemical analysis (including a comprehensive set of parameters, for example: pH, particle composition, and contaminants – including hydrocarbons), at a frequency not less than one sample per 5000m^3 (with a minimum of at least one sample per source site) should be submitted to the Local Authority for approval before material is imported. After approval and placement of material, the chemical quality should be analysed, with the frequency of analysis being one sample per 50m^3. The depth of placement shall also be recorded in order to ensure remedial targets are met. The post-placement details shall be submitted as part of the validation report.

PHASED DEVELOPMENT: If works are intended to complete on a phased basis, then it is acceptable to submit source/certification details, and subsequent validation reports on a phased basis also, provided that plans showing the relevant area are also submitted alongside the other details for each phase.

JAPANESE KNOTWEED

Before any works are undertaken, the site must be surveyed by an approved environmental consultant for the presence of Japanese Knotweed and a copy of this survey sent to the Local Planning Authority. Please note that Japanese Knotweed can be far more extensive than the visible parts on the surface and that the underground parts of the plant may extend laterally up to 7 metres beyond this.

Therefore, this survey must also note any knotweed adjoining the site. If Japanese Knotweed is confirmed, full details of a scheme for its eradication and/or control shall be submitted to and approved by the Local Planning Authority prior to the commencement of work on site, and the approved scheme shall be implemented prior to the commencement of the use of the building(s).

Reason for conditions:
To prevent unacceptable risks to health and pollution of the environment in accordance with the aims and objectives of the National Planning Policy Framework. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

ADDITIONAL NOTES

i) It is assumed that the Petroleum Officer has been consulted in connection with the removal or decommissioning of any underground storage tanks and associated pipe work.

ii) It is essential that all parties concerned with the development of the site are informed of the risks and appropriate measures should be taken to protect worker safety, such as PPE and hygiene practices. All works shall be carried out with regard to Health and Safety legislation.

iii) It is assumed that the Environment Agency has been consulted on the proposed development.

iv) Any material imported for landscaped areas or gardens should be analysed to ensure it is suitable for use, the results of which should be submitted to the Local Authority for approval.

v) Please refer to the attached informative for advice on the requirements of this condition.

Dave Fountain
Contaminated Land Officer

Informative to Paragraph C1:

The Council's Environmental Health Department offers the following advice regarding the preparation of the recording and remediation of ground contamination.

- A **Phase 1 'Desktop' Study**, carried out by a competent person, should be completed as a first step. This is used to identify and evaluate all potential sources and impacts of land and/or groundwater contamination relevant to the site (historic and current). The Phase 1 study will inform later stages of the investigation.

- If the Desktop Study indicates a potential for contamination, a **Phase 2 Intrusive Site Investigation** should follow to identify areas of contamination and allow a site-specific risk assessment to be completed. This work should be completed in line with: *BS10175 - Investigation of Potentially Contaminated Sites - Code of Practice*; and *BS5930 - Code of practice for site investigations*. The main objective for this Phase 2 report should be to quantify the risk to human health, groundwater and surface water.

- Where remediation of the site proves necessary, a remediation strategy may be discussed with this Authority's Contaminated Land Officer in advance of detailed submission to the LPA. This can be helpful to both parties in resolving any issues with the site.

- To speed up the process, it is suggested that all investigation and associated reports are submitted to the LPA as soon as they are completed. These should be produced in duplicate with copies being made available to both Planning Control and Environmental Health Divisions of this Authority. Submission of an additional copy in electronic format is also welcomed.

Advice on Phase 3 Reports – Remediation & Validation
These reports should include information on the following:

i) Remediation Statements

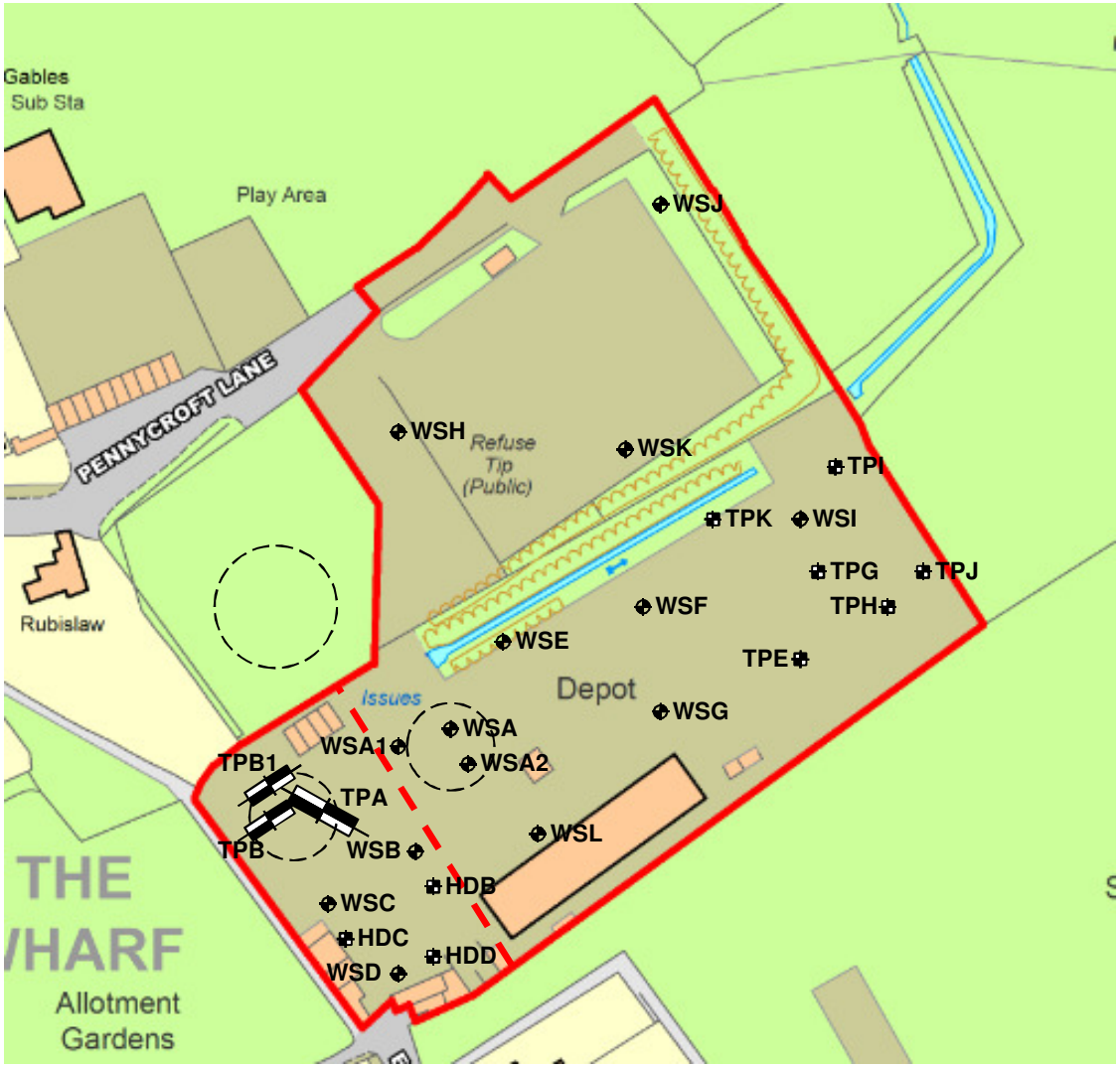
- Objectives of the remediation works.
- Details of the remedial works to be carried out, to include:
  * Description of ground conditions (soil and groundwater).
  * Type, form and scale of contamination to be remediated.
  * Remediation methodology.
  * Site plans/drawings.
  * Phasing of works and approximate timescales.
  * Consents and licences e.g. (discharge consents, waste management licence, asbestos waste material removal licence etc.).
  * Site management measures to protect neighbours.
- Details of how the works will be validated to ensure the remediation objectives have been met; to include:
  * Sampling strategy.
  * Use of on- site observations, visual/olfactory evidence.
  * Chemical analysis.
  * Proposed clean-up standards (i.e. contaminant concentration).

ii) Validation Reports

- Include information as detailed in i) above.
- Details of whom carried out the work.
- Details and justification of any changes from original remediation statement.
- Substantiating data - should include where appropriate:
  * Laboratory and in situ test results.
  * Monitoring for groundwater and gases.
  * Summary data plots and tables relating to clean-up criteria.
  * Plans showing treatment areas and details of any differences from the original remediation statement.
  * Waste management documentation.
- Confirmation that remediation objectives have been met.

Dave Fountain
Contaminated Land Officer

APPENDIX D



N

KEY:

- WS Borehole
- Trial Pit
- Approximate Location of Historical Gas Holder

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TITLE: 2013 Exploratory Hole Location Plan

PROJECT: Pennycroft Lane, Uttoxeter

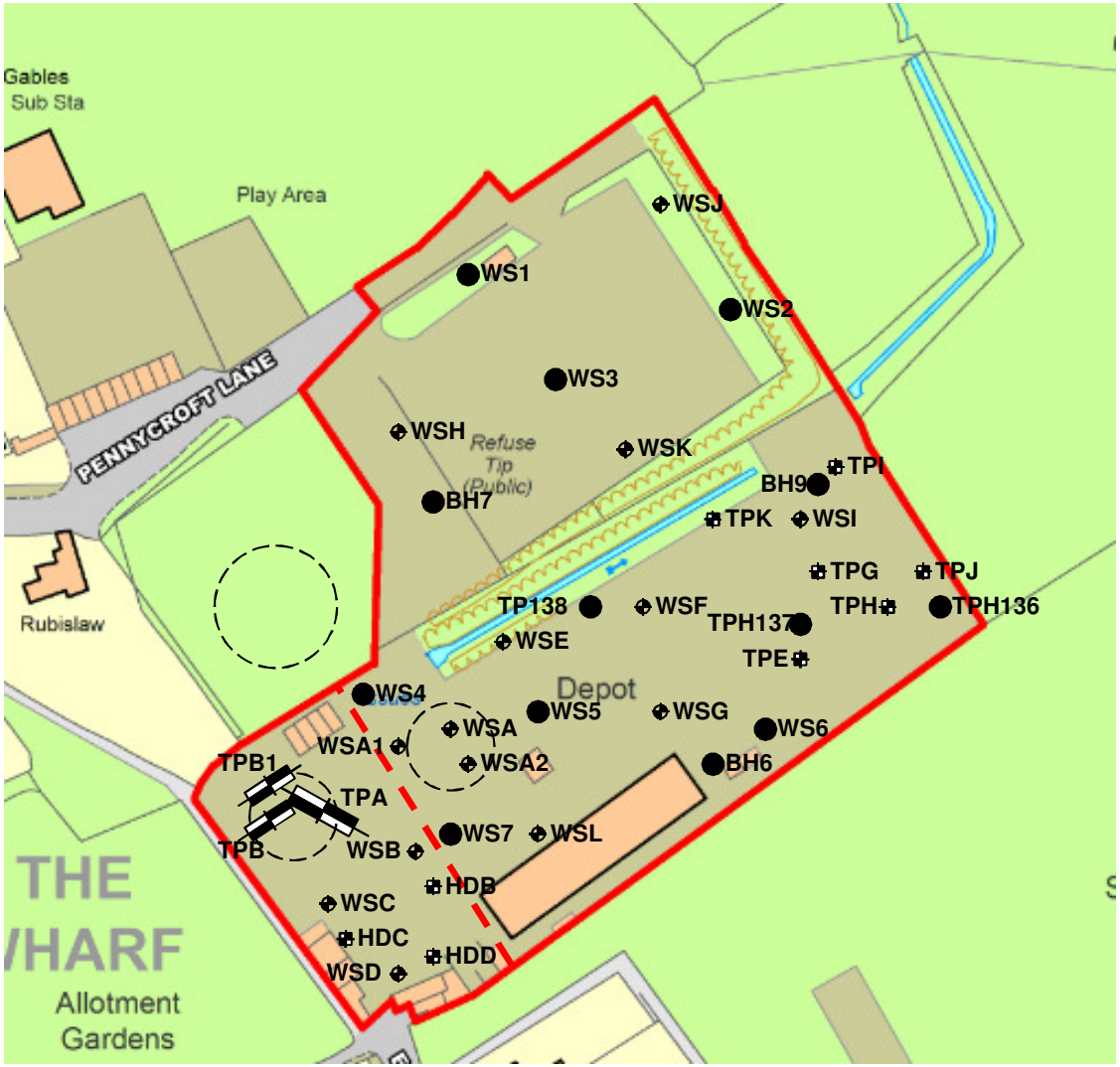
PROJECT No: IV.58.13

DATE: 11/2013

SCALE: NTS

DRAWN: RPS

DWG No: Figure 5



N

KEY:

- WS Borehole
- Trial Pit
- Approximate Location of Historical Gas Holder
- 2010 Exploratory Hole

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TITLE: 2010 & 2013 Exploratory Hole Location Plan

PROJECT: Pennycroft Lane, Uttoxeter

PROJECT No: IV.58.13

DATE: 11/2013

SCALE: NTS

DRAWN: RPS

DWG No: Figure 6

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Trial Pit No.

TPA

Sheet 1 of 1

Project No:	IV.58.13	**Method:**	Trial Pit Excavation	**Co-ordinates:**	N/R
Site:	Pennycroft, Uttoxeter			**Ground Level:**	N/R
		Plant:	JCB 3CX	**Start Date:**	08.10.13
Client:	East Staffs BC			**Finish Date:**	08.10.13

Description of Strata	Depth (m)	Sampling Type & Depth (m)		Legend	U100 / N Value Field / Lab. Testing
MADE GROUND: Roadstone with gravel of brick and tarmac planings.	0.2				
MADE GROUND: whole bricks and concrete.	0.4				
MADE GROUND: Dark brown, sandy fine to coarse GRAVEL of concrete, brick, clinker, coal and brick cobbles. Strong tar odour.	1.0	D/J	1.0		
	1.4	D/J	1.4		
Brickwork obstruction @ 1.4mbgl. Trial pit extended into trench in southerly direction.					
2.0 – 7.0 metres along trench. MADE GROUND: Black, clayey, sandy fine to coarse GRAVEL of ash-clinker, brick, sandstone and limestone. Tar stained and strong odour.	0.4 – 1.4				
Soft reddish brown very sandy CLAY. Slit tar stain and odour noted throughout.	1.6				
Trial Trench terminated at 1.0mbgl & 7m in length					

Key:			
	Bulk (Bulk Bag)	D. Disturbed	V. 40ml Glass Vial
	W. Water	G. Amber Glass Jar / Bottle	N. 'N' value
	PID. Photo Ionisation Detector (ppm)	T. Plastic Tub	HP. Hand Penetrometer

Contamination Observations During Excavation				PID Monitoring		
Depth Observed	Made ground and perched water within the gas holder contaminated with tar residues.			Depth: PPM:	Depth: PPM:	Depth: PPM:
Seepage at 1.4m along trench						

NOTES:
Services: Prior to excavation, the trial pit location was scanned with a Cable Avoidance Tool (CAT).
Backfill: The trial pit was backfilled on completion with arisings and levelled to existing ground level.

N/R - Not Required N/A - Not Applicable
All depths in metres below ground level;

Logged By: RS
Approved By: CRS

IVY HOUSE environmental

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Trial Pit No.

TPB

Sheet 1 of 1

Project No:	IV.58.13	**Method:**	Trial Pit Excavation	**Co-ordinates:**	N/R
Site:	Pennycroft, Uttoxeter			**Ground Level:**	N/R
		Plant:	JCB 3CX	**Start Date:**	08.10.13
Client:	East Staffs BC			**Finish Date:**	08.10.13

Description of Strata	Depth (m)	Sampling Type & Depth (m)		Legend	U100 / N Value Field / Lab. Testing
MADE GROUND: Roadstone with gravel of brick and tarmac planings.	0.2				
MADE GROUND: whole bricks and concrete.	0.5				
MADE GROUND: Black, clayey, sandy fine to coarse GRAVEL of ash-clinker, brick, sandstone and limestone. Tar stained and strong odour. Trial pit extended into trench at right angles to TPA in westerly direction.	1.4				
2.0 – 4.0 metres along trench. MADE GROUND: Black, clayey, sandy fine to coarse GRAVEL of ash-clinker, brick, sandstone and limestone. Tar stained and strong odour Heavy perched water ingress at 2.2m, filled trench to 1.6mbgl.	1.4 2.5	D/J	1.4 @ 3.0m		
Trial Trench terminated at 1.0 – 2.5mbgl & 4m in length					

Key:			
	Bulk (Bulk Bag)	D. Disturbed	V. 40ml Glass Vial
	W. Water	G. Amber Glass Jar / Bottle	N. 'N' value
	PID. Photo Ionisation Detector (ppm)	T. Plastic Tub	HP. Hand Penetrometer

Contamination Observations During Excavation				PID Monitoring		
Depth Observed	Made ground and perched water within the gas holder contaminated with tar residues.			Depth: PPM:	Depth: PPM:	Depth: PPM:
Seepage at 1.4 at start of trench. Heavy flow at 4m along trench at 2.2mbgl.						

NOTES:

Services: Prior to excavation, the trial pit location was scanned with a Cable Avoidance Tool (CAT).

Backfill: The trial pit was backfilled on completion with arisings and levelled to existing ground level.

N/R - Not Required N/A - Not Applicable

All depths in metres below ground level;

Logged By: RS

Approved By: CRS

IVY HOUSE environmental

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Trial Pit No.

TPB1

Sheet 1 of 1

Project No:	IV.58.13	**Method:**	Trial Pit Excavation	**Co-ordinates:**	N/R
				Ground Level:	N/R
Site:	Pennycroft, Uttoxeter	**Plant:**	JCB 3CX	**Start Date:**	08.10.13
Client:	East Staffs BC			**Finish Date:**	08.10.13

Description of Strata	Depth (m)	Sampling Type & Depth (m)		Legend	U100 / N Value Field / Lab. Testing
MADE GROUND: Roadstone with gravel of brick and tarmac planings.	0.2				
MADE GROUND: whole bricks and concrete.	0.6				
MADE GROUND: Black ashy, gravelly fill of brick, concrete and wood with strong tar odour		D/J	1.0		
Trial pit extended to the east by 5m. Brick wall encountered at 4.5m along trench. Red brown soft sandy CLAY, with slight tar odour noted beyond wall.	2.9	D/J	2.6 @ 5m		
Trial trench terminated at 2.9mbgl and 5m length					

Key:			
	Bulk (Bulk Bag)	D. Disturbed	V. 40ml Glass Vial
	W. Water	G. Amber Glass Jar / Bottle	N. 'N' value
	PID. Photo Ionisation Detector (ppm)	T. Plastic Tub	HP. Hand Penetrometer

Contamination Observations During Excavation				PID Monitoring		
Depth Observed	Made ground and perched water within the gas holder contaminated with tar residues.			Depth: PPM:	Depth: PPM:	Depth: PPM:
Water ingress at 2.1m						

NOTES:

Services: Prior to excavation, the trial pit location was scanned with a Cable Avoidance Tool (CAT).

Backfill: The trial pit was backfilled on completion with arisings and levelled to existing ground level.

N/R - Not Required N/A - Not Applicable

All depths in metres below ground level;

Logged By: RPS

Approved By: CRS

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Trial Pit No.

TPG

Sheet 1 of 1

Project No:	IV.58.13	**Method:**	Trial Pit Excavation	**Co-ordinates:**	N/R
Site:	Pennycroft, Uttoxeter			**Ground Level:**	N/R
		Plant:	JCB 3CX	**Start Date:**	08.10.13
Client:	East Staffs BC			**Finish Date:**	08.10.13

Description of Strata	Depth (m)	Sampling Type & Depth (m)		Legend	U100 / N Value Field / Lab. Testing
MADE GROUND: Brown slightly clayey sand with fill of bricks and waste including plastic, polythene, carpet, road cones, kerbstones, rope etc. Above ground tipping.	+2.0m GL	D/J	+1.0		
MADE GROUND: Tarmac.	0.3				
MADE GROUND: Roadstone with gravel of brick and tarmac planings.	0.6				
MADE GROUND: Sandy clay with gravel of brick, pottery, plastic and asbestos fragments.	1.75				
Grey/black sandy gravelly CLAY with slight tar odour	2.0	D/J	1.8		
Black sandy gravelly soft CLAY	3.0				
Brown slightly clayey sand with much gravel	3.2	D/J	3.2		
Trial Pit terminated at 3.2mbgl					

Key:	Bulk (Bulk Bag)	D. Disturbed	V. 40ml Glass Vial
	W. Water	G. Amber Glass Jar / Bottle	N. 'N' value
	PID. Photo Ionisation Detector (ppm)	T. Plastic Tub	HP. Hand Penetrometer

Contamination Observations During Excavation				PID Monitoring		
Depth Observed	2m high waste spoil at surface. Tarmac underlain by sandy fill to 1.75mbgl. Tar stained clays to 3.0mbgl			Depth: PPM:	Depth: PPM:	Depth: PPM:
Seepage at 2.0m and strata noted to be damp to base of trial pit.						

NOTES:

Services: Prior to excavation, the trial pit location was scanned with a Cable Avoidance Tool (CAT).

Backfill: The trial pit was backfilled on completion with arisings and levelled to existing ground level. Trial pit stable.

N/R - Not Required N/A - Not Applicable

All depths in metres below ground level;

Logged By: RPS

Approved By: CRS

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Trial Pit No.

TPH

Sheet 1 of 1

Project No:	IV.58.13	**Method:**	Trial Pit Excavation	**Co-ordinates:**	N/R
Site:	Pennycroft, Uttoxeter			**Ground Level:**	N/R
		Plant:	JCB 3CX	**Start Date:**	08.10.13
Client:	East Staffs BC			**Finish Date:**	08.10.13

Description of Strata	Depth (m)	Sampling Type & Depth (m)		Legend	U100 / N Value Field / Lab. Testing
MADE GROUND: Fire residues at surface – ash, burnt wood.					
Black/brown ash with clinker, brick, and roadstone	0.7	D/J	0.4		
MADE GROUND: Black/brown Ash/clinker with sulphurous odour.	2.9	D/J	07.-1.6		
Dark brown stiff slightly sandy CLAY	3.2				
Brown slightly clayey sand with much gravel	3.4				
Trial Pit terminated at 3.4mbgl					

Key:			
	Bulk (Bulk Bag)	D. Disturbed	V. 40ml Glass Vial
	W. Water	G. Amber Glass Jar / Bottle	N. 'N' value
	PID. Photo Ionisation Detector (ppm)	T. Plastic Tub	HP. Hand Penetrometer

Contamination Observations During Excavation			PID Monitoring		
Depth Observed	Made ground including ash and clinker to 2.9mbg.		Depth: PPM:	Depth: PPM:	Depth: PPM:
Damp from 3.0m.					

NOTES:

Services: Prior to excavation, the trial pit location was scanned with a Cable Avoidance Tool (CAT).

Backfill: The trial pit was backfilled on completion with arisings and levelled to existing ground level. Partial collapse at 3.0m and below.

N/R - Not Required N/A - Not Applicable Logged By: RPS

All depths in metres below ground level; Approved By: CRS

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Trial Pit No.

