



Six Town Housing

Traveller Site (Fernhill Caravan Park), Bury

Soil assessment – GQRA

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RSK GENERAL NOTES

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1 INTRODUCTION

RSK Environment Limited (RSK) was commissioned by Six Town Housing (STH) to carry out an assessment of a series of raised earth screening mounds placed around the perimeter of the Travellers Site (known as Fernhill Caravan Park) located on Every Street in Bury.

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

A summary of legislation and policy relating to contaminated land is given in Appendix B.

1.1 Aim

The initial aim of the work was to assess the potential for chronic (long-term) risk to the site residents from the contaminants contained within the soil screening mounds, as part of a generic quantitative risk assessment (GQRA). To achieve this, sufficient characterisation of the soil within the soil screening mounds is required. An assessment of the soil composition and contaminant quality is required to determine if the soil is suitable for use within a residential setting or if it poses a potential long-term risk to human health and further investigation, risk assessment or remediation is required.

1.2 Scope

The scope of the investigation and the layout of this report has been designed with consideration of relevant legislation and industry standards, in particular:

- Environment Agency (2004), report referred to as CLR11 and titled 'Model Procedures for the Management of Contaminated Land'
- Environment Agency (2010), report titled 'Guiding Principles of Land Contamination' (GPLC1)
- Environment Agency (2010), report titled 'Frequently Asked Questions, Technical Information, Detailed Advice and References' (GPLC2)
- British Standards Institute (BS 10175:2011+ A2 2017 (BSI, 2017)), report titled 'Investigation of potentially contaminated sites: Code of practice'

To assess the potential risk from the soil-borne contaminants in the screening mounds to the site occupants the following scope of works was proposed (note changes to the scope in Section 1.3):

- a review of existing data collected at the site (the Tergeo investigation from 2017)
- an investigation consisting of 14 hand excavated trial pits at shallow depths in the following locations around the site:
 - 12 shallow soil samples from the perimeter soil screening mounds
 - 2 Shallow soil samples from the landscaped areas along the side of the main roadway through the site
- chemical analysis of the soil samples at a laboratory

- assessment of all contaminant test data collected to date (Tergeo 2017 and RSK 2018) by comparing the data to GAC
- if the assessment shows that GAC are exceeded at the site and there is a potential risk to the site residents from the soil in the screening mounds then the investigation will proceed to a DQRA

1.3 Deviations from the scope

During the site works, RSK discussed the ongoing works with some of the residents. The RSK engineers were approached by a resident of Plot 15 who was concerned about the landscaped area within their fenced plot and the plot of another family member. Following a discussion with a representative of STH, it was agreed that the following additional sampling would be undertaken:

- 1 sample from the landscaped area within Plot 15 (HP14)
- 1 sample from the landscaped area within Plot 17 (HP13)
- 1 sample from the raised soil mound within Plot 10 (HP17)

Permission from the plot resident or plot resident's family member was obtained before each of the additional samples were collected.

1.4 Limitations

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

2 SITE SETTING

2.1 Site details

The site is located within an industrial setting in Fernhill, Bury, and occupies an area of 0.6 hectares. Access to the site is through a gated entrance off Every Street, which is to the north.

A site location plan is presented in Figure 1.

To the west of the site is a waste transfer station and to the north, beyond Every Street are the playing fields of a primary school. To the east of the site are various companies including tree felling, transportation and material distribution. To the south of the site is another traveller site.

The site accommodates approximately 17 separate traveller families on individual plots. The plots are generally covered in hardstanding although three plots contain a small landscaped area, which have been investigated as part of this phase of work. Small brick buildings that contain utility and washing facilities are located between each plot. Tarmac roadways allow access around the site, but parking and vehicle movements are constrained.

A series of raised soil screening mounds are located within the north-west, north-east and south-eastern parts of the site. It is understood that in the late 1980s made ground from an adjoining area was placed on site as a series of screening mounds so that the surrounding industrial setting can be screened from site occupants. The screening mounds are covered with grass although some unmanaged excavations of the screening mound in the north-west has occurred and the contents of the screening mound are now exposed in these areas. The following excavations have been identified:

- immediately west of the site entrance a small parking area has been enlarged to the west by excavating into the screening mound. Aerial photographs suggest the excavated material may have been placed on the northern flank of this mound.
- the plot in the north-west corner of the site appears to have been enlarged westwards. To accommodate this enlargement soil from the screening mound has been excavated. It is unclear where this excavated soil has been placed but it is possible it is mixed with the soil from the excavation immediately west of the site entrance (above).

In both cases where soil has been excavated from the screening mounds an exposed face of soil has been left.

A topographical survey of the screening mounds has been undertaken and the survey groups the screening mounds with volumes of soil relating to a screening mound in the west and a screening mound in the east:

- west screening mound – surface area = 721m², volume = 782m³
- east screening mound – surface area = 1,179m², volume = 1,217m³

The topographical survey is presented in Figure 2.

The source of the soil in the screening mounds (perimeter mounds or the mound within Plot 10) is not fully known by any party related to the site. It has been suggested that the mounds were constructed from waste materials associated with nearby, off-site activities. The contaminant composition of the soil within the screening mounds was also unknown at the time of commissioning the current investigation. RSK understand that several residents of the site have previously expressed concern to Six Town Housing about the potential negative impacts to health from them coming into contact with the soil. These concerns appear to have been increased when areas of the screening mounds were excavated by some of the site residents.

2.2 Previous investigation

An investigation of the soil within some of the screening mounds was undertaken in March 2017 by Tergeo Consulting (report reference 0293_01).

The Tergeo Consulting investigation included hand augering through the soil screening mounds at nine locations from 0.5 m to a maximum depth of 2.5m below the top of the mound (m BTM); no shallow soil samples were scheduled for analysis. During the investigation, the contents of the screening mounds were described, in Section 3 of the report, as made ground (containing man-made material) comprising sandy, gravelly clay with fragments of brick, concrete, ceramic, plastics, fabrics, glass, bituminous surfacing and mixed lithologies (mixed rock types). No water was encountered during the investigation. It is noted no exploratory hole logs are included in the Tergeo report.

No significant odours or visual signs of contamination was recorded during the investigation. Tergeo used a handheld instrument to detect volatile organic compounds (VOCs) and their field records show readings during their investigation to be low at levels below 1.5ppm (part per million). Asbestos was identified at a microscopic level (i.e. not visible to the naked eye) in soil samples that were collected from two locations with the following quantification results being reported by the laboratory:

- BH02 at 2.0m BTM). Chrysotile 0.062% - fibres/clumps
- BH06 at 1.0m BTM. Chrysotile 0.006% - fibres/clumps

Tergeo Consulting used the laboratory test data from their investigation and completed an assessment of the potential risk to human health. They concluded that some contaminants have been identified at concentrations in the screening mounds in excess of the chosen GAC. A GAC is contaminant concentration in soil, which if it is exceeded may suggest that a potential risk is present, and that further investigation is required. Tergeo Consulting used a GAC that evaluates the potential for vapours to impact the occupants of a house, which has been constructed directly on top of the soil. Tergeo Consulting did not consider the potential risk to site users through direct contact (soil and dust ingestion and inhalation, dermal contact) of receptors (the residents) with the soil. Given the manner in which the site is used, i.e. there are no permanently occupied houses on top of the soil in the screening mounds RSK do not consider the assessment is appropriate and doesn't not evaluate all potential exposure pathways that are likely to be present at the site.

Tergeo Consulting concluded that the soil contaminant concentrations reported by the laboratory are not significantly above the vapour GAC used in their assessment but

given their assessment of a likely moderate risk to site users, they recommended that remedial works are required.

Tergeo Consulting recommend either placement of a clean capping layer over the soil screening mounds or their complete removal.

To allow a comprehensive assessment of the soil within the soil screening mounds, data collected during the Tergeo Consulting investigation will be combined with the recently collected RSK data and assessed as a whole as part of the GQRA.

2.3 Conceptual understanding of the site

RSK has used information from the Tergeo Consulting report and information about the site, which was provided by Six Town Housing and the residents, to identify potential sources of contaminants and sensitive receptors (i.e. site residents who may come into contact with the material) and plausible routes by which the receptor can be exposed to soil borne contaminants (also known as exposure pathways). Where there is a plausible link between the source and the receptor, this is referred to as a potentially complete contaminant linkage and requires further investigation.

Table 1 sets out the plausible sources, pathways and receptors that have been identified on the site. Where there is a potentially complete contaminant linkage this is identified.

The current report is specific to site residents only and does not consider occupational exposure of workers (e.g. maintenance workers) at the site.

Table 1: Plausible source, pathway and receptor summary

Source	Pathway	Receptor	Potentially complete
Made ground derived from off-site sources used within raised perimeter soil screening mounds	Direct contact (soil and dust ingestion / inhalation and dermal contact, excluding asbestos)	Site residents	Yes - there is the potential for residents to come into contact with potentially contaminated shallow soil within the soil screening mounds. The mounds are located immediately adjacent to residential plots and are accessible by residents. It is anticipated that children may play on the mounds and there is evidence of poultry being reared and dog cages situated on top of the mounds. Typically, only shallow soils, within the top 300mm of the surface of the earth mounds, are accessible for direct contact and considered to pose a potential risk to human health. It is considered unlikely that soils deeper than 300mm will be routinely disturbed through the likely activities taking place on the site (animal roaming, children playing, storage of materials). In their current condition and if no further excavation into the mounds is carried out, soils deeper than 300mm from the surface of the soil screening mounds are considered unlikely to pose a potential risk to site residents or maintenance workers.

Source	Pathway	Receptor	Potentially complete
	Inhalation asbestos fibres		Yes – there is the potential for asbestos fibres, if present, to be released from exposed soils and be inhaled by site residents. Soils have been identified to contain loose fibres of chrysotile asbestos at quantification levels of 0.006% and 0.062% by Tergeo consulting (albeit at depths > 0.5 mBTM). However, the soil screening mounds and landscaped areas are covered in grasses and weeds which will reduce the amount of soil borne dust and associated fibres liberated from the soils without intervention to disturb the soil mounds.
	Inhalation of vapours in outdoor air		No – the raised soil screening mounds are located around the perimeter of the site. All site residents live in caravans, which are raised off the ground with a clear air gap between the caravan and the ground. None of the caravans are located on top of the soil screening mounds. Potentially hazardous vapours generated from soil-borne contaminants (if present) within the made ground will release directly to the atmosphere and will be diluted and dispersed before they can enter any of the caravans. Potential vapours in the soils are not considered to pose a potential risk to residents.
	Inhalation asbestos fibres	Adjacent site users	No – In their current condition and if no further excavation into the mounds is carried out, the soil screening mounds are not considered to pose a risk to adjacent site users.

Source	Pathway	Receptor	Potentially complete
Made ground topsoil from unknown source(s) used within landscaped areas in plots (10, 15 and 17) and along internal roadways	Direct contact (soil and dust ingestion / inhalation and dermal contact, excluding asbestos)	Site residents	Yes - there is the potential for residents to come into contact with potentially contaminated shallow soil within landscaped areas in Plots 10, 15 and 17 (tested at the request of residents) and along the side of the site access road. Landscaped areas are located within the confines of residential plots and are accessible by residents. Plants and trees are planted in the landscaped areas and it is anticipated that residents maintain these areas frequently. The narrow strips of landscaping along the main roadway into the site is likely to be mown by Six Town Housing on an approximately monthly basis. It is not anticipated that this activity disturbs the soil however these areas are freely accessible to residents and could therefore be disturbed during routine gardening or recreational activities. Typically, only shallow soils, within the top 300mm of the surface of the landscaped areas, are considered to pose a potential risk to human health. It is considered unlikely that soils deeper than 300mm will be routinely disturbed through the likely activities taking place in these areas of the site.
	Inhalation asbestos fibres		Yes – there is the potential for soil-borne dust and asbestos fibres, if present, to be released from exposed soil in landscaped areas and for this to be inhaled by site residents. The soil used in landscaped areas within the individual plots and along the roadway has not been investigated previously but given the unknown source of the material, there is the potential for asbestos to be present.
	Inhalation of vapours in outdoor air		No – individual dwellings are not located on top of landscaped areas and therefore any potentially hazardous vapours generated from soil-borne contaminants (if present) within the made ground will release directly to the atmosphere and are considered unlikely to pose a health risk to residents.

The potentially complete contaminant linkages identified at the site are:

1. direct contact (via soil and dust ingestion or inhalation and dermal contact) with potentially contaminated shallow soils in the raised perimeter soil screening bunds by site residents
2. asbestos fibre inhalation from potentially contaminated shallow soils in the raised perimeter soil screening mounds by site residents

3. direct contact (via soil and dust ingestion or inhalation and dermal contact) with potentially contaminated shallow soils in landscaped areas within individual plots and along roadways by site residents
4. asbestos fibre inhalation from potentially contaminated shallow soils in landscaped areas within plots and along roadways by site residents

Further assessment of these potentially complete contaminant linkages, which are summarised as either direct contact or asbestos fibre inhalation is considered to be required.

3 SITE INVESTIGATION METHODOLOGY

RSK carried out an investigation on 13 June 2018. The investigation included the collection of soil samples and a description of the shallow ground conditions

Photographs of the investigation works are included in Appendix C.

3.1.1 Health, safety and environment considerations

Before arriving at site, a site-specific health and safety plan was developed specifically for the works. The investigation was undertaken in raised soil mounds of imported material, to shallow depths (<0.5m BTM) and using hand tools. An RSK Director confirmed that the use of a cable avoidance tool (CAT) is sufficient to confirm the presence of utilities and that the collection of utility plans and a ground penetrating radar (GPR) survey were unnecessary. Trial pits were excavated in a slow and controlled manner using hand tools. In addition, permit to dig forms were completed for each location.

3.1.2 Investigation locations

Twelve exploratory hole positions were located by RSK at regular intervals along the crests of the earth mounds. In addition, and as discussed in Section 1.3, three exploratory holes were also excavated in landscaped areas of individual plots (Plots 15, 17 and 10) and two exploratory holes in the narrow strips of landscaping on either side of the main roadway through the site.

During the RSK investigation a total of seventeen locations (referenced HP01 to HP17) were excavated to a maximum depth of 0.4m BTM.

During the Tergeo Consulting investigation in March 2017, a total of nine exploratory holes (referenced BH01 to BH09) by hand held window sampling technique were drilled. During the Tergeo Consulting investigation, the soil mounds were designated a numbering system to differentiate between the various mounds around the site. For consistency this numbering system has been used by RSK.

The table below details the area designation around the site and the exploratory hole reference for each of the investigations, either RSK or Tergeo.

An exploratory hole location plan is presented in **Figure 3**.

Table 2: Exploratory hole locations

Site area designation	Exploratory hole ID	Depth ranges (m BTM)	Investigation
Area 1	BH01, BH02 and BH03	0.5 – 2.0	Tergeo Consulting (2017)
	HP05 and HP06	0.2	RSK (2018)
Area 2	BH07, BH08 BH09	0.5 – 2.5	Tergeo Consulting (2017)
	HP11 and HP12	0.4	RSK (2018)
Area 3	BH04, BH05 and BH06	1.0 – 1.5	Tergeo Consulting (2017)

Site area designation	Exploratory hole ID	Depth ranges (m BTM)	Investigation
	HP01, HP02, HP03 and HP04	0.4	RSK (2018)
Area 4	HP07, HP08, HP09 and HP10	0.3	RSK (2018)
Plot 15	HP14	0.1	
Plot 17	HP13	0.2	
Roadway landscaping	HP15 and HP16	0.2	
Plot 10	HP17	0.2	

3.1.3 Soil sampling and laboratory analysis

A total of 19 soil samples were collected from the 17 exploratory holes (two samples were collected from HP10 located in the soil mounds and two samples from HP16 located in the landscaped area adjacent to the roadway) were collected during the RSK (2018) investigation. Samples were placed into a variety of containers appropriate to the anticipated chemical testing suite. Samples were stored in accordance with the RSK quality procedures to maintain sample integrity and preservation and to minimise the chance of cross contamination before being transferred under chain of custody documentation to the testing laboratory at Envirolab in Hyde. Sample depths are reported in the ground conditions table in Appendix D.

All 19 samples were analysed for the following suite of contaminants:

- metals (including arsenic, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium and zinc)
- pH
- total organic carbon (TOC),
- poly-cyclic aromatic hydrocarbons (the USEPA16 compounds by mass spectrometry)
- asbestos screen and identification

Nine selected samples were analysed for the following suite of contaminants:

- petroleum hydrocarbons (TPHCWG)
- total petroleum hydrocarbons with identification
- natural moisture content

4 GROUND CONDITIONS

This section combines the information collected by RSK with the information collected by Tergeo Consulting from their investigation, which was completed in March 2017. This approach will allow a comprehensive assessment of the soil within the soil mounds to be made using all the available data.

The descriptions of the soil and any other notes that were recorded during the RSK sample collection, including visual or olfactory evidence if observed are presented in the ground conditions table in Appendix D

The results of the RSK laboratory tests are presented in Appendix F and results of the Tergeo Consulting laboratory tests are presented in Appendix G.

4.1 Soil screening mounds (perimeter)

4.1.1 Tergeo Consulting soil description

During the Tergeo Consulting investigation in March 2017, the soil within the screening mounds was described as Made Ground of predominantly sandy, gravelly clay with fragments of brick, concrete, ceramic, plastics, fabrics, glass, bituminous surfacing and mixed lithologies (rock types). This was identified at all locations and at all depths (from 0.5m BTM to 2.5m BTM). However, no logs are included in the report and it is not known if logging was undertaken in accordance with BS5930.

Tergeo Consulting reported that they had not identified any evidence of visual or olfactory contamination during their investigation.

4.1.2 RSK soil description

During the RSK investigation, the soil within the screening mounds was generally the same as that described by Tergeo Consulting following their investigation on site. RSK describe the soil as two distinct layers:

- thin topsoil layer comprising light to dark brown slightly silty (in places), gravelly SAND with sandstone, rare brick and concrete and abundant rootlets, generally encountered from the surface to 0.1m BTM.
- Made Ground generally comprising dark brown gravelly SAND with low to medium cobble content and manmade products making up between <5 and 30% of the volume, generally encountered from 0.1m to 0.4m BTM.

The Made Ground underlying the uppermost topsoil layer comprised a variety of material including brick, concrete, plastic sheeting, glass, asphalt, ceramic, clinker, plastic wrappers, string, wood (manufactured) and cloth. Items such as nails, tin cans, rubber tyres, a bin lid and concrete flagstones were identifiable. Each area of the site generally contained the following approximations of man-made products:

- Area 1 – between 20% and 30% man-made products including asphalt, glass, metal wire, nails plastic piping, wood, string and plastic wrappers

- Area 2 - <5% man-made products generally comprising brick, concrete, coal, rare plastic sheeting, clinker, rubber and glass
- Area 3 – between 10-15% man-made products comprising glass, ceramic, bricks, clinker, wood, plastic wrapper and ceramic tiles. The bin lid and rubber tyres were identified at the surface in this area.
- Area 4 - <5% man-made products comprising brick, concrete, coal, rare plastic sheeting, clinker, rubber and glass.

RSK did not identify any olfactory evidence of odours within the soil during the investigation.

4.2 Soil used within plots and roadway landscaping areas

The soil encountered in the landscaped areas of Plots 10 (a soil mound), 15, 17 and the narrow, landscaped strips on either side of the main roadway generally comprised topsoil with less man made material than was observed in the soil screening mounds.

The material was generally described as light to dark brown slightly silty gravelly SAND with sandstone, rare brick, concrete and abundant rootlets, plastic sheeting and coal.

A garden textile layer (weed suppressant) was encountered in Plot 15 (HP14) at 0.02m below the surface and it was extensive across the landscaped area. The sample collected for analysis was taken from below this textile layer.

4.3 Perched water

Water was not encountered during the RSK or Tergeo Consulting investigations.

5 GENERIC QUANTITATIVE RISK ASSESSMENT

In line with CLR11 (EA, 2004), there are two stages of quantitative risk assessment, generic risk assessment and detailed risk assessment. The generic quantitative risk assessment (GQRA) comprises the comparison of soil, groundwater, soil gas and ground gas results with GAC that are appropriate to the linkage and the receptor being assessed. This comparison can be undertaken directly against the laboratory results or following statistical analysis depending upon the sampling procedure that was adopted.

A human health risk assessment, whether generic or detailed, is the process to estimate the nature and probability of adverse health effects in humans (the receptor) who may be exposed via one or more pathways (e.g. soil ingestion) to contaminants in contaminated environmental media (the source; e.g. soil, air, water), now or in the future.

Human health risk assessment involves characterisation of the hazard in terms of the quantities of the substances present in a defined area, their toxicological properties and assessment of the potential exposure of receptors to the contaminants. Risk is therefore assessed on the basis of predicted exposure and the anticipated toxicological effects of those exposures.

A GQRA is the first stage in a human health risk assessment and uses generic assumptions about receptor behaviour at a site and precautionary GAC against which to evaluate if further investigation is required.

5.1 Linkages for assessment

The potentially complete contaminant linkages requiring further investigation are presented in the table below together with their method of assessment.

Table 3: Linkages for generic quantitative risk assessment

Potentially relevant contaminant linkage	Assessment method
1. Direct contact (via soil and dust ingestion and/or inhalation and dermal contact) with potentially contaminated shallow soils in the raised perimeter soil screening mounds by site residents	Contaminant results have been compared against the human health GAC for a residential without home grown plant uptake scenario (in Appendix H). Statistical analysis has been undertaken the dataset comprising samples from the mounds owing to the sampling locations being non-targeted and soils of similar composition. The statistical analysis is presented in Appendix I.
2. Asbestos fibre inhalation of asbestos from potentially contaminated shallow soils in the raised perimeter soil	Qualitative assessment based on the asbestos minerals present, their form, concentration, location and the nature of the existing land use.

Potentially relevant contaminant linkage	Assessment method
screening mounds by site residents	
3. Direct contact (via soil and dust ingestion and/or inhalation and dermal contact) with potentially contaminated shallow soils in landscaped areas within plots and along roadways by site residents	Contaminant results have been compared against the human health GAC for a residential without home grown plant uptake scenario (in Appendix H). Statistical analysis has not been undertaken owing to three sampling locations being targeted to individual plots and two samples targeted to the internal roadway.
4. Asbestos fibre inhalation of asbestos from potentially contaminated shallow soils in landscaped areas within plots and along roadways by site residents	Qualitative assessment based on the asbestos minerals present, their form, concentration, location and the nature of the existing land use.

5.2 Justification for use of GAC

5.2.1 Site specific information relating to use of the soil mounds and the landscaped areas

A member of the tenancy sustainment team at Six Town Housing provided RSK with some additional information regarding the likely activities that are undertaken on the soil screening mounds and the frequency these areas of the site are used by residents.

Resident activities

The member of the tenancy sustainment team informed RSK that the team visits the site approximately once or twice a week in a 'site management' capacity. The residents have been informed by the team to not go on the soil screening mounds and during recent visits (within the last year) team members have only seen residents on the mounds a small number of times. During a particular visit a group of teenage males were observed playing a game (throwing horse shoes at a stick in the ground) in Area 2. The member of the tenancy sustainment team informed RSK that they are aware children play on the mounds and that poultry and dogs are stored on the mounds. RSK has therefore assumed that the residents view the perimeter soil screening mounds as their 'garden area'. Additionally, a travelling education officer has previously used the soil screening mounds as a teaching area for younger children.

During the RSK site investigation, several metal cages were observed on top of the mounds, particularly in Area 3 housing chickens and dogs. RSK also observed areas of fly tipping (mattresses, wood planks, bricks, asphalt and tyres) in this area.

The landscaped area in Plot 10 comprises a raised area of soil covered with coarse grass, which appeared to have been cut relatively recently. The ground is relatively rough and does not appear to be an area used for recreation.

In Plot 15 the landscaped area is also raised although this area is generally occupied by herbaceous perennials and shrubs with some imported decorative stones and blocks.

The landscaped area in Plot 17 is generally grass covered although several areas of bare soil are present and temporary storage units cover the area of bare soil.

The landscaped areas adjacent to the roadway are separated from the adjacent road by a series of low metal barriers, which prevent vehicles from driving on the grass, but they do not stop residents entering this area. The grass in this area does not appear to have been cut recently.

Form this information, RSK assumes the soil mounds are used or have been used in the past, for the following activities:

- recreational activities (playing games, socialising)
- teaching area
- storage of equipment, materials
- storage and rearing of animals (not known if residents consume chickens or eggs)
- disposal of waste by residents

There is no evidence of, or reports of, the cultivation of home-grown produce at the site.

Frequency of resident use

Despite the tenancy sustainment team not seeing frequent activity on the mounds, they may not be visiting at times when residents are using the soil mounds. It is therefore assumed by RSK that residents are potentially using the soil mounds more frequently than the tenancy sustainment team is aware of.

Notwithstanding this, during the RSK site investigation, the soil mounds were observed to be steeply sloping and covered in thick grass vegetation. With the exception of a few discreet areas the thick grass vegetation did not look to be overly disturbed or distressed with little or no evidence of accessing the mounds. It is therefore assumed that residents use discreet parts of the mounds more frequently than other areas and had not accessed the majority of the soil mounds recently (at least the growing season of the vegetation) otherwise there would have been evidence of flattened vegetation and worn tracks.

Age range of users

RSK has been informed that within the community living at the site, generally younger children tend to go to school and older children, generally of high school age (>13), tend to stay at home.

From this information, RSK assumes that older children are potentially present on the site for a greater portion of the day and therefore have more time to access the soil mounds. This ties in with the observation made by the tenancy sustainment team member who saw teenage males playing on the mounds. However, it cannot be ruled out that younger children, of primary school age (>3-12), are using the soil mounds for recreational activities in the evenings, weekends and during school holidays.

The sides of the earth mounds are steeply sloped, with the slopes in some areas likely to be hazardous when the ground is wet. The shape of the soil screening mounds is likely to concentrate access paths (if the mounds are used for recreation) to very discreet locations and areas of play along the top of each mound. It is assumed

therefore that very young children, of <3 years old) would not be left unattended to use the soil mounds given the steep slope angle.

Maintenance

The member of the tenancy sustainment team informed RSK that the soil mounds were previously maintained (strimmed and mown) by a Council-employed gardener as often as weekly during the summer months and monthly in the winter. However, the gardener has not been to the site in the last year. This is consistent with RSK's observation of the vegetation being dense and long during the recent site investigation. The narrow strips of landscaping on either side of the main roadway through the site does get mown/strimmed by a council-employed gardener approximately monthly.

The soil mound in Plot 10 was previously maintained by the Council. However due to the Council no longer cutting vegetation on the larger soil screening mounds around the perimeter of the site, the mound in Plot 10 is no longer maintained by the Council. It is assumed that the resident(s) of Plot 10 is maintaining this mound. During the RSK site investigation, grass on the mound within Plot 10 was observed to be short and assumed to have been cut relatively recently.

5.2.2 RSK Generic Assessment Criteria

RSK's soil assessment criteria used within a GQRA are based on a specific receptor, which in this case is the site residents.