TPI

Sheet 1 of 1

Project No:	IV.58.13	**Method:**	Trial Pit Excavation	**Co-ordinates:**	N/R
				Ground Level:	N/R
Site:	Pennycroft, Uttoxeter	**Plant:**	JCB 3CX	**Start Date:**	08.10.13
Client:	East Staffs BC			**Finish Date:**	08.10.13

Description of Strata	Depth (m)	Sampling Type & Depth (m)		Legend	U100 / N Value Field / Lab. Testing
MADE GROUND: Red brown roadstone	0.2				
MADE GROUND: Clayey sand with brick, plastic, tiles/pottery and concrete gravel of brick and tarmac planings.	1.7	D/J	1.0		
Brown/yellow slightly clayey sand and gravel with slight tar odour. Damp from 2.5m	3.2	D/J	3.2		
Trial Pit terminated at 3.2mbgl					

Key:
Bulk (Bulk Bag)
W. Water
PID. Photo Ionisation Detector (ppm)
D. Disturbed
G. Amber Glass Jar / Bottle
T. Plastic Tub
V. 40ml Glass Vial
N. 'N' value
HP. Hand Penetrometer

Contamination Observations During Excavation				PID Monitoring		
Depth Observed	Made ground to1.7mbgl. Slight tar odour in sand and gravel from 1.7-3.2mbgl.			Depth: PPM:	Depth: PPM:	Depth: PPM:
Damp from 2.5m.						

NOTES:
Services: Prior to excavation, the trial pit location was scanned with a Cable Avoidance Tool (CAT).
Backfill: The trial pit was backfilled on completion with arisings and levelled to existing ground level.
Trial pit stable.

N/R - Not Required
N/A - Not Applicable
All depths in metres below ground level;

Logged By: RPS
Approved By: CRS

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Trial Pit No.

TPJ

Sheet 1 of 1

Project No:	IV.58.13	**Method:**	Trial Pit Excavation	**Co-ordinates:**	N/R
				Ground Level:	N/R
Site:	Pennycroft, Uttoxeter	**Plant:**	JCB 3CX	**Start Date:**	08.10.13
Client:	East Staffs BC			**Finish Date:**	08.10.13

Description of Strata	Depth (m)	Sampling Type & Depth (m)		Legend	U100 / N Value Field / Lab. Testing
MADE GROUND: Slightly clayey sand with gravel of brick and concrete.	0.5 1.4	D/J	0.5		
MADE GROUND: Slightly clayey silty sand with waste including brick, plastic, concrete, kerbstones, glass, re-bar and polythene.	3.2	D/J	3.2		
Orange brown clayey sand and gravel	3.5	D/J	3.4		
Trial Pit terminated at 3.2mbgl					

Key:			
	Bulk (Bulk Bag)	D. Disturbed	V. 40ml Glass Vial
	W. Water	G. Amber Glass Jar / Bottle	N. 'N' value
	PID. Photo Ionisation Detector (ppm)	T. Plastic Tub	HP. Hand Penetrometer

Contamination Observations During Excavation				PID Monitoring		
Depth Observed	Made ground 3.2mbgl – waste/fill.			Depth: PPM:	Depth: PPM:	Depth: PPM:
Damp from 3.2m.						

NOTES:

Services: Prior to excavation, the trial pit location was scanned with a Cable Avoidance Tool (CAT).

Backfill: The trial pit was backfilled on completion with arisings and levelled to existing ground level. Trial pit stable.

N/R - Not Required N/A - Not Applicable

All depths in metres below ground level;

Logged By: RPS

Approved By: CRS

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Trial Pit No.

TPK

Sheet 1 of 1

Project No:	IV.58.13	**Method:**	Trial Pit Excavation	**Co-ordinates:**	N/R
Site:	Pennycroft, Uttoxeter			**Ground Level:**	N/R
		Plant:	JCB 3CX	**Start Date:**	08.10.13
Client:	East Staffs BC			**Finish Date:**	08.10.13

Description of Strata	Depth (m)	Sampling Type & Depth (m)		Legend	U100 / N Value Field / Lab. Testing
MADE GROUND: Sandy clay with roadstone	0.5				
MADE GROUND: lack brown slightly sandy soft CLAY with gravel of sandstone and ash. Slight tar odour.	2.1	D/J	1.0		
MADE GROUND: Black sandy gravelly soft CLAY with fragments of wood, brick and concrete. Slight tar odour.	3.0				
Brown/orange very sandy clay with occasional fine to coarse gravel	3.2	D/J	3.1		
Trial Pit terminated at 3.2mbgl					

Key:			
	Bulk (Bulk Bag)	D. Disturbed	V. 40ml Glass Vial
	W. Water	G. Amber Glass Jar / Bottle	N. 'N' value
	PID. Photo Ionisation Detector (ppm)	T. Plastic Tub	HP. Hand Penetrometer

Contamination Observations During Excavation			PID Monitoring		
Depth Observed	Made ground with ash and tar odour to 3.0m.		Depth: PPM:	Depth: PPM:	Depth: PPM:
Seepage at 2.5m.					

NOTES:

Services: Prior to excavation, the trial pit location was scanned with a Cable Avoidance Tool (CAT).

Backfill: The trial pit was backfilled on completion with arisings and levelled to existing ground level. Trial pit stable.

N/R - Not Required N/A - Not Applicable Logged By: RPS

All depths in metres below ground level; Approved By: CRS

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Trial Pit No.

HDB

Sheet 1 of 1

Project No:	IV.58.13	**Method:**	Hand Dug Pit	**Co-ordinates:**	N/R
				Ground Level:	N/R
Site:	Pennycroft, Uttoxeter				
		Plant:	Grafter	**Start Date:**	18.11.13
Client:	East Staffs BC			**Finish Date:**	18.11.13

Description of Strata	Depth (m)	Sampling Type & Depth (m)		Legend	U100 / N Value Field / Lab. Testing
MADE GROUND: Tarmac underlain by sandy clay with roadstone, brick and concrete fragments	0.5	D/J	0.3		
Pit terminated at 0.5mbgl					

Key:			
	Bulk (Bulk Bag)	D. Disturbed	V. 40ml Glass Vial
	W. Water	G. Amber Glass Jar / Bottle	N. 'N' value
	PID. Photo Ionisation Detector (ppm)	T. Plastic Tub	HP. Hand Penetrometer

Contamination Observations During Excavation				PID Monitoring		
Depth Observed	Made ground with tarmac to 0.5m.			Depth: PPM:	Depth: PPM:	Depth: PPM:
Dry						

NOTES:

Services: Prior to excavation, the trial pit location was scanned with a Cable Avoidance Tool (CAT).

Backfill: The pit was backfilled on completion with arisings and levelled to existing ground level.

N/R - Not Required N/A - Not Applicable Logged By: RPS

All depths in metres below ground level; Approved By: CRS

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Trial Pit No.

HDC

Sheet 1 of 1

Project No:	IV.58.13	**Method:**	Hand Dug Pit	**Co-ordinates:**	N/R
				Ground Level:	N/R
Site:	Pennycroft, Uttoxeter				
		Plant:	Grafter	**Start Date:**	18.11.13
Client:	East Staffs BC			**Finish Date:**	18.11.13

Description of Strata	Depth (m)	Sampling Type & Depth (m)		Legend	U100 / N Value Field / Lab. Testing
MADE GROUND: Tarmac underlain by red brown gravel of roadstone, brick, tarmac and concrete	0.5	D/J	0.4		
Pit terminated at 0.5mbgl					

Key:			
	Bulk (Bulk Bag)	D. Disturbed	V. 40ml Glass Vial
	W. Water	G. Amber Glass Jar / Bottle	N. 'N' value
	PID. Photo Ionisation Detector (ppm)	T. Plastic Tub	HP. Hand Penetrometer

Contamination Observations During Excavation				PID Monitoring		
Depth Observed	Made ground with brick, tarmac gravel to 0.5m.			Depth: PPM:	Depth: PPM:	Depth: PPM:
Dry						

NOTES:

Services: Prior to excavation, the trial pit location was scanned with a Cable Avoidance Tool (CAT).

Backfill: The pit was backfilled on completion with arisings and levelled to existing ground level.

N/R - Not Required N/A - Not Applicable Logged By: RPS

All depths in metres below ground level; Approved By: CRS

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Trial Pit No.

HDD

Sheet 1 of 1

Project No:	IV.58.13	**Method:**	Hand Dug Pit	**Co-ordinates:**	N/R
				Ground Level:	N/R
Site:	Pennycroft, Uttoxeter				
		Plant:	Grafter	**Start Date:**	18.11.13
Client:	East Staffs BC			**Finish Date:**	18.11.13

Description of Strata	Depth (m)	Sampling Type & Depth (m)		Legend	U100 / N Value Field / Lab. Testing
MADE GROUND: Tarmac underlain by black sandy gravel of tarmac, roadstone, brick and concrete.	0.5	D/J	0.25		
Pit terminated at 0.5mbgl					

Key:	Bulk (Bulk Bag)	D. Disturbed	V. 40ml Glass Vial
	W. Water	G. Amber Glass Jar / Bottle	N. 'N' value
	PID. Photo Ionisation Detector (ppm)	T. Plastic Tub	HP. Hand Penetrometer

Contamination Observations During Excavation				PID Monitoring		
Depth Observed	Made ground with black tarmac, brick, concrete gravel to 0.5m.			Depth: PPM:	Depth: PPM:	Depth: PPM:
Dry						

NOTES:

Services: Prior to excavation, the trial pit location was scanned with a Cable Avoidance Tool (CAT).

Backfill: The pit was backfilled on completion with arisings and levelled to existing ground level.

N/R - Not Required N/A - Not Applicable Logged By: RPS

All depths in metres below ground level; Approved By: CRS

IV 58 13-Pennycroft, Dovecote Lane: WS A

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.10	MADE GROUND: TARMACADAM with limited dolomite sub-base.		
0.10	0.20	MADE GROUND: Light brown and light grey very sandy GRAVEL.		
0.20	0.80	MADE GROUND: Dark grey clayey, sandy fine to coarse GRAVEL of concrete, limestone, brick, clinker, coal, rare tarmac and many brick cobbles.		0.35-0.70 B
0.80	3.20	MADE GROUND: Dark grey, occasionally clayey, slightly sandy fine to coarse GRAVEL of ash-clinker, some concrete, brick, sandstone and limestone with occasional brick cobbles. Rare wood and tar stain and strong odour noted from 0.80m to base. Sample tube refusal at 3.20m		0.80-1.00 J2 2.00 J2 3.20 spt = 25/18/32 n=50/150mm
		End of borehole Water strike and SWL at 0.80m		

Site: Pennycroft, Uttoxeter
Client: Ivy House
Client Reference: N/A
Engineer: GE
Site Works Date: 08/10/2013
Plant: Archway Competitor C130 Superheavy

Log Notes:
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

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IV 58 13-Pennycroft, Dovecote Lane: WS A1

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.10	MADE GROUND: TARMACADAM.		
0.10	0.30	MADE GROUND: Dark grey very sandy fine to coarse GRAVEL of concrete, limestone, brick, clinker, coal, rare tarmac and many brick cobbles.		0.10-0.30 B
0.30	0.60	MADE GROUND: Dark grey, slightly sandy fine to coarse GRAVEL of ash-clinker, some concrete, brick, sandstone and limestone. Some possible slag noted.		0.30-0.60 B
0.60	1.40	Light brown, slightly clayey sandstone, limestone and quartz SAND + GRAVEL.		0.80-1.00 J2 1.00-1.50 B
1.40	3.00	Soft reddish brown very sandy CLAY. Light tar stain and odour noted throughout.		2.00 J 3.00 J
		End of borehole BH remained open and dry on completion		

Site: Pennycroft, Uttoxeter
Client: Ivy House
Client Reference: N/A
Engineer: GE
Site Works Date: 08/10/2013
Plant: Archway Competitor C130 Superheavy

Log Notes:
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

IV 58 13-Pennycroft, Dovecote Lane: WS A2

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.08	MADE GROUND: TARMACADAM with limited dolomite sub-base.		
0.08	0.28	MADE GROUND: Light brown and light grey very sandy GRAVEL.		0.10-0.20 B
0.28	0.55	MADE GROUND: Dark grey clayey, sandy fine to coarse GRAVEL of concrete, limestone, brick, clinker, coal, rare tarmac and many brick cobbles.		
0.55	2.00	MADE GROUND: Dark grey, occasionally clayey, slightly sandy fine to coarse GRAVEL of ash-clinker, some concrete, brick, sandstone and limestone with occasional brick cobbles. Rare wood and tar stain and strong odour noted from 0.75m to base.		0.60-1.00 B 0.70 J2 1.50 J2
		End of borehole Water strike and SWL at 0.70m Installed 1.00m slotted/1.00m plain pipe		

Site: Pennycroft, Uttoxeter
Client: Ivy House
Client Reference: N/A
Engineer: GE
Site Works Date: 08/10/2013
Plant: Archway Competitor C130 Superheavy

Log Notes:
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

IV 58 13-Pennycroft, Dovecote Lane: WS B

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.22	MADE GROUND: Dolomite and limestone GRAVEL with some concrete and brick.		
0.22	0.25	MADE GROUND: Red shale GRAVEL.		
0.45	3.20	MADE GROUND: Dark grey, occasionally clayey, slightly sandy fine to coarse GRAVEL of ash-clinker, some concrete, brick, sandstone and limestone with occasional brick cobbles. Rare wood and tar stain and strong odour noted from 0.75m to base. Possible rare slag noted. Much concrete gravel below 2.90m Sample tube refusal at 3.20m		0.25-0.50 J2 1.00 J2 2.00 J2 3.00 J2 3.20 spt = 9/13/21/29 n=50/150mm
		End of borehole Water strike and SWL at 0.75m Installed 2.00m slotted/0.40m plain pipe		

Site: Pennycroft, Uttoxeter
Client: Ivy House
Client Reference: N/A
Engineer: GE
Site Works Date: 08/10/2013
Plant: Archway Competitor C130 Superheavy

Log Notes:
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

IV 58 13-Pennycroft, Dovecote Lane: WS C

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.09	MADE GROUND: TARMACADAM.		
0.09	0.16	MADE GROUND: Red and grey fine to coarse red shale GRAVEL with some tarmac and limestone. Sub-base.		0.10-0.16 J2
0.16	0.45	MADE GROUND: Dark brown and red sandy brick FILL with much concrete, clinker and limestone gravel.		
0.45	1.00	MADE GROUND: Dark grey, occasionally clayey, slightly sandy fine to coarse GRAVEL of ash-clinker, some concrete, brick, sandstone and limestone with occasional brick cobbles. Rare wood and light tar stain noted.		0.50-0.70 J2
1.00	1.70	Firm becoming soft reddish brown very sandy CLAY with much limestone, sandstone and sandstone gravel.		
1.70	2.10	Dark grey very clayey, gravelly fine to coarse SAND. Tar stain and smell noted.		1.70-1.90 J2
2.10	3.00	Soft reddish brown sandy CLAY with black tar stain and odour to 2.35m.		2.10-2.30 J2 2.50-3.00 J2
		End of borehole Borehole remained open and dry on completion Backfilled with arisings		

Site: Pennycroft, Uttoxeter
Client: Ivy House
Client Reference: N/A
Engineer: GE
Site Works Date: 08/10/2013
Plant: Archway Competitor C130 Superheavy

Log Notes:
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

IV 58 13-Pennycroft, Dovecote Lane: WS D

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.10	MADE GROUND: TARMACADAM.		
0.10	0.28	MADE GROUND: Grey fine sandy to coarse GRAVEL of tarmac, dolomite, limestone, brick and concrete.		0.10-0.28 J2
0.28	1.60	MADE GROUND: Red sandy brick FILL with some brick and concrete gravel. Sample tube refusal at 1.60m		1.00-1.60 B 1.60 spt = 7/18/19/31/25mm n=50/100mm
		End of borehole Borehole remained open and dry on completion Backfilled with arisings		

Site: Pennycroft, Uttoxeter
Client: Ivy House
Client Reference: N/A
Engineer: GE
Site Works Date: 08/10/2013
Plant: Archway Competitor C130 Superheavy

Log Notes:
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

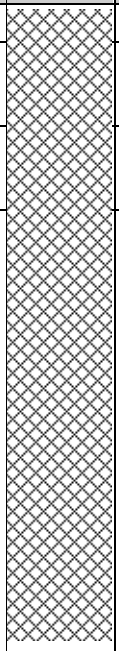
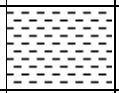
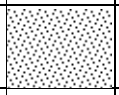
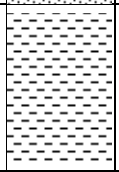
IV 58 13-Pennycroft, Dovecote Lane: WS E

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.08	MADE GROUND: TARMACADAM.		
0.08	0.27	MADE GROUND: Dolomite sub-base.		
0.27	0.60	MADE GROUND: Grey slightly clayey, very sandy fine to coarse GRAVEL of limestone, brick, concrete, some coal, clinker and slate.		0.30-0.60 B
0.60	2.20	MADE GROUND: Dark brown and brown CLAY FILL with much fine to coarse gravel of brick, limestone, concrete and clinker.		1.00-1.50 B
2.20	3.80	Brown very sandy, slightly gravelly CLAY with black tar stain and odour below 2.80m.		3.00 J 3.70 B
3.80	3.95	Black slightly clayey limestone and sandstone SAND + GRAVEL. Tar odour noted		3.80 J
		End of borehole Borehole remained open and dry on completion Installed 3.00m slotted/0.90m plain pipe		

Site: Pennycroft, Uttoxeter
Client: Ivy House
Client Reference: N/A
Engineer: GE
Site Works Date: 09/10/2013
Plant: Archway Competitor C130 Superheavy

Log Notes:
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

IV 58 13-Pennycroft, Dovecote Lane: WS F

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.15	MADE GROUND: Limestone GRAVEL over dolomite.		
0.15	0.60	MADE GROUND: Dark grey, very sandy fine to coarse GRAVEL of concrete, clinker, brick and some coal. Brick cobbles noted.		0.20-0.50 B
0.60	0.90	MADE GROUND: Grey concrete SAND + GRAVEL.		
0.90	3.00	MADE GROUND: Brown and dark brown sandy fine to coarse GRAVEL of brick, limestone, concrete and clinker.		1.00-1.50 B
3.00	3.40	Soft grey and brown very sandy CLAY.		3.00-3.40 B
3.40	3.80	Brown limestone and sandstone SAND + GRAVEL.		
3.80	4.45	Stiff reddish brown sandy CLAY.		3.80-4.00 B 4.00 spt = 3/7/5/5/6/7 n=23
		End of borehole Borehole remained open and dry on completion		

Site: Pennycroft, Uttoxeter
Client: Ivy House
Client Reference: N/A
Engineer: GE
Site Works Date: 09/10/2013
Plant: Archway Competitor C130 Superheavy

Log Notes:
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

IV 58 13-Pennycroft, Dovecote Lane: WS G

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.10	MADE GROUND: Turf over topsoil. Brown gravelly SAND.		
0.10	1.70	MADE GROUND: Black ash-clinker FILL with much brick, some limestone, sandstone, concrete and coal.		0.50-1.00 B
1.70	2.00	MADE GROUND: Soft light brown sandy CLAY FILL with much brick gravel.		1.70-2.00 B
2.00	2.40	MADE GROUND: Dark grey clayey limestone and sandstone SAND + GRAVEL with much brick, clinker and concrete. Stain and sheen but no obvious odour.		2.00-2.40 B
2.40	2.70	Soft grey and brown sandy CLAY.		2.40-2.70 B
2.70	3.00	Brown limestone and sandstone SAND + GRAVEL.		
		End of borehole BH remained open and dry on completion		

Site: Pennycroft, Uttoxeter
Client: Ivy House
Client Reference: N/A
Engineer: GE
Site Works Date: 10/10/2013
Plant: Archway Competitor C130 Superheavy

Log Notes:
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

IV 58 13-Pennycroft, Dovecote Lane: WS H

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.17	MADE GROUND: Turf over topsoil. Brown gravelly fine to coarse SAND.		
0.17	0.30	MADE GROUND: Red clayey, brick FILL with much limestone, sandstone, rare glass and clinker gravel.		
0.30	1.70	MADE GROUND: Dark brown clayey fine to coarse SAND with much fine to coarse gravel of brick, coal, limestone, sandstone and clinker.		1.00 B
1.70	2.70	Dense becoming very dense reddish brown very clayey slightly sandy limestone and sandstone GRAVEL.		2.00 B 2.00 spt = 8/8/7/8/10/10 n=35 2.70 spt = 7/9/11/13/17/10/50mm n=50/275mm
		End of borehole Borehole remained open and dry on completion Backfilled with arisings		

Site: Pennycroft, Uttoxeter
Client: Ivy House
Client Reference: N/A
Engineer: GE
Site Works Date: 09/10/2013
Plant: Archway Competitor C130 Superheavy

Log Notes:
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

IV 58 13-Pennycroft, Dovecote Lane: WS I

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.13	MADE GROUND: Turf over topsoil. Brown gravelly SAND.		
0.13	0.70	MADE GROUND: Grey brick, concrete and breeze block FILL with rare possible asbestos tile.		0.20-0.50 B
0.70	1.00	MADE GROUND: Light brown sandy CLAY FILL.		
1.00	1.30	MADE GROUND: Dark grey sandy fine to coarse GRAVEL of clinker, brick, limestone and concrete.		1.00-1.30 B
1.30	1.50	MADE GROUND: Black ash-clinker FILL. Tar stain and odour.		1.30-1.50 B
1.50	3.00	Dark grey very sandy CLAY with much gravel at base. Tar odour and slight stain throughout.		1.50-2.00 B 2.00-3.00 B
		End of borehole Water strike and SWL at 1.30m Installed 0.20m bentonite/1.80m slotted/1.00m plain pipe		

Site: Pennycroft, Uttoxeter
Client: Ivy House
Client Reference: N/A
Engineer: GE
Site Works Date: 10/10/2013
Plant: Archway Competitor C130 Superheavy

Log Notes:
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

IV 58 13-Pennycroft, Dovecote Lane: WS J

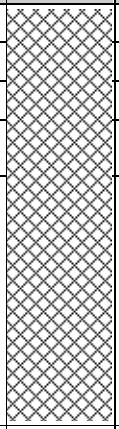
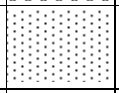
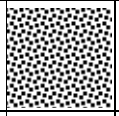
Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.10	MADE GROUND: Turf over topsoil. Reddish brown gravelly fine to coarse SAND.		0.00-0.50 B
0.10	1.30	MADE GROUND: Very dense brown fine to coarse SAND with much fine to coarse gravel of brick, coal, limestone, sandstone and rare clinker. Some possible asbestos tile noted.		0.50-1.00 B 1.00 spt = 11/13/11/39 n=50/150 1.30 spt = 50
		End of borehole Borehole remained open and dry on completion Backfilled with arisings		

Site: Pennycroft, Uttoxeter
Client: Ivy House
Client Reference: N/A
Engineer: GE
Site Works Date: 09/10/2013
Plant: Archway Competitor C130 Superheavy

Log Notes:
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

GEO Environmental Engineering

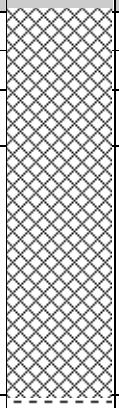
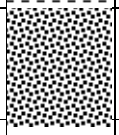
IV 58 13-Pennycroft, Dovecote Lane: WS K

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.12	MADE GROUND: TARMACADAM.		
0.12	0.33	MADE GROUND: Tarmac and limestone GRAVEL sub-base.		0.12-0.30 J
0.33	0.45	MADE GROUND: Fine grey limestone COBBLES.		
0.45	0.70	MADE GROUND: Sandy brick FILL with some concrete, limestone and clinker.		
0.70	1.70	MADE GROUND: Brown very sandy CLAY FILL with much limestone, sandstone, rare coal and clinker gravel.		1.00-1.50 B
1.70	2.10	Relic Topsoil. Dark brown organic, slightly clayey fine to coarse SAND.		1.70-2.00 B
2.10	2.50	Dense brown limestone and sandstone SAND + GRAVEL.		
		End of borehole BH remained open and dry on completion Installed 2.00m slotted/0.50m plain pipe		

Site: Pennycroft, Uttoxeter
Client: Ivy House
Client Reference: N/A
Engineer: GE
Site Works Date: 10/10/2013
Plant: Archway Competitor C130 Superheavy

Log Notes:
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

IV 58 13-Pennycroft, Dovecote Lane: WS L

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.12	MADE GROUND: TARMACADAM.		
0.12	0.33	MADE GROUND: Tarmac and limestone GRAVEL sub-base.		0.12-0.30 J
0.45	0.70	MADE GROUND: Sandy brick FILL with some concrete, limestone and clinker.		
0.70	1.70	MADE GROUND: Dark brown and brown CLAY FILL with much fine to coarse gravel of brick, limestone, concrete and clinker.		1.30-1.50 B
1.70	2.10	Soft grey and brown sandy CLAY.		2.0-2.10 B
2.10	2.50	Dense brown limestone and sandstone SAND + GRAVEL.		
		End of borehole BH remained open and dry on completion Installed 2.00m slotted/0.50m plain pipe		

Site: Pennycroft, Uttoxeter
Client: Ivy House
Client Reference: N/A
Engineer: GE
Site Works Date: 10/10/2013
Plant: Archway Competitor C130 Superheavy

Log Notes:
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

APPENDIX E

Richard Sutton
Ivy House Environmental Ltd
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Ockbrook
Derby
DE72 3RX

QTS Environmental Ltd
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t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 13-17089

Site Reference:	Pennycroft, Uttoxeter
Project / Job Ref:	IV.58.13
Order No:	None Supplied
Sample Receipt Date:	10/10/2013
Sample Scheduled Date:	10/10/2013
Report Issue Number:	2
Reporting Date:	20/11/2013

Authorised by:

Russell Jarvis
Director
On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Director
On behalf of QTS Environmental Ltd

QTS Environmental Ltd
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Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
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4480

Soil Analysis Certificate						
QTS Environmental Report No: 13-17089	**Date Sampled**	08/10/13	08/10/13	08/10/13	08/10/13	08/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	TPA	TPA	TPB1A	TPG	TPG
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	+1.00m	None Supplied
Order No: None Supplied	**Depth (m)**	1.40 @ 4.00	1.00 @ 7.00	2.60 @ 5.00	None Supplied	1.60
Reporting Date: 20/11/2013	**QTSE Sample No**	82124	82125	82126	82127	82128

Determinand	Unit	MDL	Accreditation					
Asbestos Screen [S]	N/a	N/a	ISO17025				Detected	
Asbestos Matrix [S]	Material Type	N/a	ISO17025				Loose fibres	
Asbestos Type [S]	PLM Result	N/a	ISO17025				Chrysotile	
pH	pH Units	N / a	MCERTS				7.8	
Total Cyanide	mg/kg	< 2	NONE				< 2	
Complex Cyanide	mg/kg	< 2	NONE	< 2	< 2			< 2
Free Cyanide	mg/kg	< 2	NONE	< 2	< 2			< 2
Thiocyanate as SCN	mg/kg	< 3	NONE	< 3	< 3			< 3
Total Sulphate as SO_4	mg/kg	< 200	NONE				1995	
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	NONE				0.10	
Organic Matter	%	< 0.1	NONE				8.5	
Arsenic (As)	mg/kg	< 2	MCERTS	2	16		5	29
W/S Boron	mg/kg	< 1	NONE	1.9	1.7			1.5
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	< 0.5	0.5		2.9	0.6
Chromium (Cr)	mg/kg	< 2	MCERTS	49	17		31	32
Chromium (hexavalent)	mg/kg	< 2	NONE				< 2	
Copper (Cu)	mg/kg	< 4	MCERTS	11	54		205	76
Lead (Pb)	mg/kg	< 3	MCERTS	18	280		594	221
Mercury (Hg)	mg/kg	< 1	NONE	< 1	1		4.7	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	51	27		26	17
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3		< 3	< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	67	97		439	181
Total Phenols (monohydric)	mg/kg	< 2	NONE				< 2	
EPH (C10 - C40)	mg/kg	< 6	MCERTS			< 6	707	

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C
Analysis carried out on the dried sample is corrected for the stone content
Subcontracted analysis [S]

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Soil Analysis Certificate						
QTS Environmental Report No: 13-17089	**Date Sampled**	08/10/13	08/10/13	08/10/13	08/10/13	08/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	TPG	TPI	TPI	TPH	TPH
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	3.20	1.00	3.20	0.70 - 1.60	3.40
Reporting Date: 20/11/2013	**QTSE Sample No**	82129	82130	82131	82132	82133

Determinand	Unit	MDL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025		None Detected		None Detected	
Asbestos Matrix (S)	Material Type	N/a	NONE					
Asbestos Type (S)	PLM Result	N/a	ISO17025					
pH	pH Units	N / a	MCERTS		7.7		7.7	
Total Cyanide	mg/kg	< 2	NONE		< 2		< 2	
Complex Cyanide	mg/kg	< 2	NONE	< 2				
Free Cyanide	mg/kg	< 2	NONE	< 2				
Thiocyanate as SCN	mg/kg	< 3	NONE	< 3				
Total Sulphate as SO_4	mg/kg	< 200	NONE		1376		1083	
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	NONE		0.08		0.06	
Organic Matter	%	< 0.1	NONE		3		2.7	
Arsenic (As)	mg/kg	< 2	MCERTS	5	11		6	
W/S Boron	mg/kg	< 1	NONE	< 1				
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	< 0.5	0.8		< 0.5	
Chromium (Cr)	mg/kg	< 2	MCERTS	8	19		13	
Chromium (hexavalent)	mg/kg	< 2	NONE		< 2		< 2	
Copper (Cu)	mg/kg	< 4	MCERTS	5	58		74	
Lead (Pb)	mg/kg	< 3	MCERTS	14	105		104	
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1		< 1	
Nickel (Ni)	mg/kg	< 3	MCERTS	6	21		22	
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3		< 3	
Zinc (Zn)	mg/kg	< 3	MCERTS	30	165		61	
Total Phenols (monohydric)	mg/kg	< 2	NONE		< 2		< 2	
EPH (C10 - C40)	mg/kg	< 6	MCERTS			< 6	200	< 6

Analytical results are expressed on a dry weight basis where samples are dried at less than 30^{O}C
Analysis carried out on the dried sample is corrected for the stone content
Subcontracted analysis (S)

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4480

Soil Analysis Certificate							
QTS Environmental Report No: 13-17089	**Date Sampled**	08/10/13	08/10/13	08/10/13		
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	TPJ	TPK	TPK		
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	**Depth (m)**	0.50	2.10	3.20		
Reporting Date: 20/11/2013	**QTSE Sample No**	82134	82135	82136		

Determinand	Unit	MDL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025	None Detected				
Asbestos Matrix (S)	Material Type	N/a	NONE					
Asbestos Type (S)	PLM Result	N/a	ISO17025					
pH	pH Units	N / a	MCERTS	7.1				
Total Cyanide	mg/kg	< 2	NONE	< 2				
Complex Cyanide	mg/kg	< 2	NONE		< 2	< 2		
Free Cyanide	mg/kg	< 2	NONE		< 2	< 2		
Thiocyanate as SCN	mg/kg	< 3	NONE		< 3	< 3		
Total Sulphate as SO_4	mg/kg	< 200	NONE	777				
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	NONE	0.03				
Organic Matter	%	< 0.1	NONE	4				
Arsenic (As)	mg/kg	< 2	MCERTS	9	32	16		
W/S Boron	mg/kg	< 1	NONE		< 1	< 1		
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	< 0.5	< 0.5	< 0.5		
Chromium (Cr)	mg/kg	< 2	MCERTS	17	26	19		
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2				
Copper (Cu)	mg/kg	< 4	MCERTS	32	117	16		
Lead (Pb)	mg/kg	< 3	MCERTS	95	354	27		
Mercury (Hg)	mg/kg	< 1	NONE	< 1	1.2	< 1		
Nickel (Ni)	mg/kg	< 3	MCERTS	17	20	27		
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3		
Zinc (Zn)	mg/kg	< 3	MCERTS	118	83	63		
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2				
EPH (C10 - C40)	mg/kg	< 6	MCERTS	50				

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C
Analysis carried out on the dried sample is corrected for the stone content
Subcontracted analysis (S)

QTS Environmental Ltd
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Rose Lane
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Soil Analysis Certificate - Speciated PAHs						
QTS Environmental Report No: 13-17089	**Date Sampled**	08/10/13	08/10/13	08/10/13	08/10/13	
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	TPG	TPI	TPH	TPJ	
Project / Job Ref: IV.58.13	**Additional Refs**	+1.00m	None Supplied	None Supplied	None Supplied	
Order No: None Supplied	**Depth (m)**	None Supplied	1.00	0.70 - 1.60	0.50	
Reporting Date: 20/11/2013	**QTSE Sample No**	82127	82130	82132	82134	

Determinand	Unit	MDL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Acenaphthylene	mg/kg	< 0.1	MCERTS	0.11	< 0.1	< 0.1	< 0.1	
Acenaphthene	mg/kg	< 0.1	MCERTS	0.56	< 0.1	< 0.1	< 0.1	
Fluorene	mg/kg	< 0.1	MCERTS	0.43	< 0.1	< 0.1	< 0.1	
Phenanthrene	mg/kg	< 0.1	MCERTS	5.04	0.57	0.68	0.76	
Anthracene	mg/kg	< 0.1	MCERTS	1.41	0.18	0.21	0.26	
Fluoranthene	mg/kg	< 0.1	MCERTS	11.80	1.75	2.51	2.02	
Pyrene	mg/kg	< 0.1	MCERTS	9.51	1.49	2.14	1.69	
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	4.84	0.92	1.41	1.29	
Chrysene	mg/kg	< 0.1	MCERTS	4.48	0.81	1.13	1.25	
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	5.80	1.11	1.82	1.78	
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	2.66	0.49	0.57	0.77	
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	4.32	0.80	1.42	1.63	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	2.73	0.50	0.90	0.91	
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	0.28	< 0.1	0.12	< 0.1	
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	2.61	0.48	0.69	0.69	
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	56.5	9.1	13.6	13.1	

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

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Soil Analysis Certificate - TPH CWG Banded						
QTS Environmental Report No: 13-17089	**Date Sampled**	08/10/13	08/10/13	08/10/13	08/10/13	08/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	TPA	TPA	TPG	TPG	TPK
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	1.40 @ 4.00	1.00 @ 7.00	1.60	3.20	2.10
Reporting Date: 20/11/2013	**QTSE Sample No**	82124	82125	82128	82129	82135

Determinand	Unit	MDL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	12.60	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 1	NONE	< 1	69	< 1	< 1	< 1
Aliphatic >C10 - C12	mg/kg	< 1	NONE	< 1	119	9	< 1	< 1
Aliphatic >C12 - C16	mg/kg	< 1	NONE	< 1	606	37	< 1	< 1
Aliphatic >C16 - C21	mg/kg	< 1	NONE	< 1	1716	62	< 1	< 1
Aliphatic >C21 - C34	mg/kg	< 6	NONE	< 6	810	47	< 6	< 6
Aliphatic (C5 - C34)	mg/kg	< 12	NONE	< 12	3331	154	< 12	< 12
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	0.12	11.90	0.06	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	0.48	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 1	NONE	< 1	88	< 1	< 1	< 1
Aromatic >C10 - C12	mg/kg	< 1	NONE	< 1	104	3	< 1	< 1
Aromatic >C12 - C16	mg/kg	< 1	NONE	< 1	238	12	< 1	< 1
Aromatic >C16 - C21	mg/kg	< 1	NONE	< 1	705	35	< 1	< 1
Aromatic >C21 - C35	mg/kg	< 6	NONE	< 6	515	44	< 6	< 6
Aromatic (C5 - C35)	mg/kg	< 12	NONE	< 12	1661	93	< 12	< 12
Total >C5 - C35	mg/kg	< 24	NONE	< 24	4993	248	< 24	< 24

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

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Soil Analysis Certificate - TPH CWG Banded							
QTS Environmental Report No: 13-17089	**Date Sampled**	08/10/13					
Ivy House Environmental Ltd	**Time Sampled**	None Supplied					
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	TPK					
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied					
Order No: None Supplied	**Depth (m)**	3.20					
Reporting Date: 20/11/2013	**QTSE Sample No**	82136					

Determinand	Unit	MDL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01				
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05				
Aliphatic >C8 - C10	mg/kg	< 1	NONE	< 1				
Aliphatic >C10 - C12	mg/kg	< 1	NONE	< 1				
Aliphatic >C12 - C16	mg/kg	< 1	NONE	< 1				
Aliphatic >C16 - C21	mg/kg	< 1	NONE	< 1				
Aliphatic >C21 - C34	mg/kg	< 6	NONE	< 6				
Aliphatic (C5 - C34)	mg/kg	< 12	NONE	< 12				
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01				
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05				
Aromatic >C8 - C10	mg/kg	< 1	NONE	< 1				
Aromatic >C10 - C12	mg/kg	< 1	NONE	< 1				
Aromatic >C12 - C16	mg/kg	< 1	NONE	< 1				
Aromatic >C16 - C21	mg/kg	< 1	NONE	< 1				
Aromatic >C21 - C35	mg/kg	< 6	NONE	< 6				
Aromatic (C5 - C35)	mg/kg	< 12	NONE	< 12				
Total >C5 - C35	mg/kg	< 24	NONE	< 24				

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

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Soil Analysis Certificate - BTEX / MTBE						
QTS Environmental Report No: 13-17089	**Date Sampled**	08/10/13	08/10/13	08/10/13	08/10/13	08/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	TPA	TPA	TPG	TPG	TPK
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	1.40 @ 4.00	1.00 @ 7.00	1.60	3.20	2.10
Reporting Date: 20/11/2013	**QTSE Sample No**	82124	82125	82128	82129	82135

Determinand	Unit	MDL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	121	11887	55	< 2	< 2
Toluene	ug/kg	< 5	MCERTS	12	478	18	< 5	< 5
Ethylbenzene	ug/kg	< 10	MCERTS	16	24871	50	< 10	< 10
p & m-xylene	ug/kg	< 10	MCERTS	18	16134	112	< 10	< 10
o-xylene	ug/kg	< 10	MCERTS	15	13639	83	< 10	< 10

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

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Soil Analysis Certificate - BTEX / MTBE						
QTS Environmental Report No: 13-17089	**Date Sampled**	08/10/13				
Ivy House Environmental Ltd	**Time Sampled**	None Supplied				
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	TPK				
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied				
Order No: None Supplied	**Depth (m)**	3.20				
Reporting Date: 20/11/2013	**QTSE Sample No**	82136				

Determinand	Unit	MDL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2				
Toluene	ug/kg	< 5	MCERTS	< 5				
Ethylbenzene	ug/kg	< 10	MCERTS	< 10				
p & m-xylene	ug/kg	< 10	MCERTS	< 10				
o-xylene	ug/kg	< 10	MCERTS	< 10				

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

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Soil Analysis Certificate - Volatile Organic Compounds (VOC)						
QTS Environmental Report No: 13-17089	**Date Sampled**	08/10/13	08/10/13	08/10/13	08/10/13	08/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	TPA	TPA	TPB1A	TPG	TPG
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	1.40 @ 4.00	1.00 @ 7.00	2.60 @ 5.00	1.60	3.20
Reporting Date: 20/11/2013	**QTSE Sample No**	82124	82125	82126	82128	82129

Determinand	Unit	MDL	Accreditation					
Dichlorodifluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Chloromethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Chloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromomethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Trichlorofluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	ug/kg	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
trans-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
cis-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
2,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Chloroform	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1,1-Trichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1-Dichloropropene	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Carbon Tetrachloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Benzene	ug/kg	< 2	MCERTS	121	11890	71	55	< 2
1,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Trichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromodichloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Dibromomethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
TAME	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Toluene	ug/kg	< 5	MCERTS	12	478	< 5	18	< 5
trans-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
1,3-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dibromoethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1,1,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethyl Benzene	ug/kg	< 10	MCERTS	16	24870	12	50	< 10
m,p-Xylene	ug/kg	< 10	MCERTS	18	16130	< 10	112	< 10
o-Xylene	ug/kg	< 10	MCERTS	15	13640	< 10	83	< 10
Styrene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromoform	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Isopropylbenzene	ug/kg	< 5	MCERTS	< 5	377	< 5	8	< 5
1,1,2,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2,3-Trichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
n-Propylbenzene	ug/kg	< 5	MCERTS	< 5	321	< 5	7	< 5
Bromobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
2-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,3,5-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5	316	< 5	177	< 5
4-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
tert-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2,4-Trimethylbenzene	ug/kg	< 5	MCERTS	11	32620	< 5	197	< 5
sec-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
p-Isopropyltoluene	ug/kg	< 5	MCERTS	< 5	149	< 5	8	< 5
1,3-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,4-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
n-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dibromo-3-chloropropane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Hexachlorobutadiene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C

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Soil Analysis Certificate - Volatile Organic Compounds (VOC)						
QTS Environmental Report No: 13-17089	**Date Sampled**	08/10/13	08/10/13	08/10/13	08/10/13	
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	TP1	TP4	TP6	TP6	
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: None Supplied	**Depth (m)**	3.20	3.40	2.10	3.20	
Reporting Date: 20/11/2013	**QTSE Sample No**	82131	82133	82135	82136	

Determinand	Unit	MDL	Accreditation					
Dichlorodifluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Vinyl Chloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Chloromethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	
Chloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Bromomethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	
Trichlorofluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
1,1-Dichloroethene	ug/kg	< 5	ISO17025	< 5	< 5	< 5	< 5	
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
trans-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
1,1-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
cis-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
2,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Chloroform	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Bromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
1,1,1-Trichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
1,1-Dichloropropene	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	
Carbon Tetrachloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
1,2-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
1,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Trichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Bromodichloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Dibromomethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
TAME	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
cis-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
trans-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
1,1,2-Trichloroethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	
1,3-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Tetrachloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Dibromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
1,2-Dibromoethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Chlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
1,1,1,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Ethyl Benzene	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	
m,p-Xylene	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	
o-Xylene	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	
Styrene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Bromoform	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	
Isopropylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
1,1,2,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
1,2,3-Trichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
n-Propylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Bromobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
2-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
1,3,5-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
4-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
tert-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
1,2,4-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
sec-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
p-Isopropyltoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
1,3-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
1,4-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
n-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
1,2-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
1,2-Dibromo-3-chloropropane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	
Hexachlorobutadiene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C

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Soil Analysis Certificate - Semi Volatile Organic Compounds (SVOC)						
QTS Environmental Report No: 13-17089	**Date Sampled**	08/10/13	08/10/13	08/10/13	08/10/13	08/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	TPA	TPA	TPB1A	TPG	TPG
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	1.40 @ 4.00	1.00 @ 7.00	2.60 @ 5.00	1.60	3.20
Reporting Date: 20/11/2013	**QTSE Sample No**	82124	82125	82126	82128	82129

Determinand	Unit	MDL	Accreditation					
Phenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,4-Trichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nitrobenzene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
0-Cresol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
bis(2-chloroethoxy)methane	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
bis(2-chloroethyl)ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chlorophenol	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,3-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dimethylphenol	mg/kg	< 0.15	ISO17025	< 0.15	< 0.15	< 0.15	0.26	< 0.15
Isophorone	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachloroethane	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
p-Cresol	mg/kg	< 0.15	MCERTS	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
2,4,6-Trichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylnaphthalene	mg/kg	< 0.1	MCERTS	0.1	3.5	< 0.1	2.3	< 0.1
Hexachlorocyclopentadiene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethyl phthalate	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloroanaline	mg/kg	< 0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chlorophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Bromophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobenzene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Diethyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.1	< 0.1	< 0.1
Dibenzofuran	mg/kg	< 0.1	MCERTS	0.1	10.3	< 0.1	6.6	0.1
Azobenzene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibutyl phthalate	mg/kg	< 0.15	ISO17025	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
Carbazole	mg/kg	< 0.1	ISO17025	0.2	4.8	0.1	1.9	0.1
bis(2-ethylhexyl)phthalate	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzyl butyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Di-n-octyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

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

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Tel : 01622 850410

Soil Analysis Certificate - Semi Volatile Organic Compounds (SVOC)						
QTS Environmental Report No: 13-17089	**Date Sampled**	08/10/13	08/10/13	08/10/13	08/10/13	
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	TP1	TP4	TP6	TP8	
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: None Supplied	**Depth (m)**	3.20	3.40	2.10	3.20	
Reporting Date: 20/11/2013	**QTSE Sample No**	82131	82133	82135	82136	

Determinand	Unit	MDL	Accreditation					
Phenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
1,2,4-Trichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	
2-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Nitrobenzene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
0-Cresol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
bis(2-chloroethoxy)methane	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
bis(2-chloroethyl)ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
2,4-Dichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
2-Chlorophenol	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	
1,3-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	
1,4-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	
1,2-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	
2,4-Dimethylphenol	mg/kg	< 0.15	ISO17025	< 0.15	< 0.15	< 0.15	< 0.15	
Isophorone	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Hexachloroethane	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
p-Cresol	mg/kg	< 0.15	MCERTS	< 0.15	< 0.15	< 0.15	< 0.15	
2,4,6-Trichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
2,4,5-Trichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
2-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
4-Chloro-3-methylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
2-Methylnaphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.2	< 0.1	
Hexachlorocyclopentadiene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Hexachlorobutadiene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	
2,6-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Dimethyl phthalate	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
2-Chloronaphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
4-Chloroanaline	mg/kg	< 0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	
4-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
4-Chlorophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
3-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
4-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
4-Bromophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Hexachlorobenzene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
2,4-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Diethyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Dibenzofuran	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.2	< 0.1	
Azobenzene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Dibutyl phthalate	mg/kg	< 0.15	ISO17025	< 0.15	< 0.15	< 0.15	< 0.15	
Carbazole	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	0.2	< 0.1	
bis(2-ethylhexyl)phthalate	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Benzyl butyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Di-n-octyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	

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

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Leachate Analysis Certificate						
QTS Environmental Report No: 13-17089	**Date Sampled**	08/10/13				
Ivy House Environmental Ltd	**Time Sampled**	None Supplied				
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	TPB				
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied				
Order No: None Supplied	**Depth (m)**	1.40 @ 3.00				
Reporting Date: 20/11/2013	**QTSE Sample No**	82137				