Generic Assessment Criteria are based on a generic conceptual model (an understanding of the potential contaminant sources, the receptors that might be exposed to the contaminant(s) and the pathways by which the receptor maybe exposed) for a pre-defined land use (e.g. residential, commercial, public open space, allotments). Such criteria make broad assumptions about receptor behaviour at a site and their likely exposure to contaminants, site conditions and building type and are therefore not site-specific.

The UK approach to risk assessment normally involves the use of the EA Contaminated Land Exposure Assessment (CLEA) model when deriving assessment criteria for soils within a human health risk assessment (either generic or site-specific criteria). This model is used in all parts of the UK. RSK soil GAC have been derived using CLEA version 1.071.

Using the information in section 5.2.1, RSK consider the most appropriate generic land use scenario to be residential without home-grown produce. However, undertaking a GQRA using this generic land use is acknowledged to be the first stage in the assessment of potential risks associated with soil-borne contaminants (if present) and the assumptions behind the generic land use are not directly applicable to the site.

Full details of the derivation of the RSK GAC used in this GQRA are presented in Appendix H.

5.3 Discussion of laboratory results

5.3.1 Soil screening mounds

A total of 24 soil samples have been analysed from the soil screening mounds located around the perimeter of the site; comprising 13 soil samples taken by RSK (2018) at depths of between 0.0m and 0.4m below the top of the mounds (m BTM) and 11 samples taken by Tergeo Consulting at depths of between 0.5m and 2.5m BTM.

Soil pH values (RSK dataset) ranged between 8.02 and 6.62.

All 13 RSK soil samples were analysed for TOC which was converted to Soil Organic Matter (SOM) to aid the selection of the mode appropriate GAC for the organic content of the site soils. The SOM was measured to be between 5.6% and 11.2% with an average of 7.34%.

Several of the contaminants that were tested for by the laboratory exceed the RSK human health GAC for a residential without home-grown produce land use. A summary of these exceedances is presented in Table 5 below, with GQRA screening sheets presented in Appendix H.

Table 4: Exceedances of GAC - soil screening mounds (RSK and Tergeo data)

Determinand	GAC (mg/kg)	Sample Count	Number of Exceedances	Maximum concentration (mg/kg)	Minimum concentration (mg/kg)	Location / depth of maximum exceedance
Lead	310	18	9	377	133	HP05 / 0.1-0.25m
Benzo(a)anthracene	15	18	3	34	1.24	BH01 / 1.0m
Benzo(a)pyrene	5.3	18	7	15	0.93	BH01 / 1.0m
Benzo(b)fluoranthene	4.1	18	10	36	1.08	BH01 / 1.0m
Dibenzo(ah)anthracene	0.32	18	9	2.03	0.11	HP10 / 0.2 – 0.3m
Notes: PAH compounds include: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene and dibenzo(ah)anthracene						

It is possible that the elevated lead and PAH compounds relate to high volumes of ash, clinker and coal within the soils used in the soil screening mounds. This is included in the field observations included in Appendix D.

None of the 13 samples analysed for petroleum hydrocarbons exceeded the human health GAC.

Five RSK soil samples were analysed for total petroleum hydrocarbon (TPH) identification which aims to identify the type of hydrocarbon present. The results for all five samples were reported as 'possible PAHs and mixture of unknown hydrocarbons'.

All 24 soil samples were analysed for the presence of asbestos. Four samples returned positive results for asbestos identification and the samples were further scheduled to determine the quantity of asbestos that is present. The results of the quantification analysis are detailed in the table below.

Table 5: Asbestos laboratory data - soil screening mounds (RSK and Tergeo data)

Location	Depth (m BTM)	Asbestos type	Asbestos form	Quantification (% ^{w/w})
HP02	0.0 – 0.3	Chrysotile	Board	<0.001
HP06	0.0 – 0.2	Chrysotile	Loose fibre	<0.001
BH02	2.0	Chrysotile	Fibres/clumps	0.062
BH06	1.0	Chrysotile	Fibre/clumps	0.006

It should be noted that the samples HP02 and HP06 were collected from the exposed face of the soil screening mound.

5.3.1.1 Assessment of non-targeted samples

Statistical analysis of the RSK results, with the exception of asbestos, has been conducted in accordance with *Guidance on Comparing Soil Contamination Data with a Critical Concentration* (CIEH and CL:AIRE, 2008). Full details of the approach to the statistical analysis is presented in this document.

Tergeo results have not been included in the statistical analysis as they were collected from a depth where there is not considered to be a plausible linkage, as previously discussed. The statistical assessment is therefore solely based on shallow soil samples.

Statistical analysis is utilised to establish whether the land is suitable for the proposed use under the land use planning system by attempting to answer a key question. For a site being developed the key question is: 'can we confidently say that the level of contamination on this land is low relative to some appropriate measure of risk?' More specifically, this is expressed as 'Is there sufficient evidence that the true mean concentration of the contaminant (μ) is less than the critical concentration (C_c)?', where the critical concentration could be the GAC or a site-specific assessment criterion (SSAC). The true mean (μ) is unknown and therefore a conservative estimate, termed the upper confidence limit (UCL), of this value is derived from the data. The UCL is then compared against the GAC.

Statistical analysis was completed on the perimeter soil mounds dataset, for four PAHs and for lead, which reported individual exceedances of the GAC. No outliers were detected in the dataset. With regards to the treatment of non-detects (samples that are

reported as less than the laboratory method detection limit (LMDL)), these are treated within the statistics as a concentration (half of) to the LMDL. This related to only a single sample result. The results of the assessment are presented in Table 6.

Table 6: Summary of statistical assessment – perimeter soil mounds

Determinant	No of samples in dataset	Normality	Test used	Mean mg/kg	Cc* mg/kg	UCL mg/kg	Reject H0? (% confidence level)
Lead	13	Normal	One sample t-test	265.77	310	307.79	Yes
Benzo(a)anthracene	13	Normal	One sample t-test	6.23	15	8.45	Yes
Benzo(a)pyrene	13	Not normal	Chebyshev's theorem	4.71	5.3	8.96	No
Benzo(b)fluoranthene	13	Not normal	Chebyshev's theorem	5.43	4.1	10.77	No
Dibenzo(a,h)anthracene	13	Not normal	Chebyshev's theorem	0.64	0.32	1.37	No

The results of the statistical assessment of shallow soil samples from the perimeter soil mounds indicate that no potentially significant risks associated with lead or benzo(a)anthracene have been identified in shallow soils.

On the basis of the statistical assessment of shallow soil samples from the perimeter soil mounds, additional risk assessment is required for the PAHs benzo(a)pyrene, benzo(b)fluoranthene and dibenzo(a,h)anthracene.

5.3.2 Plots and roadway landscaped areas (RSK data)

A total of six targeted soil samples were collected by RSK from landscaped areas within Plot 10 (HP17), Plot 15 (HP14) and Plot 17 (HP13) and in the narrow strips of landscaping (HP15 and HP16) on either side of the main roadway through the site at depths of between 0.0m and 0.2m bgl). No samples were collected by Tergeo in these areas.

Soil pH values ranged between 7.11 and 6.82 with an average pH of 6.99. All soil samples were analysed for TOC, which was converted to SOM. The SOM as measured to be between 4.90% and 10.38% with an average of 7.68%.

Several of the soil samples had contaminants that exceeded the human health GAC for a residential without home-grown produce land use. Neither of the two samples analysed for petroleum hydrocarbons exceeded the human health GAC. Targeted samples are not suitable for statistical analysis and the samples from the plot and landscaped areas have therefore been compared individually to the GAC. The results are presented in the table below.

Table 7: Exceedances of GAC - plot and roadway landscaped areas

Determinand	GAC (mg/kg)	Sample count	Number of Exceedences	Maximum concentration (mg/kg)	Minimum concentration (mg/kg)	Location / depth of maximum exceedance
Benzo(a)anthracene	15	6	2	18.2	1.24	HP14 / 0.0 - 0.1m
Benzo(a)pyrene	5.3	6	4	14.7	1.11	HP14 / 0.0 - 0.1m
Benzo(b)fluoranthene	4.1	6	4	18.4	1.41	HP14 / 0.0 - 0.1m
Dibenzo(ah)anthracene	0.32	6	5	2.04	0.13	HP16 / 0.15 – 0.2m
Notes: PAH compounds include: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene and dibenzo(ah)anthracene						

It is possible that the elevated PAH compounds relate to high volumes of ash, clinker and coal within the soils used in the landscaped areas.

Four soil samples were analysed for TPH identification which aims to identify the type of hydrocarbon present. The results of the analyses were reported by the laboratory as 'possible PAHs and mixture of unknown hydrocarbons'.

All six soil samples were analysed for the presence of asbestos and in all samples, no asbestos was detected.

On the basis of the above assessment of shallow soil samples from the plots/landscaped areas, additional risk assessment is required for the four PAHs detailed in Table 7. It should be noted that there were no exceedances of the GAC reported in the single soil sample from Plot 10 (HP17).

5.4 Refinement of the initial conceptual site model

The nature of the soil (i.e. the soil descriptions) in the perimeter soil screening mounds encountered in the RSK and Tergeo Consulting investigations was broadly similar, although only limited detail (no exploratory hole logs) are provided in the Tergeo report. The soil mounds have been shown to be made of a dark brown gravelly sand containing varying amounts of man-made products including brick, concrete, plastic sheeting, glass, asphalt, ceramic, clinker, plastic wrappers, string, wood (manufactured) and cloth. Each screening mound has been observed to contain different amounts of man-made products although this assessment is based on limited sample size and distribution within the soil mass. The mounds in Area 1 are reported to contain the greatest proportion of man-made material at between 20-30%.

The soil encountered in the landscaped areas in Plots 10, 15 and 17, and in the narrow strips on either side of the main roadway was described as a topsoil and contained less waste material than was present in the earth mounds.

Evidence of visual or olfactory contamination was not identified during either the RSK or Tergeo Consulting investigation.

5.4.1 Contaminant linkages 1 and 3

A number of soil samples reported elevated concentrations of lead and various PAHs above the GAC in the perimeter soil mounds (see Table 6) and plots/landscaped areas (see Table 7).

It is possible that the elevated lead and PAH compounds relate to high volumes of ash, clinker and coal within the soils used within both the earth screening mounds and the plots/landscaped areas.

Given the presence of elevated contaminants above the conservative GAC used in the initial GQRA, the contaminant linkage remains complete for the perimeter soil mounds (benzo(a)pyrene, benzo(b)fluoranthene and dibenzo(a,h)anthracene) and for the plots/landscaped areas (benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene and dibenzo(a,h)anthracene).

The reported exceedances are not indicative that there is a potential risk to human health, but these linkages require additional risk assessment.

5.4.2 Contaminant linkages 2 and 4 (asbestos)

Asbestos visible to the naked eye was not encountered during either the RSK or Tergeo Consulting investigations. Asbestos was not detected in soil samples taken from the soil within individual plots or from along the roadway landscaped areas and therefore, the contaminant linkage of inhalation of fibres from these areas is considered incomplete (linkage 4).

Asbestos was detected in four samples from the mounds (two RSK shallow samples; two Tergeo samples from depth). Chrysotile board (one sample) and fibres/clumps (three samples) at quantifiable levels of <0.001% (two samples), 0.006% and 0.062% were identified in samples from the soil screening mounds. Shallow soil samples taken from depths of between 0.0m and 0.3m BTM by RSK contained asbestos loose fibres at levels below the laboratory limit of quantification (i.e. <0.001%); the two Tergeo samples where asbestos was quantifiable were from depths of 1m BTM and 2m BTM.

There is no precise level of exposure to asbestos to which it can be stated that below that exposure a person will definitely not develop adverse health effects and above that level a person will definitely develop adverse health effects. In this way it is analogous to smoking, in that there is no precise number of cigarettes a person can smoke below which disease will definitely not develop and above which disease will definitely develop.

As the risk from asbestos fibres is through the inhalation of airborne fibres, the airborne fibre concentration is the relevant parameter for assessing risk to human health, rather than the concentration of asbestos present within the ground. The relationship between the two parameters – asbestos fibre concentration in the soils and asbestos fibre concentration in the air – is the subject of ongoing research and therefore no current GAC exists for asbestos in soil.

There are a number of factors that influence the release of asbestos fibres from the ground to air:

- type of asbestos fibres / materials present, and their condition
- concentration / amount of asbestos present
- type of soil / Made Ground
- climatic conditions and soil moisture content
- type of activities disturbing the ground.

The quantifiable levels of asbestos, i.e. the instances where asbestos was measured by the laboratory to be 0.006% and 0.062%, were identified during the Tergeo investigation and were found at depths greater than 1.0m BTM. RSK considers the risk of asbestos from depths deeper than 0.3m BTM to not pose a potential risk to human health. This is because it is unlikely that soils at greater depths than 0.3m will be routinely disturbed by the activities being undertaken at the site. This assumption is based on the soil mounds remaining in their current state and the slopes are also not excavated in order to remove large volumes of material to create additional space at the site. Furthermore, it is considered that excavation into the mounds is unlikely due to the existing vegetation on the mounds and the steep sides.

If soils at a depth greater than 0.3m are disturbed in an uncontrolled manner the assumptions of the current risk assessment are no longer valid and this qualitative assessment of potential risks may not be appropriate.

The locations where asbestos has been identified in shallow soils at depths <0.3m BTM (i.e. RSK sampling and analysis) reported concentrations that are less than the laboratory lower limit of quantification (<0.001%). RSK considers that while asbestos containing materials (board; HP02) and loose fibres (HP06) are reported to be present in two out of the 14 soil mound samples, the asbestos identified in shallow soil samples poses a low risk to site residents. This is due to several reasons:

- the type of asbestos identified is chrysotile, which is generally considered to be the lowest risk of all five major types of asbestos identified in the UK
- quantifiable concentrations are so low that soil disturbance activities would have to be intense for significant fibre counts to be liberated from the soils and become airborne
- only two out of 13 soil samples (15%) analysed at shallow depths (<0.3m BTM) were found to contain asbestos. Therefore, asbestos is not considered likely to be pervasive at shallow depths within the soil mounds
- the mounds are covered in relatively dense grass vegetation which is likely to restrict fibres from becoming freely available in air, should there be asbestos fibres or ACM in shallow soils
- weather conditions in the UK, especially in the north of Manchester, are generally wet, meaning that the soil moisture content is relatively high throughout the year. Moisture within the soils reduces liberation of soil-borne dust and associated asbestos fibres (if present) into the air.

In conclusion, RSK considers the reported asbestos fibres at shallow depths in the soil mounds do not currently pose a risk to human health that requires further investigation or intervention currently. Therefore, this contaminant linkage is incomplete.

Notwithstanding this conclusion, asbestos (chrysotile) at quantifiable levels greater than <0.001% have been reported to be present at depths >1.0m BTM and if these soils are disturbed, likely by highly destructive techniques (digging out by machine), this is considered to potentially pose a risk to site residents. Should the use of the soil mounds change, and the mounds are excavated into to create additional space, this risk assessment should be reviewed.

There is significant uncertainty regarding the material within the mounds. While visually the material appears to be broadly similar in different mounds, and at different depths, it is not known if the material is all from the same source or was placed at the same time. Asbestos is often found in discrete pockets and therefore may not have been encountered in the current investigation. The current risk assessment is based on the ground conditions encountered during the investigation and the laboratory testing undertaken. However, the presence of asbestos at depth within the mounds (Tergeo samples) in strata that is broadly the same as that at shallow depths indicates that asbestos in the mounds is highly variable and may be present at locations that have not been investigated.

5.5 Conclusions

Following the investigation and refinement of the initial conceptual model through assessment of the ground conditions and laboratory results, the potentially complete contaminant linkages which are considered to require further investigation or assessment are:

- direct contact (soil and dust ingestion and/or inhalation and dermal contact) with potentially contaminated shallow soils in the perimeter soil mounds by site residents
- direct contact (soil and dust ingestion and/or inhalation and dermal contact) with potentially contaminated shallow soils in the plots/landscaped areas adjacent to internal roadways by site residents

The contaminants of concern in the perimeter soil mounds are three PAHs; within the landscaped areas the contaminants of concern are four PAHs. It should be noted that there were no exceedances of the GAC reported in the single soil sample from Plot 10 (HP17).

The GAC used in this GQRA are inherently conservative and the conceptual model behind a residential without home-grown produce land use is not directly applicable to the residential setting of the traveller site. Refinement of the GAC to remove conservatism and to derive more site-specific assessment criteria would enable a more appropriate assessment of potential risks to human health at the site.

While RSK results are indicative that asbestos is not pervasive in soils within the mounds, being reported in a small number of samples, there remains uncertainty as with all intrusive investigations, regarding the extent of asbestos contamination within the mounds.

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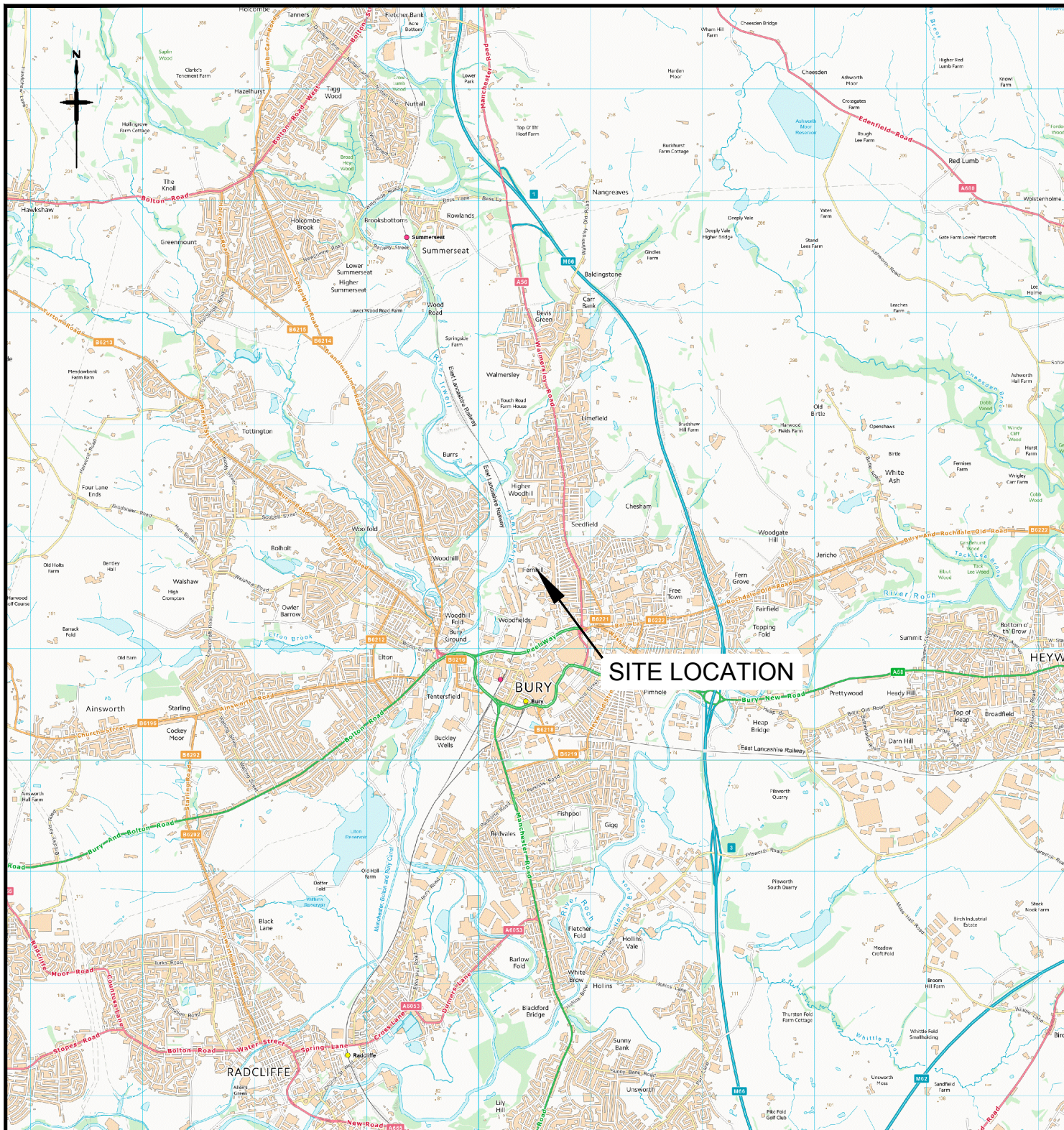
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FIGURES



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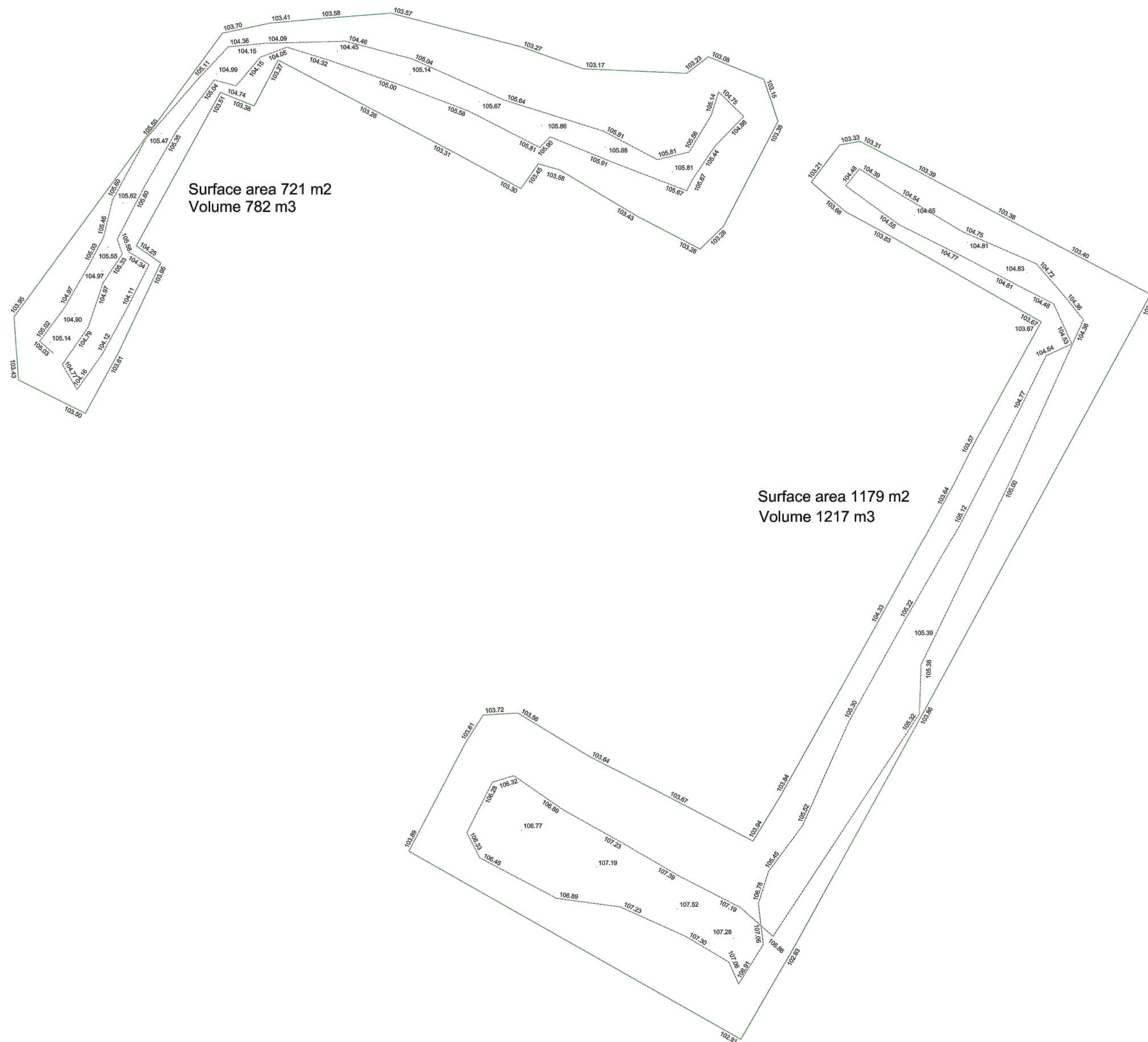
Project Title

TRAVELLER SITE, BURY

Drawing Title

SITE LOCATION PLAN

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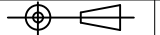


LEGEND:

Notes

Topographic survey undertaken by RSK on September 2017.
Taken from drawing '193052-TOPO-01'

REV.	DATE	DESCRIPTION	BY	CHD.	APR.
A	24.07.18	FIRST ISSUE	AP	EH	EH

Dimensions	Projection	Scale	Orig Size
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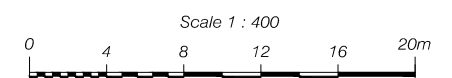
CLIENT
SIX TOWN HOUSING

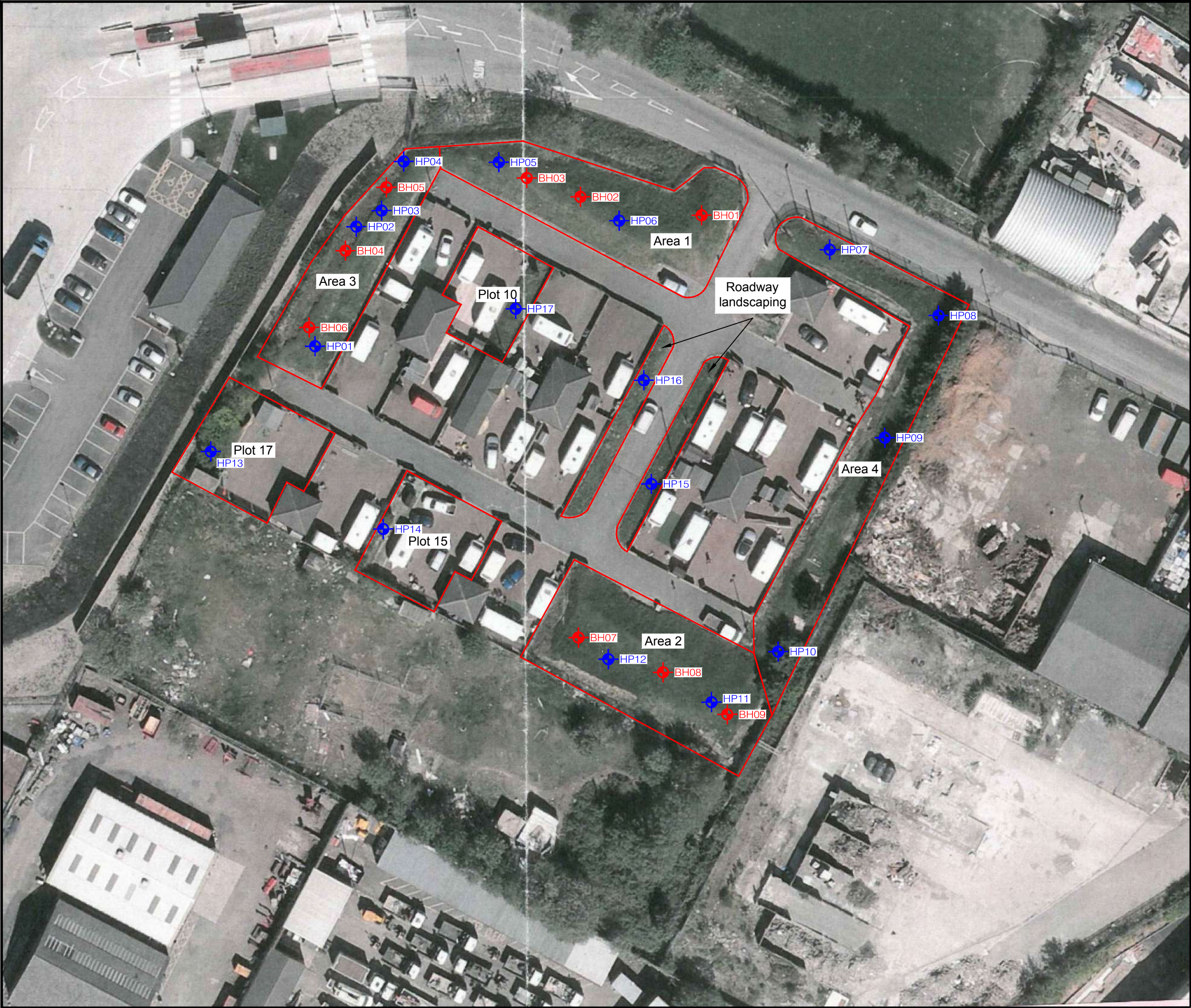
PROJECT
TRAVELLER SITE, BURY

TITLE
TOPOGRAPHIC SURVEY

JOB No.:	DRAWING FILE:
11151	11151-R01(00)D002A

BY:	DATE:	CONTRACT NO.	FIGURE 2	REV:
AP	24.07.18			A





LEGEND:

Tergeo investigation (March 2017)

RSK investigation (June 2018)

N

Notes

Base plan provided by the client

Area numbers consistent with Tergeo investigation

A	24.07.18	FIRST ISSUE	AP	EH	EH
REV.	DATE	DESCRIPTION	BY	CHD.	APR.
Dimensions		Projection	Scale	Orig Size	
m			nts	A3	

RSK

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CLIENT

SIX TOWN HOUSING

PROJECT

TRAVELLER SITE, BURY

TITLE

EXPLORATORY HOLE LOCATION PLAN

JOB No.:			DRAWING FILE:		
11151			11151-R01(00)D003A		
BY:	DATE:	CONTRACT NO.	FIGURE 3		REV:
AP	24.07.18				A

APPENDIX A

SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for Six Town Housing (the "client") in accordance with the terms of a contract between RSK and the "client", dated 11 January 2018. The Services were performed by RSK with the skill and care ordinarily exercised by a reasonable environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the client.
2. Other than that expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed in writing the Services were performed by RSK exclusively for the purposes of the client. RSK is not aware of any interest of or reliance by any party other than the client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a walk-over survey of the site together with RSK's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The Services are also based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely. The Services clearly are limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the walk-over survey. Further RSK was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services. RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the client and RSK.
8. The intrusive environmental site investigation aspects of the Services is a limited sampling of the site at pre-determined borehole and soil vapour locations based on the operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and RSK] [based on an understanding of the available operational and historical information,] and it should not be inferred that other chemical species are not present.
9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (boreholes, trial pits etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.