Determinand	**Unit**	**MDL**	**Accreditation**					
Complex Cyanide	ug/l	< 5	NONE	< 5				
Free Cyanide	ug/l	< 5	NONE	< 5				
Thiocyanate as SCN	ug/l	< 10	NONE	< 10				
Arsenic	ug/l	< 10	NONE	< 10				
Boron	ug/l	< 50	NONE	59				
Cadmium	ug/l	< 0.5	NONE	< 0.5				
Chromium	ug/l	< 5	NONE	< 5				
Copper	ug/l	< 10	NONE	< 10				
Lead	ug/l	< 5	NONE	< 5				
Mercury	ug/l	< 0.05	NONE	< 0.05				
Nickel	ug/l	< 7	NONE	< 7				
Selenium	ug/l	< 5	NONE	< 5				
Zinc	ug/l	< 5	NONE	< 5				

Subcontracted analysis [S]

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Leachate Analysis Certificate - TPH CWG Banded							
QTS Environmental Report No: 13-17089	**Date Sampled**	08/10/13					
Ivy House Environmental Ltd	**Time Sampled**	None Supplied					
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	TPB					
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied					
Order No: None Supplied	**Depth (m)**	1.40 @ 3.00					
Reporting Date: 20/11/2013	**QTSE Sample No**	82137					

Determinand	**Unit**	**MDL**	**Accreditation**					
Aliphatic >C5 - C6	ug/l	< 10	NONE	< 10				
Aliphatic >C6 - C8	ug/l	< 10	NONE	< 10				
Aliphatic >C8 - C10	ug/l	< 10	NONE	< 10				
Aliphatic >C10 - C12	ug/l	< 10	NONE	< 10				
Aliphatic >C12 - C16	ug/l	< 10	NONE	< 10				
Aliphatic >C16 - C21	ug/l	< 10	NONE	< 10				
Aliphatic >C21 - C34	ug/l	< 10	NONE	< 10				
Aliphatic (C5 - C34)	ug/l	< 70	NONE	< 70				
Aromatic >C5 - C7	ug/l	< 10	NONE	43				
Aromatic >C7 - C8	ug/l	< 10	NONE	< 10				
Aromatic >C8 - C10	ug/l	< 10	NONE	21				
Aromatic >C10 - C12	ug/l	< 10	NONE	40				
Aromatic >C12 - C16	ug/l	< 10	NONE	111				
Aromatic >C16 - C21	ug/l	< 10	NONE	72				
Aromatic >C21 - C35	ug/l	< 10	NONE	< 10				
Aromatic (C5 - C35)	ug/l	< 70	NONE	287				
Total >C5 - C35	ug/l	< 140	NONE	287				

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Leachate Analysis Certificate - BTEX / MTBE						
QTS Environmental Report No: 13-17089	**Date Sampled**	08/10/13				
Ivy House Environmental Ltd	**Time Sampled**	None Supplied				
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	TPB				
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied				
Order No: None Supplied	**Depth (m)**	1.40 @ 3.00				
Reporting Date: 20/11/2013	**QTSE Sample No**	82137				

Determinand	Unit	MDL	Accreditation					
Benzene	ug/l	< 1	ISO17025	43				
Toluene	ug/l	< 5	ISO17025	< 5				
Ethylbenzene	ug/l	< 5	ISO17025	20				
p & m-xylene	ug/l	< 10	ISO17025	< 10				
o-xylene	ug/l	< 5	ISO17025	< 5				

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UKAS TESTING 4480

Leachate Analysis Certificate - Volatile Organic Compounds (VOC)							
QTS Environmental Report No: 13-17089	**Date Sampled**	08/10/13					
Ivy House Environmental Ltd	**Time Sampled**	None Supplied					
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	TPB					
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied					
Order No: None Supplied	**Depth (m)**	1.40 @ 3.00					
Reporting Date: 20/11/2013	**QTSE Sample No**	82137					

Determinand	Unit	MDL	Accreditation					
Dichlorodifluoromethane	ug/l	< 5	ISO17025	< 5				
Vinyl Chloride	ug/l	< 5	ISO17025	< 5				
Chloromethane	ug/l	< 5	ISO17025	< 5				
Chloroethane	ug/l	< 5	ISO17025	< 5				
Bromomethane	ug/l	< 5	ISO17025	< 5				
Trichlorofluoromethane	ug/l	< 5	ISO17025	< 5				
1,1-Dichloroethene	ug/l	< 5	ISO17025	< 5				
MTBE	ug/l	< 10	ISO17025	< 10				
trans-1,2-Dichloroethene	ug/l	< 5	ISO17025	< 5				
1,1-Dichloroethane	ug/l	< 5	ISO17025	< 5				
cis-1,2-Dichloroethene	ug/l	< 5	ISO17025	< 5				
2,2-Dichloropropane	ug/l	< 5	ISO17025	< 5				
Chloroform	ug/l	< 5	ISO17025	< 5				
Bromochloromethane	ug/l	< 10	ISO17025	< 10				
1,1,1-Trichloroethane	ug/l	< 5	ISO17025	< 5				
1,1-Dichloropropene	ug/l	< 5	ISO17025	< 5				
Carbon Tetrachloride	ug/l	< 5	ISO17025	< 5				
1,2-Dichloroethane	ug/l	< 10	ISO17025	< 10				
Benzene	ug/l	< 1	ISO17025	43				
1,2-Dichloropropane	ug/l	< 5	ISO17025	< 5				
Trichloroethene	ug/l	< 5	ISO17025	< 5				
Bromodichloromethane	ug/l	< 5	ISO17025	< 5				
Dibromomethane	ug/l	< 5	ISO17025	< 5				
TAME	ug/l	< 5	ISO17025	< 5				
cis-1,3-Dichloropropene	ug/l	< 5	ISO17025	< 5				
Toluene	ug/l	< 5	ISO17025	< 5				
trans-1,3-Dichloropropene	ug/l	< 5	ISO17025	< 5				
1,1,2-Trichloroethane	ug/l	< 10	ISO17025	< 10				
1,3-Dichloropropane	ug/l	< 5	ISO17025	< 5				
Tetrachloroethene	ug/l	< 5	ISO17025	< 5				
Dibromochloromethane	ug/l	< 5	ISO17025	< 5				
1,2-Dibromoethane	ug/l	< 5	ISO17025	< 5				
Chlorobenzene	ug/l	< 5	ISO17025	< 5				
1,1,1,2-Tetrachloroethane	ug/l	< 5	ISO17025	< 5				
Ethyl Benzene	ug/l	< 5	ISO17025	20				
m,p-Xylene	ug/l	< 10	ISO17025	< 10				
o-Xylene	ug/l	< 5	ISO17025	< 5				
Styrene	ug/l	< 5	ISO17025	< 5				
Bromoform	ug/l	< 10	ISO17025	< 10				
Isopropylbenzene	ug/l	< 5	ISO17025	< 5				
1,1,2,2-Tetrachloroethane	ug/l	< 10	ISO17025	< 10				
1,2,3-Trichloropropane	ug/l	< 5	ISO17025	< 5				
n-Propylbenzene	ug/l	< 5	ISO17025	< 5				
Bromobenzene	ug/l	< 5	ISO17025	< 5				
2-Chlorotoluene	ug/l	< 5	ISO17025	< 5				
1,3,5-Trimethylbenzene	ug/l	< 5	ISO17025	< 5				
4-Chlorotoluene	ug/l	< 5	ISO17025	< 5				
tert-Butylbenzene	ug/l	< 5	ISO17025	< 5				
1,2,4-Trimethylbenzene	ug/l	< 5	ISO17025	< 5				
sec-Butylbenzene	ug/l	< 5	ISO17025	< 5				
p-Isopropyltoluene	ug/l	< 5	ISO17025	< 5				
1,3-Dichlorobenzene	ug/l	< 5	ISO17025	< 5				
1,4-Dichlorobenzene	ug/l	< 5	ISO17025	< 5				
n-Butylbenzene	ug/l	< 5	ISO17025	< 5				
1,2-Dichlorobenzene	ug/l	< 5	ISO17025	< 5				
,2-Dibromo-3-chloropropane	ug/l	< 10	ISO17025	< 10				
Hexachlorobutadiene	ug/l	< 5	ISO17025	< 5				

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Leachate Analysis Certificate - Semi Volatile Organic Compounds (SVOC)							
QTS Environmental Report No: 13-17089	**Date Sampled**	08/10/13					
Ivy House Environmental Ltd	**Time Sampled**	None Supplied					
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	TPB					
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied					
Order No: None Supplied	**Depth (m)**	1.40 @ 3.00					
Reporting Date: 20/11/2013	**QTSE Sample No**	82137					

Determinand	**Unit**	**MDL**	**Accreditation**					
Phenol	ug/l	< 0.1	NONE	< 0.1				
1,2,4-Trichlorobenzene	ug/l	< 0.1	NONE	< 0.1				
2-Nitrophenol	ug/l	< 0.1	NONE	< 0.1				
Nitrobenzene	ug/l	< 0.1	NONE	< 0.1				
0-Cresol	ug/l	< 0.1	NONE	< 0.1				
bis(2-chloroethoxy)methane	ug/l	< 0.1	NONE	< 0.1				
bis(2-chloroethyl)ether	ug/l	< 0.1	NONE	< 0.1				
2,4-Dichlorophenol	ug/l	< 0.1	NONE	< 0.1				
2-Chlorophenol	ug/l	< 0.1	NONE	< 0.1				
1,3-Dichlorobenzene	ug/l	< 0.1	NONE	< 0.1				
1,4-Dichlorobenzene	ug/l	< 0.1	NONE	< 0.1				
1,2-Dichlorobenzene	ug/l	< 0.1	NONE	< 0.1				
2,4-Dimethylphenol	ug/l	< 0.1	NONE	< 0.1				
Isophorone	ug/l	< 0.1	NONE	< 0.1				
Hexachloroethane	ug/l	< 0.1	NONE	< 0.1				
p-Cresol	ug/l	< 0.1	NONE	< 0.1				
2,4,6-Trichlorophenol	ug/l	< 0.1	NONE	< 0.1				
2,4,5-Trichlorophenol	ug/l	< 0.1	NONE	< 0.1				
2-Nitroaniline	ug/l	< 0.1	NONE	< 0.1				
4-Chloro-3-methylphenol	ug/l	< 0.1	NONE	< 0.1				
2-Methylnaphthalene	ug/l	< 0.1	NONE	< 0.1				
Hexachlorocyclopentadiene	ug/l	< 0.1	NONE	< 0.1				
Hexachlorobutadiene	ug/l	< 0.1	NONE	< 0.1				
2,6-Dinitrotoluene	ug/l	< 0.1	NONE	< 0.1				
Dimethyl phthalate	ug/l	< 0.1	NONE	< 0.1				
2-Chloronaphthalene	ug/l	< 0.1	NONE	< 0.1				
4-Chloroanaline	ug/l	< 0.1	NONE	< 0.1				
4-Nitrophenol	ug/l	< 0.1	NONE	< 0.1				
4-Chlorophenyl phenyl ether	ug/l	< 0.1	NONE	< 0.1				
3-Nitroaniline	ug/l	< 0.1	NONE	< 0.1				
4-Nitroaniline	ug/l	< 0.1	NONE	< 0.1				
4-Bromophenyl phenyl ether	ug/l	< 0.1	NONE	< 0.1				
Hexachlorobenzene	ug/l	< 0.1	NONE	< 0.1				
2,4-Dinitrotoluene	ug/l	< 0.1	NONE	< 0.1				
Diethyl phthalate	ug/l	< 0.1	NONE	< 0.1				
Dibenzofuran	ug/l	< 0.1	NONE	13.2				
Azobenzene	ug/l	< 0.1	NONE	< 0.1				
Dibutyl phthalate	ug/l	< 0.1	NONE	< 0.1				
Carbazole	ug/l	< 0.1	NONE	49.1				
bis(2-ethylhexyl)phthalate	ug/l	< 0.1	NONE	< 0.1				
Benzyl butyl phthalate	ug/l	< 0.1	NONE	< 0.1				
Di-n-octyl phthalate	ug/l	< 0.1	NONE	< 0.1				

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Soil Analysis Certificate - Sample Descriptions
QTS Environmental Report No: 13-17089
Ivy House Environmental Ltd
Site Reference: Pennycroft, Uttoxeter
Project / Job Ref: IV.58.13
Order No: None Supplied
Reporting Date: 20/11/2013

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
82124	TPA	None Supplied	1.40 @ 4.00	16.9	Red sandy clay with stones
82125	TPA	None Supplied	1.00 @ 7.00	16.4	Black loamy clay with rubble
82126	TPB1A	None Supplied	2.60 @ 5.00	17.9	Red loamy clay
82127	TPG	+1.00m	None Supplied	9	Brown sandy loam with stones and vegetation
82128	TPG	None Supplied	1.60	25.8	Black loamy gravel
82129	TPG	None Supplied	3.20	13.6	Light brown gravelly clay with stones
82130	TPI	None Supplied	1.00	14.7	Grey loamy gravel with brick and stones
82131	TPI	None Supplied	3.20	13.1	Light brown clayey gravel with stones
82132	TPH	None Supplied	0.70 - 1.60	11.3	Grey loamy gravel with rubble and stones
82133	TPH	None Supplied	3.40	12.5	Grey sandy clay with stones
82134	TPJ	None Supplied	0.50	13.5	Brown sandy loam
82135	TPK	None Supplied	2.10	22.6	Grey loamy gravel with rubble
82136	TPK	None Supplied	3.20	11.3	Red sandy clay

Insufficient sample I/S
Unsuitable Sample U/S

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Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 13-17089
Ivy House Environmental Ltd
Site Reference: Pennycroft, Uttoxeter
Project / Job Ref: IV.58.13
Order No: None Supplied
Reporting Date: 20/11/2013

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

Key

D Dried
AR As Received

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QTS Environmental Report No: 13-17152

Site Reference:	Pennycroft, Uttoxeter
Project / Job Ref:	IV.58.13
Order No:	None Supplied
Sample Receipt Date:	14/10/2013
Sample Scheduled Date:	14/10/2013
Report Issue Number:	1
Reporting Date:	22/10/2013

Authorised by:

Russell Jarvis
Director
On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Director
On behalf of QTS Environmental Ltd

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Soil Analysis Certificate						
QTS Environmental Report No: 13-17152	**Date Sampled**	09/10/13	09/10/13	09/10/13	09/10/13	09/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSA1	WSA2	WSB	WSC	WSC
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	2.00	0.70	2.00	2.10 - 2.30	2.50 - 3.00
Reporting Date: 22/10/2013	**QTSE Sample No**	82473	82474	82475	82476	82477

Determinand	Unit	MDL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025			None Detected		
pH	pH Units	N / a	MCERTS			8.7		
Total Cyanide	mg/kg	< 2	NONE			< 2		
Complex Cyanide	mg/kg	< 2	NONE	< 2	< 2		< 2	< 2
Free Cyanide	mg/kg	< 2	NONE	< 2	< 2		< 2	< 2
Thiocyanate as SCN	mg/kg	< 3	NONE	< 3	< 3		< 3	< 3
Total Sulphate as SO_4	mg/kg	< 200	NONE			7471		
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	NONE			1.38		
Organic Matter	%	< 0.1	NONE			2.5		
Arsenic (As)	mg/kg	< 2	MCERTS	6	24	12	5	< 2
W/S Boron	mg/kg	< 1	NONE	1.9	4.1		3.8	3.6
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium (Cr)	mg/kg	< 2	MCERTS	20	34	16	51	53
Chromium (hexavalent)	mg/kg	< 2	NONE			< 2		
Copper (Cu)	mg/kg	< 4	MCERTS	12	148	73	16	12
Lead (Pb)	mg/kg	< 3	MCERTS	15	121	35	6	6
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	18	57	21	51	53
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3	< 3	< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	52	94	48	61	62
Total Phenols (monohydric)	mg/kg	< 2	NONE			< 2		
EPH (C10 - C40)	mg/kg	< 6	MCERTS	311		358		

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C
Analysis carried out on the dried sample is corrected for the stone content
Subcontracted analysis (S)

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Soil Analysis Certificate						
QTS Environmental Report No: 13-17152	**Date Sampled**	09/10/13	09/10/13	09/10/13	09/10/13	09/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSD	WSE	WSG	WSG	WSH
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	1.00 - 1.60	3.70	1.15	2.00 - 2.40	1.00
Reporting Date: 22/10/2013	**QTSE Sample No**	82478	82479	82480	82481	82482

Determinand	Unit	MDL	Accreditation					
Asbestos Screen [S]	N/a	N/a	ISO17025	None Detected	None Detected			None Detected
pH	pH Units	N / a	MCERTS	7.9	7.2			7.1
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2			< 2
Complex Cyanide	mg/kg	< 2	NONE			< 2	< 2	
Free Cyanide	mg/kg	< 2	NONE			< 2	< 2	
Thiocyanate as SCN	mg/kg	< 3	NONE			< 3	< 3	
Total Sulphate as SO_4	mg/kg	< 200	NONE	2691	898			2637
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	NONE	0.48	0.21			1.02
Organic Matter	%	< 0.1	NONE	4.3	2			5.1
Arsenic (As)	mg/kg	< 2	MCERTS	3	4	20	26	13
W/S Boron	mg/kg	< 1	NONE			2.1	1.5	
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	1.6	< 0.5	0.5	0.6	0.9
Chromium (Cr)	mg/kg	< 2	MCERTS	14	12	20	12	26
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2			< 2
Copper (Cu)	mg/kg	< 4	MCERTS	12	10	54	40	62
Lead (Pb)	mg/kg	< 3	MCERTS	29	21	256	58	197
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	10	11	21	17	30
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3	< 3	< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	58	46	121	59	208
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2			< 2
EPH (C10 - C40)	mg/kg	< 6	MCERTS	901	< 6			116

Analytical results are expressed on a dry weight basis where samples are dried at less than 30^{O}C
Analysis carried out on the dried sample is corrected for the stone content
Subcontracted analysis [S]

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Soil Analysis Certificate						
QTS Environmental Report No: 13-17152	**Date Sampled**	09/10/13				
Ivy House Environmental Ltd	**Time Sampled**	None Supplied				
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WS7				
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied				
Order No: None Supplied	**Depth (m)**	0.50 - 1.00				
Reporting Date: 22/10/2013	**QTSE Sample No**	82483				

Determinand	Unit	MDL	Accreditation					
Asbestos Screen [S]	N/a	N/a	ISO17025	None Detected				
pH	pH Units	N / a	MCERTS	7.5				
Total Cyanide	mg/kg	< 2	NONE	< 2				
Complex Cyanide	mg/kg	< 2	NONE					
Free Cyanide	mg/kg	< 2	NONE					
Thiocyanate as SCN	mg/kg	< 3	NONE					
Total Sulphate as SO_4	mg/kg	< 200	NONE	1012				
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	NONE	0.25				
Organic Matter	%	< 0.1	NONE	1.3				
Arsenic (As)	mg/kg	< 2	MCERTS	5				
W/S Boron	mg/kg	< 1	NONE					
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	1.3				
Chromium (Cr)	mg/kg	< 2	MCERTS	12				
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2				
Copper (Cu)	mg/kg	< 4	MCERTS	11				
Lead (Pb)	mg/kg	< 3	MCERTS	32				
Mercury (Hg)	mg/kg	< 1	NONE	< 1				
Nickel (Ni)	mg/kg	< 3	MCERTS	11				
Selenium (Se)	mg/kg	< 3	NONE	< 3				
Zinc (Zn)	mg/kg	< 3	MCERTS	114				
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2				
EPH (C10 - C40)	mg/kg	< 6	MCERTS					

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C
Analysis carried out on the dried sample is corrected for the stone content
Subcontracted analysis [S]

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Soil Analysis Certificate - Speciated PAHs						
QTS Environmental Report No: 13-17152	**Date Sampled**	09/10/13	09/10/13	09/10/13	09/10/13	09/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSB	WSD	WSE	WSH	WS7
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	2.00	1.00 - 1.60	3.70	1.00	0.50 - 1.00
Reporting Date: 22/10/2013	**QTSE Sample No**	82475	82478	82479	82482	82483

Determinand	Unit	MDL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	1.80	0.30	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	0.59	0.33	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	0.69	0.46	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	1.23	0.59	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	5.73	6.43	< 0.1	0.20	0.62
Anthracene	mg/kg	< 0.1	MCERTS	1.49	1.23	< 0.1	< 0.1	0.17
Fluoranthene	mg/kg	< 0.1	MCERTS	6.14	10.20	< 0.1	0.77	1.26
Pyrene	mg/kg	< 0.1	MCERTS	5.50	8.08	< 0.1	0.67	1.01
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	2.02	3.96	< 0.1	0.35	0.56
Chrysene	mg/kg	< 0.1	MCERTS	2.04	4.11	< 0.1	0.32	0.54
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	2.05	4.43	< 0.1	0.47	0.68
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.74	1.95	< 0.1	0.21	0.25
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	1.52	3.27	< 0.1	0.37	0.55
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.92	2.01	< 0.1	0.25	0.38
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	0.16	0.13	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.79	1.80	< 0.1	0.25	0.32
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	33.4	49.3	< 1.6	3.9	6.3

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

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Soil Analysis Certificate - TPH CWG Banded						
QTS Environmental Report No: 13-17152	**Date Sampled**	09/10/13	09/10/13	09/10/13	09/10/13	09/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSA2	WSC	WSC	WSG	WSG
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	0.70	2.10 - 2.30	2.50 - 3.00	1.15	2.00 - 2.40
Reporting Date: 22/10/2013	**QTSE Sample No**	82474	82476	82477	82480	82481

Determinand	Unit	MDL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 1	NONE	< 1	25	< 1	< 1	< 1
Aliphatic >C10 - C12	mg/kg	< 1	NONE	2	57	< 1	< 1	< 1
Aliphatic >C12 - C16	mg/kg	< 1	NONE	33	177	< 1	11	< 1
Aliphatic >C16 - C21	mg/kg	< 1	NONE	119	154	< 1	59	< 1
Aliphatic >C21 - C34	mg/kg	< 6	NONE	155	109	< 6	136	< 6
Aliphatic (C5 - C34)	mg/kg	< 12	NONE	309	522	< 12	206	< 12
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	0.05	1.87	0.17	0.03	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	2.36	0.06	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 1	NONE	< 1	20	< 1	< 1	< 1
Aromatic >C10 - C12	mg/kg	< 1	NONE	2	31	< 1	< 1	< 1
Aromatic >C12 - C16	mg/kg	< 1	NONE	16	117	< 1	6	< 1
Aromatic >C16 - C21	mg/kg	< 1	NONE	81	159	< 1	55	< 1
Aromatic >C21 - C35	mg/kg	< 6	NONE	156	191	< 6	192	< 6
Aromatic (C5 - C35)	mg/kg	< 12	NONE	254	523	< 12	253	< 12
Total >C5 - C35	mg/kg	< 24	NONE	563	1045	< 24	459	< 24

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

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Soil Analysis Certificate - BTEX / MTBE						
QTS Environmental Report No: 13-17152	**Date Sampled**	09/10/13	09/10/13	09/10/13	09/10/13	09/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSA2	WSC	WSC	WSG	WSG
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	0.70	2.10 - 2.30	2.50 - 3.00	1.15	2.00 - 2.40
Reporting Date: 22/10/2013	**QTSE Sample No**	82474	82476	82477	82480	82481