APPENDIX B

SUMMARY OF LEGISLATION AND POLICY RELATING TO CONTAMINATED LAND

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

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

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

Water Framework Directive (WFD)

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

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

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

Groundwater Directive (GWD)

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

Environmental Permitting Regulations (EPR)

The Environmental Permitting (England and Wales) Regulations 2016 provide a single regulatory framework that streamlines and integrates waste management licensing, pollution prevention and control, water discharge consenting, groundwater authorisations, and radioactive substances regulation. Schedule 22, paragraph 6 of EPR 2016 states: 'the regulator must, in exercising its relevant functions, take all necessary measures - (a) to prevent the input of any hazardous substance to groundwater; and (b) to limit the input of non-hazardous pollutants to groundwater so as to ensure that such inputs do not cause pollution of groundwater.'

Water Resources Act (WRA)

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

Priority Substances Directive (PSD)

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

Planning Policy

Contaminated land is often dealt with through planning because of land redevelopment. This approach was documented in Planning Policy Statement: Planning and Pollution Control PPS23, which states that it remains the responsibility of the landowner and developer to identify land affected by contamination and carry out sufficient remediation to render the land suitable for use. PPS23 was withdrawn early in 2012 and has been replaced by much reduced guidance within the National Planning Policy Framework (NPPF).

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

- *"planning policies and decisions should also ensure that:*
 - *the site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including*

land remediation or impacts on the natural environment arising from that remediation;

- *after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and*
- *adequate site investigation information, prepared by a competent person, is presented”.*

APPENDIX C

SITE PHOTOGRAPHS

PHOTOGRAPHIC LOG		
Photo no.	Date:	
1	13.06.2018	
Direction photo taken:		
Southwest		
Description:		
Perimeter mound in west of the site (Area 3)		

Photo No. 2	Date: 13.06.2018	
Direction photo taken: Southeast		
Description: Perimeter mound in south of the site (Area 2)		

Photo No. 3	Date: 13.06.2018
Direction Photo Taken: North	
Description: Perimeter mound view in east of site (Area 4)	

A photograph taken from an elevated position looking down at a grassy area. In the foreground, a white caravan is parked on a paved surface. The caravan has "AUTOQUEST" written on its side in red letters. To the right of the caravan is a tall, thin utility pole. The background shows a dense line of green trees and a fence. The overall scene appears to be a campsite or a storage area for caravans.

Photo No. 4	Date: 13.06.2018	
Direction Photo Taken: Northwest		
Description: Area of soil removal in the north of the site, currently used by residents for additional car parking (Area 1)		

Photo No.	Date:
5	13.06.2018
Direction Photo Taken:	
North	
Description:	
Site entrance and security/maintenance hut.	



Photo No. 6	Date: 13.06.2018
Direction Photo Taken: N/A	
Description: HP01 ground conditions	



Photo No. 7	Date: 13.06.2018
Direction Photo Taken: N/A	
Description: HP02 Ground Conditions	

A photograph showing a cross-section of a soil mound. A yellow measuring tape is placed vertically against the soil face, indicating a depth of approximately 1 meter. The soil is dark brown and appears moist. There is some debris, including a piece of a green plastic bottle, visible within the soil profile. Grass and other vegetation are growing on the top and sides of the mound.

Photo No. 8	Date: 13.06.2018
Direction Photo Taken: North	
Description: Location of HP03 in face of mound showing exposed rubbish/debris within mound	

A photograph showing a grassy mound or embankment. The ground is covered with tall green grass and some dry, brownish vegetation. Scattered across the mound is various debris, including pieces of wood, plastic, and other unidentifiable trash. A wooden fence runs along the right side of the mound, and a portion of a red-tiled roof is visible in the upper right corner. The overall scene appears to be a natural area with some human-made structures and waste.

Photo No. 9	Date: 13.06.2018
Direction Photo Taken: N/A	
Description: HP06 ground conditions	

A photograph showing a green snake coiled in a hole in the ground, with a yellow measuring tape placed vertically next to it for scale. The surrounding area is covered with dry grass and some green plants.

Photo No. 10	Date: 13.06.2018	
Direction Photo Taken: N/A		
Description: HP07 ground conditions		

Photo No. 11	Date: 13.06.2018
Direction Photo Taken: N/A	
Description: HP09 Ground Conditions	

A photograph showing a vertical soil profile. A yellow measuring tape is placed vertically against the soil face, with the 0 mark at the top and the 100 cm mark at the bottom. The soil is dark brown and appears to be a mix of clay and silt, with some roots visible. The top of the profile is covered with green grass and some small plants. The bottom of the profile is a darker, more uniform soil.

Photo No. 12	Date: 13.06.2018
Direction Photo Taken: South	
Description: Location of HP10 in southeast of site	

A photograph showing a grassy area with a brick wall in the background. In the foreground, a shovel and a pitchfork are lying on the grass. The area appears to be a garden or a small field. The brick wall has some graffiti on it. There are some trees and a small structure in the background.

Photo No.	Date:	
13	13.06.2018	
Direction Photo Taken: North		
Description: Plot 17 garden (HP13)		

Photo No. 14	Date: 13.06.2018
Direction Photo Taken: N/A	
Description: HP13 ground conditions	

A photograph showing a vertical yellow measuring tape placed next to a hole in the ground. The hole is filled with dark, moist soil. The surrounding area is covered with green grass and some small rocks.

Photo No. 15	Date: 13.06.2018
Direction Photo Taken: North	
Description: Landscaping areas on either side of access road	


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Photo No. 16	Date: 13.06.2018	
Direction Photo Taken: N/A		
Description: HP17 ground conditions		

Photo No. 17	Date: 13.06.2018	
Direction Photo Taken: Southwest		
Description: Plot 10 landscaping area (HP17)		

APPENDIX D

GROUND CONDITIONS

Ground Conditions Table - from RSK investigation (2018)

Exploratory Position	Top Depth (m)	Bottom Depth (m)	Stratum Description	Sample
HP01	0	0.2	MADE GROUND: Grass over light brown gravelly fine to coarse SAND with a low cobble contact. Gravel is subangular to angular fine to coarse of sandstone and concrete. With frequent glass, ceramic, plastic sheeting, roots, wood and fragments of coal, plastic and clinker. (~10% man made products)	ES1
	0.2	0.4	MADE GROUND: Dark brown gravelly fine to coarse SAND with a low cobble contact. Gravel is subangular to angular fine to coarse of sandstone and concrete. With frequent glass, ceramic, plastic sheeting, roots, wood, coal, plastic and clinker. (~10% man made products)	-
Hand-dug pit terminated at 0.40m.				
HP02	0	0.3	MADE GROUND: dark brown gravelly fine to coarse SAND with a low to medium cobble content of concrete and sandstone. Gravel is subangular to subrounded fine to coarse of sandstone, brick and concrete. With plastic bags, grass, straws, cloth, wood fragments, fencing, ceramic tile (pipe headworks), coal and fragments of plastic (10-15% man-made products)	ES1
Hand-dug pit terminated at 0.30m.				

HP03 (Located on face of mound) 0.60m deep into mound from crest x 0.0m to 0.2m into face	0	0.2	MADE GROUND: Sparse grass over brown and gravelly fine to coarse SAND with subangular to angular fine to coarse gravel of concrete, asphalt, glass, tile/ ceramic, plastic fragments and wrappers. With rare rubber, bin lid and concrete flags. (10%-15% man made)	ES1
Hand-dug pit terminated at 0.20m.				
HP04 (Hole adjacent to well trodden path) Pathway contains waste at surface - sandstone /concrete slabs; asphalt; clinker; metal	0	0.15	MADE GROUND: Grass over brown gravelly fine to coarse SAND. Gravel is subangular to angular, fine to coarse sandstone and concrete.	-
	0.15	0.4	MADE GROUND: dark brown gravelly fine to coarse SAND with a low to medium cobble content of concrete and sandstone. Gravel is subangular to subrounded fine to coarse of concrete sandstone and brick with frequent plastic, glass, clinker, thin metal fragments and cloth. (10%-15% man made)	ES1
Hand-dug pit terminated at 0.40m.				
HP05	0	0.1	MADE GROUND: Grass over light brown gravelly SAND of concrete and sandstone with frequent rootlets and brick.	ES1
	0.1	0.25	MADE GROUND: Darkish brown gravelly fine to coarse SAND with a low cobble content of concrete. Gravel is angular fine to coarse of brick, asphalt, concrete and sandstone with occasional plastic wrappers, glass, nails and wire (20-30% man-made products) Whole brick at 0.25m.	-
Hand-dug pit terminated at 0.25m.				

HP06 (Located in face of mound 1.00m below crest)	0	0.2	MADE GROUND: Sparse grass over light brown gravelly fine to coarse SAND with a medium cobble content of concrete. Gravel is subangular to angular of brick, concrete, wood (manufactured), cloth, plastic piping, wrappers, string and tin can (30% man made)	ES1
Hand-dug pit terminated at 0.2m.				
HP07	0	0.05	MADE GROUND: Grass over light to dark brown gravelly SAND with a low cobble content. Gravel is subangular to angular fine to coarse of sandstone and rootlets. With rare concrete and brick.	-
	0.05	0.25	MADE GROUND: Dark brown gravelly fine to coarse SAND with a low to medium cobble content of sandstone and concrete. Gravel is subangular to angular fine to coarse of brick, concrete, coal, rare plastic sheeting and glass (5-10% man-made products)	ES1
Hand-dug pit terminated at 0.25m.				
HP08	0	0.05	MADE GROUND: Grass over light brown gravelly fine to coarse SAND with a low cobble content of sandstone. Gravel is subangular to angular fine to coarse of sandstone, concrete, asphalt and rootlets.	-
	0.05	0.25	MADE GROUND: Light greyish brown gravelly SAND with a low cobble content of concrete and asphalt. Gravel is subangular to angular fine to coarse of brick, sandstone, asphalt, rootlets and a bundle of cloth fibres. (<5% man made)	ES1
Hand-dug pit terminated at 0.25m.				

HP09	0	0.1	MADE GROUND: Grass over light brown slightly gravelly fine to medium SAND. Gravel is subangular to angular fine to coarse of brick, sandstone and concrete. With rootlets.	-
	0.1	0.3	MADE GROUND: Brown gravelly fine to coarse SAND with a low cobble content of concrete, glass, plastic sheeting, metal cans, rootlets, rubber, clinker and coal (finer matrix and less cobbles). (<5% man made waste)	ES1
Hand-dug pit terminated at 0.3m.				
HP10	0	0.2	MADE GROUND: Grass / weeds over brown with black patching gravelly SAND with low cobble content of concrete. Black patching is pseudo fibrous organic rich. Gravel is fine to coarse of brick, sandstone, concrete and rootlets (<5% man-made products) 0.05m to 0.07m, layer of organic rich matter. Becoming more gravelly at 0.15m. Mudstone (weak) on face of Hand Dug Pit	ES1
	0.2	0.35	MADE GROUND: Greyish brown SAND AND GRAVEL. Sand is fine to medium. Gravel is angular fine to coarse of mudstone and concrete with occasional glass, asphalt, brick and rootlets. (<5% man-made products)	ES2
Hand-dug pit terminated at 0.35m.				
HP11	0	0.15	MADE GROUND: Long grass over light brown very gravelly SAND with a low cobble content. Gravel is sandstone, concrete and rootlets.	ES1
Hand-dug pit terminated at 0.15m.				
	0	0.2	MADE GROUND: Long grass over light-ish grey brown gravelly fine to coarse SAND with abundant rootlets.	-

HP12	0.2	0.4	MADE GROUND: Greyish brown gravelly SAND with a low cobble content of sandstone. Gravel if subangular to angular fine to coarse of brick, sandstone and concrete. With rare plastic sheeting and glass, rootlets, ceramic tile and polystyrene. (<5% man made waste)	ES1
Hand-dug pit terminated at 0.40m.				
HP13 (Plot 17 grass patch on edge of plot)	0	0.2	MADE GROUND: Cut grass over brown gravelly fine to medium silty SAND with a low cobble content of sandstone. Gravel is subangular to angular fine to coarse of sandstone, brick and occasional coal. With rare plastic sheeting, plastic cap, slate and asphalt. (<5% man made waste)	ES1
Hand-dug pit terminated at 0.20m.				
HP14 (Plot 17 bedding planting area along edge of plot). Garden textile layer at 0.02m (not extensive across whole of bedding area)	0	0.1	MADE GROUND: Dark brown slightly silty gravelly SAND. Gravel if fine to coarse of sandstone, rootlets, coal (rare) and brick (TOPSOIL)	ES1
Hand-dug pit terminated at 0.10m on concrete slab (old path?).				
HP15	0	0.25	MADE GROUND: Grass over greyish brown slightly silty very gravelly fine to coarse SAND with a low cobble content. Gravel is angular fine to coarse of concrete, brick, coal, clinker and rare plastic (TOPSOIL)	ES1
Hand-dug pit terminated at 0.25m.				
	0	0.12	MADE GROUND: Grass over brown slightly gravelly SAND with sandstone concrete gravel and abundant rootlets.	ES1

HP16	0.12	0.2	MADE GROUND: Greyish brown gravelly fine to coarse SAND. Gravel is subangular to angular fine to coarse of concrete, sandstone, metal ring pull, plastic sheeting and occasional rootlets.	ES2
Hand-dug pit terminated at 0.25m.				
HP17 (Within Plot 10 - centre of raised soil mound)	0	0.2	MADE GROUND: Grass over dark brown slightly silty gravelly fine to medium SAND with a medium cobble content of concrete. Gravel is angular fine to coarse brick, concrete, sandstone, coal and clinker (TOPSOIL) More clinker at 0.20m	ES1
Hand-dug pit terminated at 0.20m.				

All positions scanned with CAT & Genny prior to digging

APPENDIX E

LABORATORY CERTIFICATES - RSK

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 18/04765
Issue Number: 1

Date: 06 July, 2018

Client: RSK Environment Ltd Manchester
Fourways House
57 Hilton Street
Manchester
Lancashire
UK
M1 2EJ

Project Manager: Emma Hobbs/Gavin Saddington
Project Name: Travellers Site, Bury
Project Ref: 11151
Order No: N/A
Date Samples Received: 14/06/18
Date Instructions Received: 15/06/18
Date Analysis Completed: 06/07/18

Prepared by:



Richard Wong
Client Manager

Approved by:



Georgia King
Admin & Client Services Supervisor

Envirolab Job Number: 18/04765

Client Project Name: Travellers Site, Bury

Client Project Ref: 11151

Lab Sample ID	18/04765/1	18/04765/2	18/04765/3	18/04765/4	18/04765/5	18/04765/6	18/04765/7	18/04765/8	Units	Method ref
Client Sample No	1	1	1	1	1	1	1	1		
Client Sample ID	HP01	HP02	HP03	HP04	HP05	HP06	HP07	HP08		
Depth to Top	0.00	0.00	0.00	0.15	0.10	0.00	0.05	0.10		
Depth To Bottom	0.20	0.30	0.20	0.40	0.25	0.20	0.25	0.25		
Date Sampled	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4ABE	4ABCD	4AB	4AB	4ABE	4ABE	4AB	4AE		
% Natural Moisture Content (NMC) at 40C _A	-	-	4.2	-	6.1	-	12.1	-	% w/w	A-T-044
% Stones >10mm _A	14.3	<0.1	6.1	16.1	11.9	<0.1	5.0	6.7	% w/w	A-T-044
pH _D ^{M#}	7.32	7.95	7.88	7.35	6.95	8.02	7.27	6.80	pH	A-T-031s
Total Organic Carbon _D ^{M#}	3.52	5.09	3.97	3.90	6.48	4.91	4.12	3.30	% w/w	A-T-032s
Arsenic _D ^{M#}	8	11	8	8	11	5	10	9	mg/kg	A-T-024s
Cadmium _D ^{M#}	1.2	1.6	1.6	1.4	1.9	1.9	1.1	0.9	mg/kg	A-T-024s
Copper _D ^{M#}	136	147	104	109	209	114	149	139	mg/kg	A-T-024s
Chromium _D ^{M#}	33	33	35	31	37	65	28	46	mg/kg	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	A-T-040s
Lead _D ^{M#}	222	311	362	251	377	375	175	133	mg/kg	A-T-024s
Mercury _D	<0.17	0.45	0.34	0.37	0.38	0.25	<0.17	0.54	mg/kg	A-T-024s
Nickel _D ^{M#}	33	43	40	38	45	45	36	30	mg/kg	A-T-024s
Selenium _D ^{M#}	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	A-T-024s
Zinc _D ^{M#}	248	349	684	215	369	320	178	166	mg/kg	A-T-024s

Envirolab Job Number: 18/04765

Client Project Name: Travellers Site, Bury

Client Project Ref: 11151

Lab Sample ID	18/04765/1	18/04765/2	18/04765/3	18/04765/4	18/04765/5	18/04765/6	18/04765/7	18/04765/8	Units	Method ref
Client Sample No	1	1	1	1	1	1	1	1		
Client Sample ID	HP01	HP02	HP03	HP04	HP05	HP06	HP07	HP08		
Depth to Top	0.00	0.00	0.00	0.15	0.10	0.00	0.05	0.10		
Depth To Bottom	0.20	0.30	0.20	0.40	0.25	0.20	0.25	0.25		
Date Sampled	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4ABE	4ABCD	4AB	4AB	4ABE	4ABE	4AB	4AE		
Asbestos in Soil (inc. matrix)										
Asbestos in soil _A [#]	NAD	Chrysotile	NAD	NAD	NAD	Chrysotile	NAD	NAD		A-T-045
Asbestos Matrix (microscope) _A	-	Board	-	-	-	Loose Fibres	-	-		A-T-045
Asbestos ACM - Suitable for Water Absorption Test?	N/A	NO	N/A	N/A	N/A	N/A	N/A	N/A		
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing) ₀	-	<0.001	-	-	-	<0.001	-	-	% w/w	A-T-054

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Client Project Name: Travellers Site, Bury

Client Project Ref: 11151

Lab Sample ID	18/04765/1	18/04765/2	18/04765/3	18/04765/4	18/04765/5	18/04765/6	18/04765/7	18/04765/8	Units	Method ref
Client Sample No	1	1	1	1	1	1	1	1		
Client Sample ID	HP01	HP02	HP03	HP04	HP05	HP06	HP07	HP08		
Depth to Top	0.00	0.00	0.00	0.15	0.10	0.00	0.05	0.10		
Depth To Bottom	0.20	0.30	0.20	0.40	0.25	0.20	0.25	0.25		
Date Sampled	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4ABE	4ABCD	4AB	4AB	4ABE	4ABE	4AB	4AE		
PAH-16MS										
Acenaphthene _A ^{M#}	0.89	1.79	0.42	5.11	0.58	0.33	0.56	0.34	mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	0.08	0.14	0.16	0.16	0.10	0.22	<0.10	0.05	mg/kg	A-T-019s
Anthracene _A ^{M#}	1.41	3.24	1.20	6.14	0.71	3.66	0.78	0.55	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	4.79	10.7	4.89	13.1	1.67	4.68	2.16	1.24	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	4.11	6.80	3.33	11.4	1.33	3.51	2.04	0.93	mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	4.51	7.29	3.53	14.3	1.49	3.49	2.64	1.08	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	2.22	3.40	1.83	6.20	0.79	1.89	1.30	0.50	mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	1.63	2.82	1.27	5.78	0.47	1.22	1.35	0.35	mg/kg	A-T-019s
Chrysene _A ^{M#}	4.63	9.26	4.11	17.2	1.66	4.24	2.74	1.26	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.47	0.91	0.46	1.76	0.16	0.40	<0.40	0.11	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	11.9	23.6	9.77	34.4	3.34	8.48	5.39	2.83	mg/kg	A-T-019s
Fluorene _A ^{M#}	0.63	1.32	0.33	3.47	0.38	0.21	0.30	0.28	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	2.76	4.65	2.43	7.21	1.03	2.54	1.36	0.59	mg/kg	A-T-019s
Naphthalene _A ^{M#}	0.19	0.45	0.11	0.59	1.96	0.11	<0.30	0.10	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	6.15	13.1	4.51	29.7	2.83	3.18	3.23	2.40	mg/kg	A-T-019s
Pyrene _A ^{M#}	10.6	20.2	8.54	28.9	3.11	7.36	4.95	2.50	mg/kg	A-T-019s
Total PAH-16MS _A ^{M#}	57	110	46.9	185	21.6	45.5	28.8	15.1	mg/kg	A-T-019s
TPH Total with ID										
TPH total (>C6-C40) _A ^{M#}	-	-	2120	-	3070	-	2110	-	mg/kg	A-T-007s
TPH ID (for FID characterisations) _A	-	-	Possible PAHs + mixture of other unknown hydrocarbons	-	Possible PAHs + mixture of other unknown hydrocarbons	-	Possible PAHs + mixture of other unknown hydrocarbons	-		A-T-007s

Envirolab Job Number: 18/04765

Client Project Name: Travellers Site, Bury

Client Project Ref: 11151

Lab Sample ID	18/04765/1	18/04765/2	18/04765/3	18/04765/4	18/04765/5	18/04765/6	18/04765/7	18/04765/8	Units	Method ref
Client Sample No	1	1	1	1	1	1	1	1		
Client Sample ID	HP01	HP02	HP03	HP04	HP05	HP06	HP07	HP08		
Depth to Top	0.00	0.00	0.00	0.15	0.10	0.00	0.05	0.10		
Depth To Bottom	0.20	0.30	0.20	0.40	0.25	0.20	0.25	0.25		
Date Sampled	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4ABE	4ABCD	4AB	4AB	4ABE	4ABE	4AB	4AE		
TPH CWG										
Ali >C5-C6 _A [#]	<0.01	<0.01	-	<0.01	-	<0.01	-	<0.01	mg/kg	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	-	<0.01	-	<0.01	-	<0.01	mg/kg	A-T-022s
Ali >C8-C10 _A [#]	<0.01	<0.01	-	<0.01	-	<0.01	-	<0.01	mg/kg	A-T-022s
Ali >C10-C12 _A [#]	<0.1	0.9	-	0.5	-	0.4	-	2.4	mg/kg	A-T-023s
Ali >C12-C16 _A [#]	<0.1	3.9	-	5.6	-	5.5	-	22.1	mg/kg	A-T-023s
Ali >C16-C21 _A [#]	<0.1	15.3	-	13.1	-	16.4	-	30.4	mg/kg	A-T-023s
Ali >C21-C35 _A [#]	57.7	166	-	218	-	182	-	92.1	mg/kg	A-T-023s
Total Aliphatics _A	57.7	186	-	238	-	205	-	147	mg/kg	A-T-023s
Aro >C5-C7 _A [#]	<0.01	<0.01	-	<0.01	-	<0.01	-	<0.01	mg/kg	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	-	<0.01	-	<0.01	-	<0.01	mg/kg	A-T-022s
Aro >C8-C9 _A [#]	<0.01	<0.01	-	<0.01	-	<0.01	-	<0.01	mg/kg	A-T-022s
Aro >C9-C10 _A [#]	<0.01	<0.01	-	<0.01	-	<0.01	-	<0.01	mg/kg	A-T-022s
Aro >C10-C12 _A [#]	0.4	0.6	-	1.7	-	<0.1	-	2.1	mg/kg	A-T-023s
Aro >C12-C16 _A [#]	6.8	9.2	-	26.4	-	2.6	-	73.6	mg/kg	A-T-023s
Aro >C16-C21 _A [#]	38.0	68.9	-	118	-	29.5	-	467	mg/kg	A-T-023s
Aro >C21-C35 _A [#]	135	193	-	188	-	150	-	672	mg/kg	A-T-023s
Total Aromatics _A	180	272	-	334	-	182	-	1210	mg/kg	A-T-023s
TPH (Ali & Aro) _A	238	458	-	572	-	387	-	1360	mg/kg	A-T-023s
BTEX - Benzene _A [#]	<0.01	<0.01	-	<0.01	-	<0.01	-	<0.01	mg/kg	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	-	<0.01	-	<0.01	-	<0.01	mg/kg	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	-	<0.01	-	<0.01	-	<0.01	mg/kg	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	-	<0.01	-	<0.01	-	<0.01	mg/kg	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	-	<0.01	-	<0.01	-	<0.01	mg/kg	A-T-022s
MTBE _A [#]	<0.01	<0.01	-	<0.01	-	<0.01	-	<0.01	mg/kg	A-T-022s