Determinand	Unit	MDL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	45	1866	166	33	< 2
Toluene	ug/kg	< 5	MCERTS	10	2357	57	13	< 5
Ethylbenzene	ug/kg	< 10	MCERTS	19	831	13	< 10	< 10
p & m-xylene	ug/kg	< 10	MCERTS	< 10	16098	96	23	< 10
o-xylene	ug/kg	< 10	MCERTS	< 10	2372	37	< 10	< 10

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

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Soil Analysis Certificate - Volatile Organic Compounds (VOC)						
QTS Environmental Report No: 13-17152	**Date Sampled**	09/10/13	09/10/13	09/10/13	09/10/13	09/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSA1	WSA2	WSB	WSC	WSC
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	2.00	0.70	2.00	2.10 - 2.30	2.50 - 3.00
Reporting Date: 22/10/2013	**QTSE Sample No**	82473	82474	82475	82476	82477

Determinand	Unit	MDL	Accreditation					
Dichlorodifluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Chloromethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Chloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromomethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Trichlorofluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	ug/kg	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
trans-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
cis-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
2,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Chloroform	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1,1-Trichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1-Dichloropropene	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Carbon Tetrachloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Benzene	ug/kg	< 2	MCERTS	11	45	466	1866	166
1,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Trichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromodichloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Dibromomethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
TAME	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Toluene	ug/kg	< 5	MCERTS	< 5	10	34	2357	57
trans-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
1,3-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dibromoethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1,1,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethyl Benzene	ug/kg	< 10	MCERTS	< 10	19	25	831	13
m,p-Xylene	ug/kg	< 10	MCERTS	< 10	< 10	47	16100	96
o-Xylene	ug/kg	< 10	MCERTS	< 10	< 10	51	2372	37
Styrene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromoform	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Isopropylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	162	< 5
1,1,2,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2,3-Trichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
n-Propylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	253	< 5
Bromobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
2-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,3,5-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	16	1323	12
4-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
tert-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2,4-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	31	3251	35
sec-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
p-Isopropyltoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	118	< 5
1,3-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,4-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
n-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dibromo-3-chloropropane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Hexachlorobutadiene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C

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Soil Analysis Certificate - Volatile Organic Compounds (VOC)						
QTS Environmental Report No: 13-17152	**Date Sampled**	09/10/13	09/10/13	09/10/13		
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSD	WSG	WSG		
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	**Depth (m)**	1.00 - 1.60	1.15	2.00 - 2.40		
Reporting Date: 22/10/2013	**QTSE Sample No**	82478	82480	82481		

Determinand	Unit	MDL	Accreditation					
Dichlorodifluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Vinyl Chloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Chloromethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10		
Chloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Bromomethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10		
Trichlorofluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
1,1-Dichloroethene	ug/kg	< 5	ISO17025	< 5	< 5	< 5		
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
trans-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
1,1-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
cis-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
2,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Chloroform	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Bromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
1,1,1-Trichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
1,1-Dichloropropene	ug/kg	< 10	MCERTS	< 10	< 10	< 10		
Carbon Tetrachloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
1,2-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Benzene	ug/kg	< 2	MCERTS	9	33	< 2		
1,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Trichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Bromodichloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Dibromomethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
TAME	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
cis-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Toluene	ug/kg	< 5	MCERTS	6	13	< 5		
trans-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
1,1,2-Trichloroethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10		
1,3-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Tetrachloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Dibromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
1,2-Dibromoethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Chlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
1,1,1,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Ethyl Benzene	ug/kg	< 10	MCERTS	< 10	< 10	< 10		
m,p-Xylene	ug/kg	< 10	MCERTS	< 10	23	< 10		
o-Xylene	ug/kg	< 10	MCERTS	< 10	< 10	< 10		
Styrene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Bromoform	ug/kg	< 10	MCERTS	< 10	< 10	< 10		
Isopropylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
1,1,2,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
1,2,3-Trichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
n-Propylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Bromobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
2-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
1,3,5-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5	8	< 5		
4-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
tert-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
1,2,4-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5	10	< 5		
sec-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
p-Isopropyltoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
1,3-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
1,4-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
n-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
1,2-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
1,2-Dibromo-3-chloropropane	ug/kg	< 10	MCERTS	< 10	< 10	< 10		
Hexachlorobutadiene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		

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

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Soil Analysis Certificate - Semi Volatile Organic Compounds (SVOC)						
QTS Environmental Report No: 13-17152	**Date Sampled**	09/10/13	09/10/13	09/10/13	09/10/13	09/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSA1	WSA2	WSC	WSC	WSE
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	2.00	0.70	2.10 - 2.30	2.50 - 3.00	3.70
Reporting Date: 22/10/2013	**QTSE Sample No**	82473	82474	82476	82477	82479

Determinand	Unit	MDL	Accreditation					
Phenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,4-Trichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nitrobenzene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
0-Cresol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
bis(2-chloroethoxy)methane	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
bis(2-chloroethyl)ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chlorophenol	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,3-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dimethylphenol	mg/kg	< 0.15	ISO17025	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
Isophorone	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachloroethane	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
p-Cresol	mg/kg	< 0.15	MCERTS	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
2,4,6-Trichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylnaphthalene	mg/kg	< 0.1	MCERTS	< 0.1	0.3	43.4	< 0.1	< 0.1
Hexachlorocyclopentadiene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethyl phthalate	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloroanaline	mg/kg	< 0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chlorophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Bromophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobenzene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Diethyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzofuran	mg/kg	< 0.1	MCERTS	< 0.1	3	15.9	< 0.1	< 0.1
Azobenzene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibutyl phthalate	mg/kg	< 0.15	ISO17025	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
Carbazole	mg/kg	< 0.1	ISO17025	< 0.1	1.6	3.4	< 0.1	< 0.1
bis(2-ethylhexyl)phthalate	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzyl butyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Di-n-octyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

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

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Soil Analysis Certificate - Semi Volatile Organic Compounds (SVOC)						
QTS Environmental Report No: 13-17152	**Date Sampled**	09/10/13	09/10/13			
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied			
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSG	WSG			
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied			
Order No: None Supplied	**Depth (m)**	1.15	2.00 - 2.40			
Reporting Date: 22/10/2013	**QTSE Sample No**	82480	82481			

Determinand	Unit	MDL	Accreditation					
Phenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
1,2,4-Trichlorobenzene	mg/kg	< 0.1	**ISO17025**	< 0.1	< 0.1			
2-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
Nitrobenzene	mg/kg	< 0.1	**MCERTS**	< 0.1	< 0.1			
0-Cresol	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
bis(2-chloroethoxy)methane	mg/kg	< 0.1	**MCERTS**	< 0.1	< 0.1			
bis(2-chloroethyl)ether	mg/kg	< 0.1	**MCERTS**	< 0.1	< 0.1			
2,4-Dichlorophenol	mg/kg	< 0.1	**MCERTS**	< 0.1	< 0.1			
2-Chlorophenol	mg/kg	< 0.1	**ISO17025**	< 0.1	< 0.1			
1,3-Dichlorobenzene	mg/kg	< 0.1	**ISO17025**	< 0.1	< 0.1			
1,4-Dichlorobenzene	mg/kg	< 0.1	**ISO17025**	< 0.1	< 0.1			
1,2-Dichlorobenzene	mg/kg	< 0.1	**ISO17025**	< 0.1	< 0.1			
2,4-Dimethylphenol	mg/kg	< 0.15	**ISO17025**	< 0.15	< 0.15			
Isophorone	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
Hexachloroethane	mg/kg	< 0.1	**MCERTS**	< 0.1	< 0.1			
p-Cresol	mg/kg	< 0.15	**MCERTS**	< 0.15	< 0.15			
2,4,6-Trichlorophenol	mg/kg	< 0.1	**MCERTS**	< 0.1	< 0.1			
2,4,5-Trichlorophenol	mg/kg	< 0.1	**MCERTS**	< 0.1	< 0.1			
2-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
4-Chloro-3-methylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
2-Methylnaphthalene	mg/kg	< 0.1	**MCERTS**	0.5	< 0.1			
Hexachlorocyclopentadiene	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
Hexachlorobutadiene	mg/kg	< 0.1	**ISO17025**	< 0.1	< 0.1			
2,6-Dinitrotoluene	mg/kg	< 0.1	**MCERTS**	< 0.1	< 0.1			
Dimethyl phthalate	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
2-Chloronaphthalene	mg/kg	< 0.1	**MCERTS**	< 0.1	< 0.1			
4-Chloroanaline	mg/kg	< 0.2	NONE	< 0.2	< 0.2			
4-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
4-Chlorophenyl phenyl ether	mg/kg	< 0.1	**MCERTS**	< 0.1	< 0.1			
3-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
4-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
4-Bromophenyl phenyl ether	mg/kg	< 0.1	**MCERTS**	< 0.1	< 0.1			
Hexachlorobenzene	mg/kg	< 0.1	**MCERTS**	< 0.1	< 0.1			
2,4-Dinitrotoluene	mg/kg	< 0.1	**MCERTS**	< 0.1	< 0.1			
Diethyl phthalate	mg/kg	< 0.1	**MCERTS**	< 0.1	< 0.1			
Dibenzofuran	mg/kg	< 0.1	**MCERTS**	1.1	< 0.1			
Azobenzene	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
Dibutyl phthalate	mg/kg	< 0.15	**ISO17025**	< 0.15	< 0.15			
Carbazole	mg/kg	< 0.1	**ISO17025**	0.9	0.2			
bis(2-ethylhexyl)phthalate	mg/kg	< 0.2	**MCERTS**	< 0.2	< 0.2			
Benzyl butyl phthalate	mg/kg	< 0.1	**MCERTS**	< 0.1	< 0.1			
Di-n-octyl phthalate	mg/kg	< 0.1	**MCERTS**	< 0.1	< 0.1			

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

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Soil Analysis Certificate - Sample Descriptions
QTS Environmental Report No: 13-17152
Ivy House Environmental Ltd
Site Reference: Pennycroft, Uttoxeter
Project / Job Ref: IV.58.13
Order No: None Supplied
Reporting Date: 22/10/2013

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
82473	WSA1	None Supplied	2.00	10.7	Light brown sandy clay
82474	WSA2	None Supplied	0.70	20	Black sandy gravel
82475	WSB	None Supplied	2.00	21.4	Black sandy gravel
82476	WSC	None Supplied	2.10 - 2.30	18.7	Brown clay
82477	WSC	None Supplied	2.50 - 3.00	19.3	Red clay with rubble
82478	WSD	None Supplied	1.00 - 1.60	9.7	Brown sandy gravel
82479	WSE	None Supplied	3.70	13.5	Brown silt
82480	WSG	None Supplied	1.15	5.9	Brown sandy clay
82481	WSG	None Supplied	2.00 - 2.40	20.4	Brown sandy clay
82482	WSH	None Supplied	1.00	17.8	Brown sandy clay
82483	WS7	None Supplied	0.50 - 1.00	5.8	Light brown clayey sand with rubble and stones

Insufficient sample I/S
Unsuitable Sample U/S

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Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 13-17152
Ivy House Environmental Ltd
Site Reference: Pennycroft, Uttoxeter
Project / Job Ref: IV.58.13
Order No: None Supplied
Reporting Date: 22/10/2013

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

Key

D Dried
AR As Received

Richard Sutton
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QTS Environmental Report No: 13-17848

Site Reference:	Pennycroft, Uttoxeter
Project / Job Ref:	IV.58.13
Order No:	None Supplied
Sample Receipt Date:	19/11/2013
Sample Scheduled Date:	19/11/2013
Report Issue Number:	1
Reporting Date:	21/11/2013

Authorised by:

Russell Jarvis
Director
On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Director
On behalf of QTS Environmental Ltd

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4480

Soil Analysis Certificate							
QTS Environmental Report No: 13-17848	**Date Sampled**	18/11/13	18/11/13	18/11/13		
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	HDB	HDC	HDD		
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	**Depth (m)**	0.30	0.40	0.25		
Reporting Date: 21/11/2013	**QTSE Sample No**	86229	86230	86231		

Determinand	Unit	MDL	Accreditation					
Asbestos Screen [S]	N/a	N/a	ISO17025	None Detected	None Detected	None Detected		
pH	pH Units	N/a	MCERTS	6.6	7.9	7.8		
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2		
Total Sulphate as SO_4	mg/kg	< 200	NONE	6547	1484	683		
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	NONE	1.25	0.08	0.04		
Organic Matter	%	< 0.1	NONE	4.9	5.9	2.6		
Arsenic (As)	mg/kg	< 2	MCERTS	18	5	5		
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	< 0.5	2.3	0.9		
Chromium (Cr)	mg/kg	< 2	MCERTS	18	21	14		
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2		
Copper (Cu)	mg/kg	< 4	MCERTS	86	33	25		
Lead (Pb)	mg/kg	< 3	MCERTS	140	125	36		
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1		
Nickel (Ni)	mg/kg	< 3	MCERTS	23	16	14		
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3		
Zinc (Zn)	mg/kg	< 3	MCERTS	72	91	70		
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2		

Analytical results are expressed on a dry weight basis where samples are dried at less than 30^{O}C
Analysis carried out on the dried sample is corrected for the stone content
Subcontracted analysis [S]

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Soil Analysis Certificate - Speciated PAHs						
QTS Environmental Report No: 13-17848	**Date Sampled**	18/11/13	18/11/13	18/11/13		
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	HDB	HDC	HDD		
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	**Depth (m)**	0.30	0.40	0.25		
Reporting Date: 21/11/2013	**QTSE Sample No**	86229	86230	86231		

Determinand	Unit	MDL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	14.20	0.47	< 0.1		
Acenaphthylene	mg/kg	< 0.1	MCERTS	8.53	0.60	< 0.1		
Acenaphthene	mg/kg	< 0.1	MCERTS	3.44	0.20	< 0.1		
Fluorene	mg/kg	< 0.1	MCERTS	12.90	0.29	< 0.1		
Phenanthrene	mg/kg	< 0.1	MCERTS	80.70	6.20	< 0.1		
Anthracene	mg/kg	< 0.1	MCERTS	23.40	2.11	< 0.1		
Fluoranthene	mg/kg	< 0.1	MCERTS	97.60	30.60	0.37		
Pyrene	mg/kg	< 0.1	MCERTS	77.80	26.40	0.42		
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	30.60	13.60	0.23		
Chrysene	mg/kg	< 0.1	MCERTS	32.20	13.40	0.36		
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	32.40	16.50	0.70		
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	15	7.52	0.27		
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	28	14.10	0.48		
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	12.90	7.42	0.27		
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	0.90	0.26	< 0.1		
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	10.60	5.88	0.31		
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	481	146	3.4		

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

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Soil Analysis Certificate - Sample Descriptions	
QTS Environmental Report No: 13-17848	
Ivy House Environmental Ltd	
Site Reference: Pennycroft, Uttoxeter	
Project / Job Ref: IV.58.13	
Order No: None Supplied	
Reporting Date: 21/11/2013	

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
86229	HDB	None Supplied	0.30	17.5	Brown clayey gravel with rubble and metal
86230	HDC	None Supplied	0.40	9.1	Brown gravelly clay with rubble and brick
86231	HDD	None Supplied	0.25	6.5	Brown gravel with rubble

Insufficient sample I/S
Unsuitable Sample U/S

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Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 13-17848
Ivy House Environmental Ltd
Site Reference: Pennycroft, Uttoxeter
Project / Job Ref: IV.58.13
Order No: None Supplied
Reporting Date: 21/11/2013

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

Key

D Dried
AR As Received

APPENDIX F

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QTS Environmental Report No: 13-17439

Site Reference:	Pennycroft, Uttoxeter
Project / Job Ref:	IV.58.13
Order No:	None Supplied
Sample Receipt Date:	28/10/2013
Sample Scheduled Date:	28/10/2013
Report Issue Number:	1
Reporting Date:	05/11/2013

Authorised by:

Russell Jarvis
Director
On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Director
On behalf of QTS Environmental Ltd

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UKAS TESTING 4480

Water Analysis Certificate						
QTS Environmental Report No: 13-17439	**Date Sampled**	25/10/13	25/10/13	25/10/13	25/10/13	25/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSA2	BWBBH7	WSB	WSL	WSE
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 05/11/2013	**QTSE Sample No**	83843	83844	83845	83846	83847

Determinand	Unit	MDL	Accreditation					
pH	pH Units	N / a	ISO17025	7.8	7.1	7.9	6.9	7.2
Total Cyanide	ug/l	< 5	NONE	< 5	< 5	< 5	< 5	< 5
Complex Cyanide	ug/l	< 5	NONE	< 5	< 5	< 5	< 5	< 5
Free Cyanide	ug/l	< 5	NONE	< 5	< 5	< 5	< 5	< 5
Thiocyanate as SCN	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Sulphate as SO_4	mg/l	< 1	NONE	985	99	1250	541	163
Total Organic Carbon (TOC)	mg/l	< 0.1	NONE	6.2	1.8	29	9.9	10.1
Arsenic (dissolved)	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Cadmium (dissolved)	ug/l	< 0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium (dissolved)	ug/l	< 5	NONE	< 5	5	< 5	< 5	< 5
Chromium (hexavalent)	ug/l	< 5	NONE	< 5	< 5	< 5	< 5	< 5
Copper (dissolved)	ug/l	< 10	NONE	< 10	< 10	< 10	13	< 10
Lead (dissolved)	ug/l	< 5	NONE	< 5	< 5	< 5	< 5	< 5
Mercury (dissolved)	ug/l	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	ug/l	< 7	NONE	< 7	< 7	< 7	< 7	< 7
Selenium (dissolved)	ug/l	< 5	NONE	< 5	< 5	< 5	< 5	< 5
Zinc (dissolved)	ug/l	< 5	NONE	8	< 5	< 5	5	23
Total Phenols	ug/l	< 0.5	NONE	0.5	< 0.5	37.8	< 0.5	< 0.5

Subcontracted analysis [S]

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UKAS TESTING
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Water Analysis Certificate						
QTS Environmental Report No: 13-17439	**Date Sampled**	25/10/13				
Ivy House Environmental Ltd	**Time Sampled**	None Supplied				
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSI				
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied				
Order No: None Supplied	**Depth (m)**	None Supplied				
Reporting Date: 05/11/2013	**QTSE Sample No**	83848				

Determinand	**Unit**	**MDL**	**Accreditation**					
pH	pH Units	N / a	**ISO17025**	7.2				
Total Cyanide	ug/l	< 5	NONE	< 5				
Complex Cyanide	ug/l	< 5	NONE	< 5				
Free Cyanide	ug/l	< 5	NONE	< 5				
Thiocyanate as SCN	ug/l	< 10	NONE	< 10				
Sulphate as SO_4	mg/l	< 1	NONE	36				
Total Organic Carbon (TOC)	mg/l	< 0.1	NONE	8.5				
Arsenic (dissolved)	ug/l	< 10	NONE	< 10				
Cadmium (dissolved)	ug/l	< 0.5	NONE	< 0.5				
Chromium (dissolved)	ug/l	< 5	NONE	< 5				
Chromium (hexavalent)	ug/l	< 5	NONE	< 5				
Copper (dissolved)	ug/l	< 10	NONE	< 10				
Lead (dissolved)	ug/l	< 5	NONE	< 5				
Mercury (dissolved)	ug/l	< 0.05	NONE	< 0.05				
Nickel (dissolved)	ug/l	< 7	NONE	< 7				
Selenium (dissolved)	ug/l	< 5	NONE	< 5				
Zinc (dissolved)	ug/l	< 5	NONE	< 5				
Total Phenols	ug/l	< 0.5	NONE	< 0.5				

Subcontracted analysis [S]

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Water Analysis Certificate - Speciated PAH							
QTS Environmental Report No: 13-1	**Date Sampled**	25/10/13	25/10/13	25/10/13	25/10/13	25/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSA2	BWBBH7	WSB	WSL	WSE
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 05/11/2013	**QTSE Sample No**	83843	83844	83845	83846	83847

Determinand	Unit	MDL	Accreditation					
Naphthalene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	ug/l	< 0.01	NONE	11.61	< 0.01	8.38	< 0.01	< 0.01
Acenaphthene	ug/l	< 0.01	NONE	8.77	< 0.01	5.82	< 0.01	< 0.01
Fluorene	ug/l	< 0.01	NONE	3.61	< 0.01	4.95	< 0.01	< 0.01
Phenanthrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	3.86	< 0.01	< 0.01
Anthracene	ug/l	< 0.01	NONE	1.19	< 0.01	1.09	< 0.01	< 0.01
Fluoranthene	ug/l	< 0.01	NONE	4.84	< 0.01	1.63	< 0.01	< 0.01
Pyrene	ug/l	< 0.01	NONE	3.12	< 0.01	1.02	< 0.01	< 0.01
Benzo(a)anthracene	ug/l	< 0.01	NONE	0.39	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	ug/l	< 0.01	NONE	0.23	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	ug/l	< 0.01	NONE	0.28	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total EPA-16 PAHs	ug/l	< 0.01	NONE	34.04	< 0.01	26.75	< 0.01	< 0.01

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Water Analysis Certificate - Speciated PAH							
QTS Environmental Report No: 13-1	**Date Sampled**	25/10/13					
Ivy House Environmental Ltd	**Time Sampled**	None Supplied					
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSI					
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied					
Order No: None Supplied	**Depth (m)**	None Supplied					
Reporting Date: 05/11/2013	**QTSE Sample No**	83848					

Determinand	Unit	MDL	Accreditation					
Naphthalene	ug/l	< 0.01	NONE	< 0.01				
Acenaphthylene	ug/l	< 0.01	NONE	0.39				
Acenaphthene	ug/l	< 0.01	NONE	0.90				
Fluorene	ug/l	< 0.01	NONE	1.91				
Phenanthrene	ug/l	< 0.01	NONE	2.07				
Anthracene	ug/l	< 0.01	NONE	0.55				
Fluoranthene	ug/l	< 0.01	NONE	1.24				
Pyrene	ug/l	< 0.01	NONE	0.82				
Benzo(a)anthracene	ug/l	< 0.01	NONE	0.20				
Chrysene	ug/l	< 0.01	NONE	0.14				
Benzo(b)fluoranthene	ug/l	< 0.01	NONE	0.22				
Benzo(k)fluoranthene	ug/l	< 0.01	NONE	< 0.01				
Benzo(a)pyrene	ug/l	< 0.01	NONE	< 0.01				
Indeno(1,2,3-cd)pyrene	ug/l	< 0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	ug/l	< 0.01	NONE	< 0.01				
Benzo(ghi)perylene	ug/l	< 0.01	NONE	< 0.01				
Total EPA-16 PAHs	ug/l	< 0.01	NONE	8.44				

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Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Water Analysis Certificate - TPH CWG Banded						
QTS Environmental Report No: 13-17439	**Date Sampled**	25/10/13	25/10/13	25/10/13	25/10/13	25/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSA2	BWBBH7	WSB	WSL	WSE
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 05/11/2013	**QTSE Sample No**	83843	83844	83845	83846	83847

Determinand	Unit	MDL	Accreditation					
Aliphatic >C5 - C6	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aliphatic >C6 - C8	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aliphatic >C8 - C10	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aliphatic >C10 - C12	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aliphatic >C12 - C16	ug/l	< 10	NONE	11	< 10	< 10	< 10	< 10
Aliphatic >C16 - C21	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aliphatic >C21 - C34	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C34)	ug/l	< 70	NONE	< 70	< 70	< 70	< 70	< 70
Aromatic >C5 - C7	ug/l	< 10	NONE	< 10	< 10	384	< 10	< 10
Aromatic >C7 - C8	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aromatic >C8 - C10	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aromatic >C10 - C12	ug/l	< 10	NONE	< 10	< 10	18	< 10	< 10
Aromatic >C12 - C16	ug/l	< 10	NONE	80	< 10	58	< 10	< 10
Aromatic >C16 - C21	ug/l	< 10	NONE	37	< 10	35	< 10	< 10
Aromatic >C21 - C35	ug/l	< 10	NONE	20	< 10	< 10	< 10	< 10
Aromatic (C5 - C35)	ug/l	< 70	NONE	138	< 70	496	< 70	< 70
Total >C5 - C35	ug/l	< 140	NONE	149	< 140	496	< 140	< 140

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Water Analysis Certificate - TPH CWG Banded						
QTS Environmental Report No: 13-17439	**Date Sampled**	25/10/13				
Ivy House Environmental Ltd	**Time Sampled**	None Supplied				
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSI				
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied				
Order No: None Supplied	**Depth (m)**	None Supplied				
Reporting Date: 05/11/2013	**QTSE Sample No**	83848				

Determinand	Unit	MDL	Accreditation					
Aliphatic >C5 - C6	ug/l	< 10	NONE	< 10				
Aliphatic >C6 - C8	ug/l	< 10	NONE	< 10				
Aliphatic >C8 - C10	ug/l	< 10	NONE	< 10				
Aliphatic >C10 - C12	ug/l	< 10	NONE	< 10				
Aliphatic >C12 - C16	ug/l	< 10	NONE	< 10				
Aliphatic >C16 - C21	ug/l	< 10	NONE	< 10				
Aliphatic >C21 - C34	ug/l	< 10	NONE	< 10				
Aliphatic (C5 - C34)	ug/l	< 70	NONE	< 70				
Aromatic >C5 - C7	ug/l	< 10	NONE	< 10				
Aromatic >C7 - C8	ug/l	< 10	NONE	< 10				
Aromatic >C8 - C10	ug/l	< 10	NONE	< 10				
Aromatic >C10 - C12	ug/l	< 10	NONE	< 10				
Aromatic >C12 - C16	ug/l	< 10	NONE	24				
Aromatic >C16 - C21	ug/l	< 10	NONE	16				
Aromatic >C21 - C35	ug/l	< 10	NONE	< 10				
Aromatic (C5 - C35)	ug/l	< 70	NONE	< 70				
Total >C5 - C35	ug/l	< 140	NONE	< 140				

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4480

Water Analysis Certificate - BTEX / MTBE						
QTS Environmental Report No: 13-17439	**Date Sampled**	25/10/13	25/10/13	25/10/13	25/10/13	25/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSA2	BWBBH7	WSB	WSL	WSE
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 05/11/2013	**QTSE Sample No**	83843	83844	83845	83846	83847

Determinand	Unit	MDL	Accreditation					
Benzene	ug/l	< 1	ISO17025	< 1	< 1	384	< 1	< 1
Toluene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
p & m-xylene	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	< 10
o-xylene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5

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Water Analysis Certificate - BTEX / MTBE						
QTS Environmental Report No: 13-17439	**Date Sampled**	25/10/13				
Ivy House Environmental Ltd	**Time Sampled**	None Supplied				
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSI				
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied				
Order No: None Supplied	**Depth (m)**	None Supplied				
Reporting Date: 05/11/2013	**QTSE Sample No**	83848				

Determinand	Unit	MDL	Accreditation					
Benzene	ug/l	< 1	ISO17025	< 1				
Toluene	ug/l	< 5	ISO17025	< 5				
Ethylbenzene	ug/l	< 5	ISO17025	< 5				
p & m-xylene	ug/l	< 10	ISO17025	< 10				
o-xylene	ug/l	< 5	ISO17025	< 5				

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Water Analysis Certificate - Volatile Organic Compounds (VOC)						
QTS Environmental Report No: 13-17439	**Date Sampled**	25/10/13	25/10/13	25/10/13	25/10/13	25/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSA2	BWBBH7	WSB	WSL	WSE
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 05/11/2013	**QTSE Sample No**	83843	83844	83845	83846	83847

Determinand	Unit	MDL	Accreditation					
Dichlorodifluoromethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Chloromethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Chloroethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Bromomethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Trichlorofluoromethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
MTBE	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	< 10
trans-1,2-Dichloroethene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
cis-1,2-Dichloroethene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
2,2-Dichloropropane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Chloroform	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Bromochloromethane	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,1-Dichloropropene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Carbon Tetrachloride	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	< 10
Benzene	ug/l	< 1	ISO17025	< 1	< 1	384	< 1	< 1
1,2-Dichloropropane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Trichloroethene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Bromodichloromethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Dibromomethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
TAME	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Toluene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
trans-1,3-Dichloropropene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	< 10
1,3-Dichloropropane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,2-Dibromoethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,1,1,2-Tetrachloroethane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Ethyl Benzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
m,p-Xylene	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	< 10
o-Xylene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Styrene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Bromoform	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	< 10
Isopropylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	< 10
1,2,3-Trichloropropane	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
n-Propylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Bromobenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
2-Chlorotoluene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,3,5-Trimethylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
4-Chlorotoluene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
tert-Butylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,2,4-Trimethylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
sec-Butylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
p-Isopropyltoluene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,3-Dichlorobenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,4-Dichlorobenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
n-Butylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,2-Dichlorobenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
1,2-Dibromo-3-chloropropane	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	< 10
Hexachlorobutadiene	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5

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UKAS TESTING
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Water Analysis Certificate - Volatile Organic Compounds (VOC)						
QTS Environmental Report No: 13-17439	**Date Sampled**	25/10/13				
Ivy House Environmental Ltd	**Time Sampled**	None Supplied				
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSI				
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied				
Order No: None Supplied	**Depth (m)**	None Supplied				
Reporting Date: 05/11/2013	**QTSE Sample No**	83848				

Determinand	Unit	MDL	Accreditation					
Dichlorodifluoromethane	ug/l	< 5	ISO17025	< 5				
Vinyl Chloride	ug/l	< 5	ISO17025	< 5				
Chloromethane	ug/l	< 5	ISO17025	< 5				
Chloroethane	ug/l	< 5	ISO17025	< 5				
Bromomethane	ug/l	< 5	ISO17025	< 5				
Trichlorofluoromethane	ug/l	< 5	ISO17025	< 5				
1,1-Dichloroethene	ug/l	< 5	ISO17025	< 5				
MTBE	ug/l	< 10	ISO17025	< 10				
trans-1,2-Dichloroethene	ug/l	< 5	ISO17025	< 5				
1,1-Dichloroethane	ug/l	< 5	ISO17025	< 5				
cis-1,2-Dichloroethene	ug/l	< 5	ISO17025	< 5				
2,2-Dichloropropane	ug/l	< 5	ISO17025	< 5				
Chloroform	ug/l	< 5	ISO17025	< 5				
Bromochloromethane	ug/l	< 10	ISO17025	< 10				
1,1,1-Trichloroethane	ug/l	< 5	ISO17025	< 5				
1,1-Dichloropropene	ug/l	< 5	ISO17025	< 5				
Carbon Tetrachloride	ug/l	< 5	ISO17025	< 5				
1,2-Dichloroethane	ug/l	< 10	ISO17025	< 10				
Benzene	ug/l	< 1	ISO17025	< 1				
1,2-Dichloropropane	ug/l	< 5	ISO17025	< 5				
Trichloroethene	ug/l	< 5	ISO17025	< 5				
Bromodichloromethane	ug/l	< 5	ISO17025	< 5				
Dibromomethane	ug/l	< 5	ISO17025	< 5				
TAME	ug/l	< 5	ISO17025	< 5				
cis-1,3-Dichloropropene	ug/l	< 5	ISO17025	< 5				
Toluene	ug/l	< 5	ISO17025	< 5				
trans-1,3-Dichloropropene	ug/l	< 5	ISO17025	< 5				
1,1,2-Trichloroethane	ug/l	< 10	ISO17025	< 10				
1,3-Dichloropropane	ug/l	< 5	ISO17025	< 5				
Tetrachloroethene	ug/l	< 5	ISO17025	< 5				
Dibromochloromethane	ug/l	< 5	ISO17025	< 5				
1,2-Dibromoethane	ug/l	< 5	ISO17025	< 5				
Chlorobenzene	ug/l	< 5	ISO17025	< 5				
1,1,1,2-Tetrachloroethane	ug/l	< 5	ISO17025	< 5				
Ethyl Benzene	ug/l	< 5	ISO17025	< 5				
m,p-Xylene	ug/l	< 10	ISO17025	< 10				
o-Xylene	ug/l	< 5	ISO17025	< 5				
Styrene	ug/l	< 5	ISO17025	< 5				
Bromoform	ug/l	< 10	ISO17025	< 10				
Isopropylbenzene	ug/l	< 5	ISO17025	< 5				
1,1,2,2-Tetrachloroethane	ug/l	< 10	ISO17025	< 10				
1,2,3-Trichloropropane	ug/l	< 5	ISO17025	< 5				
n-Propylbenzene	ug/l	< 5	ISO17025	< 5				
Bromobenzene	ug/l	< 5	ISO17025	< 5				
2-Chlorotoluene	ug/l	< 5	ISO17025	< 5				
1,3,5-Trimethylbenzene	ug/l	< 5	ISO17025	< 5				
4-Chlorotoluene	ug/l	< 5	ISO17025	< 5				
tert-Butylbenzene	ug/l	< 5	ISO17025	< 5				
1,2,4-Trimethylbenzene	ug/l	< 5	ISO17025	< 5				
sec-Butylbenzene	ug/l	< 5	ISO17025	< 5				
p-Isopropyltoluene	ug/l	< 5	ISO17025	< 5				
1,3-Dichlorobenzene	ug/l	< 5	ISO17025	< 5				
1,4-Dichlorobenzene	ug/l	< 5	ISO17025	< 5				
n-Butylbenzene	ug/l	< 5	ISO17025	< 5				
1,2-Dichlorobenzene	ug/l	< 5	ISO17025	< 5				
1,2-Dibromo-3-chloropropane	ug/l	< 10	ISO17025	< 10				
Hexachlorobutadiene	ug/l	< 5	ISO17025	< 5				

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Water Analysis Certificate - Semi Volatile Organic Compounds (SVOC)						
QTS Environmental Report No: 13-17439	**Date Sampled**	25/10/13	25/10/13	25/10/13	25/10/13	25/10/13
Ivy House Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSA2	BWBBH7	WSB	WSL	WSE
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 05/11/2013	**QTSE Sample No**	83843	83844	83845	83846	83847

Determinand	Unit	MDL	Accreditation					
Phenol	ug/l	< 0.1	NONE	0.5	< 0.1	< 0.1	< 0.1	< 0.1
1,2,4-Trichlorobenzene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Nitrophenol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nitrobenzene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
0-Cresol	ug/l	< 0.1	NONE	< 0.1	< 0.1	1.2	< 0.1	< 0.1
bis(2-chloroethoxy)methane	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
bis(2-chloroethyl)ether	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chlorophenol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,3-Dichlorobenzene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2-Dichlorobenzene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dimethylphenol	ug/l	< 0.1	NONE	< 0.1	< 0.1	36.6	< 0.1	< 0.1
Isophorone	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachloroethane	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
p-Cresol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Nitroaniline	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylnaphthalene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorocyclopentadiene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethyl phthalate	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloroanaline	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Nitrophenol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chlorophenyl phenyl ether	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3-Nitroaniline	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Nitroaniline	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Bromophenyl phenyl ether	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobenzene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dinitrotoluene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Diethyl phthalate	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzofuran	ug/l	< 0.1	NONE	5.2	< 0.1	3.3	< 0.1	< 0.1
Azobenzene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibutyl phthalate	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Carbazole	ug/l	< 0.1	NONE	< 0.1	< 0.1	5.1	< 0.1	< 0.1
bis(2-ethylhexyl)phthalate	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzyl butyl phthalate	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Di-n-octyl phthalate	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

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

Water Analysis Certificate - Semi Volatile Organic Compounds (SVOC)							
QTS Environmental Report No: 13-17439	**Date Sampled**	25/10/13					
Ivy House Environmental Ltd	**Time Sampled**	None Supplied					
Site Reference: Pennycroft, Uttoxeter	**TP / BH No**	WSI					
Project / Job Ref: IV.58.13	**Additional Refs**	None Supplied					
Order No: None Supplied	**Depth (m)**	None Supplied					
Reporting Date: 05/11/2013	**QTSE Sample No**	83848					

Determinand	Unit	MDL	Accreditation					
Phenol	ug/l	< 0.1	NONE	< 0.1				
1,2,4-Trichlorobenzene	ug/l	< 0.1	NONE	< 0.1				
2-Nitrophenol	ug/l	< 0.1	NONE	< 0.1				
Nitrobenzene	ug/l	< 0.1	NONE	< 0.1				
0-Cresol	ug/l	< 0.1	NONE	< 0.1				
bis(2-chloroethoxy)methane	ug/l	< 0.1	NONE	< 0.1				
bis(2-chloroethyl)ether	ug/l	< 0.1	NONE	< 0.1				
2,4-Dichlorophenol	ug/l	< 0.1	NONE	< 0.1				
2-Chlorophenol	ug/l	< 0.1	NONE	< 0.1				
1,3-Dichlorobenzene	ug/l	< 0.1	NONE	< 0.1				
1,4-Dichlorobenzene	ug/l	< 0.1	NONE	< 0.1				
1,2-Dichlorobenzene	ug/l	< 0.1	NONE	< 0.1				
2,4-Dimethylphenol	ug/l	< 0.1	NONE	< 0.1				
Isophorone	ug/l	< 0.1	NONE	< 0.1				
Hexachloroethane	ug/l	< 0.1	NONE	< 0.1				
p-Cresol	ug/l	< 0.1	NONE	< 0.1				
2,4,6-Trichlorophenol	ug/l	< 0.1	NONE	< 0.1				
2,4,5-Trichlorophenol	ug/l	< 0.1	NONE	< 0.1				
2-Nitroaniline	ug/l	< 0.1	NONE	< 0.1				
4-Chloro-3-methylphenol	ug/l	< 0.1	NONE	< 0.1				
2-Methylnaphthalene	ug/l	< 0.1	NONE	< 0.1				
Hexachlorocyclopentadiene	ug/l	< 0.1	NONE	< 0.1				
Hexachlorobutadiene	ug/l	< 0.1	NONE	< 0.1				
2,6-Dinitrotoluene	ug/l	< 0.1	NONE	< 0.1				
Dimethyl phthalate	ug/l	< 0.1	NONE	< 0.1				
2-Chloronaphthalene	ug/l	< 0.1	NONE	< 0.1				
4-Chloroanaline	ug/l	< 0.1	NONE	< 0.1				
4-Nitrophenol	ug/l	< 0.1	NONE	< 0.1				
4-Chlorophenyl phenyl ether	ug/l	< 0.1	NONE	< 0.1				
3-Nitroaniline	ug/l	< 0.1	NONE	< 0.1				
4-Nitroaniline	ug/l	< 0.1	NONE	< 0.1				
4-Bromophenyl phenyl ether	ug/l	< 0.1	NONE	< 0.1				
Hexachlorobenzene	ug/l	< 0.1	NONE	< 0.1				
2,4-Dinitrotoluene	ug/l	< 0.1	NONE	< 0.1				
Diethyl phthalate	ug/l	< 0.1	NONE	< 0.1				
Dibenzofuran	ug/l	< 0.1	NONE	2.3				
Azobenzene	ug/l	< 0.1	NONE	< 0.1				
Dibutyl phthalate	ug/l	< 0.1	NONE	< 0.1				
Carbazole	ug/l	< 0.1	NONE	1.5				
bis(2-ethylhexyl)phthalate	ug/l	< 0.1	NONE	< 0.1				
Benzyl butyl phthalate	ug/l	< 0.1	NONE	< 0.1				
Di-n-octyl phthalate	ug/l	< 0.1	NONE	< 0.1				

APPENDIX G

Jones Environmental Laboratory

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

Ivy House Environmental
Scotland Farm
Ockbrook
Derby
DE72 3RX

4225

Attention :	Richard Sutton
Date :	4th November, 2013
Your reference :	IV.58.13
Our reference :	Test Report 13/9972 Batch 1
Location :	Pennycroft, Uttoxeter
Date samples received :	29th October, 2013
Status :	Final report
Issue :	1

Three samples were received for analysis on 29th October, 2013. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Paul Lee-Boden BSc
Project Manager

Bob Millward BSc FRSC
Principal Chemist

Jones Environmental Laboratory

Client Name:	Ivy House Environmental		
Reference:	IV.58.13	**Sample Date:**	25 Oct 2013
Location:	Pennycroft, Uttoxeter	**Date of Receipt:**	29 Oct 2013
Contact:	Richard Sutton	**Date Analysed:**	4 Nov 2013

Sample ID:	WSB
Depth:	
JE Job No:	13/9972
JE Sample No:	1
Matrix:	Air
Method:	TM68 VOCs on gases (GC-MS)
Initial Vaccum (inches Hg)	-28
Final Pressure (psi)	-6
Canister Serial number	-

Q* - Qualifiers

B	Indicates analyte found in associated method blank
++	Indicates value exceeds calibration range

Key

MDL	Method Detection Limit
RL	Reporting Limit
#	UKAS Accredited

Cas No	Molecular Weight	Compound	Q*	Result ppbv	RL ppbv	MDL ppbv	Result ug/m^3	RL ug/m^3	MDL ug/m^3
75-01-4	62.5	# Vinyl Chloride		<1.5	1.5	1.5	<3.8	3.8	3.8
75-71-8	120.91	Dichlorodifluoromethane (F-12)		<2.5	2.5	2.5	<12.4	12.4	12.4
74-87-3	50.49	Chloromethane		<1.5	1.5	1.5	<3.1	3.1	3.1
74-83-9	94.95	Bromomethane		<1.5	1.5	1.5	<5.8	5.8	5.8
75-00-3	64.52	# Chloroethane		<1.5	1.5	1.5	<4.0	4	4
75-69-4	137.36	# Trichlorofluoromethane (F-11)		<1.5	1.5	1.5	<8.4	8.4	8.4
75-35-4	96.95	1,1-Dichloroethene (1,1 DCE)		<1.5	1.5	1.5	<5.9	5.9	5.9
75-09-2	84.93	Dichloromethane (DCM)		<14.4	14.4	14.4	<50	50	50
156-60-5	96.94	Trans-1,2-Dichloroethene		<1.5	1.5	1.5	<5.9	5.9	5.9
75-34-3	98.97	# 1,1-Dichloroethane		<1.5	1.5	1.5	<6.1	6.1	6.1
156-59-2	96.94	# cis-1,2-Dichloroethene		<1	1	1	<4	4	4
594-20-7	112.99	2,2-Dichloropropane		<1.5	1.5	1.5	<6.9	6.9	6.9
74-97-5	129.38	Bromochloromethane (Int Std)		NA	1.5	1.5	NA	7.9	7.9
67-66-3	119.39	# Chloroform		<1.5	1.5	1.5	<7.3	7.3	7.3
71-55-6	133.42	# 1,1,1-Trichloroethane		<1.5	1.5	1.5	<8.2	8.2	8.2
563-58-6	110.97	1,1-Dichloropropene		<1.5	1.5	1.5	<6.8	6.8	6.8
56-23-5	153.84	# Carbon Tetrachloride		<1.5	1.5	1.5	<9.4	9.4	9.4
107-06-2	98.96	# 1,2-Dichloroethane		<1.5	1.5	1.5	<6.1	6.1	6.1
71-43-2	78.11	# Benzene		6.9	1.5	1.5	22	4.8	4.8
79-01-6	131.4	# Trichloroethene (TCE)		<1.5	1.5	1.5	<8.1	8.1	8.1
78-87-5	112.99	# 1,2-Dichloropropane		<1.5	1.5	1.5	<6.9	6.9	6.9
74-95-3	173.83	Dibromomethane		<1.5	1.5	1.5	<10.7	10.7	10.7
75-27-4	163.83	Bromodichloromethane		<1.5	1.5	1.5	<10.1	10.1	10.1
10061-01-5	110.97	# cis-1,3-Dichloropropene		<1.5	1.5	1.5	<6.8	6.8	6.8
108-88-3	92.13	# Toluene		84.8	1.5	1.5	319.5	5.7	5.7
10061-02-6	110.97	trans-1,3-Dichloropropene		<1.5	1.5	1.5	<6.8	6.8	6.8
79-00-5	133.4	# 1,1,2-Trichloroethane		<1.5	1.5	1.5	<8.2	8.2	8.2
127-18-4	165.85	# Tetrachloroethene (PCE)		<1.5	1.5	1.5	<10.2	10.2	10.2
142-28-9	112.99	1,3-Dichloropropane		<1.5	1.5	1.5	<6.9	6.9	6.9
124-48-1	208.28	Dibromochloromethane		<1.5	1.5	1.5	<12.8	12.8	12.8
106-93-4	187.86	# 1,2-Dibromoethane		<1.5	1.5	1.5	<11.5	11.5	11.5
108-90-7	112.56	# Chlorobenzene		<1.5	1.5	1.5	<6.9	6.9	6.9
630-20-6	167.85	1,1,1,2-Tetrachloroethane		<1.5	1.5	1.5	<10.3	10.3	10.3
100-41-4	106.16	# Ethylbenzene		15.6	1.5	1.5	67.7	6.5	6.5
	106.17	# m&p - Xylenes		61.5	1.5	1.5	267	6.5	6.5
95-47-6	106.17	# o-Xylene		15.6	1.5	1.5	67.7	6.5	6.5
100-42-5	104.14	# Styrene		5.1	1.5	1.5	21.7	6.4	6.4
75-25-2	252.77	Bromoform		<1.5	1.5	1.5	<15.5	15.5	15.5
98-82-8	120.19	Isopropylbenzene		<1.5	1.5	1.5	<7.4	7.4	7.4

Jones Environmental Laboratory

Client Name:	Ivy House Environmental		
Reference:	IV.58.13	**Sample Date:**	25 Oct 2013
Location:	Pennycroft, Uttoxeter	**Date of Receipt:**	29 Oct 2013
Contact:	Richard Sutton	**Date Analysed:**	4 Nov 2013

Sample ID:	WSB
Depth:	
JE Job No:	13/9972
JE Sample No:	1
Matrix:	Air
Method:	TM68 VOCs on gases (GC-MS)
Initial Vaccum (inches Hg)	-28
Final Pressure (psi)	-6
Canister Serial number	-

Q* - Qualifiers

B	Indicates analyte found in associated method blank
++	Indicates value exceeds calibration range