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Lab Sample ID	18/04765/9	18/04765/10	18/04765/11	18/04765/12	18/04765/13	18/04765/14	18/04765/15	18/04765/16	Units	Method ref
Client Sample No	1	1	2	1	1	1	1	1		
Client Sample ID	HP09	HP10	HP10	HP11	HP12	HP13	HP14	HP15		
Depth to Top	0.20	0.00	0.20	0.00	0.20	0.00	0.00	0.00		
Depth To Bottom	0.30	0.10	0.30	0.15	0.40	0.20	0.10	0.20		
Date Sampled	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4ABE	4ABE	4ABE	4ABE	4ABE	4AE	4ABE	4AE		
% Natural Moisture Content (NMC) at 40C _A	4.5	-	-	-	7.8	8.9	14.1	9.3		
% Stones >10mm _A	5.5	6.5	21.0	<0.1	24.4	20.1	4.4	16.7	% w/w	A-T-044
pH _D ^{M#}	7.55	6.80	7.07	6.62	7.43	7.06	6.94	7.00	pH	A-T-031s
Total Organic Carbon _D ^{M#}	4.60	3.61	4.04	3.24	4.54	4.85	6.02	2.84	% w/w	A-T-032s
Arsenic _D ^{M#}	10	12	7	11	8	8	11	7	mg/kg	A-T-024s
Cadmium _D ^{M#}	1.5	1.1	1.2	1.2	2.0	0.9	1.1	0.7	mg/kg	A-T-024s
Copper _D ^{M#}	132	275	168	175	155	95	119	77	mg/kg	A-T-024s
Chromium _D ^{M#}	35	38	27	37	29	23	30	21	mg/kg	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	A-T-040s
Lead _D ^{M#}	351	257	178	178	285	119	128	77	mg/kg	A-T-024s
Mercury _D	0.48	0.35	0.39	0.45	0.37	0.38	0.54	<0.17	mg/kg	A-T-024s
Nickel _D ^{M#}	39	27	47	33	43	23	29	23	mg/kg	A-T-024s
Selenium _D ^{M#}	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	A-T-024s
Zinc _D ^{M#}	254	240	206	195	289	159	201	97	mg/kg	A-T-024s

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Client Project Name: Travellers Site, Bury

Client Project Ref: 11151

Lab Sample ID	18/04765/9	18/04765/10	18/04765/11	18/04765/12	18/04765/13	18/04765/14	18/04765/15	18/04765/16	Units	Method ref
Client Sample No	1	1	2	1	1	1	1	1		
Client Sample ID	HP09	HP10	HP10	HP11	HP12	HP13	HP14	HP15		
Depth to Top	0.20	0.00	0.20	0.00	0.20	0.00	0.00	0.00		
Depth To Bottom	0.30	0.10	0.30	0.15	0.40	0.20	0.10	0.20		
Date Sampled	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4ABE	4ABE	4ABE	4ABE	4ABE	4AE	4ABE	4AE		
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD		A-T-045
Asbestos ACM - Suitable for Water Absorption Test?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

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Client Project Name: Travellers Site, Bury

Client Project Ref: 11151

Lab Sample ID	18/04765/9	18/04765/10	18/04765/11	18/04765/12	18/04765/13	18/04765/14	18/04765/15	18/04765/16	Units	Method ref
Client Sample No	1	1	2	1	1	1	1	1		
Client Sample ID	HP09	HP10	HP10	HP11	HP12	HP13	HP14	HP15		
Depth to Top	0.20	0.00	0.20	0.00	0.20	0.00	0.00	0.00		
Depth To Bottom	0.30	0.10	0.30	0.15	0.40	0.20	0.10	0.20		
Date Sampled	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4ABE	4ABE	4ABE	4ABE	4ABE	4AE	4ABE	4AE		
PAH-16MS										
Acenaphthene _A ^{M#}	1.16	1.41	2.76	0.23	1.09	3.02	4.61	1.04	mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	0.26	0.18	0.30	0.09	0.13	0.12	0.19	0.11	mg/kg	A-T-019s
Anthracene _A ^{M#}	2.54	1.64	6.43	0.49	2.33	3.88	7.94	1.54	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	9.08	4.47	15.1	2.24	6.92	7.82	18.2	4.47	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	6.08	3.06	11.9	2.11	4.61	7.12	14.7	3.61	mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	6.48	3.57	14.8	2.43	5.00	8.79	18.4	4.09	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	2.56	1.38	5.70	1.14	2.16	4.04	7.75	1.77	mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	2.38	1.22	6.30	0.75	1.83	3.56	7.64	1.33	mg/kg	A-T-019s
Chrysene _A ^{M#}	7.92	4.13	17.7	2.26	6.03	10.3	21.8	4.20	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.69	0.32	2.03	0.27	0.54	0.99	1.94	0.36	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	17.9	9.90	33.4	3.74	14.8	20.4	43.3	10.5	mg/kg	A-T-019s
Fluorene _A ^{M#}	0.92	0.99	1.78	0.16	0.83	2.09	3.32	0.76	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	3.63	1.62	7.34	1.36	3.01	4.52	8.84	2.11	mg/kg	A-T-019s
Naphthalene _A ^{M#}	0.38	0.91	<0.30	0.05	0.19	0.42	1.03	0.26	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	9.68	9.16	18.6	1.96	8.20	17	30.9	6.84	mg/kg	A-T-019s
Pyrene _A ^{M#}	16	9.78	28	3.47	13.7	17.1	36.2	9.22	mg/kg	A-T-019s
Total PAH-16MS _A ^{M#}	87.7	53.7	172	22.8	71.4	111	227	52.2	mg/kg	A-T-019s
TPH Total with ID										
TPH total (>C6-C40) _A ^{M#}	2340	-	-	-	1510	1890	2100	46	mg/kg	A-T-007s
TPH ID (for FID characterisations) _A	Possible PAHs + mixture of other unknown hydrocarbons	-	-	-	Possible PAHs + mixture of other unknown hydrocarbons	Possible PAHs + mixture of other unknown hydrocarbons	Possible PAHs + mixture of other unknown hydrocarbons	Possible PAHs + mixture of other unknown hydrocarbons		A-T-007s

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Lab Sample ID	18/04765/9	18/04765/10	18/04765/11	18/04765/12	18/04765/13	18/04765/14	18/04765/15	18/04765/16	Units	Method ref
Client Sample No	1	1	2	1	1	1	1	1		
Client Sample ID	HP09	HP10	HP10	HP11	HP12	HP13	HP14	HP15		
Depth to Top	0.20	0.00	0.20	0.00	0.20	0.00	0.00	0.00		
Depth To Bottom	0.30	0.10	0.30	0.15	0.40	0.20	0.10	0.20		
Date Sampled	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18	13-Jun-18		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	4ABE	4ABE	4ABE	4ABE	4ABE	4AE	4ABE	4AE		
TPH CWG										
Ali >C5-C6 _A [#]	-	<0.01	<0.01	<0.01	-	-	-	-	mg/kg	A-T-022s
Ali >C6-C8 _A [#]	-	<0.01	<0.01	<0.01	-	-	-	-	mg/kg	A-T-022s
Ali >C8-C10 _A [#]	-	<0.01	<0.01	<0.01	-	-	-	-	mg/kg	A-T-022s
Ali >C10-C12 _A [#]	-	0.6	1.4	<0.1	-	-	-	-	mg/kg	A-T-023s
Ali >C12-C16 _A [#]	-	4.6	16.7	<0.1	-	-	-	-	mg/kg	A-T-023s
Ali >C16-C21 _A [#]	-	8.8	36.0	<0.1	-	-	-	-	mg/kg	A-T-023s
Ali >C21-C35 _A [#]	-	43.0	126	<0.1	-	-	-	-	mg/kg	A-T-023s
Total Aliphatics _A	-	57.0	180	<0.1	-	-	-	-	mg/kg	A-T-023s
Aro >C5-C7 _A [#]	-	<0.01	<0.01	<0.01	-	-	-	-	mg/kg	A-T-022s
Aro >C7-C8 _A [#]	-	<0.01	<0.01	<0.01	-	-	-	-	mg/kg	A-T-022s
Aro >C8-C9 _A [#]	-	<0.01	<0.01	<0.01	-	-	-	-	mg/kg	A-T-022s
Aro >C9-C10 _A [#]	-	<0.01	<0.01	<0.01	-	-	-	-	mg/kg	A-T-022s
Aro >C10-C12 _A [#]	-	0.6	2.5	0.5	-	-	-	-	mg/kg	A-T-023s
Aro >C12-C16 _A [#]	-	6.5	38.0	1.9	-	-	-	-	mg/kg	A-T-023s
Aro >C16-C21 _A [#]	-	27.8	288	13.6	-	-	-	-	mg/kg	A-T-023s
Aro >C21-C35 _A [#]	-	57.2	511	34.1	-	-	-	-	mg/kg	A-T-023s
Total Aromatics _A	-	92.3	840	50.1	-	-	-	-	mg/kg	A-T-023s
TPH (Ali & Aro) _A	-	149	1020	50.1	-	-	-	-	mg/kg	A-T-023s
BTEX - Benzene _A [#]	-	<0.01	<0.01	<0.01	-	-	-	-	mg/kg	A-T-022s
BTEX - Toluene _A [#]	-	<0.01	<0.01	<0.01	-	-	-	-	mg/kg	A-T-022s
BTEX - Ethyl Benzene _A [#]	-	<0.01	<0.01	<0.01	-	-	-	-	mg/kg	A-T-022s
BTEX - m & p Xylene _A [#]	-	<0.01	<0.01	<0.01	-	-	-	-	mg/kg	A-T-022s
BTEX - o Xylene _A [#]	-	<0.01	<0.01	<0.01	-	-	-	-	mg/kg	A-T-022s
MTBE _A [#]	-	<0.01	<0.01	<0.01	-	-	-	-	mg/kg	A-T-022s

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Lab Sample ID	18/04765/17	18/04765/18	18/04765/19						Units	Method ref
Client Sample No	1	2	1							
Client Sample ID	HP16	HP16	HP17							
Depth to Top	0.00	0.15	0.00							
Depth To Bottom	0.12	0.20	0.20							
Date Sampled	13-Jun-18	13-Jun-18	13-Jun-18							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	4AE	4ABE	6AE							
% Natural Moisture Content (NMC) at 40C _A	-	6.4	-						% w/w	A-T-044
% Stones >10mm _A	9.9	21.2	<0.1						% w/w	A-T-044
pH _D ^{M#}	6.82	7.11	6.64						pH	A-T-031s
Total Organic Carbon _D ^{M#}	4.46	4.10	2.58						% w/w	A-T-032s
Arsenic _D ^{M#}	12	9	10						mg/kg	A-T-024s
Cadmium _D ^{M#}	1.0	0.9	0.9						mg/kg	A-T-024s
Copper _D ^{M#}	86	106	178						mg/kg	A-T-024s
Chromium _D ^{M#}	31	24	33						mg/kg	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1						mg/kg	A-T-040s
Lead _D ^{M#}	135	129	131						mg/kg	A-T-024s
Mercury _D	0.36	0.37	0.63						mg/kg	A-T-024s
Nickel _D ^{M#}	30	26	27						mg/kg	A-T-024s
Selenium _D ^{M#}	<1	<1	2						mg/kg	A-T-024s
Zinc _D ^{M#}	153	137	150						mg/kg	A-T-024s

Envirolab Job Number: 18/04765

Client Project Name: Travellers Site, Bury

Client Project Ref: 11151

Lab Sample ID	18/04765/17	18/04765/18	18/04765/19						Units	Method ref
Client Sample No	1	2	1							
Client Sample ID	HP16	HP16	HP17							
Depth to Top	0.00	0.15	0.00							
Depth To Bottom	0.12	0.20	0.20							
Date Sampled	13-Jun-18	13-Jun-18	13-Jun-18							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	4AE	4ABE	6AE							
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD							A-T-045
Asbestos ACM - Suitable for Water Absorption Test?	N/A	N/A	N/A							

Envirolab Job Number: 18/04765

Client Project Name: Travellers Site, Bury

Client Project Ref: 11151

Lab Sample ID	18/04765/17	18/04765/18	18/04765/19						Units	Method ref
Client Sample No	1	2	1							
Client Sample ID	HP16	HP16	HP17							
Depth to Top	0.00	0.15	0.00							
Depth To Bottom	0.12	0.20	0.20							
Date Sampled	13-Jun-18	13-Jun-18	13-Jun-18							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	4AE	4ABE	6AE							
PAH-16MS										
Acenaphthene _A ^{M#}	3.89	6.05	0.26						mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	0.11	0.22	0.06						mg/kg	A-T-019s
Anthracene _A ^{M#}	4.95	8.14	0.37						mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	9.23	16.4	1.24						mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	8.54	13.8	1.11						mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	10.8	17.3	1.41						mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	4.46	7.61	0.56						mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	4.16	7.09	0.46						mg/kg	A-T-019s
Chrysene _A ^{M#}	11.7	22.6	1.33						mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	1.29	2.04	0.13						mg/kg	A-T-019s
Fluoranthene _A ^{M#}	25.3	38.6	2.75						mg/kg	A-T-019s
Fluorene _A ^{M#}	2.95	4.13	0.16						mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	5.14	8.55	0.69						mg/kg	A-T-019s
Naphthalene _A ^{M#}	0.85	0.71	0.06						mg/kg	A-T-019s
Phenanthrene _A ^{M#}	23.6	34.7	1.68						mg/kg	A-T-019s
Pyrene _A ^{M#}	21	35	2.49						mg/kg	A-T-019s
Total PAH-16MS _A ^{M#}	138	223	14.8						mg/kg	A-T-019s
TPH Total with ID										
TPH total (>C6-C40) _A ^{M#}	-	3350	-						mg/kg	A-T-007s
TPH ID (for FID characterisations) _A	-	Possible PAHs + mixture of other unknown hydrocarbons	-							A-T-007s

Envirolab Job Number: 18/04765

Client Project Name: Travellers Site, Bury

Client Project Ref: 11151

Lab Sample ID	18/04765/17	18/04765/18	18/04765/19						Units	Method ref
Client Sample No	1	2	1							
Client Sample ID	HP16	HP16	HP17							
Depth to Top	0.00	0.15	0.00							
Depth To Bottom	0.12	0.20	0.20							
Date Sampled	13-Jun-18	13-Jun-18	13-Jun-18							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	4AE	4ABE	6AE							
TPH CWG										
Ali >C5-C6 _A [#]	<0.01	-	<0.01						mg/kg	A-T-022s
Ali >C6-C8 _A [#]	<0.01	-	<0.01						mg/kg	A-T-022s
Ali >C8-C10 _A [#]	<0.01	-	<0.01						mg/kg	A-T-022s
Ali >C10-C12 _A [#]	0.2	-	<0.1						mg/kg	A-T-023s
Ali >C12-C16 _A [#]	3.6	-	<0.1						mg/kg	A-T-023s
Ali >C16-C21 _A [#]	9.9	-	<0.1						mg/kg	A-T-023s
Ali >C21-C35 _A [#]	43.1	-	<0.1						mg/kg	A-T-023s
Total Aliphatics _A	56.7	-	<0.1						mg/kg	A-T-023s
Aro >C5-C7 _A [#]	<0.01	-	<0.01						mg/kg	A-T-022s
Aro >C7-C8 _A [#]	<0.01	-	<0.01						mg/kg	A-T-022s
Aro >C8-C9 _A [#]	<0.01	-	<0.01						mg/kg	A-T-022s
Aro >C9-C10 _A [#]	<0.01	-	<0.01						mg/kg	A-T-022s
Aro >C10-C12 _A [#]	1.6	-	2.0						mg/kg	A-T-023s
Aro >C12-C16 _A [#]	16.2	-	3.0						mg/kg	A-T-023s
Aro >C16-C21 _A [#]	87.0	-	5.9						mg/kg	A-T-023s
Aro >C21-C35 _A [#]	149	-	8.7						mg/kg	A-T-023s
Total Aromatics _A	254	-	19.6						mg/kg	A-T-023s
TPH (Ali & Aro) _A	310	-	19.6						mg/kg	A-T-023s
BTEX - Benzene _A [#]	<0.01	-	<0.01						mg/kg	A-T-022s
BTEX - Toluene _A [#]	<0.01	-	<0.01						mg/kg	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	-	<0.01						mg/kg	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	-	<0.01						mg/kg	A-T-022s
BTEX - o Xylene _A [#]	<0.01	-	<0.01						mg/kg	A-T-022s
MTBE _A [#]	<0.01	-	<0.01						mg/kg	A-T-022s

REPORT NOTES

General:

This report shall not be reproduced, except in full, without written approval from Envirolab.

All samples contained within this report, and any received with the same delivery, will be disposed of one month after the date of this report.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure and there is insufficient sample to repeat the analysis. These are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

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

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

APPENDIX F

LABORATORY CERTIFICATES - TERGEO

Results - Soil

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:				17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:				422869	422870	422871	422872	422873	422874	422875	422876
Order No.:	Client Sample Ref.:				BH01	BH02	BH02	BH03	BH04	BH04	BH05	BH06
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				1.0	0.5	2.0	1.0	0.5	1.5	1.0	1.0
	Date Sampled:				09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD								
ACM Type	U	2192		N/A	-	-	Fibres/Clumps	-	-	-	-	Fibres/Clumps
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	Chrysotile	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	Chrysotile
Asbestos by Gravimetry	U	2192	%	0.001			0.062					0.006
Total Asbestos	N	2192	%	0.001			0.062					0.006
Moisture	N	2030	%	0.020	14	18	15	12		13		16
pH	U	2010		N/A	8.6		9.3			8.7		8.6
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40		< 0.40			< 0.40		< 0.40
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.020		0.14			< 0.010		0.036
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50		< 0.50			< 0.50		1.4
Cyanide (Total)	U	2300	mg/kg	0.50	2.2		0.50			0.80		7.8
Arsenic	U	2450	mg/kg	1.0	17		14			13		16
Beryllium	U	2450	mg/kg	1.0	< 1.0		1.7			< 1.0		1.0
Cadmium	U	2450	mg/kg	0.10	1.4		2.2			0.99		0.90
Chromium	U	2450	mg/kg	1.0	24		35			44		34
Copper	U	2450	mg/kg	0.50	95		130			120		120
Mercury	U	2450	mg/kg	0.10	0.29		0.24			0.26		0.27
Nickel	U	2450	mg/kg	0.50	34		44			47		44
Lead	U	2450	mg/kg	0.50	190		310			330		330
Selenium	U	2450	mg/kg	0.20	< 0.20		< 0.20			< 0.20		< 0.20
Vanadium	U	2450	mg/kg	5.0	25		31			36		30
Zinc	U	2450	mg/kg	0.50	160		320			250		270
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50		< 0.50			< 0.50		< 0.50
Fraction of Organic Carbon	U	2625		0.0010		0.038		0.019		0.032		0.041
Aliphatic TPH >C5-C6	N	2680	mg/kg	0.010	< 0.010		< 0.010			< 0.010		
Aliphatic TPH >C6-C8	N	2680	mg/kg	0.010	< 0.010		< 0.010			< 0.010		
Aliphatic TPH >C8-C10	N	2680	mg/kg	0.10	24		< 0.10			21		
Aliphatic TPH >C10-C12	N	2680	mg/kg	0.10	23		< 0.10			20		
Aliphatic TPH >C12-C16	N	2680	mg/kg	0.10	39		< 0.10			2.0		
Aliphatic TPH >C16-C21	N	2680	mg/kg	0.10	30		< 0.10			14		
Aliphatic TPH >C21-C35	N	2680	mg/kg	0.10	73		< 0.10			55		
Aliphatic TPH >C35-C44	N	2680	mg/kg	0.10	47		< 0.10			< 0.10		
Total Aliphatic Hydrocarbons	N	2680	mg/kg	1.0	230		< 1.0			110		
Aromatic TPH >C5-C7	N	2680	mg/kg	0.010	< 0.010		< 0.010			< 0.010		
Aromatic TPH >C7-C8	N	2680	mg/kg	0.010	< 0.010		< 0.010			< 0.010		
Aromatic TPH >C8-C10	N	2680	mg/kg	0.10	< 0.10		< 0.10			< 0.10		
Aromatic TPH >C10-C12	N	2680	mg/kg	0.10	24		< 0.10			< 0.10		
Aromatic TPH >C12-C16	N	2680	mg/kg	0.10	290		10			8.4		
Aromatic TPH >C16-C21	N	2680	mg/kg	0.10	1100		73			130		

Results - Soil

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:					17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:					422869	422870	422871	422872	422873	422874	422875	422876
Order No.:	Client Sample Ref.:					BH01	BH02	BH02	BH03	BH04	BH04	BH05	BH06
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					1.0	0.5	2.0	1.0	0.5	1.5	1.0	1.0
	Date Sampled:					09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:					COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD									
Aromatic TPH >C21-C35	N	2680	mg/kg	0.10	2700			180			1000		
Aromatic TPH >C35-C44	N	2680	mg/kg	0.10	110			13			< 0.10		
Total Aromatic Hydrocarbons	N	2680	mg/kg	1.0	4200			280			1200		
Total Petroleum Hydrocarbons	N	2680	mg/kg	2.0	4500			280			1300		
Methanal (Formaldehyde)	N		mg/kg	0.0050	0.064			0.035			0.021		
Dichlorodifluoromethane	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
Chloromethane	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
Vinyl Chloride	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
Bromomethane	U	2760	µg/kg	20	< 20			< 20			< 20		
Chloroethane	U	2760	µg/kg	2.0	< 2.0			< 2.0			< 2.0		
Trichlorofluoromethane	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
1,1-Dichloroethene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
Trans 1,2-Dichloroethene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
1,1-Dichloroethane	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
cis 1,2-Dichloroethene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
Bromochloromethane	U	2760	µg/kg	5.0	< 5.0			< 5.0			< 5.0		
Trichloromethane	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
1,1,1-Trichloroethane	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
Tetrachloromethane	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
1,1-Dichloropropene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
Benzene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
1,2-Dichloroethane	U	2760	µg/kg	2.0	< 2.0			< 2.0			< 2.0		
Trichloroethene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
1,2-Dichloropropane	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
Dibromomethane	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
Bromodichloromethane	U	2760	µg/kg	5.0	< 5.0			< 5.0			< 5.0		
cis-1,3-Dichloropropene	N	2760	µg/kg	10	< 10			< 10			< 10		
Toluene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	< 10			< 10			< 10		
1,1,2-Trichloroethane	U	2760	µg/kg	10	< 10			< 10			< 10		
Tetrachloroethene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
1,3-Dichloropropane	U	2760	µg/kg	2.0	< 2.0			< 2.0			< 2.0		
Dibromochloromethane	U	2760	µg/kg	10	< 10			< 10			< 10		
1,2-Dibromoethane	U	2760	µg/kg	5.0	< 5.0			< 5.0			< 5.0		
Chlorobenzene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0	< 2.0			< 2.0			< 2.0		
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
o-Xylene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:				17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:				422869	422870	422871	422872	422873	422874	422875	422876
Order No.:	Client Sample Ref.:				BH01	BH02	BH02	BH03	BH04	BH04	BH05	BH06
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				1.0	0.5	2.0	1.0	0.5	1.5	1.0	1.0
	Date Sampled:				09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD								
Styrene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Tribromomethane	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Isopropylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Bromobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50		< 50			< 50		
N-Propylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
2-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
1,3,5-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
4-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Tert-Butylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
1,2,4-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Sec-Butylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
1,3-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
4-Isopropyltoluene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
1,4-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
N-Butylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
1,2-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	< 50		< 50			< 50		
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Hexachlorobutadiene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	< 2.0		< 2.0			< 2.0		
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
N-Nitrosodimethylamine	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Phenol	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
2-Chlorophenol	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Bis-(2-Chloroethyl)Ether	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
1,3-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
1,2-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
2-Methylphenol	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Bis(2-Chloroisopropyl)Ether	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Hexachloroethane	N	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
N-Nitrosodi-n-propylamine	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
4-Methylphenol	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Nitrobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Isophorone	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
2-Nitrophenol	N	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
2,4-Dimethylphenol	N	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Bis(2-Chloroethoxy)Methane	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		

Results - Soil

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:				17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:				422869	422870	422871	422872	422873	422874	422875	422876
Order No.:	Client Sample Ref.:				BH01	BH02	BH02	BH03	BH04	BH04	BH05	BH06
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				1.0	0.5	2.0	1.0	0.5	1.5	1.0	1.0
	Date Sampled:				09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD								
2,4-Dichlorophenol	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
1,2,4-Trichlorobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Naphthalene	U	2790	mg/kg	0.50	5.6		< 0.50			< 0.50		
4-Chloroaniline	N	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Hexachlorobutadiene	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
4-Chloro-3-Methylphenol	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
2-Methylnaphthalene	U	2790	mg/kg	0.50	6.0		< 0.50			< 0.50		
4-Nitrophenol	N	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
2,4,6-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
2,4,5-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
2-Chloronaphthalene	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
2-Nitroaniline	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Acenaphthylene	U	2790	mg/kg	0.50	< 0.50		0.73			< 0.50		
Dimethylphthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
2,6-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Acenaphthene	U	2790	mg/kg	0.50	18		3.0			1.1		
3-Nitroaniline	N	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Dibenzofuran	U	2790	mg/kg	0.50	13		2.1			0.54		
4-Chlorophenylphenylether	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
2,4-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Fluorene	U	2790	mg/kg	0.50	14		2.3			0.77		
Diethyl Phthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
4-Nitroaniline	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Azobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
4-Bromophenylphenyl Ether	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Hexachlorobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Pentachlorophenol	N	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Phenanthrene	U	2790	mg/kg	0.50	120		45			7.4		
Anthracene	U	2790	mg/kg	0.50	27		9.5			2.1		
Carbazole	U	2790	mg/kg	0.50	6.3		2.3			< 0.50		
Di-N-Butyl Phthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Fluoranthene	U	2790	mg/kg	0.50	110		56			13		
Pyrene	U	2790	mg/kg	0.50	83		39			9.6		
Butylbenzyl Phthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Benzo[a]anthracene	U	2790	mg/kg	0.50	34		18			5.6		
Chrysene	U	2790	mg/kg	0.50	32		17			5.3		
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		

Results - Soil

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:				17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:				422869	422870	422871	422872	422873	422874	422875	422876
Order No.:	Client Sample Ref.:				BH01	BH02	BH02	BH03	BH04	BH04	BH05	BH06
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				1.0	0.5	2.0	1.0	0.5	1.5	1.0	1.0
	Date Sampled:				09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD								
Di-N-Octyl Phthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Benzo[b]fluoranthene	U	2790	mg/kg	0.50	36		20			7.7		
Benzo[k]fluoranthene	U	2790	mg/kg	0.50	13		6.9			2.6		
Benzo[a]pyrene	U	2790	mg/kg	0.50	15		8.5			3.3		
Indeno(1,2,3-c,d)Pyrene	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Dibenz(a,h)Anthracene	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Benzo[g,h,i]perylene	U	2790	mg/kg	0.50	13		8.1			3.7		
Resorcinol	U	2920	mg/kg	0.050	< 0.050		< 0.050	< 0.050		< 0.050		
Phenol	U	2920	mg/kg	0.050	< 0.050		< 0.050	< 0.050		< 0.050		
Cresols	U	2920	mg/kg	0.050	< 0.050		< 0.050	< 0.050		< 0.050		
Xylenols	U	2920	mg/kg	0.050	< 0.050		< 0.050	< 0.050		< 0.050		
1-Naphthol	N	2920	mg/kg	0.050	< 0.050		< 0.050	< 0.050		< 0.050		
Trimethylphenols	U	2920	mg/kg	0.050	< 0.050		< 0.050	< 0.050		< 0.050		
Total Phenols	U	2920	mg/kg	0.30	< 0.30		< 0.30	< 0.30		< 0.30		

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:				17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:				422877	422878	422879
Order No.:	Client Sample Ref.:				BH07	BH09	BH09
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				1.5	0.5	2.5
	Date Sampled:				09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD			
ACM Type	U	2192		N/A	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Asbestos by Gravimetry	U	2192	%	0.001			
Total Asbestos	N	2192	%	0.001			
Moisture	N	2030	%	0.020	18	14	12
pH	U	2010		N/A		8.6	
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40		< 0.40	
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010		0.013	
Cyanide (Free)	U	2300	mg/kg	0.50		< 0.50	
Cyanide (Total)	U	2300	mg/kg	0.50		< 0.50	
Arsenic	U	2450	mg/kg	1.0		11	
Beryllium	U	2450	mg/kg	1.0		< 1.0	
Cadmium	U	2450	mg/kg	0.10		0.95	
Chromium	U	2450	mg/kg	1.0		33	
Copper	U	2450	mg/kg	0.50		120	
Mercury	U	2450	mg/kg	0.10		0.18	
Nickel	U	2450	mg/kg	0.50		58	
Lead	U	2450	mg/kg	0.50		270	
Selenium	U	2450	mg/kg	0.20		< 0.20	
Vanadium	U	2450	mg/kg	5.0		38	
Zinc	U	2450	mg/kg	0.50		220	
Chromium (Hexavalent)	N	2490	mg/kg	0.50		< 0.50	
Fraction of Organic Carbon	U	2625		0.0010	0.050		0.037
Aliphatic TPH >C5-C6	N	2680	mg/kg	0.010	< 0.010		< 0.010
Aliphatic TPH >C6-C8	N	2680	mg/kg	0.010	< 0.010		< 0.010
Aliphatic TPH >C8-C10	N	2680	mg/kg	0.10	< 0.10		< 0.10
Aliphatic TPH >C10-C12	N	2680	mg/kg	0.10	< 0.10		6.2
Aliphatic TPH >C12-C16	N	2680	mg/kg	0.10	< 0.10		3.7
Aliphatic TPH >C16-C21	N	2680	mg/kg	0.10	< 0.10		25
Aliphatic TPH >C21-C35	N	2680	mg/kg	0.10	< 0.10		56
Aliphatic TPH >C35-C44	N	2680	mg/kg	0.10	< 0.10		< 0.10
Total Aliphatic Hydrocarbons	N	2680	mg/kg	1.0	< 1.0		91
Aromatic TPH >C5-C7	N	2680	mg/kg	0.010	< 0.010		< 0.010
Aromatic TPH >C7-C8	N	2680	mg/kg	0.010	< 0.010		< 0.010
Aromatic TPH >C8-C10	N	2680	mg/kg	0.10	< 0.10		< 0.10
Aromatic TPH >C10-C12	N	2680	mg/kg	0.10	< 0.10		1.2
Aromatic TPH >C12-C16	N	2680	mg/kg	0.10	< 0.10		27
Aromatic TPH >C16-C21	N	2680	mg/kg	0.10	3.6		170

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:				17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:				422877	422878	422879
Order No.:	Client Sample Ref.:				BH07	BH09	BH09
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				1.5	0.5	2.5
	Date Sampled:				09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD			
Aromatic TPH >C21-C35	N	2680	mg/kg	0.10	< 0.10		1500
Aromatic TPH >C35-C44	N	2680	mg/kg	0.10	< 0.10		68
Total Aromatic Hydrocarbons	N	2680	mg/kg	1.0	3.6		1800
Total Petroleum Hydrocarbons	N	2680	mg/kg	2.0	3.6		1900
Methanal (Formaldehyde)	N		mg/kg	0.0050	0.040		0.11
Dichlorodifluoromethane	U	2760	µg/kg	1.0	< 1.0		< 1.0
Chloromethane	U	2760	µg/kg	1.0	< 1.0		< 1.0
Vinyl Chloride	U	2760	µg/kg	1.0	< 1.0		< 1.0
Bromomethane	U	2760	µg/kg	20	< 20		< 20
Chloroethane	U	2760	µg/kg	2.0	< 2.0		< 2.0
Trichlorofluoromethane	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,1-Dichloroethene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Trans 1,2-Dichloroethene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,1-Dichloroethane	U	2760	µg/kg	1.0	< 1.0		< 1.0
cis 1,2-Dichloroethene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Bromochloromethane	U	2760	µg/kg	5.0	< 5.0		< 5.0
Trichloromethane	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,1,1-Trichloroethane	U	2760	µg/kg	1.0	< 1.0		< 1.0
Tetrachloromethane	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,1-Dichloropropene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Benzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,2-Dichloroethane	U	2760	µg/kg	2.0	< 2.0		< 2.0
Trichloroethene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,2-Dichloropropane	U	2760	µg/kg	1.0	< 1.0		< 1.0
Dibromomethane	U	2760	µg/kg	1.0	< 1.0		< 1.0
Bromodichloromethane	U	2760	µg/kg	5.0	< 5.0		< 5.0
cis-1,3-Dichloropropene	N	2760	µg/kg	10	< 10		< 10
Toluene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	< 10		< 10
1,1,2-Trichloroethane	U	2760	µg/kg	10	< 10		< 10
Tetrachloroethene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,3-Dichloropropane	U	2760	µg/kg	2.0	< 2.0		< 2.0
Dibromochloromethane	U	2760	µg/kg	10	< 10		< 10
1,2-Dibromoethane	U	2760	µg/kg	5.0	< 5.0		< 5.0
Chlorobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0	< 2.0		< 2.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0		< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0		< 1.0

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:				17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:				422877	422878	422879
Order No.:	Client Sample Ref.:				BH07	BH09	BH09
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				1.5	0.5	2.5
	Date Sampled:				09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD			
Styrene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Tribromomethane	U	2760	µg/kg	1.0	< 1.0		< 1.0
Isopropylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Bromobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50		< 50
N-Propylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
2-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,3,5-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
4-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Tert-Butylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,2,4-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Sec-Butylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,3-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
4-Isopropyltoluene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,4-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
N-Butylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,2-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	< 50		< 50
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Hexachlorobutadiene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	< 2.0		< 2.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0		< 1.0
N-Nitrosodimethylamine	U	2790	mg/kg	0.50	< 0.50		< 0.50
Phenol	U	2790	mg/kg	0.50	< 0.50		< 0.50
2-Chlorophenol	U	2790	mg/kg	0.50	< 0.50		< 0.50
Bis-(2-Chloroethyl)Ether	U	2790	mg/kg	0.50	< 0.50		< 0.50
1,3-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	< 0.50		< 0.50
1,2-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50
2-Methylphenol	U	2790	mg/kg	0.50	< 0.50		< 0.50
Bis(2-Chloroisopropyl)Ether	U	2790	mg/kg	0.50	< 0.50		< 0.50
Hexachloroethane	N	2790	mg/kg	0.50	< 0.50		< 0.50
N-Nitrosodi-n-propylamine	U	2790	mg/kg	0.50	< 0.50		< 0.50
4-Methylphenol	U	2790	mg/kg	0.50	< 0.50		< 0.50
Nitrobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50
Isophorone	U	2790	mg/kg	0.50	< 0.50		< 0.50
2-Nitrophenol	N	2790	mg/kg	0.50	< 0.50		< 0.50
2,4-Dimethylphenol	N	2790	mg/kg	0.50	< 0.50		< 0.50
Bis(2-Chloroethoxy)Methane	U	2790	mg/kg	0.50	< 0.50		< 0.50

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:				17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:				422877	422878	422879
Order No.:	Client Sample Ref.:				BH07	BH09	BH09
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				1.5	0.5	2.5
	Date Sampled:				09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD			
2,4-Dichlorophenol	U	2790	mg/kg	0.50	< 0.50		< 0.50
1,2,4-Trichlorobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50
Naphthalene	U	2790	mg/kg	0.50	< 0.50		< 0.50
4-Chloroaniline	N	2790	mg/kg	0.50	< 0.50		< 0.50
Hexachlorobutadiene	U	2790	mg/kg	0.50	< 0.50		< 0.50
4-Chloro-3-Methylphenol	U	2790	mg/kg	0.50	< 0.50		< 0.50
2-Methylnaphthalene	U	2790	mg/kg	0.50	< 0.50		< 0.50
4-Nitrophenol	N	2790	mg/kg	0.50	< 0.50		< 0.50
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	< 0.50		< 0.50
2,4,6-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50		< 0.50
2,4,5-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50		< 0.50
2-Chloronaphthalene	U	2790	mg/kg	0.50	< 0.50		< 0.50
2-Nitroaniline	U	2790	mg/kg	0.50	< 0.50		< 0.50
Acenaphthylene	U	2790	mg/kg	0.50	< 0.50		< 0.50
Dimethylphthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50
2,6-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50		< 0.50
Acenaphthene	U	2790	mg/kg	0.50	< 0.50		1.8
3-Nitroaniline	N	2790	mg/kg	0.50	< 0.50		< 0.50
Dibenzofuran	U	2790	mg/kg	0.50	< 0.50		0.89
4-Chlorophenylphenylether	U	2790	mg/kg	0.50	< 0.50		< 0.50
2,4-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50		< 0.50
Fluorene	U	2790	mg/kg	0.50	< 0.50		< 0.50
Diethyl Phthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50
4-Nitroaniline	U	2790	mg/kg	0.50	< 0.50		< 0.50
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50	< 0.50		< 0.50
Azobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50
4-Bromophenylphenyl Ether	U	2790	mg/kg	0.50	< 0.50		< 0.50
Hexachlorobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50
Pentachlorophenol	N	2790	mg/kg	0.50	< 0.50		< 0.50
Phenanthrene	U	2790	mg/kg	0.50	3.8		14
Anthracene	U	2790	mg/kg	0.50	1.0		4.5
Carbazole	U	2790	mg/kg	0.50	< 0.50		1.3
Di-N-Butyl Phthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50
Fluoranthene	U	2790	mg/kg	0.50	5.7		25
Pyrene	U	2790	mg/kg	0.50	< 0.50		19
Butylbenzyl Phthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50
Benzo[a]anthracene	U	2790	mg/kg	0.50	2.5		11
Chrysene	U	2790	mg/kg	0.50	2.5		10
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50	< 0.50		< 0.50

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:				17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:				422877	422878	422879
Order No.:	Client Sample Ref.:				BH07	BH09	BH09
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				1.5	0.5	2.5
	Date Sampled:				09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD			
Di-N-Octyl Phthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50
Benzo[b]fluoranthene	U	2790	mg/kg	0.50	3.4		14
Benzo[k]fluoranthene	U	2790	mg/kg	0.50	1.0		5.0
Benzo[a]pyrene	U	2790	mg/kg	0.50	1.5		5.9
Indeno(1,2,3-c,d)Pyrene	U	2790	mg/kg	0.50	< 0.50		< 0.50
Dibenz(a,h)Anthracene	U	2790	mg/kg	0.50	< 0.50		< 0.50
Benzo[g,h,i]perylene	U	2790	mg/kg	0.50	1.5		6.1
Resorcinol	U	2920	mg/kg	0.050	< 0.050		
Phenol	U	2920	mg/kg	0.050	< 0.050		
Cresols	U	2920	mg/kg	0.050	< 0.050		
Xylenols	U	2920	mg/kg	0.050	< 0.050		
1-Naphthol	N	2920	mg/kg	0.050	< 0.050		
Trimethylphenols	U	2920	mg/kg	0.050	< 0.050		
Total Phenols	U	2920	mg/kg	0.30	< 0.30		

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.co.uk



2183

Final Report

Report No.: 17-05905-1

Initial Date of Issue: 16-Mar-2017

Client Tergeo Consulting Ltd

Client Address: Unit 3
Lanwades Business Park
Kentford
Suffolk
CB8 7PN

Contact(s): James Tansley Thomas

Project 0293 Bury Travellers Site

Quotation No.: **Date Received:** 10-Mar-2017

Order No.: **Date Instructed:** 10-Mar-2017

No. of Samples: 11

Turnaround (Wkdays): 5 **Results Due:** 16-Mar-2017

Date Approved: 16-Mar-2017

Approved By:



Details: Robert Monk, Technical Development
Chemist

Results - Soil

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:				17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:				422869	422870	422871	422872	422873	422874	422875	422876
Order No.:	Client Sample Ref.:				BH01	BH02	BH02	BH03	BH04	BH04	BH05	BH06
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				1.0	0.5	2.0	1.0	0.5	1.5	1.0	1.0
	Date Sampled:				09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD								
ACM Type	U	2192		N/A	-	-	Fibres/Clumps	-	-	-	-	Fibres/Clumps
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	Chrysotile	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	Chrysotile
Moisture	N	2030	%	0.020	14	18	15	12		13		16
pH	U	2010		N/A	8.6		9.3			8.7		8.6
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40		< 0.40			< 0.40		< 0.40
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.020		0.14			< 0.010		0.036
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50		< 0.50			< 0.50		1.4
Cyanide (Total)	U	2300	mg/kg	0.50	2.2		0.50			0.80		7.8
Arsenic	U	2450	mg/kg	1.0	17		14			13		16
Beryllium	U	2450	mg/kg	1.0	< 1.0		1.7			< 1.0		1.0
Cadmium	U	2450	mg/kg	0.10	1.4		2.2			0.99		0.90
Chromium	U	2450	mg/kg	1.0	24		35			44		34
Copper	U	2450	mg/kg	0.50	95		130			120		120
Mercury	U	2450	mg/kg	0.10	0.29		0.24			0.26		0.27
Nickel	U	2450	mg/kg	0.50	34		44			47		44
Lead	U	2450	mg/kg	0.50	190		310			330		330
Selenium	U	2450	mg/kg	0.20	< 0.20		< 0.20			< 0.20		< 0.20
Vanadium	U	2450	mg/kg	5.0	25		31			36		30
Zinc	U	2450	mg/kg	0.50	160		320			250		270
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50		< 0.50			< 0.50		< 0.50
Fraction of Organic Carbon	U	2625		0.0010		0.038		0.019		0.032		0.041
Aliphatic TPH >C5-C6	N	2680	mg/kg	0.010	< 0.010		< 0.010			< 0.010		
Aliphatic TPH >C6-C8	N	2680	mg/kg	0.010	< 0.010		< 0.010			< 0.010		
Aliphatic TPH >C8-C10	N	2680	mg/kg	0.10	24		< 0.10			21		
Aliphatic TPH >C10-C12	N	2680	mg/kg	0.10	23		< 0.10			20		
Aliphatic TPH >C12-C16	N	2680	mg/kg	0.10	39		< 0.10			2.0		
Aliphatic TPH >C16-C21	N	2680	mg/kg	0.10	30		< 0.10			14		
Aliphatic TPH >C21-C35	N	2680	mg/kg	0.10	73		< 0.10			55		
Aliphatic TPH >C35-C44	N	2680	mg/kg	0.10	47		< 0.10			< 0.10		
Total Aliphatic Hydrocarbons	N	2680	mg/kg	1.0	230		< 1.0			110		
Aromatic TPH >C5-C7	N	2680	mg/kg	0.010	< 0.010		< 0.010			< 0.010		
Aromatic TPH >C7-C8	N	2680	mg/kg	0.010	< 0.010		< 0.010			< 0.010		
Aromatic TPH >C8-C10	N	2680	mg/kg	0.10	< 0.10		< 0.10			< 0.10		
Aromatic TPH >C10-C12	N	2680	mg/kg	0.10	24		< 0.10			< 0.10		
Aromatic TPH >C12-C16	N	2680	mg/kg	0.10	290		10			8.4		
Aromatic TPH >C16-C21	N	2680	mg/kg	0.10	1100		73			130		
Aromatic TPH >C21-C35	N	2680	mg/kg	0.10	2700		180			1000		
Aromatic TPH >C35-C44	N	2680	mg/kg	0.10	110		13			< 0.10		

Results - Soil

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:				17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:				422869	422870	422871	422872	422873	422874	422875	422876
Order No.:	Client Sample Ref.:				BH01	BH02	BH02	BH03	BH04	BH04	BH05	BH06
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				1.0	0.5	2.0	1.0	0.5	1.5	1.0	1.0
	Date Sampled:				09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD								
Total Aromatic Hydrocarbons	N	2680	mg/kg	1.0	4200		280			1200		
Total Petroleum Hydrocarbons	N	2680	mg/kg	2.0	4500		280			1300		
Methanal (Formaldehyde)	N		mg/kg	0.0050	0.064		0.035			0.021		
Dichlorodifluoromethane	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Chloromethane	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Vinyl Chloride	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Bromomethane	U	2760	µg/kg	20	< 20		< 20			< 20		
Chloroethane	U	2760	µg/kg	2.0	< 2.0		< 2.0			< 2.0		
Trichlorofluoromethane	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
1,1-Dichloroethene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Trans 1,2-Dichloroethene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
1,1-Dichloroethane	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
cis 1,2-Dichloroethene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Bromochloromethane	U	2760	µg/kg	5.0	< 5.0		< 5.0			< 5.0		
Trichloromethane	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
1,1,1-Trichloroethane	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Tetrachloromethane	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
1,1-Dichloropropene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Benzene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
1,2-Dichloroethane	U	2760	µg/kg	2.0	< 2.0		< 2.0			< 2.0		
Trichloroethene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
1,2-Dichloropropane	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Dibromomethane	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Bromodichloromethane	U	2760	µg/kg	5.0	< 5.0		< 5.0			< 5.0		
cis-1,3-Dichloropropene	N	2760	µg/kg	10	< 10		< 10			< 10		
Toluene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	< 10		< 10			< 10		
1,1,2-Trichloroethane	U	2760	µg/kg	10	< 10		< 10			< 10		
Tetrachloroethene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
1,3-Dichloropropane	U	2760	µg/kg	2.0	< 2.0		< 2.0			< 2.0		
Dibromochloromethane	U	2760	µg/kg	10	< 10		< 10			< 10		
1,2-Dibromoethane	U	2760	µg/kg	5.0	< 5.0		< 5.0			< 5.0		
Chlorobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0	< 2.0		< 2.0			< 2.0		
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
o-Xylene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Styrene	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		
Tribromomethane	U	2760	µg/kg	1.0	< 1.0		< 1.0			< 1.0		

Results - Soil

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:					17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:					422869	422870	422871	422872	422873	422874	422875	422876
Order No.:	Client Sample Ref.:					BH01	BH02	BH02	BH03	BH04	BH04	BH05	BH06
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					1.0	0.5	2.0	1.0	0.5	1.5	1.0	1.0
	Date Sampled:					09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:					COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD									
Isopropylbenzene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
Bromobenzene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50			< 50			< 50		
N-Propylbenzene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
2-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
1,3,5-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
4-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
Tert-Butylbenzene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
1,2,4-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
Sec-Butylbenzene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
1,3-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
4-Isopropyltoluene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
1,4-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
N-Butylbenzene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
1,2-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	< 50			< 50			< 50		
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
Hexachlorobutadiene	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	< 2.0			< 2.0			< 2.0		
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0			< 1.0			< 1.0		
N-Nitrosodimethylamine	U	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
Phenol	U	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
2-Chlorophenol	U	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
Bis-(2-Chloroethyl)Ether	U	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
1,3-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
1,2-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
2-Methylphenol	U	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
Bis(2-Chloroisopropyl)Ether	U	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
Hexachloroethane	N	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
N-Nitrosodi-n-propylamine	U	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
4-Methylphenol	U	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
Nitrobenzene	U	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
Isophorone	U	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
2-Nitrophenol	N	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
2,4-Dimethylphenol	N	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
Bis(2-Chloroethoxy)Methane	U	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
2,4-Dichlorophenol	U	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		
1,2,4-Trichlorobenzene	U	2790	mg/kg	0.50	< 0.50			< 0.50			< 0.50		

Results - Soil

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:		17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:		422869	422870	422871	422872	422873	422874	422875	422876
Order No.:	Client Sample Ref.:		BH01	BH02	BH02	BH03	BH04	BH04	BH05	BH06
	Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):		1.0	0.5	2.0	1.0	0.5	1.5	1.0	1.0
	Date Sampled:		09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD						
Naphthalene	U	2790	mg/kg	0.50	5.6		< 0.50		< 0.50	
4-Chloroaniline	N	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
Hexachlorobutadiene	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
4-Chloro-3-Methylphenol	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
2-Methylnaphthalene	U	2790	mg/kg	0.50	6.0		< 0.50		< 0.50	
4-Nitrophenol	N	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
2,4,6-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
2,4,5-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
2-Chloronaphthalene	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
2-Nitroaniline	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
Acenaphthylene	U	2790	mg/kg	0.50	< 0.50		0.73		< 0.50	
Dimethylphthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
2,6-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
Acenaphthene	U	2790	mg/kg	0.50	18		3.0		1.1	
3-Nitroaniline	N	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
Dibenzofuran	U	2790	mg/kg	0.50	13		2.1		0.54	
4-Chlorophenylphenylether	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
2,4-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
Fluorene	U	2790	mg/kg	0.50	14		2.3		0.77	
Diethyl Phthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
4-Nitroaniline	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
Azobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
4-Bromophenylphenyl Ether	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
Hexachlorobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
Pentachlorophenol	N	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
Phenanthrene	U	2790	mg/kg	0.50	120		45		7.4	
Anthracene	U	2790	mg/kg	0.50	27		9.5		2.1	
Carbazole	U	2790	mg/kg	0.50	6.3		2.3		< 0.50	
Di-N-Butyl Phthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
Fluoranthene	U	2790	mg/kg	0.50	110		56		13	
Pyrene	U	2790	mg/kg	0.50	83		39		9.6	
Butylbenzyl Phthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
Benzo[a]anthracene	U	2790	mg/kg	0.50	34		18		5.6	
Chrysene	U	2790	mg/kg	0.50	32		17		5.3	
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
Di-N-Octyl Phthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50		< 0.50	
Benzo[b]fluoranthene	U	2790	mg/kg	0.50	36		20		7.7	

Results - Soil

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:				17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:				422869	422870	422871	422872	422873	422874	422875	422876
Order No.:	Client Sample Ref.:				BH01	BH02	BH02	BH03	BH04	BH04	BH05	BH06
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				1.0	0.5	2.0	1.0	0.5	1.5	1.0	1.0
	Date Sampled:				09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD								
Benzo[k]fluoranthene	U	2790	mg/kg	0.50	13		6.9			2.6		
Benzo[a]pyrene	U	2790	mg/kg	0.50	15		8.5			3.3		
Indeno(1,2,3-c,d)Pyrene	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Dibenz(a,h)Anthracene	U	2790	mg/kg	0.50	< 0.50		< 0.50			< 0.50		
Benzo[g,h,i]perylene	U	2790	mg/kg	0.50	13		8.1			3.7		
Resorcinol	U	2920	mg/kg	0.050	< 0.050		< 0.050	< 0.050		< 0.050		
Phenol	U	2920	mg/kg	0.050	< 0.050		< 0.050	< 0.050		< 0.050		
Cresols	U	2920	mg/kg	0.050	< 0.050		< 0.050	< 0.050		< 0.050		
Xylenols	U	2920	mg/kg	0.050	< 0.050		< 0.050	< 0.050		< 0.050		
1-Naphthol	N	2920	mg/kg	0.050	< 0.050		< 0.050	< 0.050		< 0.050		
Trimethylphenols	U	2920	mg/kg	0.050	< 0.050		< 0.050	< 0.050		< 0.050		
Total Phenols	U	2920	mg/kg	0.30	< 0.30		< 0.30	< 0.30		< 0.30		

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:				17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:				422877	422878	422879
Order No.:	Client Sample Ref.:				BH07	BH09	BH09
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				1.5	0.5	2.5
	Date Sampled:				09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD			
ACM Type	U	2192		N/A	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	18	14	12
pH	U	2010		N/A		8.6	
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40		< 0.40	
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010		0.013	
Cyanide (Free)	U	2300	mg/kg	0.50		< 0.50	
Cyanide (Total)	U	2300	mg/kg	0.50		< 0.50	
Arsenic	U	2450	mg/kg	1.0		11	
Beryllium	U	2450	mg/kg	1.0		< 1.0	
Cadmium	U	2450	mg/kg	0.10		0.95	
Chromium	U	2450	mg/kg	1.0		33	
Copper	U	2450	mg/kg	0.50		120	
Mercury	U	2450	mg/kg	0.10		0.18	
Nickel	U	2450	mg/kg	0.50		58	
Lead	U	2450	mg/kg	0.50		270	
Selenium	U	2450	mg/kg	0.20		< 0.20	
Vanadium	U	2450	mg/kg	5.0		38	
Zinc	U	2450	mg/kg	0.50		220	
Chromium (Hexavalent)	N	2490	mg/kg	0.50		< 0.50	
Fraction of Organic Carbon	U	2625		0.0010	0.050		0.037
Aliphatic TPH >C5-C6	N	2680	mg/kg	0.010	< 0.010		< 0.010
Aliphatic TPH >C6-C8	N	2680	mg/kg	0.010	< 0.010		< 0.010
Aliphatic TPH >C8-C10	N	2680	mg/kg	0.10	< 0.10		< 0.10
Aliphatic TPH >C10-C12	N	2680	mg/kg	0.10	< 0.10		6.2
Aliphatic TPH >C12-C16	N	2680	mg/kg	0.10	< 0.10		3.7
Aliphatic TPH >C16-C21	N	2680	mg/kg	0.10	< 0.10		25
Aliphatic TPH >C21-C35	N	2680	mg/kg	0.10	< 0.10		56
Aliphatic TPH >C35-C44	N	2680	mg/kg	0.10	< 0.10		< 0.10
Total Aliphatic Hydrocarbons	N	2680	mg/kg	1.0	< 1.0		91
Aromatic TPH >C5-C7	N	2680	mg/kg	0.010	< 0.010		< 0.010
Aromatic TPH >C7-C8	N	2680	mg/kg	0.010	< 0.010		< 0.010
Aromatic TPH >C8-C10	N	2680	mg/kg	0.10	< 0.10		< 0.10
Aromatic TPH >C10-C12	N	2680	mg/kg	0.10	< 0.10		1.2
Aromatic TPH >C12-C16	N	2680	mg/kg	0.10	< 0.10		27
Aromatic TPH >C16-C21	N	2680	mg/kg	0.10	3.6		170
Aromatic TPH >C21-C35	N	2680	mg/kg	0.10	< 0.10		1500
Aromatic TPH >C35-C44	N	2680	mg/kg	0.10	< 0.10		68