Key

MDL	Method Detection Limit
RL	Reporting Limit
#	UKAS Accredited

Cas No	Molecular Weight	Compound	Q*	Result ppbv	RL ppbv	MDL ppbv	Result ug/m^3	RL ug/m^3	MDL ug/m^3
79-34-5	167.85	# 1,1,2,2-Tetrachloroethane		<1.5	1.5	1.5	<10.3	10.3	10.3
108-86-1	157.01	Bromobenzene		<1.5	1.5	1.5	<9.6	9.6	9.6
96-18-4	147.43	1,2,3-Trichloropropane		<1.5	1.5	1.5	<9.0	9	9
103-65-1	120.19	Propylbenzene		<1.5	1.5	1.5	<7.4	7.4	7.4
95-49-8	126.58	2-Chlorotoluene		<1.5	1.5	1.5	<7.8	7.8	7.8
108-67-8	120.2	# 1,3,5-Trimethylbenzene		3.1	1.5	1.5	15.2	7.4	7.4
106-43-4	126.58	4-Chlorotoluene		<1.5	1.5	1.5	<7.8	7.8	7.8
98-06-6	134.22	Tert-Butylbenzene		<1.5	1.5	1.5	<8.2	8.2	8.2
95-63-6	120.19	# 1,2,4-Trimethylbenzene		9.2	1.5	1.5	45.2	7.4	7.4
135-98-8	134.22	Sec-Butylbenzene		<1.5	1.5	1.5	<8.2	8.2	8.2
99-87-6	134.22	4-Isopropyltoluene		<1.5	1.5	1.5	<8.2	8.2	8.2
106-46-7	147.01	# 1,4-Dichlorobenzene		<1.5	1.5	1.5	<9.0	9	9
541-73-1	147.01	# 1,3-Dichlorobenzene		<1.5	1.5	1.5	<9.0	9	9
104-51-8	134.22	n-Butylbenzene		<1.5	1.5	1.5	<8.2	8.2	8.2
95-50-1	147	# 1,2-Dichlorobenzene		<1.5	1.5	1.5	<9.0	9	9
96-12-8	236.33	1,2-Dibromo-3-chloropropane		<1.5	1.5	1.5	<14.5	14.5	14.5
120-82-1	181.46	1,2,4-Trichlorobenzene		<1.5	1.5	1.5	<11.1	11.1	11.1
87-68-3	260.76	Hexachlorobutadiene		<1.5	1.5	1.5	<16.0	16	16
91-20-3	128.17	Naphthalene		<0.32	0.32	0.32	<1.7	1.7	1.7
87-61-6	181.45	1,2,3-Trichlorobenzene		<1.5	1.5	1.5	<11.1	11.1	11.1
1634-04-4	88.15	Methyl tertiary butyl ether		<1.5	1.5	1.5	<5.4	5.4	5.4
		Sum of VOC USEPA compounds		201.8			826		
460-00-4		4-Bromofluorobenzene Surrogate Recovery		89%	0%	0%			

Jones Environmental Laboratory

Client Name: Ivy House Environmental
Reference: IV.58.13
Location: Pennycroft, Uttoxeter
Contact: Richard Sutton

Sample Date: 25 Oct 2013
Date of Receipt: 29 Oct 2013
Date Analysed: 4 Nov 2013

Sample ID: WSA2
Depth:
JE Job No: 13/9972
JE Sample No: 2
Matrix: Air
Method: TM68 VOCs on gases (GC-MS)

Initial Vaccum (inches Hg)	-25
Final Pressure (psi)	-3
Canister Serial number	-

Q* - Qualifiers

B Indicates analyte found in associated method blank
++ Indicates value exceeds calibration range

Key

MDL Method Detection Limit
RL Reporting Limit
UKAS Accredited

Cas No	Molecular Weight	Compound	Q*	Result ppbv	RL ppbv	MDL ppbv	Result ug/m^3	RL ug/m^3	MDL ug/m^3
75-01-4	62.5	# Vinyl Chloride		<1.5	1.5	1.5	<3.8	3.8	3.8
75-71-8	120.91	Dichlorodifluoromethane (F-12)		<2.5	2.5	2.5	<12.4	12.4	12.4
74-87-3	50.49	Chloromethane		<1.5	1.5	1.5	<3.1	3.1	3.1
74-83-9	94.95	Bromomethane		<1.5	1.5	1.5	<5.8	5.8	5.8
75-00-3	64.52	# Chloroethane		<1.5	1.5	1.5	<4.0	4	4
75-69-4	137.36	# Trichlorofluoromethane (F-11)		<1.5	1.5	1.5	<8.4	8.4	8.4
75-35-4	96.95	1,1-Dichloroethene (1,1 DCE)		<1.5	1.5	1.5	<5.9	5.9	5.9
75-09-2	84.93	Dichloromethane (DCM)		<14.4	14.4	14.4	<50	50	50
156-60-5	96.94	Trans-1,2-Dichloroethene		<1.5	1.5	1.5	<5.9	5.9	5.9
75-34-3	98.97	# 1,1-Dichloroethane		<1.5	1.5	1.5	<6.1	6.1	6.1
156-59-2	96.94	# cis-1,2-Dichloroethene		6	1	1	24	4	4
594-20-7	112.99	2,2-Dichloropropane		<1.5	1.5	1.5	<6.9	6.9	6.9
74-97-5	129.38	Bromochloromethane (Int Std)		NA	1.5	1.5	NA	7.9	7.9
67-66-3	119.39	# Chloroform		<1.5	1.5	1.5	<7.3	7.3	7.3
71-55-6	133.42	# 1,1,1-Trichloroethane		1.8	1.5	1.5	9.8	8.2	8.2
563-58-6	110.97	1,1-Dichloropropene		<1.5	1.5	1.5	<6.8	6.8	6.8
56-23-5	153.84	# Carbon Tetrachloride		<1.5	1.5	1.5	<9.4	9.4	9.4
107-06-2	98.96	# 1,2-Dichloroethane		<1.5	1.5	1.5	<6.1	6.1	6.1
71-43-2	78.11	# Benzene		14.2	1.5	1.5	45.4	4.8	4.8
79-01-6	131.4	# Trichloroethene (TCE)		<1.5	1.5	1.5	<8.1	8.1	8.1
78-87-5	112.99	# 1,2-Dichloropropane		<1.5	1.5	1.5	<6.9	6.9	6.9
74-95-3	173.83	Dibromomethane		<1.5	1.5	1.5	<10.7	10.7	10.7
75-27-4	163.83	Bromodichloromethane		<1.5	1.5	1.5	<10.1	10.1	10.1
10061-01-5	110.97	# cis-1,3-Dichloropropene		<1.5	1.5	1.5	<6.8	6.8	6.8
108-88-3	92.13	# Toluene		86.7	1.5	1.5	326.7	5.7	5.7
10061-02-6	110.97	trans-1,3-Dichloropropene		<1.5	1.5	1.5	<6.8	6.8	6.8
79-00-5	133.4	# 1,1,2-Trichloroethane		<1.5	1.5	1.5	<8.2	8.2	8.2
127-18-4	165.85	# Tetrachloroethene (PCE)		<1.5	1.5	1.5	<10.2	10.2	10.2
142-28-9	112.99	1,3-Dichloropropane		<1.5	1.5	1.5	<6.9	6.9	6.9
124-48-1	208.28	Dibromochloromethane		<1.5	1.5	1.5	<12.8	12.8	12.8
106-93-4	187.86	# 1,2-Dibromoethane		<1.5	1.5	1.5	<11.5	11.5	11.5
108-90-7	112.56	# Chlorobenzene		<1.5	1.5	1.5	<6.9	6.9	6.9
630-20-6	167.85	1,1,1,2-Tetrachloroethane		<1.5	1.5	1.5	<10.3	10.3	10.3
100-41-4	106.16	# Ethylbenzene		11.9	1.5	1.5	51.7	6.5	6.5
	106.17	# m&p - Xylenes		41.5	1.5	1.5	180.2	6.5	6.5
95-47-6	106.17	# o-Xylene		11.5	1.5	1.5	49.9	6.5	6.5
100-42-5	104.14	# Styrene		61.5	1.5	1.5	261.9	6.4	6.4
75-25-2	252.77	Bromoform		<1.5	1.5	1.5	<15.5	15.5	15.5
98-82-8	120.19	Isopropylbenzene		<1.5	1.5	1.5	<7.4	7.4	7.4

Jones Environmental Laboratory

Client Name:	Ivy House Environmental		
Reference:	IV.58.13	**Sample Date:**	25 Oct 2013
Location:	Pennycroft, Uttoxeter	**Date of Receipt:**	29 Oct 2013
Contact:	Richard Sutton	**Date Analysed:**	4 Nov 2013

Sample ID:	WSA2
Depth:	
JE Job No:	13/9972
JE Sample No:	2
Matrix:	Air
Method:	TM68 VOCs on gases (GC-MS)
Initial Vaccum (inches Hg)	-25
Final Pressure (psi)	-3
Canister Serial number	-

Q* - Qualifiers

B	Indicates analyte found in associated method blank
++	Indicates value exceeds calibration range

Key

MDL	Method Detection Limit
RL	Reporting Limit
#	UKAS Accredited

Cas No	Molecular Weight	Compound	Q*	Result ppbv	RL ppbv	MDL ppbv	Result ug/m^3	RL ug/m^3	MDL ug/m^3
79-34-5	167.85	# 1,1,2,2-Tetrachloroethane		<1.5	1.5	1.5	<10.3	10.3	10.3
108-86-1	157.01	Bromobenzene		<1.5	1.5	1.5	<9.6	9.6	9.6
96-18-4	147.43	1,2,3-Trichloropropane		<1.5	1.5	1.5	<9.0	9	9
103-65-1	120.19	Propylbenzene		<1.5	1.5	1.5	<7.4	7.4	7.4
95-49-8	126.58	2-Chlorotoluene		<1.5	1.5	1.5	<7.8	7.8	7.8
108-67-8	120.2	# 1,3,5-Trimethylbenzene		1.8	1.5	1.5	8.8	7.4	7.4
106-43-4	126.58	4-Chlorotoluene		<1.5	1.5	1.5	<7.8	7.8	7.8
98-06-6	134.22	Tert-Butylbenzene		<1.5	1.5	1.5	<8.2	8.2	8.2
95-63-6	120.19	# 1,2,4-Trimethylbenzene		5.2	1.5	1.5	25.6	7.4	7.4
135-98-8	134.22	Sec-Butylbenzene		<1.5	1.5	1.5	<8.2	8.2	8.2
99-87-6	134.22	4-Isopropyltoluene		<1.5	1.5	1.5	<8.2	8.2	8.2
106-46-7	147.01	# 1,4-Dichlorobenzene		<1.5	1.5	1.5	<9.0	9	9
541-73-1	147.01	# 1,3-Dichlorobenzene		<1.5	1.5	1.5	<9.0	9	9
104-51-8	134.22	n-Butylbenzene		<1.5	1.5	1.5	<8.2	8.2	8.2
95-50-1	147	# 1,2-Dichlorobenzene		<1.5	1.5	1.5	<9.0	9	9
96-12-8	236.33	1,2-Dibromo-3-chloropropane		<1.5	1.5	1.5	<14.5	14.5	14.5
120-82-1	181.46	1,2,4-Trichlorobenzene		<1.5	1.5	1.5	<11.1	11.1	11.1
87-68-3	260.76	Hexachlorobutadiene		<1.5	1.5	1.5	<16.0	16	16
91-20-3	128.17	Naphthalene		<0.32	0.32	0.32	<1.7	1.7	1.7
87-61-6	181.45	1,2,3-Trichlorobenzene		<1.5	1.5	1.5	<11.1	11.1	11.1
1634-04-4	88.15	Methyl tertiary butyl ether		<1.5	1.5	1.5	<5.4	5.4	5.4
		Sum of VOC USEPA compounds		242.1			984		
460-00-4		4-Bromofluorobenzene Surrogate Recovery		89%	0%	0%			

Jones Environmental Laboratory

Client Name:	Ivy House Environmental		
Reference:	IV.58.13	**Sample Date:**	25 Oct 2013
Location:	Pennycroft, Uttoxeter	**Date of Receipt:**	29 Oct 2013
Contact:	Richard Sutton	**Date Analysed:**	4 Nov 2013

Sample ID:	WSI
Depth:	
JE Job No:	13/9972
JE Sample No:	3
Matrix:	Air
Method:	TM68 VOCs on gases (GC-MS)
Initial Vaccum (inches Hg)	-28
Final Pressure (psi)	-3
Canister Serial number	-

Q* - Qualifiers

B	Indicates analyte found in associated method blank
++	Indicates value exceeds calibration range

Key

MDL	Method Detection Limit
RL	Reporting Limit
#	UKAS Accredited

Cas No	Molecular Weight	Compound	Q*	Result ppbv	RL ppbv	MDL ppbv	Result ug/m^3	RL ug/m^3	MDL ug/m^3
75-01-4	62.5	# Vinyl Chloride		<1.5	1.5	1.5	<3.8	3.8	3.8
75-71-8	120.91	Dichlorodifluoromethane (F-12)		<2.5	2.5	2.5	<12.4	12.4	12.4
74-87-3	50.49	Chloromethane		<1.5	1.5	1.5	<3.1	3.1	3.1
74-83-9	94.95	Bromomethane		<1.5	1.5	1.5	<5.8	5.8	5.8
75-00-3	64.52	# Chloroethane		<1.5	1.5	1.5	<4.0	4	4
75-69-4	137.36	# Trichlorofluoromethane (F-11)		<1.5	1.5	1.5	<8.4	8.4	8.4
75-35-4	96.95	1,1-Dichloroethene (1,1 DCE)		<1.5	1.5	1.5	<5.9	5.9	5.9
75-09-2	84.93	Dichloromethane (DCM)		<14.4	14.4	14.4	<50	50	50
156-60-5	96.94	Trans-1,2-Dichloroethene		<1.5	1.5	1.5	<5.9	5.9	5.9
75-34-3	98.97	# 1,1-Dichloroethane		<1.5	1.5	1.5	<6.1	6.1	6.1
156-59-2	96.94	# cis-1,2-Dichloroethene		<1	1	1	<4	4	4
594-20-7	112.99	2,2-Dichloropropane		<1.5	1.5	1.5	<6.9	6.9	6.9
74-97-5	129.38	Bromochloromethane (Int Std)		NA	1.5	1.5	NA	7.9	7.9
67-66-3	119.39	# Chloroform		<1.5	1.5	1.5	<7.3	7.3	7.3
71-55-6	133.42	# 1,1,1-Trichloroethane		<1.5	1.5	1.5	<8.2	8.2	8.2
563-58-6	110.97	1,1-Dichloropropene		<1.5	1.5	1.5	<6.8	6.8	6.8
56-23-5	153.84	# Carbon Tetrachloride		<1.5	1.5	1.5	<9.4	9.4	9.4
107-06-2	98.96	# 1,2-Dichloroethane		<1.5	1.5	1.5	<6.1	6.1	6.1
71-43-2	78.11	# Benzene		<1.5	1.5	1.5	<4.8	4.8	4.8
79-01-6	131.4	# Trichloroethene (TCE)		<1.5	1.5	1.5	<8.1	8.1	8.1
78-87-5	112.99	# 1,2-Dichloropropane		<1.5	1.5	1.5	<6.9	6.9	6.9
74-95-3	173.83	Dibromomethane		<1.5	1.5	1.5	<10.7	10.7	10.7
75-27-4	163.83	Bromodichloromethane		<1.5	1.5	1.5	<10.1	10.1	10.1
10061-01-5	110.97	# cis-1,3-Dichloropropene		<1.5	1.5	1.5	<6.8	6.8	6.8
108-88-3	92.13	# Toluene		13.6	1.5	1.5	51.2	5.7	5.7
10061-02-6	110.97	trans-1,3-Dichloropropene		<1.5	1.5	1.5	<6.8	6.8	6.8
79-00-5	133.4	# 1,1,2-Trichloroethane		<1.5	1.5	1.5	<8.2	8.2	8.2
127-18-4	165.85	# Tetrachloroethene (PCE)		<1.5	1.5	1.5	<10.2	10.2	10.2
142-28-9	112.99	1,3-Dichloropropane		<1.5	1.5	1.5	<6.9	6.9	6.9
124-48-1	208.28	Dibromochloromethane		<1.5	1.5	1.5	<12.8	12.8	12.8
106-93-4	187.86	# 1,2-Dibromoethane		<1.5	1.5	1.5	<11.5	11.5	11.5
108-90-7	112.56	# Chlorobenzene		<1.5	1.5	1.5	<6.9	6.9	6.9
630-20-6	167.85	1,1,1,2-Tetrachloroethane		<1.5	1.5	1.5	<10.3	10.3	10.3
100-41-4	106.16	# Ethylbenzene		<1.5	1.5	1.5	<6.5	6.5	6.5
	106.17	# m&p - Xylenes		3.9	1.5	1.5	16.9	6.5	6.5
95-47-6	106.17	# o-Xylene		1.6	1.5	1.5	6.9	6.5	6.5
100-42-5	104.14	# Styrene		<1.5	1.5	1.5	<6.4	6.4	6.4
75-25-2	252.77	Bromoform		<1.5	1.5	1.5	<15.5	15.5	15.5
98-82-8	120.19	Isopropylbenzene		<1.5	1.5	1.5	<7.4	7.4	7.4

Jones Environmental Laboratory

Client Name:	Ivy House Environmental		
Reference:	IV.58.13	**Sample Date:**	25 Oct 2013
Location:	Pennycroft, Uttoxeter	**Date of Receipt:**	29 Oct 2013
Contact:	Richard Sutton	**Date Analysed:**	4 Nov 2013

Sample ID:	WSI
Depth:	
JE Job No:	13/9972
JE Sample No:	3
Matrix:	Air
Method:	TM68 VOCs on gases (GC-MS)
Initial Vaccum (inches Hg)	-28
Final Pressure (psi)	-3
Canister Serial number	-

Q* - Qualifiers

B	Indicates analyte found in associated method blank
++	Indicates value exceeds calibration range

Key

MDL	Method Detection Limit
RL	Reporting Limit
#	UKAS Accredited

Cas No	Molecular Weight	Compound	Q*	Result ppbv	RL ppbv	MDL ppbv	Result ug/m^3	RL ug/m^3	MDL ug/m^3
79-34-5	167.85	# 1,1,2,2-Tetrachloroethane		<1.5	1.5	1.5	<10.3	10.3	10.3
108-86-1	157.01	Bromobenzene		<1.5	1.5	1.5	<9.6	9.6	9.6
96-18-4	147.43	1,2,3-Trichloropropane		<1.5	1.5	1.5	<9.0	9	9
103-65-1	120.19	Propylbenzene		<1.5	1.5	1.5	<7.4	7.4	7.4
95-49-8	126.58	2-Chlorotoluene		<1.5	1.5	1.5	<7.8	7.8	7.8
108-67-8	120.2	# 1,3,5-Trimethylbenzene		<1.5	1.5	1.5	<7.4	7.4	7.4
106-43-4	126.58	4-Chlorotoluene		<1.5	1.5	1.5	<7.8	7.8	7.8
98-06-6	134.22	Tert-Butylbenzene		<1.5	1.5	1.5	<8.2	8.2	8.2
95-63-6	120.19	# 1,2,4-Trimethylbenzene		3.4	1.5	1.5	16.7	7.4	7.4
135-98-8	134.22	Sec-Butylbenzene		<1.5	1.5	1.5	<8.2	8.2	8.2
99-87-6	134.22	4-Isopropyltoluene		<1.5	1.5	1.5	<8.2	8.2	8.2
106-46-7	147.01	# 1,4-Dichlorobenzene		<1.5	1.5	1.5	<9.0	9	9
541-73-1	147.01	# 1,3-Dichlorobenzene		<1.5	1.5	1.5	<9.0	9	9
104-51-8	134.22	n-Butylbenzene		<1.5	1.5	1.5	<8.2	8.2	8.2
95-50-1	147	# 1,2-Dichlorobenzene		<1.5	1.5	1.5	<9.0	9	9
96-12-8	236.33	1,2-Dibromo-3-chloropropane		<1.5	1.5	1.5	<14.5	14.5	14.5
120-82-1	181.46	1,2,4-Trichlorobenzene		<1.5	1.5	1.5	<11.1	11.1	11.1
87-68-3	260.76	Hexachlorobutadiene		<1.5	1.5	1.5	<16.0	16	16
91-20-3	128.17	Naphthalene		<0.32	0.32	0.32	<1.7	1.7	1.7
87-61-6	181.45	1,2,3-Trichlorobenzene		<1.5	1.5	1.5	<11.1	11.1	11.1
1634-04-4	88.15	Methyl tertiary butyl ether		<1.5	1.5	1.5	<5.4	5.4	5.4
		Sum of VOC USEPA compounds		22.5			91.7		
460-00-4		4-Bromofluorobenzene Surrogate Recovery		87%	0%	0%			

Client Name: Ivy House Environmental
Reference: IV.58.13
Location: Pennycroft, Uttoxeter
Contact: Richard Sutton

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 13/9972						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 13/9972

SOILS

Please note we are only MCERTS accredited for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. If we are instructed to keep samples, a storage charge of £1 (1.5 Euros) per sample per month will be applied until we are asked to dispose of them.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

WATERS

Please note we are not a Drinking Water Inspectorate (DWI) Approved Laboratory . It is important that detection limits are carefully considered when requesting water analysis.

UKAS accreditation applies to surface water and groundwater and one other matrix which is analysis specific, any other liquids are outside our scope of accreditation

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

NOTE

Data is only accredited when all the requirements of our Quality System have been met. In certain circumstances where the requirements have not been met, the laboratory may issue the data in an interim report but will remove the accreditation, in this instance results should be considered indicative only. Where possible samples will be re-extracted and a final report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	UKAS accredited.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance.
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
CO	Suspected carry over
OC	Outside Calibration Range
NFD	No Fibres Detected

JE Job No: 13/9972

Test Method No.	Description	Prep Method No. (if appropriate)	Description	UKAS	MCERTS (soils only)	Analysis done on As Received (AR) or Air Dried (AD)	Reported on dry weight basis
TM68	VOCs on gases (GC-MS)	PM0	No preparation is required.				
TM68	VOCs on gases (GC-MS)	PM0	No preparation is required.	Yes			
NONE	No Method Code	NONE	No Method Code				

APPENDIX H

IVY HOUSE environmental

Scotland Farm, Ockbrook, Derby, DE72 3RX
rps@ivyhousenv.co.uk • www.ivyhousenv.co.uk • 01332 820 488

GAS & GROUNDWATER MONITORING

Site: Pennycroft, Uttoxeter
Project ref: IV.58.13
Date: 25.10.13
Operator: R Sutton

	GAS					GROUNDWATER			
	CH_4 (% Vol)	CO_2 (% Vol)	O_2 (% Vol)	Atmospheric Pressure (mb)	Flow Rate (l/hr)	Dip to Water (m)	Dip to Base (m)	Datum (mAOD)*	Groundwater Datum (mAOD)
WSK	0.2	6.6	15.4	991	0	DRY	2.48	84.5	N/A
BWBBH7	0.1	2.6	18.2	991	0	2.71	7.83	84.74	82.03
WSB	0.1	1	13.2	991	0.1	0.6	2.35	84.9	84.3
WSL	0	2.1	18.7	991	0.2	1.765	2.56	84.4	82.635
WSA2	0.1	0	20.1	991	0.1	0.51	1.98	84.75	84.24
WSE	0.1	0.4	19.4	991	0.1	2.085	3.78	84.8	82.715
WSI	0.1	0.5	20.2	991	0	0.6	2.82	83.8	83.2

*approximate datum

Confirmed as true and accurate readings: 

IVY HOUSE environmental

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GAS & GROUNDWATER MONITORING

Site: Pennycroft, Uttoxeter
Project ref: IV.58.13
Date: 11.11.13
Operator: R Sutton

	GAS					GROUNDWATER			
	CH_4 (% Vol)	CO_2 (% Vol)	O_2 (% Vol)	Atmospheric Pressure (mb)	Flow Rate (l/hr)	Dip to Water (m)	Dip to Base (m)	Datum (mAOD)*	Groundwater Datum (mAOD)
WSK	0.1	3.4	13.8	1008	0	DRY	2.48	84.5	N/A
BWBBH7	0.1	0.1	20.9	1008	0	2.65	7.83	84.74	82.09
WSB	0.1	1.7	7.4	1008	0.2	0.6	2.35	84.9	84.3
WSL	0.1	0.7	18.7	1008	0.1	1.93	2.56	84.4	82.47
WSA2	0.1	0.1	20.9	1008	0.1	0.55	1.98	84.75	84.2
WSE	0.1	0.3	20.1	1008	0	1.915	3.78	84.8	82.885
WSI	0.1	0.2	20.9	1008	0	0.64	2.82	83.8	83.16

*approximate datum

Confirmed as true and accurate readings:  .....