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:				17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:				422877	422878	422879
Order No.:	Client Sample Ref.:				BH07	BH09	BH09
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				1.5	0.5	2.5
	Date Sampled:				09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD			
Total Aromatic Hydrocarbons	N	2680	mg/kg	1.0	3.6		1800
Total Petroleum Hydrocarbons	N	2680	mg/kg	2.0	3.6		1900
Methanal (Formaldehyde)	N		mg/kg	0.0050	0.040		0.11
Dichlorodifluoromethane	U	2760	µg/kg	1.0	< 1.0		< 1.0
Chloromethane	U	2760	µg/kg	1.0	< 1.0		< 1.0
Vinyl Chloride	U	2760	µg/kg	1.0	< 1.0		< 1.0
Bromomethane	U	2760	µg/kg	20	< 20		< 20
Chloroethane	U	2760	µg/kg	2.0	< 2.0		< 2.0
Trichlorofluoromethane	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,1-Dichloroethene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Trans 1,2-Dichloroethene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,1-Dichloroethane	U	2760	µg/kg	1.0	< 1.0		< 1.0
cis 1,2-Dichloroethene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Bromochloromethane	U	2760	µg/kg	5.0	< 5.0		< 5.0
Trichloromethane	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,1,1-Trichloroethane	U	2760	µg/kg	1.0	< 1.0		< 1.0
Tetrachloromethane	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,1-Dichloropropene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Benzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,2-Dichloroethane	U	2760	µg/kg	2.0	< 2.0		< 2.0
Trichloroethene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,2-Dichloropropane	U	2760	µg/kg	1.0	< 1.0		< 1.0
Dibromomethane	U	2760	µg/kg	1.0	< 1.0		< 1.0
Bromodichloromethane	U	2760	µg/kg	5.0	< 5.0		< 5.0
cis-1,3-Dichloropropene	N	2760	µg/kg	10	< 10		< 10
Toluene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	< 10		< 10
1,1,2-Trichloroethane	U	2760	µg/kg	10	< 10		< 10
Tetrachloroethene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,3-Dichloropropane	U	2760	µg/kg	2.0	< 2.0		< 2.0
Dibromochloromethane	U	2760	µg/kg	10	< 10		< 10
1,2-Dibromoethane	U	2760	µg/kg	5.0	< 5.0		< 5.0
Chlorobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0	< 2.0		< 2.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0		< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Styrene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Tribromomethane	U	2760	µg/kg	1.0	< 1.0		< 1.0

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:				17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:				422877	422878	422879
Order No.:	Client Sample Ref.:				BH07	BH09	BH09
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				1.5	0.5	2.5
	Date Sampled:				09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD			
Isopropylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Bromobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50		< 50
N-Propylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
2-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,3,5-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
4-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Tert-Butylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,2,4-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Sec-Butylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,3-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
4-Isopropyltoluene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,4-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
N-Butylbenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,2-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	< 50		< 50
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0	< 1.0		< 1.0
Hexachlorobutadiene	U	2760	µg/kg	1.0	< 1.0		< 1.0
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	< 2.0		< 2.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0		< 1.0
N-Nitrosodimethylamine	U	2790	mg/kg	0.50	< 0.50		< 0.50
Phenol	U	2790	mg/kg	0.50	< 0.50		< 0.50
2-Chlorophenol	U	2790	mg/kg	0.50	< 0.50		< 0.50
Bis-(2-Chloroethyl)Ether	U	2790	mg/kg	0.50	< 0.50		< 0.50
1,3-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	< 0.50		< 0.50
1,2-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50
2-Methylphenol	U	2790	mg/kg	0.50	< 0.50		< 0.50
Bis(2-Chloroisopropyl)Ether	U	2790	mg/kg	0.50	< 0.50		< 0.50
Hexachloroethane	N	2790	mg/kg	0.50	< 0.50		< 0.50
N-Nitrosodi-n-propylamine	U	2790	mg/kg	0.50	< 0.50		< 0.50
4-Methylphenol	U	2790	mg/kg	0.50	< 0.50		< 0.50
Nitrobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50
Isophorone	U	2790	mg/kg	0.50	< 0.50		< 0.50
2-Nitrophenol	N	2790	mg/kg	0.50	< 0.50		< 0.50
2,4-Dimethylphenol	N	2790	mg/kg	0.50	< 0.50		< 0.50
Bis(2-Chloroethoxy)Methane	U	2790	mg/kg	0.50	< 0.50		< 0.50
2,4-Dichlorophenol	U	2790	mg/kg	0.50	< 0.50		< 0.50
1,2,4-Trichlorobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:				17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:				422877	422878	422879
Order No.:	Client Sample Ref.:				BH07	BH09	BH09
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				1.5	0.5	2.5
	Date Sampled:				09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD			
Naphthalene	U	2790	mg/kg	0.50	< 0.50		< 0.50
4-Chloroaniline	N	2790	mg/kg	0.50	< 0.50		< 0.50
Hexachlorobutadiene	U	2790	mg/kg	0.50	< 0.50		< 0.50
4-Chloro-3-Methylphenol	U	2790	mg/kg	0.50	< 0.50		< 0.50
2-Methylnaphthalene	U	2790	mg/kg	0.50	< 0.50		< 0.50
4-Nitrophenol	N	2790	mg/kg	0.50	< 0.50		< 0.50
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	< 0.50		< 0.50
2,4,6-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50		< 0.50
2,4,5-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50		< 0.50
2-Chloronaphthalene	U	2790	mg/kg	0.50	< 0.50		< 0.50
2-Nitroaniline	U	2790	mg/kg	0.50	< 0.50		< 0.50
Acenaphthylene	U	2790	mg/kg	0.50	< 0.50		< 0.50
Dimethylphthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50
2,6-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50		< 0.50
Acenaphthene	U	2790	mg/kg	0.50	< 0.50		1.8
3-Nitroaniline	N	2790	mg/kg	0.50	< 0.50		< 0.50
Dibenzofuran	U	2790	mg/kg	0.50	< 0.50		0.89
4-Chlorophenylphenylether	U	2790	mg/kg	0.50	< 0.50		< 0.50
2,4-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50		< 0.50
Fluorene	U	2790	mg/kg	0.50	< 0.50		< 0.50
Diethyl Phthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50
4-Nitroaniline	U	2790	mg/kg	0.50	< 0.50		< 0.50
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50	< 0.50		< 0.50
Azobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50
4-Bromophenylphenyl Ether	U	2790	mg/kg	0.50	< 0.50		< 0.50
Hexachlorobenzene	U	2790	mg/kg	0.50	< 0.50		< 0.50
Pentachlorophenol	N	2790	mg/kg	0.50	< 0.50		< 0.50
Phenanthrene	U	2790	mg/kg	0.50	3.8		14
Anthracene	U	2790	mg/kg	0.50	1.0		4.5
Carbazole	U	2790	mg/kg	0.50	< 0.50		1.3
Di-N-Butyl Phthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50
Fluoranthene	U	2790	mg/kg	0.50	5.7		25
Pyrene	U	2790	mg/kg	0.50	< 0.50		19
Butylbenzyl Phthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50
Benzo[a]anthracene	U	2790	mg/kg	0.50	2.5		11
Chrysene	U	2790	mg/kg	0.50	2.5		10
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50	< 0.50		< 0.50
Di-N-Octyl Phthalate	U	2790	mg/kg	0.50	< 0.50		< 0.50
Benzo[b]fluoranthene	U	2790	mg/kg	0.50	3.4		14

Project: 0293 Bury Travellers Site

Client: Tergeo Consulting Ltd	Chemtest Job No.:				17-05905	17-05905	17-05905
Quotation No.:	Chemtest Sample ID.:				422877	422878	422879
Order No.:	Client Sample Ref.:				BH07	BH09	BH09
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				1.5	0.5	2.5
	Date Sampled:				09-Mar-2017	09-Mar-2017	09-Mar-2017
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD			
Benzo[k]fluoranthene	U	2790	mg/kg	0.50	1.0		5.0
Benzo[a]pyrene	U	2790	mg/kg	0.50	1.5		5.9
Indeno(1,2,3-c,d)Pyrene	U	2790	mg/kg	0.50	< 0.50		< 0.50
Dibenz(a,h)Anthracene	U	2790	mg/kg	0.50	< 0.50		< 0.50
Benzo[g,h,i]perylene	U	2790	mg/kg	0.50	1.5		6.1
Resorcinol	U	2920	mg/kg	0.050	< 0.050		
Phenol	U	2920	mg/kg	0.050	< 0.050		
Cresols	U	2920	mg/kg	0.050	< 0.050		
Xylenols	U	2920	mg/kg	0.050	< 0.050		
1-Naphthol	N	2920	mg/kg	0.050	< 0.050		
Trimethylphenols	U	2920	mg/kg	0.050	< 0.050		
Total Phenols	U	2920	mg/kg	0.30	< 0.30		

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.co.uk

APPENDIX G

GAC

Generic assessment criteria for human health: residential scenario without home-grown produce

Background

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

Updates to the RSK GAC

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

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

For all other substances the C4SL exposure modifications relevant for residential without home-grown produce end use have been applied to the current RSK GAC. These include alterations to daily inhalation rates for residential and commercial scenarios, reducing soil adherence factors in children (age classes 1 to 12 only) and reducing exposure frequency for dermal contact outdoors.

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

RSK GAC derivation for metals and organic compounds

Model selection

Soil assessment criteria (SAC) were calculated using the Contaminated Land Exposure Assessment (CLEA) tool v1.071, supporting EA guidance^(5,8,9) and revised exposure scenarios published for the C4SL⁽³⁾. The SAC are also termed GAC.

Conceptual model

In accordance with SR3⁽⁵⁾, the residential without home-grown produce scenario considers risks to a female child between the ages of 0 and 6 years old as the highest risk scenario. In accordance with Box 3.1 of SR3⁽⁵⁾, the pathways considered for production of the SAC in the residential without home-grown produce scenario are

- direct soil and dust ingestion in areas of soft landscaping
- dermal contact with soil and indoor dust

- inhalation of indoor and outdoor dust and vapours.

Figure 1 is a conceptual model illustrating these linkages.

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

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

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

Where the vapour pathway is the predominant pathway (contributes greater than 90% of exposure) or the only exposure route considered and the cell is highlighted red (SAC exceeds saturation limit), the risk based on the assumed conceptual model is likely to be negligible as the vapour risk is assumed to be tolerable at maximum possible soil concentrations. In such circumstances, the vapour pathway exposure should be considered based on the presence of free phase or non-aqueous phase liquid sources and the measured concentrations of volatile organic compounds (VOC) in the vapour phase. Screening could be considered based on setting the SAC as the modelled soil saturation limits. However, as stated within the CLEA handbook⁽⁹⁾, this is likely to not be practical in many cases because of the very low saturation limits and, in any case, is highly conservative.

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

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

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

polycyclic aromatic hydrocarbons (PAH) naphthalene, acenaphthene and acenaphthylene) to reduce this conservatism.

Input selection

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

For TPH, aromatic hydrocarbons C₅–C₈ were not modelled, as this range comprises benzene (>EC5-EC7) and toluene (>EC7-EC8), which are modelled separately.

Physical parameters

For the residential without home-grown produce scenario, the CLEA default building is a small, two-storey terrace house with a concrete ground-bearing slab. SR3⁽⁵⁾ notes this residential building type to be the most conservative in terms of potential for vapour intrusion. The building parameters used in the production of the RSK GACs are the default CLEA v1.06 inputs presented in Table 3.3 of SR3⁽³⁾, with a dust loading factor detailed in Section 9.3 of SR3⁽⁵⁾. The parameters for a sandy loam soil type were used in line with Table 4.4 of SR3⁽⁵⁾. This includes a value of 6% for the percentage of soil organic matter (SOM) within the soil. In RSK's experience, this is rather high for many sites. To avoid undertaking site-specific risk assessments for this SOM, RSK has produced an additional set of GAC for SOM of 1% and 2.5% for all substances using the CLEA tool.

Summary of modifications to the default CLEA SR3⁽⁵⁾ input parameters for residential without home-grown produce

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

The final selected GAC are presented by pathway in Table 3 and the combined GAC in Table 4.

Figure 1: Conceptual model for CLEA residential scenario without home-grown produce

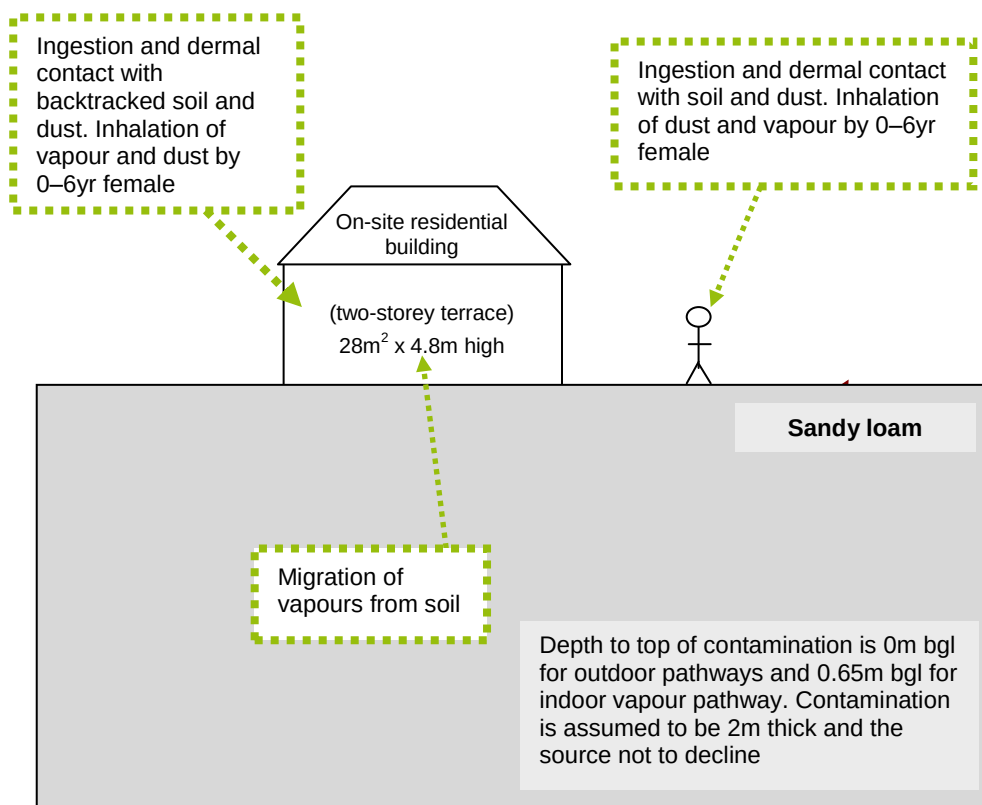


Table 1: Exposure assessment parameters for residential scenario without home-grown produce – inputs for CLEA model

Parameter	Value	Justification
Land use	Residential without home-grown produce	Chosen land use
Receptor	Female child	Key generic assumption given in Box 3.1, SR3 ⁽⁵⁾
Building	Small terraced house	Key generic assumption given in Box 3.1, SR3 ⁽⁵⁾ . Small, two-storey terraced house chosen, as it is the most conservative residential building type in terms of protection from vapor intrusion (Section 3.4.6, SR3) ⁽⁵⁾
Soil type	Sandy loam	Most common UK soil type (Section 4.3.1, from Table 3.1, SR3) ⁽⁵⁾
Start age class (AC)	1	Range of age classes corresponding to key generic assumption that the critical receptor is a young female child aged 0–6. From Box 3.1, SR3 ⁽⁵⁾
End AC	6	
SOM (%)	6	Representative of sandy loamy soil according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents' ⁽¹³⁾
	1	To provide SAC for sites where SOM <6% as often observed by RSK
	2.5	
pH	7	Model default

Table 2: Residential without home-grown produce – modified receptor data

Parameter	Unit	Age class					
		1	2	3	4	5	6
Soil to skin adherence factor – (outdoor)	mg soil/cm ² skin	0.1	0.1	0.1	0.1	0.1	0.1
Justification		Table 3.5, SP1010 ⁽³⁾					
Inhalation rate	m ³ day ⁻¹	5.4	8.0	8.9	10.1	10.1	10.1
Justification		Mean value USEPA, 2011 ⁽¹²⁾ ; Table 3.2, SP1010 ⁽³⁾					
Notes: For cadmium , the exposure assessment for a residential land use is based on estimates representative of lifetime exposure AC1-18. This is because the TDI _{oral} and TDI _{inh} are based on considerations of the kidney burden accumulated over 50 years. It is therefore reasonable to consider exposure not just in childhood but averaged over a longer period. See the Environment Agency Science Report SC05002/ TOX 3 ⁽¹⁾ , Science Report SC050021/Cadmium SGV ⁽¹⁾ and the project report SP1010 ⁽³⁾ for more information.							

References

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12. USEPA (2011), *Exposure factors handbook*, EPA/600/R-090/052F (Washington, DC: Office of Research and Development).
13. Environment Agency (2009), 'Changes made to the CLEA framework documents after the three-month evaluation period in 2008', released January 2009.
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GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITHOUT HOME-GROWN PRODUCE



Table 3

Human Health Generic Assessment Criteria by Pathway for Residential Scenario Without Home-Grown Produce

Compound	Notes	SAC Appropriate to Pathway SOM 1% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 2.5% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 6% (mg/kg)			Soil Saturation Limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Metals													
Arsenic	(a,b)	3.99E+01	5.26E+02	NR	NR	3.99E+01	5.26E+02	NR	NR	3.99E+01	5.26E+02	NR	NR
Cadmium	(a)	1.95E+02	4.88E+02	1.49E+02	NR	1.95E+02	4.88E+02	1.49E+02	NR	1.95E+02	4.88E+02	1.49E+02	NR
Chromium (III) - trivalent	(c)	1.98E+04	9.07E+02	NR	NR	1.98E+04	9.07E+02	NR	NR	1.98E+04	9.07E+02	NR	NR
Chromium (VI) - hexavalent	(a,d)	5.91E+01	2.06E+01	NR	NR	5.91E+01	2.06E+01	NR	NR	5.91E+01	2.06E+01	NR	NR
Copper		1.08E+04	1.41E+04	7.13E+03	NR	1.08E+04	1.41E+04	7.13E+03	NR	1.08E+04	1.41E+04	7.13E+03	NR
Lead	(a)	3.14E+02	NR	NR	NR	3.14E+02	NR	NR	NR	3.14E+02	NR	NR	NR
Elemental Mercury (Hg ⁰)	(d)	NR	2.41E-01	NR	4.31E+00	NR	5.74E-01	NR	1.07E+01	NR	1.25E+00	NR	2.58E+01
Inorganic Mercury (Hg ²⁺)		5.71E+01	3.63E+03	5.62E+01	NR	5.71E+01	3.63E+03	5.62E+01	NR	5.71E+01	3.63E+03	5.62E+01	NR
Methyl Mercury (Hg ⁴⁺)		1.80E+01	1.87E+01	9.16E+00	7.33E+01	1.80E+01	3.62E+01	1.20E+01	1.42E+02	1.80E+01	7.68E+01	1.46E+01	3.04E+02
Nickel	(d)	1.88E+02	1.81E+02	NR	NR	1.88E+02	1.81E+02	NR	NR	1.88E+02	1.81E+02	NR	NR
Selenium	(b)	4.31E+02	NR	NR	NR	4.31E+02	NR	NR	NR	4.31E+02	NR	NR	NR
Zinc	(b)	4.05E+04	3.63E+07	NR	NR	4.05E+04	3.63E+07	NR	NR	4.05E+04	3.63E+07	NR	NR
Cyanide (free)		4.03E+01	1.37E+04	4.02E+01	NR	4.03E+01	1.37E+04	4.02E+01	NR	4.03E+01	1.37E+04	4.02E+01	NR
Volatile Organic Compounds													
Benzene	(a)	7.36E+01	9.01E-01	8.90E-01	1.22E+03	7.36E+01	1.68E+00	1.64E+00	2.26E+03	7.36E+01	3.48E+00	3.33E+00	4.71E+03
Toluene		2.87E+04	9.08E+02	8.80E+02	8.69E+02	2.87E+04	2.00E+03	1.87E+03	1.92E+03	2.87E+04	4.55E+03	3.93E+03	4.36E+03
Ethylbenzene		1.29E+04	8.34E+01	8.29E+01	5.18E+02	1.29E+04	1.96E+02	1.93E+02	1.22E+03	1.29E+04	4.58E+02	4.42E+02	2.84E+03
Xylene - m		2.32E+04	8.25E+01	8.22E+01	6.25E+02	2.32E+04	1.95E+02	1.93E+02	1.47E+03	2.32E+04	4.56E+02	4.47E+02	3.46E+03
Xylene - o		2.32E+04	8.87E+01	8.83E+01	4.78E+02	2.32E+04	2.08E+02	2.06E+02	1.12E+03	2.32E+04	4.86E+02	4.76E+02	2.62E+03
Xylene - p		2.32E+04	7.93E+01	7.90E+01	5.76E+02	2.32E+04	1.86E+02	1.85E+02	1.35E+03	2.32E+04	4.36E+02	4.28E+02	3.17E+03
Total xylene		2.32E+04	7.93E+01	7.90E+01	6.25E+02	2.32E+04	1.86E+02	1.85E+02	1.47E+03	2.32E+04	4.36E+02	4.28E+02	3.46E+03
Methyl tertiary-Butyl ether (MTBE)		3.87E+04	1.04E+02	1.04E+02	2.04E+04	3.87E+04	1.69E+02	1.69E+02	3.31E+04	3.87E+04	3.21E+02	3.19E+02	6.27E+04
Trichloroethene		6.45E+01	1.72E-02	1.72E-02	1.54E+03	6.45E+01	3.59E-02	3.59E-02	3.22E+03	6.45E+01	7.98E-02	7.97E-02	7.14E+03
Tetrachloroethene		7.13E+02	1.79E-01	1.79E-01	4.24E+02	7.13E+02	4.02E-01	4.02E-01	9.51E+02	7.13E+02	9.21E-01	9.20E-01	2.18E+03
1,1,1-Trichloroethane		7.74E+04	9.01E+00	9.01E+00	1.43E+03	7.74E+04	1.84E+01	1.84E+01	2.92E+03	7.74E+04	4.04E+01	4.04E+01	6.39E+03
1,1,1,2-Tetrachloroethane		7.34E+02	1.54E+00	1.53E+00	2.60E+03	7.34E+02	3.56E+00	3.55E+00	6.02E+03	7.34E+02	8.29E+00	8.20E+00	1.40E+04
1,1,2,2-Tetrachloroethane		7.34E+02	3.92E+00	3.90E+00	2.67E+03	7.34E+02	8.04E+00	7.95E+00	5.46E+03	7.34E+02	1.76E+01	1.72E+01	1.20E+04
Carbon Tetrachloride		5.15E+02	2.58E-02	2.58E-02	1.52E+03	5.15E+02	5.65E-02	5.64E-02	3.32E+03	5.15E+02	1.28E-01	1.28E-01	7.54E+03
1,2-Dichloroethane		1.55E+01	9.20E-03	9.20E-03	3.41E+03	1.55E+01	1.33E-02	1.33E-02	4.91E+03	1.55E+01	2.28E-02	2.27E-02	8.43E+03
Vinyl Chloride		1.81E+00	7.73E-04	7.73E-04	1.36E+03	1.81E+00	1.00E-03	9.99E-04	1.76E+03	1.81E+00	1.53E-03	1.53E-03	2.69E+03
1,2,4-Trimethylbenzene		NR	5.58E+00	NR	4.74E+02	NR	1.29E+01	NR	1.16E+03	NR	2.69E+01	NR	2.76E+03
1,3,5-Trimethylbenzene	(e)	NR	NR	NR	2.30E+02	NR	NR	NR	5.52E+02	NR	NR	NR	1.30E+03
Semi-Volatile Organic Compounds													
Acenaphthene		7.64E+03	4.86E+04	6.60E+03	5.70E+01	7.64E+03	1.18E+05	7.17E+03	1.41E+02	7.64E+03	2.68E+05	7.43E+03	3.36E+02
Acenaphthylene		7.65E+03	4.59E+04	6.55E+03	8.61E+01	7.65E+03	1.11E+05	7.15E+03	2.12E+02	7.65E+03	2.53E+05	7.42E+03	5.06E+02
Anthracene		3.82E+04	1.53E+05	3.06E+04	1.17E+00	3.82E+04	3.77E+05	3.47E+04	2.91E+00	3.82E+04	8.76E+05	3.66E+04	6.96E+00
Benzo(a)anthracene		1.98E+01	2.47E+01	1.10E+01	1.71E+00	1.98E+01	4.37E+01	1.36E+01	4.28E+00	1.98E+01	6.26E+01	1.50E+01	1.03E+01
Benzo(a)pyrene	(a)	5.34E+00	3.51E+01	NR	9.11E-01	5.34E+00	3.77E+01	NR	2.28E+00	5.34E+00	3.89E+01	NR	5.46E+00
Benzo(b)fluoranthene		4.97E+00	1.93E+01	3.95E+00	1.22E+00	4.97E+00	2.13E+01	4.03E+00	3.04E+00	4.97E+00	2.22E+01	4.06E+00	7.29E+00
Benzo(g,h,i)perylene		4.38E+02	1.87E+03	3.55E+02	1.54E-02	4.38E+02	1.94E+03	3.58E+02	3.85E-02	4.38E+02	1.97E+03	3.59E+02	9.23E-02
Benzo(k)fluoranthene		1.31E+02	5.41E+02	1.06E+02	6.87E-01	1.31E+02	5.76E+02	1.07E+02	1.72E+00	1.31E+02	5.91E+02	1.07E+02	4.12E+00
Chrysene		3.95E+01	1.19E+02	2.97E+01	4.40E-01	3.95E+01	1.49E+02	3.12E+01	1.10E+00	3.95E+01	1.66E+02	3.19E+01	2.64E+00
Dibenzo(a,h)anthracene		3.95E-01	1.45E+00	3.10E-01	3.93E-03	3.95E-01	1.64E+00	3.18E-01	9.82E-03	3.95E-01	1.74E+00	3.22E-01	2.36E-02
Fluoranthene		1.59E+03	3.83E+04	1.53E+03	1.89E+01	1.59E+03	8.87E+04	1.56E+03	4.73E+01	1.59E+03	1.83E+05	1.58E+03	1.13E+02
Fluorene		5.09E+03	6.20E+03	2.80E+03	3.09E+01	5.09E+03	1.53E+04	3.82E+03	7.65E+01	5.09E+03	3.62E+04	4.47E+03	1.83E+02
Indeno(1,2,3-cd)pyrene		5.65E+01	2.12E+02	4.46E+01	6.13E-02	5.65E+01	2.38E+02	4.56E+01	1.53E-01	5.65E+01	2.50E+02	4.60E+01	3.68E-01

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITHOUT HOME-GROWN PRODUCE



Table 3

Human Health Generic Assessment Criteria by Pathway for Residential Scenario Without Home-Grown Produce

Compound	Notes	SAC Appropriate to Pathway SOM 1% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 2.5% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 6% (mg/kg)			Soil Saturation Limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Naphthalene		2.50E+03	2.33E+01	2.31E+01	7.64E+01	2.50E+03	5.58E+01	5.46E+01	1.83E+02	2.50E+03	1.31E+02	1.25E+02	4.32E+02
Phenanthrene		1.58E+03	7.17E+03	1.30E+03	3.60E+01	1.58E+03	1.76E+04	1.45E+03	8.96E+01	1.58E+03	4.07E+04	1.52E+03	2.14E+02
Pyrene		3.82E+03	8.79E+04	3.66E+03	2.20E+00	3.82E+03	2.04E+05	3.75E+03	5.49E+00	3.82E+03	4.23E+05	3.79E+03	1.32E+01
Phenol		6.48E+04	4.58E+02	4.55E+02	2.42E+04	6.48E+04	6.95E+02	6.88E+02	3.81E+04	6.48E+04	1.19E+03	1.17E+03	7.03E+04

Total Petroleum Hydrocarbons

Aliphatic hydrocarbons EC ₅ -EC ₆		3.23E+05	4.24E+01	4.24E+01	3.04E+02	3.23E+05	7.79E+01	7.79E+01	5.58E+02	3.23E+05	1.61E+02	1.61E+02	1.15E+03
Aliphatic hydrocarbons >EC ₆ -EC ₈		3.23E+05	1.04E+02	1.04E+02	1.44E+02	3.23E+05	2.31E+02	2.31E+02	3.22E+02	3.23E+05	5.29E+02	5.29E+02	7.36E+02
Aliphatic hydrocarbons >EC ₈ -EC ₁₀		6.45E+03	2.68E+01	2.68E+01	7.77E+01	6.45E+03	6.55E+01	6.53E+01	1.90E+02	6.45E+03	1.56E+02	1.55E+02	4.51E+02
Aliphatic hydrocarbons >EC ₁₀ -EC ₁₂		6.45E+03	1.33E+02	1.32E+02	4.75E+01	6.45E+03	3.31E+02	3.27E+02	1.18E+02	6.45E+03	7.93E+02	7.67E+02	2.83E+02
Aliphatic hydrocarbons >EC ₁₂ -EC ₁₆		6.45E+03	1.11E+03	1.06E+03	2.37E+01	6.45E+03	2.78E+03	2.42E+03	5.91E+01	6.45E+03	6.67E+03	4.37E+03	1.42E+02
Aliphatic hydrocarbons >EC ₁₆ -EC ₃₅	(b)	6.50E+04	NR	NR	8.48E+00	9.25E+04	NR	NR	2.12E+01	1.11E+05	NR	NR	5.09E+01
Aliphatic hydrocarbons >EC ₃₅ -EC ₄₄	(b)	6.50E+04	NR	NR	8.48E+00	9.25E+04	NR	NR	2.12E+01	1.11E+05	NR	NR	5.09E+01
Aromatic hydrocarbons >EC ₆ -EC ₁₀		2.58E+03	4.74E+01	4.72E+01	6.13E+02	2.58E+03	1.16E+02	1.15E+02	1.50E+03	2.58E+03	2.77E+02	2.69E+02	3.58E+03
Aromatic hydrocarbons >EC ₁₀ -EC ₁₂		2.58E+03	2.58E+02	2.52E+02	3.64E+02	2.58E+03	6.39E+02	5.94E+02	8.99E+02	2.58E+03	1.52E+03	1.24E+03	2.15E+03
Aromatic hydrocarbons >EC ₁₂ -EC ₁₆		2.58E+03	2.85E+03	1.80E+03	1.69E+02	2.58E+03	7.07E+03	2.30E+03	4.19E+02	2.58E+03	1.68E+04	2.48E+03	1.00E+03
Aromatic hydrocarbons >EC ₁₆ -EC ₂₁	(b)	1.86E+03	NR	NR	5.37E+01	1.90E+03	NR	NR	1.34E+02	1.92E+03	NR	NR	3.21E+02
Aromatic hydrocarbons >EC ₂₁ -EC ₃₅	(b)	1.93E+03	NR	NR	4.83E+00	1.93E+03	NR	NR	1.21E+01	1.93E+03	NR	NR	2.90E+01
Aromatic hydrocarbons >EC ₃₅ -EC ₄₄	(b)	1.93E+03	NR	NR	4.83E+00	1.93E+03	NR	NR	1.21E+01	1.93E+03	NR	NR	2.90E+01

Notes:

EC - equivalent carbon. GrAC - groundwater assessment criteria. SAC - soil assessment criteria.

The CLEA model output is colour coded depending upon whether the soil saturation limit has been exceeded.

	Calculated SAC exceeds soil saturation limit and may significantly affect the interpretation of any exceedances as the contribution of the indoor and outdoor vapour pathway to total exposure is >10%.
	Calculated SAC exceeds soil saturation limit but the exceedance will not affect the SAC significantly as the contribution of the indoor and outdoor vapour pathway to total exposure is <10%.
	Calculated SAC does not exceed the soil saturation limit.

The SAC for organic compounds are dependant upon soil organic matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, PAHs naphthalene, acenaphthene and acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway (Section 10.1.1, SR3)

(a) SAC for arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI and lead are derived using the C4SL toxicology data.

(b) SAC for selenium should not include the inhalation pathway as no expert group HCV has been derived; aliphatic and aromatic hydrocarbons >EC16 should not include inhalation pathway due to their non-volatile nature and inhalation exposure being minimal (oral, dermal and inhalation exposure is compared to the oral HCV); arsenic should only be based on oral contribution (rather than combined) owing to the relative small contribution from inhalation in accordance with the SGV report. The Oral SAC should be adopted for zinc and benzo(a)pyrene.

(c) SAC for CrIII should be based on the lower of the oral and inhalation SAC (see LQM/CIEH 2015 Section 6.8)

(d) SAC for elemental mercury, chromium VI and nickel should be based on the inhalation pathway only.

(e) SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data, SAC for 1,2,4 trimethylbenzene may be used.

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITHOUT HOME-GROWN PRODUCE



Table 4
Human health generic assessment criteria for residential without home-grown produce

Compound	SAC for Soil SOM 1% (mg/kg)	SAC for Soil SOM 2.5% (mg/kg)	SAC for Soil SOM 6% (mg/kg)
Metals			
Arsenic	40	40	40
Cadmium	149	149	149
Chromium (III) - trivalent	910	910	910
Chromium (VI) - hexavalent	21	21	21
Copper	7,100	7,100	7,100
Lead	310	310	310
Elemental Mercury (Hg ⁰)	0.2	0.6	1.2
Inorganic Mercury (Hg ²⁺)	56	56	56
Methyl Mercury (Hg ⁴⁺)	9	12	15
Nickel	180	180	180
Selenium	430	430	430
Zinc	40,000	40,000	40,000
Cyanide (free)	40	40	40
Volatile Organic Compounds			
Benzene	0.9	1.6	3.3
Toluene	900 (869)	1,900	3,900
Ethylbenzene	80	190	440
Xylene - m	80	190	450
Xylene - o	90	210	480
Xylene - p	80	180	430
Total xylene	80	180	430
Methyl tertiary-Butyl ether (MTBE)	100	170	320
Trichloroethene	0.02	0.04	0.08
Tetrachloroethene	0.2	0.4	0.9
1,1,1-Trichloroethane	9.0	18.4	40.4
1,1,1,2-Tetrachloroethane	1.5	3.5	8.2
1,1,2,2-Tetrachloroethane	3.9	8.0	17.2
Carbon Tetrachloride	0.026	0.056	0.128
1,2-Dichloroethane	0.009	0.013	0.023
Vinyl Chloride	0.0008	0.0010	0.0015
1,2,4-Trimethylbenzene	5.6	12.9	26.9
1,3,5-Trimethylbenzene	NR	NR	NR
Semi-Volatile Organic Compounds			
Acenaphthene	6,600 (57)	7,200	7,400
Acenaphthylene	6,600 (86)	7,200	7,400
Anthracene	31,000 (1.17)	35,000	37,000
Benzo(a)anthracene	11.0	13.6	15.0
Benzo(a)pyrene	5.3	5.3	5.3
Benzo(b)fluoranthene	4.0	4.0	4.1
Benzo(g,h,i)perylene	355	358	359
Benzo(k)fluoranthene	106	107	107
Chrysene	30	31	32
Dibenzo(a,h)anthracene	0.31	0.32	0.32
Fluoranthene	1,500	1,600	1,600
Fluorene	2,800 (31)	3,800 (77)	4,500 (183)
Indeno(1,2,3-cd)pyrene	45	46	46
Naphthalene	23	55	125
Phenanthrene	1,300 (36)	1,450	1,520
Pyrene	3,700	3,800	3,800
Phenol	440*	688	1,170
Total Petroleum Hydrocarbons			
Aliphatic hydrocarbons EC ₅ -EC ₆	42	78	161
Aliphatic hydrocarbons >EC ₆ -EC ₈	100	230	530
Aliphatic hydrocarbons >EC ₈ -EC ₁₀	27	65	155
Aliphatic hydrocarbons >EC ₁₀ -EC ₁₂	130 (48)	330 (118)	770 (283)
Aliphatic hydrocarbons >EC ₁₂ -EC ₁₆	1,100 (24)	2,400 (59)	4,400 (142)
Aliphatic hydrocarbons >EC ₁₆ -EC ₃₅	65,000 (8)	92,000 (21)	111,000
Aliphatic hydrocarbons >EC ₃₅ -EC ₄₄	65,000 (8)	92,000 (21)	111,000
Aromatic hydrocarbons >EC ₈ -EC ₁₀	47	115	269
Aromatic hydrocarbons >EC ₁₀ -EC ₁₂	300	600	1,200
Aromatic hydrocarbons >EC ₁₂ -EC ₁₆	1,800 (169)	2,300 (419)	2,500
Aromatic hydrocarbons >EC ₁₆ -EC ₂₁	1,900	1,900	1,900
Aromatic hydrocarbons >EC ₂₁ -EC ₃₅	1,900	1,900	1,900
Aromatic hydrocarbons >EC ₃₅ -EC ₄₄	1,900	1,900	1,900
Minerals			
Asbestos	No asbestos detected with ID or <0.001% dry weight ¹		
Notes:			
* Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.			
NR - SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data, SAC for 1,2,4 trimethylbenzene may be used			
EC - equivalent carbon. SAC - soil assessment criteria.			
¹ LOD for weight of asbestos per unit weight of soil calculated on a dry weight basis using PLM, handpicking and gravimetry.			
The SAC for organic compounds are dependent on Soil Organic Matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58.			
1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.			
SAC for TPH fractions, PAHs naphthalene, acenaphthene and acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway, section 10.1.1, SR3.			
(VALUE IN BRACKETS)			
RSK has adopted an approach for petroleum hydrocarbons in accordance with LQM/CIEH whereby the concentration modelled for each petroleum hydrocarbon fraction has been tabulated as the SAC with the corresponding solubility or vapour saturation limits given in brackets.			

APPENDIX H

GQRA SOIL SCREENING SHEETS

Project nameTravellers Site, Bury Project code11151 Client nameSix Town Housing AddressFernhill Caravan Park Every Street Bury BL9 5BE NGR Land useResidential without home-grown produce SOM6% GAC version2018_00										Notes Soil mounds (perimeter samples) RSK										
										Lab sample ID	18/04765/1	18/04765/2	18/04765/3	18/04765/4	18/04765/5	18/04765/6	18/04765/7	18/04765/8	18/04765/9	18/04765/10
										Client sample ID	HP01	HP02	HP03	HP04	HP05	HP06	HP07	HP08	HP09	HP10
										Depth to top	0	0	0	0.15	0.1	0	0.05	0.1	0.2	0
										Depth to bottom	0.2	0.3	0.2	0.4	0.25	0.2	0.25	0.25	0.3	0.1
										Date sampled	13/06/18	13/06/18	13/06/18	13/06/18	13/06/18	13/06/18	13/06/18	13/06/18	13/06/18	13/06/18
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects												
Metals and Inorganics																				
Arsenic	mg/kg	40		12	5	13	13	0	8	11	8	8	11	5	10	9	10	12		
Cadmium	mg/kg	149		2	0.9	13	13	0	1.2	1.6	1.6	1.4	1.9	1.9	1.1	0.9	1.5	1.1		
Chromium	mg/kg	910	21	65	27	13	13	0	33	33	35	31	37	65	28	46	35	38		
Chromium (hexavalent)	mg/kg	21				13	0	13	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
Copper	mg/kg	7100		275	104	13	13	0	136	147	104	109	209	114	149	139	132	275		
Lead	mg/kg	310		377	133	13	13	0	222	311	362	251	377	375	175	133	351	257		
Mercury	mg/kg	56	1.2	0.54	0.25	13	11	2	<0.17	0.45	0.34	0.37	0.38	0.25	<0.17	0.54	0.48	0.35		
Nickel	mg/kg	180		47	27	13	13	0	33	43	40	38	45	45	36	30	39	27		
Selenium	mg/kg	430				13	0	13	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
Zinc	mg/kg	40000		684	166	13	13	0	248	349	684	215	369	320	178	166	254	240		
Asbestos																				
Asbestos in soil		Detect				13	2	11	NAD	Chrysotile	NAD	NAD	NAD	Chrysotile	NAD	NAD	NAD	NAD		
Asbestos Matrix (microscope)		Detect				13	2	11	-	Board	-	-	-	Loose Fibres	-	-	-	-		
Asbestos in soil % composition (hand picking and weighing)	% w/w	Detect				2	2	0		<0.001				<0.001						
Petroleum Hydrocarbons																				
Ali >C5-C6	mg/kg	161				8	0	8	<0.01	<0.01		<0.01		<0.01		<0.01		<0.01		
Ali >C6-C8	mg/kg	530				8	0	8	<0.01	<0.01		<0.01		<0.01		<0.01		<0.01		
Ali >C8-C10	mg/kg	155				8	0	8	<0.01	<0.01		<0.01		<0.01		<0.01		<0.01		
Ali >C10-C12	mg/kg	770	283	2.4	0.4	8	6	2	<0.1	0.9		0.5		0.4		2.4		0.6		
Ali >C12-C16	mg/kg	4400	142	22.1	3.9	8	6	2	<0.1	3.9		5.6		5.5		22.1		4.6		
Ali >C16-C21	mg/kg			36	8.8	8	6	2	<0.1	15.3		13.1		16.4		30.4		8.8		
Ali >C21-C35	mg/kg			218	43	8	7	1	57.7	166		218		182		92.1		43		
Ali >C16-C35 calculated	mg/kg	111000		231.1	51.8	8	7	1	57.7	181.3		231.1		198.4		122.5		51.8		
Total Aliphatics	mg/kg			238	57	8	7	1	57.7	186		238		205		147		57		
Aro >C5-C7	mg/kg					8	0	8	<0.01	<0.01		<0.01		<0.01		<0.01		<0.01		
Aro >C7-C8	mg/kg					8	0	8	<0.01	<0.01		<0.01		<0.01		<0.01		<0.01		
Aro >C8-C9	mg/kg	993				8	0	8	<0.01	<0.01		<0.01		<0.01		<0.01		<0.01		
Aro >C9-C10	mg/kg	269				8	0	8	<0.01	<0.01		<0.01		<0.01		<0.01		<0.01		
Aro >C10-C12	mg/kg	1200		2.5	0.4	8	7	1	0.4	0.6		1.7		<0.1		2.1		0.6		
Aro >C12-C16	mg/kg	2500		73.6	1.9	8	8	0	6.8	9.2		26.4		2.6		73.6		6.5		
Aro >C16-C21	mg/kg	1900		467	13.6	8	8	0	38	68.9		118		29.5		467		27.8		
Aro >C21-C35	mg/kg	1900		672	34.1	8	8	0	135	193		188		150		672		57.2		
Total Aromatics	mg/kg			1210	50.1	8	8	0	180	272		334		182		1210		92.3		
TPH (Ali & Aro)	mg/kg			1360	50.1	8	8	0	238	458		572		387		1360		149		
BTEX - Benzene	mg/kg	3.3				8	0	8	<0.01	<0.01		<0.01		<0.01		<0.01		<0.01		
BTEX - Toluene	mg/kg	3900				8	0	8	<0.01	<0.01		<0.01		<0.01		<0.01		<0.01		
BTEX - Ethyl Benzene	mg/kg	440				8	0	8	<0.01	<0.01		<0.01		<0.01		<0.01		<0.01		
BTEX - o Xylene	mg/kg	480				8	0	8	<0.01	<0.01		<0.01		<0.01		<0.01		<0.01		
BTEX - m & p Xylene	mg/kg	430				8	0	8	<0.01	<0.01		<0.01		<0.01		<0.01		<0.01		
MTBE	mg/kg	320				8	0	8	<0.01	<0.01		<0.01		<0.01		<0.01		<0.01		
TPH total (>C6-C40)	mg/kg			3070	1510	5	5	0			2120		3070		2110		2340			
TPH ID (for FID characterisations)																				
Polycyclic aromatic hydrocarbons																				
										Possible PAHs + mixture of										
										Possible PAHs + mixture of										
										Possible PAHs + mixture of										
										Possible PAHs + mixture of										

Project name		Travellers Site, Bury		Notes																	
Project code		11151																			
Client name		Six Town Housing																			
Address		Fernhill Caravan Park																			
		Every Street																			
		Bury																			
BL9 5BE																					
NGR																					
Land use		Residential without home-grown produce																			
SOM		6%																			
GAC version		2018_00																			

										Lab sample ID	18/04765/11	18/04765/12	18/04765/13		Tergeo results (March 2017)							
										Client sample ID	HP10	HP11	HP12		BH01	BH02	BH02	BH03	BH04	BH04	BH05	BH06
										Depth to top	0.2	0	0.2		1	0.5	2	1	0.5	1.5	1	1
										Depth to bottom	0.3	0.15	0.4									
										Date sampled	13/06/18	13/06/18	13/06/18		09/03/17	09/03/17	09/03/17	09/03/17	09/03/17	09/03/17	09/03/17	09/03/17
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-dete														
Metals and Inorganics																						
Arsenic	mg/kg	40		12	5	13	13	0	7	11	8		17		0.5			13		16		
Cadmium	mg/kg	149		2	0.9	13	13	0	1.2	1.2	2		1.4		2.2			0.99		0.9		
Chromium	mg/kg	910	21	65	27	13	13	0	27	37	29		24		35			44		34		
Chromium (hexavalent)	mg/kg	21				13	0	13	<1	<1	<1		<0.50		<0.5			<0.5		<0.5		
Copper	mg/kg	7100		275	104	13	13	0	168	175	155		95		130			120		120		
Lead	mg/kg	310		377	133	13	13	0	178	178	285		190		310			330		330		
Mercury	mg/kg	56	1.2	0.54	0.25	13	11	2	0.39	0.45	0.37		0.29		0.24			0.26		0.27		
Nickel	mg/kg	180		47	27	13	13	0	47	33	43		34		44			47		44		
Selenium	mg/kg	430				13	0	13	<1	<1	<1		<0.2		<0.2			<0.2		<0.2		
Zinc	mg/kg	40000		684	166	13	13	0	206	195	289		160		320			250		270		
Asbestos																						
Asbestos in soil		Detect				13	2	11	NAD	NAD	NAD		NAD	NAD	Chrysotile	NAD	NAD	NAD	NAD	Chrysotile		
Asbestos Matrix (microscope)		Detect				13	2	11	-	-	-				fibres/clumps					Fibres/clun		
Asbestos in soil % composition (hand picking and weighing)	% w/w	Detect				2	2	0														
Petroleum Hydrocarbons																						
Ali >C5-C6	mg/kg	161				8	0	8	<0.01	<0.01			<0.01		<0.01			<0.01				
Ali >C6-C8	mg/kg	530				8	0	8	<0.01	<0.01			<0.01		<0.01			<0.01				
Ali >C8-C10	mg/kg	155				8	0	8	<0.01	<0.01			24		<0.1			21				
Ali >C10-C12	mg/kg	770	283	2.4	0.4	8	6	2	1.4	<0.1			23		<0.1			20				
Ali >C12-C16	mg/kg	4400	142	22.1	3.9	8	6	2	16.7	<0.1			29		<0.1			2				
Ali >C16-C21	mg/kg			36	8.8	8	6	2	36	<0.1			30		<0.1			14				
Ali >C21-C35	mg/kg			218	43	8	7	1	126	<0.1			72		<0.1			55				
Ali >C16-C35 calculated	mg/kg	111000		231.1	51.8	8	7	1	162	<0.1												
Total Aliphatics	mg/kg			238	57	8	7	1	180	<0.1			230		<1.0			110				
Aro >C5-C7	mg/kg					8	0	8	<0.01	<0.01			<0.01		<0.01			<0.01				
Aro >C7-C8	mg/kg					8	0	8	<0.01	<0.01			<0.01		<0.01			<0.01				
Aro >C8-C9	mg/kg	993				8	0	8	<0.01	<0.01			<0.01		<0.1			<0.01				
Aro >C9-C10	mg/kg	269				8	0	8	<0.01	<0.01			<0.01		<0.1			<0.1				
Aro >C10-C12	mg/kg	1200		2.5	0.4	8	7	1	2.5	0.5			24		<0.1			<0.1				
Aro >C12-C16	mg/kg	2500		73.6	1.9	8	8	0	38	1.9			290		10			8.4				
Aro >C16-C21	mg/kg	1900		467	13.6	8	8	0	288	13.6			1100		73			130				
Aro >C21-C35	mg/kg	1900		672	34.1	8	8	0	511	34.1			2700		180			1000				
Total Aromatics	mg/kg			1210	50.1	8	8	0	840	50.1			4200		280			1200				
TPH (Ali & Aro)	mg/kg			1360	50.1	8	8	0	1020	50.1			4500		280			1300				
BTEX - Benzene	mg/kg	3.3				8	0	8	<0.01	<0.01			<0.001		<0.001			<0.001				
BTEX - Toluene	mg/kg	3900				8	0	8	<0.01	<0.01			<0.001		<0.001			<0.001				
BTEX - Ethyl Benzene	mg/kg	440				8	0	8	<0.01	<0.01			<0.001		<0.001			<0.001				
BTEX - o Xylene	mg/kg	480				8	0	8	<0.01	<0.01			<0.001		<0.001			<0.001				
BTEX - m & p Xylene	mg/kg	430				8	0	8	<0.01	<0.01			<0.001		<0.001			<0.001				
MTBE	mg/kg	320				8	0	8	<0.01	<0.01			<0.001		<0.001			<0.001				
TPH total (>C6-C40)	mg/kg			3070	1510	5	5	0			1510											
TPH ID (for FID characterisations)									Other unknown hydrocarbons			Possible PAHs + mixture of other unknown hydrocarbons										
Polycyclic aromatic hydrocarbons																						

Project name	Travellers Site, Bury										Notes				
Project code	11151														
Client name	Six Town Housing														
Address	Fernhill Caravan Park														
	Every Street														
	Bury														
	BL9 5BE														
NGR															
Land use	Residential without home-grown produce														
SOM	6%														
GAC version	2018_00														
										Lab sample ID					
										Client sample ID		BH07	BH09	BH09	
										Depth to top		1.5	0.5	2.5	
										Depth to bottom					
										Date sampled		09/03/17	09/03/17	09/03/17	
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-dete							
Metals and Inorganics															
Arsenic	mg/kg	40		12	5	13	13	0		11					
Cadmium	mg/kg	149		2	0.9	13	13	0		0.95					
Chromium	mg/kg	910	21	65	27	13	13	0		33					
Chromium (hexavalent)	mg/kg	21				13	0	13		<0.5					
Copper	mg/kg	7100		275	104	13	13	0		120					
Lead	mg/kg	310		377	133	13	13	0		270					
Mercury	mg/kg	56	1.2	0.54	0.25	13	11	2		0.18					
Nickel	mg/kg	180		47	27	13	13	0		58					
Selenium	mg/kg	430				13	0	13		<0.2					
Zinc	mg/kg	40000		684	166	13	13	0		220					
Asbestos															
Asbestos in soil		Detect				13	2	11	NAD	NAD	NAD				
Asbestos Matrix (microscope)		Detect				13	2	11	hps						
Asbestos in soil % composition (hand picking and weighing)	% w/w	Detect				2	2	0							
Petroleum Hydrocarbons															
Ali >C5-C6	mg/kg	161				8	0	8	<0.01		<0.01				
Ali >C6-C8	mg/kg	530				8	0	8	<0.01		<0.01				
Ali >C8-C10	mg/kg	155				8	0	8	<0.1		<0.1				
Ali >C10-C12	mg/kg	770	283	2.4	0.4	8	6	2	<0.1			6.2			
Ali >C12-C16	mg/kg	4400	142	22.1	3.9	8	6	2	<0.1			3.7			
Ali >C16-C21	mg/kg			36	8.8	8	6	2	<0.1			25			
Ali >C21-C35	mg/kg			218	43	8	7	1	<0.1			56			
Ali >C16-C35 calculated	mg/kg	111000		231.1	51.8	8	7	1							
Total Aliphatics	mg/kg			238	57	8	7	1	<1.0			91			
Aro >C5-C7	mg/kg					8	0	8	<0.01		<0.01				
Aro >C7-C8	mg/kg					8	0	8	<0.01		<0.01				
Aro >C8-C9	mg/kg	993				8	0	8	<0.01		<0.1				
Aro >C9-C10	mg/kg	269				8	0	8	<0.1		<0.1				
Aro >C10-C12	mg/kg	1200		2.5	0.4	8	7	1	<0.1			1.2			
Aro >C12-C16	mg/kg	2500		73.6	1.9	8	8	0	<0.1			27			
Aro >C16-C21	mg/kg	1900		467	13.6	8	8	0		3.6		170			
Aro >C21-C35	mg/kg	1900		672	34.1	8	8	0	<0.1			1500			
Total Aromatics	mg/kg			1210	50.1	8	8	0		3.6		1800			
TPH (Ali & Aro)	mg/kg			1360	50.1	8	8	0		3.6		1900			
BTEX - Benzene	mg/kg	3.3				8	0	8	<0.001		<0.001				
BTEX - Toluene	mg/kg	3900				8	0	8	<0.001		<0.001				
BTEX - Ethyl Benzene	mg/kg	440				8	0	8	<0.001		<0.001				
BTEX - o Xylene	mg/kg	480				8	0	8	<0.001		<0.001				
BTEX - m & p Xylene	mg/kg	430				8	0	8	<0.001		<0.001				
MTBE	mg/kg	320				8	0	8	<0.001		<0.001				
TPH total (>C6-C40)	mg/kg			3070	1510	5	5	0							
TPH ID (for FID characterisations)															
Polycyclic aromatic hydrocarbons															