IVY HOUSE environmental

Scotland Farm, Ockbrook, Derby, DE72 3RX
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GAS & GROUNDWATER MONITORING

Site: Pennycroft, Uttoxeter
Project ref: IV.58.13
Date: 18.11.13
Operator: R Sutton

	GAS					GROUNDWATER			
	CH_4 (% Vol)	CO_2 (% Vol)	O_2 (% Vol)	Atmospheric Pressure (mb)	Flow Rate (l/hr)	Dip to Water (m)	Dip to Base (m)	Datum (mAOD)*	Groundwater Datum (mAOD)
WSK	0.1	4.8	12.8	1000	0	DRY	2.48	84.5	N/A
BWBBH7	0.1	3.3	18.3	1000	0	2.65	7.83	84.74	82.09
WSB	0.1	1.8	6.4	1000	0.2	0.56	2.35	84.9	84.34
WSL	0.1	1.3	21.1	1000	0.1	1.93	2.56	84.4	82.47
WSA2	0.1	6.2	8.3	1000	0.1	0.52	1.98	84.75	84.23
WSE	0.1	0.9	19.7	1000	0	1.91	3.78	84.8	82.89
WSI	0.1	0.2	20.9	1000	0	0.64	2.82	83.8	83.16

*approximate datum

Confirmed as true and accurate readings: .....

APPENDIX I

Client/client ref: ESBC Project ref: W.58.13 Site ref: Pennycraft, Uttoxeter Data description: Metals Contaminant(s): Metals Tier/scenario: Planning Date: 14.11.13 User details: RPS	Arsenic	Cadmium		Cr VI		Lead	Mercury	Nickel	Selenium	Zinc	Cyanide (Total)	Cyanide (Complex)	Cyanide (Free)	Phenols	Thiocyanate	Copper	Cr Total
Critical concentration, C_c	32	10		32		450	170	130	350	3700	34	213	43	415		2300	2500
Notes																	
Sample size, n	38	35	0	12	0	37	38	38	38	36	12	24	23	26	11	38	38
Sample mean, $\bar{x}$	13.2336842	0.84022857	No Data	2	No Data	105.035135	0.80436842	24.7615789	2.83821053	89.0666667	2	955.802083	1.43478261	1.04153846	3	51.0973684	23.2526316
Standard deviation, s	11.3004627	0.86504924		0		110.36297	0.76605068	13.4875153	1.8908501	69.3139648	0	4525.52626	0.5068698	0.90493621	0	42.747584	14.5090603
Number of non-detects	0	0		0		0	0	0	0	0	0	0	0	0	0	0	0
Set non-detect values to:	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi
Outliers?	Yes	Yes		No		Yes	Yes	No	Yes	Yes	No	Yes	No	No	No	Yes	Yes
Distribution	Non-normal	Non-normal		Single value		Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Single value	Non-normal	Non-normal	Non-normal	Single value	Non-normal	Non-normal
Statistical approach	Auto: Chebychev	Chebychev	Chebychev	Auto: Chebychev	Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebyche
Test scenario:	Planning: is true mean lower than critical concentration ($\mu < Cc$)?			**Evidence level required:**		95%	Use Normal distribution to test for outliers										
t statistic, t_s (or k_s)	-10.23704456	-62.64376209		N/A		-19.01307437	-1361.518171	-48.09879242	-1131.791987	-312.5719336	N/A	0.804099227	-393.2761019	-2332.520522	N/A	-324.302933	-1052.287043
Upper confidence limit (on true mean concentration, μ)	21.224318	1.47758681		2		184.121082	1.34604805	34.2986924	4.17524346	139.422095	2	4982.41859	1.89547315	1.81512355	3	81.324475	33.5120865
Evidence level	99%	100%		100%		100%	100%	100%	100%	100%	100%	0%	100%	100%		100%	100%
Base decision on:	evidence level	evidence level		evidence level		evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	lower bound	evidence level	evidence level
Result	$\mu < Cc$	$\mu < Cc$		$\mu < Cc$		$\mu < Cc$	$\mu < Cc$	$\mu < Cc$	$\mu < Cc$	$\mu < Cc$	$\mu < Cc$	$\mu \geq Cc$	$\mu < Cc$	$\mu < Cc$		$\mu < Cc$	$\mu < Cc$
Select dataset	○	○	○	○	○	○	○	○	○	○	○	●	○	○	○	○	○

Back to data | Go to outlier test | Go to normality test | Show individual summary

METALS – FULL DATASET

Client/client ref: ESBC Project ref: IW.58.13 Site ref: Pennycraft, Uttoxeter Data description: Metals Contaminant(s): Metals Test scenario: Planning Date: 14.11.13 User details: RPS	Arsenic	Cadmium		Cr VI		Lead	Mercury	Nickel	Selenium	Zinc	Cyanide (Total)	Cyanide (Complex)	Cyanide (Free)	Phenols	Thiocyanate	Copper	Cr Total
Critical concentration, C_c	32	10		32		450	170	130	350	3700	34	213	43	415	34	2300	2500
Notes																	
Sample size, n	36	30	0	12	0	36	37	38	36	33	12	20	23	26	11	36	34
Sample mean, $\bar{x}$	11.33	0.52893333	No Data	2	No Data	91.4527778	0.69908108	24.7615789	2.44033333	73.3757576	2	6.0125	1.43478261	1.04153846	3	44.1305556	19.0705882
Standard deviation, s	7.97193577	0.17536896		0		74.2104209	0.4125375	13.4875153	0.82816734	27.0180499	0	6.21480056	0.5068698	0.90493621	0	30.6075231	6.51755343
Number of non-detects	0	0		0		0	0	0	0	0	0	0	0	0	0	0	0
Set non-detect values to:	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi
Outliers?	No	No		No		No	No	No	No	No	No	No	No	No	No	No	No
Distribution	Non-normal	Non-normal		Single value		Non-normal	Non-normal	Non-normal	Non-normal	Normal	Single value	Non-normal	Non-normal	Non-normal	Single value	Non-normal	Normal
Statistical approach	Aust: Chebychev	Chebychev	Chebychev	Aust: Chebychev	Chebychev	Aust: Chebychev	Aust: Chebychev	Aust: Chebychev	Aust: Chebychev	Aust: One-sample t	Aust: Chebychev	Aust: Chebychev	Aust: Chebychev	Aust: Chebychev	Aust: Chebychev	Aust: Chebychev	Aust: One-samp
Test scenario:	Planning: is true mean lower than critical concentration ($\mu < C_c$)?				**Evidence level required:**	95%	Use Normal distribution to test for outliers										
t statistic, t_s (or k_s)	-15.55707466	-295.8058787		N/A		-28.98896555	-2496.299826	-48.09879242	-2518.03941	-771.0908172	N/A	-148.9470549	-393.2761019	-2332.520522	N/A	-442.2186218	-2219.572147
Upper confidence limit (on true mean concentration, μ)	17.1214771	0.66849588		2		145.365399	0.99470486	34.2986924	3.04198296	81.3425206	2	12.0699383	1.89547315	1.81512355	3	66.3664055	20.9622259
Evidence level	100%	100%		100%		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Base decision on:	evidence level	evidence level		evidence level		evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level
Result	$\mu < C_c$	$\mu < C_c$		$\mu < C_c$		$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$
Select dataset	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◉

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METALS – OUTLIERS REMOVED

Client ref: client ref: ESBC Project ref: IV.58.13 Site ref: Pennycraft, Uttoxeter Data description: Metals Contaminant(s): PAH's Test scenario: Planning Date: 14.11.13 User details: RPS	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a) anthracene	Chrysene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Benzo(a) pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h) anthracene	Benzo(ghi) perylene
Critical concentration, C_c	8.7	850	1000	780	380	9200	670	1600	5.9	9	7	10	1	4.2	0.9	43
Notes																
Sample size, n	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
Sample mean, $\bar{x}$	2.80344231	1.27516538	0.58418846	1.55796154	18.4423385	3.96488846	28.7045769	22.4504923	10.5516308	9.91461923	13.2473077	4.94051923	3.41889231	5.52726923	1.26269231	6.33735769
Standard deviation, s	8.98034054	2.10301405	0.90648134	3.43798253	43.4730523	7.16284964	57.7681244	42.7668028	17.6370986	17.1422157	21.1269937	7.80870519	12.4807667	9.04068913	2.07344688	10.0996331
Number of non-detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Set non-detect values to:	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi
Outliers?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Distribution	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal
Statistical approach	Auto: Chebychev	Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev
Test scenario:	Planning: is true mean lower than critical concentration ($\mu < C_c$)?				**Evidence level required:**		95%	Use Normal distribution to test for outliers								
t statistic, t_μ (or k_μ)	-3.348053741	-2057.839074	-5621.782279	-1154.540812	-42.40764044	-6546.383745	-56.60522843	-188.0887789	1.344821877	0.272057089	1.507793504	-3.303798843	3.030989805	0.748590247	0.891932737	-18.50993269
Upper confidence limit (on true mean concentration, μ)	10.4802901	3.07292782	1.35909441	4.49692233	55.6052952	10.0880534	78.087682	59.0097114	25.6287118	24.5686494	31.307727	11.6157941	19.0880809	13.2557061	3.03517924	14.9710332
Evidence level	92%	100%	100%	100%	100%	100%	100%	100%	0%	0%	0%	92%	0%	0%	0%	100%
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level
Result	$\mu \approx \geq C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu \geq C_c$	$\mu \geq C_c$	$\mu \geq C_c$	$\mu \approx \geq C_c$	$\mu \geq C_c$	$\mu \geq C_c$	$\mu \geq C_c$	$\mu < C_c$
Select dataset	◉ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y

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PAH'S – FULL DATASET

Client/client ref: ESBC Project ref: IW.58.13 Site ref: Pennycraft, Uttoxeter Data description: Metals Contaminant(s): PAH's Test scenario: Planning Date: 14.11.13 User details: RPS	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a) anthracene	Chrysene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Benzo(a) pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h) anthracene	Benzo(ghi) perylene
Critical concentration, C_c	8.7	850	1000	780	380	9200	670	1600	5.9	9	7	10	1	4.2	0.9	43
Notes																
Sample size, n	21	24	22	20	22	22	22	23	23	23	24	23	23	24	24	24
Sample mean, $\bar{x}$	0.35045238	0.7585125	0.23949545	0.27385	3.45912727	1.21214091	8.5645	8.51794783	4.96706087	4.35565652	7.85958333	2.48058696	4.64744348	3.23370833	0.73541667	3.77797083
Standard deviation, s	0.39753982	1.0437897	0.21767308	0.27275096	3.57471703	1.35253811	9.36078816	9.53465056	5.96071205	5.07180456	9.3538263	3.01207976	5.73771046	4.04805354	0.94181217	4.3972118
Number of non-detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Set non-detect values to:	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi	Half detection limi
Outliers?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Distribution	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal
Statistical approach	Auto: Chebychev	Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev
Test scenario:	Planning: is true mean lower than critical concentration ($\mu < C_c$)?				**Evidence level required:**		95%	Use Normal distribution to test for outliers								
t statistic, t_s (or k_s)	-96.24805285	-3985.876313	-21542.82221	-12784.70792	-494.0623918	-31900.12842	-331.4258842	-800.4991629	-0.75061819	-4.391629957	0.450198772	-11.9724048	3.048694165	-1.169412165	-0.856105281	-43.69767135
Upper confidence limit (on true mean concentration, μ)	0.72858818	1.68723119	0.44178348	0.53969475	6.78118465	2.46908214	17.2636712	17.1839275	10.3847119	8.9653855	16.1822113	5.21824594	9.86240984	6.83549037	1.57340019	7.69041871
Evidence level	100%	100%	100%	100%	100%	100%	100%	100%	36%	95%	0%	99%	0%	58%	42%	100%
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level
Result	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu < C_c$	$\mu \geq C_c$	$\mu < C_c$	$\mu \geq C_c$	$\mu < C_c$	$\mu \geq C_c$	$\mu \approx C_c$	$\mu \geq C_c$	$\mu < C_c$
Select dataset	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	◉ Y

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PAH'S – OUTLIERS REMOVED

Generic Assessment Criteria

	Residential With Plant Uptake	Residential Without Plant Uptake	Commercial/Industrial
Arsenic	32	35	640
Cadmium	10	17	230
Chromium (III)	2500	2700	29,000
Chromium (IV)	32	35	326
Lead	450	450	5000
Mercury	170	170	3600
Selenium	350	595	13000
Nickel	130	786	1800
Phenol	415	519	1,100,000
Acenaphthene	1,000	3,910	100,000
Acenaphthylene	850	3,870	100,000
Anthracene	9,200	23,000	500,000
Benzo(a)anthracene	5.90	6.00	97.00
Benzo(a)pyrene	1.00	1.04	14.00
Benzo(b)fluoranthene	7.00	7.30	100.00
Benzo(ghi)perylene	43	47	660
Benzo(k)fluoranthene	10.0	10.4	140.0
Chrysene	9	10	140
Copper	2,300	6,200	70,000
Free Cyanide	34	34	34
Dibenzo(ah)anthracene	0.90	0.93	13.00
Fluoranthene	670	1,000	23,000
Fluorene	780	2,800	71,000
Ideno(1,2,3-cd)pyrene	4.20	4.40	62.00
Napthalene	8.7	9.0	1,100
Phenanthrene	380	940	23,000
Pyrene	1,600	2,400	54,000
Zinc	3,700	40,000	600,000
PETROLEUM HYDROCARBONS			
Aliphatics			
C6-C8	110	113	13,000
C8-C10	370	370	42,000
C10-C12	110	110	12,000
C12-C16	540	540	49,000
C16-C21	3,000	3,000	91,000
C21-C35	76,000	89,000	1,800,000
Aromatics			
C5-C7	280	970	90,000
C7-C8	610	2,700	190,000
C8-C10	150	190	18,000
C10-C12	340	860	34,000
C12-C16	590	1,700	37,000
C16-C21	770	1,300	28,000
C21-C35	1,200	1,300	28,000

Note:
All figures are in mg/kg
Values calculated using CLEA v1.06
All organic determinands calculated using 6% SOM
SGV for Inorganic Hg quoted (ref. SGV Pg5, para 4)

UK Drinking Water Standards (UKDWS)

Parameter	Concentration	Units
Acrylamide	0.1	µg/l
Aluminium	200	µgAl/l
Ammonium	0.5	mgNH4/l
Antimony	5	µgSb/l
Arsenic	10	µgAs/l
Benzene	1	µg/l
Benzo(a)pyrene	0.01	µg/l
Boron	1	mgB/l
Bromate	10	µgBrO3/l
Cadmium	5	µgCd/l
Chromium	50	µgCr/l
Chloride (i)	250	mgCl/l
Conductivity (i)	2500	µS/cm at 20℃
Copper(ii)	2	mgCu/l
Cyanide	50	µgCN/l
1, 2 dichloroethane	3	µg/l
Epichlorohydrin	0.1	µg/l
Fluoride	1.5	mgF/l
Hydrogen ion	10	pH value
Iron	200	µgFe/l
Lead (ii)	25	µgPb/l
Manganese	50	µgMn/l
Mercury	1	µgHg/l
Mineral Oil (TPH)	10	µg/l
Nickel (ii)	20	µgNi/l
Nitrate (iii)	50	mgNO3/l
Nitrite (iii)	0.5	mgNO2/l
Phenol	0.5	µg/l
Polycyclic aromatic hydrocarbons (vii)	0.1	µg/l
Selenium	10	µgSe/l
Sodium	200	mgNa/l
Sulphate (i)	250	mgSO4/l
Tetrachloroethene and Trichloroethene (viii)	10	µg/l
Tetrachloromethane	3	µg/l
Trihalomethanes: Total (ix)	100	µg/l
Vinyl chloride	0.5	µg/l
Zinc	5000	µg/l

Pesticides		
Aldrin	0.03	µg/l
Dieldrin	0.03	µg/l
Heptachlor	0.03	µg/l
Heptachlor epoxide	0.03	µg/l
other pesticides	0.1	µg/l
Pesticides: Total (vi)	0.5	µg/l

Environmental Quality Standards (EQS) Groundwater Thresholds for List 1 & 2 Substances

Table 1: Environmental Quality Standards (EQS) for List 1 Dangerous Substances	
Substance	**All Freshwater EQS (ug/l)**
Mercury	1
Cadmium	5
Hexachlorocyclohexane	0.1
Carbon tetrachloride	12
Total DDT	0.025
pp DDT	0.01
Pentachlorophenol	2
Dieldrin	0.01
Isodrin	0.005
Aldrin	0.01
Endrin	0.005
Total 'Drins	0.03
Hexachlorobenzene	0.03
Hexachlorobutadiene	0.1
Chloroform	12
1,2-dichloroethane	10
Trichlorethylene	10
Perchlorethylene	10
Trichlorobenzene	0.4

Table 2a: Environmental Quality Standards (EQS) for List 2 Dangerous Substances					
Substance	**EQS Type**	**All Freshwater EQS (ug/l)**	**Substance**	**EQS Type**	**All Freshwater EQS (ug/l)**
1,1,1-Trichloroethane	Annual average	100	Fenitrothion	Annual average	0.01
1,1,2-Trichloroethane	Annual average	400	Flucofuron	95 percentile	1
2,4-D (ester)	Annual average	1	Iron (dissolved)	Annual average	1000
2,4-D (non-ester)	Annual average	40	Lead (dissolved)	Annual average	Hardness related (see table 2b for details)
2,4-Dichlorophenol	Annual average	20	Linuron	Annual average	2
2-Chlorophenol	Annual average	50	Malathion	Annual average	0.01
4-Chloro-3-methyl-phenol	Annual average	40	Mecoprop	Annual average	20
Arsenic (dissolved)	Annual average	50	Mevinphos	Maximum concentration	0.02
Atrazine & Simazine	Annual average	2	Naphthalene	Annual average	10
Azinphos-methyl	Annual average	0.01	Nickel (dissolved)	Annual average	Hardness related (see table 2b for details)
Bentazone	Annual average	500	Omethoate	Annual average	0.01
Benzene	Annual average	30	PCSDs	95th percentile	0.05
Biphenyl	Annual average	25	Permethrin	95th percentile	0.01
Boron (dissolved)	Annual average	2000	pH	95th percentile	06-Sep
Chloronitrotoluenes	Annual average	10	Sulcofuron	95th percentile	25
Chromium (dissolved)	Annual average	Hardness related (see table 2b for details)	Toluene	Annual average	50
Copper (dissolved)	Annual average	Hardness related (see table 2b for details)	Triazaphos	Annual average	0.005
Cyfluthrin	95th percentile	0.001	Tributyltin	Maximum concentration	0.02
Demeton	Annual average	0.5	Trifluralin	Annual average	0.1
Dichlorvos	Annual average	0.001	Triphenyltin	Maximum concentration	0.02
Dichlorvos	Maximum concentration	-	Vanadium (dissolved)	Annual average	Hardness related (see table 2b for details)
Dimethoate	Annual average	1	Xylene (m and p, o)	Annual average	30
Endosulphan	Annual average	0.003	Zinc (total)	Annual average	Hardness related (see table 2b for details)
Ammonia (as NH3)		15			

Table 2b: Environmental Quality Standards (EQS) for hardness related List 2 dangerous substances							
		EQS (ug/l) for Hardness bands (mg/l CaCO3)					
Substance	**EQS type**	**0-50**	**>50-100**	**>100-150**	**>150-200**	**>200-250**	**>250**
Freshwaters, suitable for all fishlife							
Copper (dissolved)	Annual average	1	6	10	10	10	28
Copper (dissolved)	95th percentile	5	22	40	40	40	112
Nickel (dissolved)	Annual average	50	100	150	150	200	200
Vanadium (dissolved)	Annual average	20	20	20	20	60	60
Freshwaters, suitable for Salmonid (game) fish							
Chromium (dissolved)	Annual average	5	10	20	20	50	50
Lead (dissolved)	Annual average	4	10	10	20	20	20
Zinc (total)	Annual average	8	50	75	75	75	125
Zinc (total)	95th percentile	30	200	300	300	300	500
Freshwaters, suitable for Cyprinid (coarse) fish							
Chromium (dissolved)	Annual average	150	175	200	200	250	250
Lead (dissolved	Annual average	20	125	125	250	250	250
Zinc (total)	Annual average	75	175	250	250	250	500
Zinc (total)	95th percentile	300	700	1000	1000	1000	2000

UKWIR WATER PIPE SELECTION RISK ASSESSMENT

		Pipe material					
		All threshold concentrations are in mg/kg					
	Parameter group	**PE**	**PVC**	**Barrier pipe (PE-Al-PE)**	**Wrapped Steel**	**Wrapped Ductile Iron**	**Copper**
1	Extended VOC suite by purge and trap or head space and GC-MS with TIC	0.5	0.125	Pass	Pass	Pass	Pass
1a	+ BTEX + MTBE	0.1	0.03	Pass	Pass	Pass	Pass
2	SVOCs TIC by purge and trap or head space and GC-MS with TIC (aliphatic and aromatic C5-C10)	2	1.4	Pass	Pass	Pass	Pass
2e	+ Phenols	2	0.4	Pass	Pass	Pass	Pass
2f	+ Cresols and chlorinated phenols	2	0.04	Pass	Pass	Pass	Pass
3	Mineral oil C11-C20	10	Pass	Pass	Pass	Pass	Pass
4	Mineral oil C21-C40	500	Pass	Pass	Pass	Pass	Pass
5	Corrosive (Conductivity, Redox and pH)	Pass	Pass	Pass	Corrosive if pH <7 and conductivity >400µS/cm	Corrosive if pH <5, Eh not neutral and conductivity >400µS/cm	Corrosive if PH <5 or >8 and Eh positive
	Specific suite identified as relevant following site investigation						
2a	Ethers	0.5	1	Pass	Pass	Pass	Pass
2b	Nitrobenzene	0.5	0.4	Pass	Pass	Pass	Pass
2c	Ketones	0.5	0.02	Pass	Pass	Pass	Pass
2d	Aldehydes	0.5	0.02	Pass	Pass	Pass	Pass
6	Amines	Fail	Pass	Pass	Pass	Pass	Pass

*UKWIR: Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites
Ref. 10/WM/03/21. Jan 2011.