										Lab sample ID	18/04765/1	18/04765/2	18/04765/3	18/04765/4	18/04765/5	18/04765/6	18/04765/7	18/04765/8	18/04765/9	18/04765/10
										Client sample ID	HP01	HP02	HP03	HP04	HP05	HP06	HP07	HP08	HP09	HP10
										Depth to top	0	0	0	0.15	0.1	0	0.05	0.1	0.2	0
										Depth to bottom	0.2	0.3	0.2	0.4	0.25	0.2	0.25	0.25	0.3	0.1
										Date sampled	13/06/18	13/06/18	13/06/18	13/06/18	13/06/18	13/06/18	13/06/18	13/06/18	13/06/18	13/06/18
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects												
Acenaphthene	mg/kg	7400		5.11	0.23	13	13	0	0.89	1.79	0.42	5.11	0.58	0.33	0.56	0.34	1.16	1.41		
Acenaphthylene	mg/kg	7400		0.3	0.05	13	12	1	0.08	0.14	0.16	0.16	0.1	0.22	<0.10	0.05	0.26	0.18		
Anthracene	mg/kg	37000		6.43	0.49	13	13	0	1.41	3.24	1.2	6.14	0.71	3.66	0.78	0.55	2.54	1.64		
Benzo(a)anthracene	mg/kg	15		15.1	1.24	13	13	0	4.79	10.7	4.89	13.1	1.67	4.68	2.16	1.24	9.08	4.47		
Benzo(a)pyrene	mg/kg	5.3		11.9	0.93	13	13	0	4.11	6.8	3.33	11.4	1.33	3.51	2.04	0.93	6.08	3.06		
Benzo(b)fluoranthene	mg/kg	4.1		14.8	1.08	13	13	0	4.51	7.29	3.53	14.3	1.49	3.49	2.64	1.08	6.48	3.57		
Benzo(ghi)perylene	mg/kg	359		6.2	0.5	13	13	0	2.22	3.4	1.83	6.2	0.79	1.89	1.3	0.5	2.56	1.38		
Benzo(k)fluoranthene	mg/kg	107		6.3	0.35	13	13	0	1.63	2.82	1.27	5.78	0.47	1.22	1.35	0.35	2.38	1.22		
Chrysene	mg/kg	32		17.7	1.26	13	13	0	4.63	9.26	4.11	17.2	1.66	4.24	2.74	1.26	7.92	4.13		
Dibenzo(ah)anthracene	mg/kg	0.32		2.03	0.11	13	12	1	0.47	0.91	0.46	1.76	0.16	0.4	<0.40	0.11	0.69	0.32		
Fluoranthene	mg/kg	1600		34.4	2.83	13	13	0	11.9	23.6	9.77	34.4	3.34	8.48	5.39	2.83	17.9	9.9		
Fluorene	mg/kg	4500	183	3.47	0.16	13	13	0	0.63	1.32	0.33	3.47	0.38	0.21	0.3	0.28	0.92	0.99		
Indeno(123-cd)pyrene	mg/kg	46		7.34	0.59	13	13	0	2.76	4.65	2.43	7.21	1.03	2.54	1.36	0.59	3.63	1.62		
Naphthalene	mg/kg	125		1.96	0.05	13	11	2	0.19	0.45	0.11	0.59	1.96	0.11	<0.30	0.1	0.38	0.91		
Phenanthrene	mg/kg	1520		29.7	1.96	13	13	0	6.15	13.1	4.51	29.7	2.83	3.18	3.23	2.4	9.68	9.16		
Pyrene	mg/kg	3800		28.9	2.5	13	13	0	10.6	20.2	8.54	28.9	3.11	7.36	4.95	2.5	16	9.78		
Total PAH-16MS	mg/kg			185	15.1	13	13	0	57	110	46.9	185	21.6	45.5	28.8	15.1	87.7	53.7		
Other analytes																				
% Natural Moisture Content (NMC)	% w/w			12.1	4.2	5	5	0			4.2		6.1		12.1		4.5			
% Stones >10mm	% w/w			24.4	5	13	10	3	14.3	<0.1	6.1	16.1	11.9	<0.1	5	6.7	5.5	6.5		
pH	pH			8.02	6.62	13	13	0	7.32	7.95	7.88	7.35	6.95	8.02	7.27	6.8	7.55	6.8		
Total Organic Carbon	% w/w			6.48	3.24	13	13	0	3.52	5.09	3.97	3.9	6.48	4.91	4.12	3.3	4.6	3.61		
Converted to SOM (x / 0.58)	% w/w			11.17241	5.586207	13	13	0	6.06896552	8.77586207	6.84482759	6.72413793	11.1724138	8.46551724	7.10344828	5.68965517	7.93103448	6.22413793		

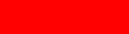
										Lab sample ID	18/04765/11	18/04765/12	18/04765/13	Tergeo results (March 2017)								
										Client sample ID	HP10	HP11	HP12		BH01	BH02	BH02	BH03	BH04	BH04	BH05	BH06
										Depth to top	0.2	0	0.2		1	0.5	2	1	0.5	1.5	1	1
										Depth to bottom	0.3	0.15	0.4									
										Date sampled	13/06/18	13/06/18	13/06/18		09/03/17	09/03/17	09/03/17	09/03/17	09/03/17	09/03/17	09/03/17	09/03/17
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-dete														
Acenaphthene	mg/kg	7400		5.11	0.23	13	13	0	2.76	0.23	1.09		18		3			1.1				
Acenaphthylene	mg/kg	7400		0.3	0.05	13	12	1	0.3	0.09	0.13		<0.5		0.73			<0.5				
Anthracene	mg/kg	37000		6.43	0.49	13	13	0	6.43	0.49	2.33		27		9.5			2.1				
Benzo(a)anthracene	mg/kg	15		15.1	1.24	13	13	0	15.1	2.24	6.92		34		18			5.6				
Benzo(a)pyrene	mg/kg	5.3		11.9	0.93	13	13	0	11.9	2.11	4.61		15		8.5			3.3				
Benzo(b)fluoranthene	mg/kg	4.1		14.8	1.08	13	13	0	14.8	2.43	5		36		20			7.7				
Benzo(ghi)perylene	mg/kg	359		6.2	0.5	13	13	0	5.7	1.14	2.16		13		8.1			3.7				
Benzo(k)fluoranthene	mg/kg	107		6.3	0.35	13	13	0	6.3	0.75	1.83		13		6.9			2.6				
Chrysene	mg/kg	32		17.7	1.26	13	13	0	17.7	2.26	6.03		32		17			5.3				
Dibenzo(ah)anthracene	mg/kg	0.32		2.03	0.11	13	12	1	2.03	0.27	0.54		<0.5		<0.5			<0.5				
Fluoranthene	mg/kg	1600		34.4	2.83	13	13	0	33.4	3.74	14.8		110		56			13				
Fluorene	mg/kg	4500	183	3.47	0.16	13	13	0	1.78	0.16	0.83		14		2.3			0.77				
Indeno(123-cd)pyrene	mg/kg	46		7.34	0.59	13	13	0	7.34	1.36	3.01		<0.5		<0.5			<0.5				
Naphthalene	mg/kg	125		1.96	0.05	13	11	2	<0.30	0.05	0.19		5.6		<0.5			<0.5				
Phenanthrene	mg/kg	1520		29.7	1.96	13	13	0	18.6	1.96	8.2		120		45			7.4				
Pyrene	mg/kg	3800		28.9	2.5	13	13	0	28	3.47	13.7		83		39			9.6				
Total PAH-16MS	mg/kg			185	15.1	13	13	0	172	22.8	71.4											
Other analytes																						
% Natural Moisture Content (NMC)	% w/w			12.1	4.2	5	5	0			7.8		14	18	15	12		13			16	
% Stones >10mm	% w/w			24.4	5	13	10	3	21	<0.1	24.4											
pH	pH			8.02	6.62	13	13	0	7.07	6.62	7.43		8.6		9.3			8.7			8.6	
Total Organic Carbon	% w/w			6.48	3.24	13	13	0	4.04	3.24	4.54			0.038		0.019		0.032			0.041	
Converted to SOM (x / 0.58)	% w/w			11.17241	5.586207	13	13	0	6.96551724	5.5862069	7.82758621											

											Lab sample ID		
											Client sample ID	BH07	BH09
											Depth to top	1.5	0.5
											Depth to bottom		
											Date sampled	09/03/17	09/03/17
												09/03/17	
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-dete					
Acenaphthene	mg/kg	7400		5.11	0.23	13	13	0	<0.5			1.8	
Acenaphthylene	mg/kg	7400		0.3	0.05	13	12	1	<0.5			<0.5	
Anthracene	mg/kg	37000		6.43	0.49	13	13	0	1			4.5	
Benzo(a)anthracene	mg/kg	15		15.1	1.24	13	13	0	2.5			11	
Benzo(a)pyrene	mg/kg	5.3		11.9	0.93	13	13	0	1.5			5.9	
Benzo(b)fluoranthene	mg/kg	4.1		14.8	1.08	13	13	0	3.4			14	
Benzo(ghi)perylene	mg/kg	359		6.2	0.5	13	13	0	1.5			6.1	
Benzo(k)fluoranthene	mg/kg	107		6.3	0.35	13	13	0	1			5	
Chrysene	mg/kg	32		17.7	1.26	13	13	0	2.5			10	
Dibenzo(ah)anthracene	mg/kg	0.32		2.03	0.11	13	12	1	<0.5			<0.5	
Fluoranthene	mg/kg	1600		34.4	2.83	13	13	0	5.7			25	
Fluorene	mg/kg	4500	183	3.47	0.16	13	13	0	<0.5			<0.5	
Indeno(123-cd)pyrene	mg/kg	46		7.34	0.59	13	13	0	<0.5			<0.5	
Naphthalene	mg/kg	125		1.96	0.05	13	11	2	<0.5			<0.5	
Phenanthrene	mg/kg	1520		29.7	1.96	13	13	0	3.8			14	
Pyrene	mg/kg	3800		28.9	2.5	13	13	0	<0.5			19	
Total PAH-16MS	mg/kg			185	15.1	13	13	0					
Other analytes													
% Natural Moisture Content (NMC)	% w/w			12.1	4.2	5	5	0	18	14		12	
% Stones >10mm	% w/w			24.4	5	13	10	3					
pH	pH			8.02	6.62	13	13	0		8.6			
Total Organic Carbon	% w/w			6.48	3.24	13	13	0	0.05			0.037	
Converted to SOM (x / 0.58)	% w/w			11.17241	5.586207	13	13	0					

Project name		Travellers Site, Bury		Notes		Landscaped areas													
Project code		11151																	
Client name		Six Town Housing																	
Address		Fernhill Caravan Park																	
		Every Street																	
		Bury																	
		BL9 5BE																	
NGR																			
Land use		Residential without home-grown produce																	
SOM		6%																	
GAC version		2018_00																	

										Lab sample ID	18/04765/14	18/04765/15	18/04765/16	18/04765/17	18/04765/18	18/04765/19				
										Client sample ID	HP13	HP14	HP15	HP16	HP16	HP17				
										Depth to top	0	0	0	0	0.15	0				
										Depth to bottom	0.2	0.1	0.2	0.12	0.2	0.2				
										Date sampled	13/06/18	13/06/18	13/06/18	13/06/18	13/06/18	13/06/18				
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects												
Metals and Inorganics																				
Arsenic	mg/kg	40		12	7	6	6	0	8	11	7	12	9	10						
Cadmium	mg/kg	149		1.1	0.7	6	6	0	0.9	1.1	0.7	1	0.9	0.9						
Chromium	mg/kg	910	21	33	21	6	6	0	23	30	21	31	24	33						
Chromium (hexavalent)	mg/kg	21				6	0	6	<1	<1	<1	<1	<1	<1						
Copper	mg/kg	7100		178	77	6	6	0	95	119	77	86	106	178						
Lead	mg/kg	310		135	77	6	6	0	119	128	77	135	129	131						
Mercury	mg/kg	56	1.2	0.63	0.36	6	5	1	0.38	0.54	<0.17	0.36	0.37	0.63						
Nickel	mg/kg	180		30	23	6	6	0	23	29	23	30	26	27						
Selenium	mg/kg	430		2	2	6	1	5	<1	<1	<1	<1	<1	2						
Zinc	mg/kg	40000		201	97	6	6	0	159	201	97	153	137	150						
Asbestos																				
Asbestos in soil						6	0	6	NAD	NAD	NAD	NAD	NAD	NAD						
Asbestos Matrix (microscope)						6	0	6	-	-	-	-	-	-						
Asbestos in soil % composition (hand picking and weighing)	% w/w					0	0	0												
Petroleum Hydrocarbons																				
Ali >C5-C6	mg/kg	161				2	0	2				<0.01		<0.01						
Ali >C6-C8	mg/kg	530				2	0	2				<0.01		<0.01						
Ali >C8-C10	mg/kg	155				2	0	2				<0.01		<0.01						
Ali >C10-C12	mg/kg	770	283	0.2	0.2	2	1	1			0.2		<0.1							
Ali >C12-C16	mg/kg	4400	142	3.6	3.6	2	1	1			3.6		<0.1							
Ali >C16-C21	mg/kg			9.9	9.9	2	1	1			9.9		<0.1							
Ali >C21-C35	mg/kg			43.1	43.1	2	1	1			43.1		<0.1							
Ali >C16-C35 calculated	mg/kg	111000		53	53	2	1	1			53		<0.1							
Total Aliphatics	mg/kg			56.7	56.7	2	1	1			56.7		<0.1							
Aro >C5-C7	mg/kg					2	0	2			<0.01		<0.01							
Aro >C7-C8	mg/kg					2	0	2			<0.01		<0.01							
Aro >C8-C9	mg/kg	993				2	0	2			<0.01		<0.01							
Aro >C9-C10	mg/kg	269				2	0	2			<0.01		<0.01							
Aro >C10-C12	mg/kg	1200		2	1.6	2	2	0			1.6		2							
Aro >C12-C16	mg/kg	2500		16.2	3	2	2	0			16.2		3							
Aro >C16-C21	mg/kg	1900		87	5.9	2	2	0			87		5.9							
Aro >C21-C35	mg/kg	1900		149	8.7	2	2	0			149		8.7							
Total Aromatics	mg/kg			254	19.6	2	2	0			254		19.6							
TPH (Ali & Aro)	mg/kg			310	19.6	2	2	0			310		19.6							
BTEX - Benzene	mg/kg	3.3				2	0	2			<0.01		<0.01							
BTEX - Toluene	mg/kg	3900				2	0	2			<0.01		<0.01							
BTEX - Ethyl Benzene	mg/kg	440				2	0	2			<0.01		<0.01							
BTEX - o Xylene	mg/kg	480				2	0	2			<0.01		<0.01							
BTEX - m & p Xylene	mg/kg	430				2	0	2			<0.01		<0.01							
MTBE	mg/kg	320				2	0	2			<0.01		<0.01							
TPH total (>C6-C40)	mg/kg			3350	46	4	4	0	1890	2100	46		3350							
TPH ID (for FID characterisations)										Possible PAHs	Possible PAHs	Possible PAHs + mixture of	Possible PAHs + mixture of other unknown hydrocarbons							
Polycyclic aromatic hydrocarbons																				

										Lab sample ID	18/04765/14	18/04765/15	18/04765/16	18/04765/17	18/04765/18	18/04765/19				
										Client sample ID	HP13	HP14	HP15	HP16	HP16	HP17				
										Depth to top	0	0	0	0	0.15	0				
										Depth to bottom	0.2	0.1	0.2	0.12	0.2	0.2				
										Date sampled	13/06/18	13/06/18	13/06/18	13/06/18	13/06/18	13/06/18				
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects												
Acenaphthene	mg/kg	7400		6.05	0.26	6	6	0	3.02	4.61	1.04	3.89	6.05	0.26						
Acenaphthylene	mg/kg	7400		0.22	0.06	6	6	0	0.12	0.19	0.11	0.11	0.22	0.06						
Anthracene	mg/kg	37000		8.14	0.37	6	6	0	3.88	7.94	1.54	4.95	8.14	0.37						
Benzo(a)anthracene	mg/kg	15		18.2	1.24	6	6	0	7.82	18.2	4.47	9.23	16.4	1.24						
Benzo(a)pyrene	mg/kg	5.3		14.7	1.11	6	6	0	7.12	14.7	3.61	8.54	13.8	1.11						
Benzo(b)fluoranthene	mg/kg	4.1		18.4	1.41	6	6	0	8.79	18.4	4.09	10.8	17.3	1.41						
Benzo(ghi)perylene	mg/kg	359		7.75	0.56	6	6	0	4.04	7.75	1.77	4.46	7.61	0.56						
Benzo(k)fluoranthene	mg/kg	107		7.64	0.46	6	6	0	3.56	7.64	1.33	4.16	7.09	0.46						
Chrysene	mg/kg	32		22.6	1.33	6	6	0	10.3	21.8	4.2	11.7	22.6	1.33						
Dibenzo(ah)anthracene	mg/kg	0.32		2.04	0.13	6	6	0	0.99	1.94	0.36	1.29	2.04	0.13						
Fluoranthene	mg/kg	1600		43.3	2.75	6	6	0	20.4	43.3	10.5	25.3	38.6	2.75						
Fluorene	mg/kg	4500	183	4.13	0.16	6	6	0	2.09	3.32	0.76	2.95	4.13	0.16						
Indeno(123-cd)pyrene	mg/kg	46		8.84	0.69	6	6	0	4.52	8.84	2.11	5.14	8.55	0.69						
Naphthalene	mg/kg	125		1.03	0.06	6	6	0	0.42	1.03	0.26	0.85	0.71	0.06						
Phenanthrene	mg/kg	1520		34.7	1.68	6	6	0	17	30.9	6.84	23.6	34.7	1.68						
Pyrene	mg/kg	3800		36.2	2.49	6	6	0	17.1	36.2	9.22	21	35	2.49						
Total PAH-16MS	mg/kg			227	14.8	6	6	0	111	227	52.2	138	223	14.8						
Other analytes																				
% Natural Moisture Content (NMC)	% w/w			14.1	6.4	4	4	0	8.9	14.1	9.3		6.4							
% Stones >10mm	% w/w			21.2	4.4	6	5	1	20.1	4.4	16.7	9.9	21.2	<0.1						
pH	pH			7.11	6.64	6	6	0	7.06	6.94	7	6.82	7.11	6.64						
Total Organic Carbon	% w/w			6.02	2.58	6	6	0	4.85	6.02	2.84	4.46	4.1	2.58						
Converted to SOM (x / 0.58)	% w/w			10.37931	4.448276	6	6	0	8.36206897	10.3793103	4.89655172	7.68965517	7.06896552	4.44827586						

Notes for GQRA (soil) Screening Tool Output		
1	Details of the GAC (landuse, SOM and GAC version) used in the GQRA are displayed at the top of the output screening sheet	
2	Full details of the GAC derivation are included in a separate appendix document	
3	The output screening sheet presents the reported Total Organic Carbon and the corresponding calculated Soil Organic Matter, using a conversion of TOC (%) divided by 0.58 to compute the SOM	
4	Any laboratory results that are appended to the reported concentrations (e.g. Tentatively Identified Compounds, PAH Double Ratio Plots etc.) are not included in the output screening sheet.	
	T1	First level screening threshold, equating to:
5		Chromium: total Cr concentration compared to Cr VI (conservative assessment)
		Chromium: total Cr concentration compared to Cr III
	<i>Comment</i>	Where Cr VI has been reported, the CrVI results are compared directly to the CrVI GAC
6		Mercury : total Hg concentration compared to elemental Hg (conservative assessment)
		Mercury : total Hg concentration compared to inorganic Hg
	<i>Comment</i>	The tool does not screen against methyl mercury (this parameter is only reported if mercury has been speciated)
7		Petroleum Hydrocarbons: The soil saturation limit has been exceeded
		Petroleum Hydrocarbons: The modelled GAC has been exceeded
	<i>Comment</i>	RSK has adopted an approach for petroleum hydrocarbons whereby the concentration modelled for each petroleum hydrocarbon fraction has been tabulated as the GAC with the corresponding solubility or vapour saturation limits given in brackets on the GAC appendix document. First level (T1) GQRA screening is against the soil saturation limit.
8		Total cyanide: total CN compared to free CN (conservative assessment)
	<i>Comment</i>	There is no GAC for total CN (risks are driven by free CN) therefore the first level GQRA screening is against free CN and no other screening is undertaken. This is a conservative assessment.
9	The GQRA screening for asbestos is in relation to presence or absence ('detect'). Presence is reported as asbestos type or quantification >0.001%. Absence is reported as < limit of quantification of 0.001% or No Asbestos Detected (NAD).	
10	Where <u>individual</u> reported concentrations are presented in grey (not black) font, the result was below the laboratory method detection limit.	
11		Where cells are shaded grey, <u>all</u> results for that analyte are below the laboratory method detection limit

APPENDIX I

STATISTICAL ANALYSIS

Test Results

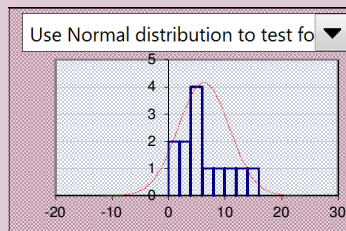
Client/client ref: Six Town Housi Site ref: Travellers Site, Bury

Date: 01-Sep-2018

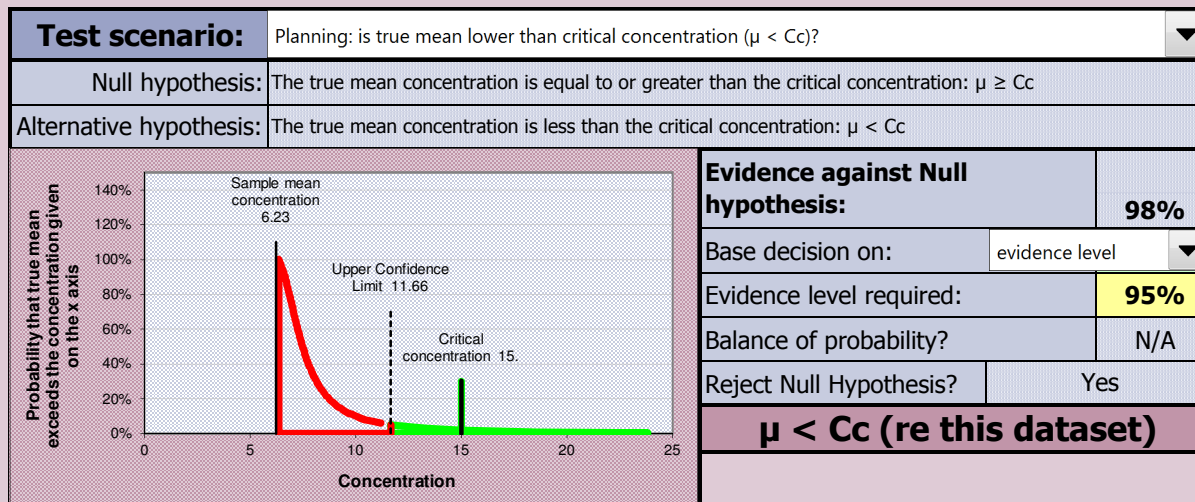
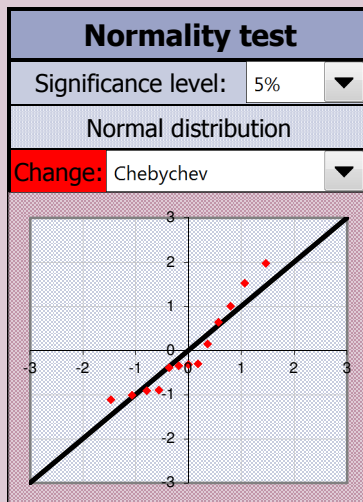
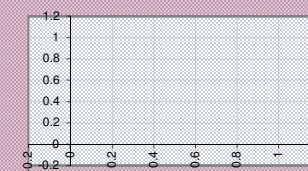
Project ref: 11151

Data description: RSK data for earth mounds. Con User details: JW

Dataset:	Benzo(a)anthracene ▼
Sample mean, $\bar{x}$	6.2338
Sample standard deviation, s	4.4907
Sample size, n	13
Critical concentration, Cc	15



Outliers & non-detects	
Outliers present?	NO
Significance level	5% ▼
Outliers removed?	0
Non-detects	0



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Test Results

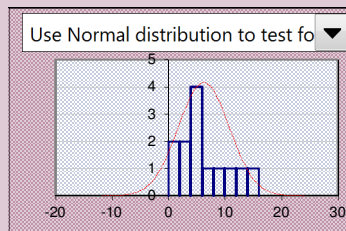
Client/client ref: Six Town Housi Site ref: Travellers Site, Bury

Date: 01-Sep-2018

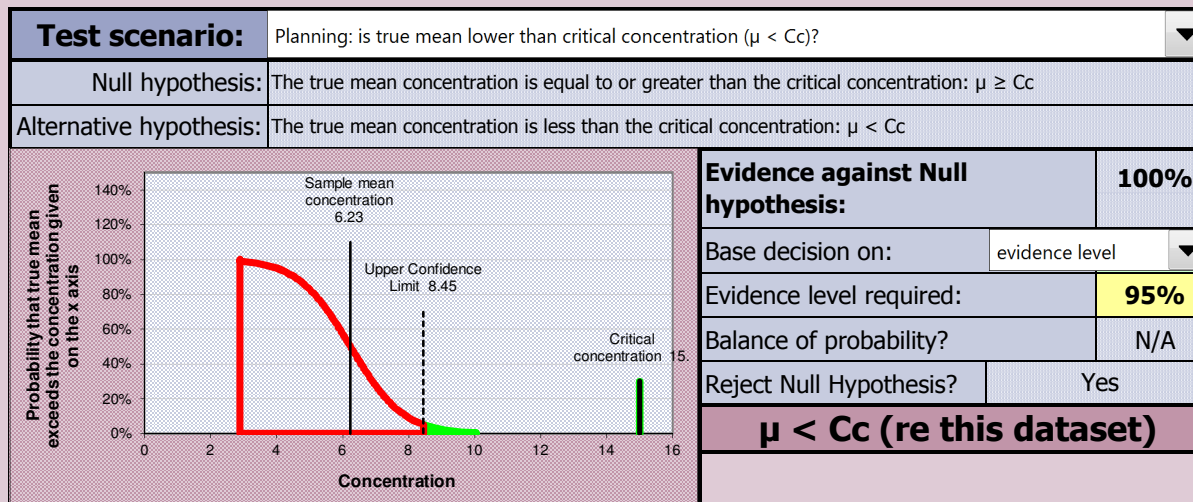
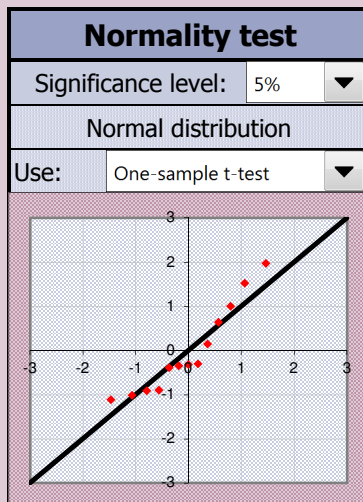
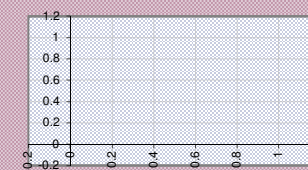
Project ref: 11151

Data description: RSK data for earth mounds. Con User details: JW

Dataset:	Benzo(a)anthracene ▼
Sample mean, $\bar{x}$	6.2338
Sample standard deviation, s	4.4907
Sample size, n	13
Critical concentration, Cc	15



Outliers & non-detects	
Outliers present?	NO
Significance level	5% ▼
Outliers removed?	0
Non-detects	0



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Test Results

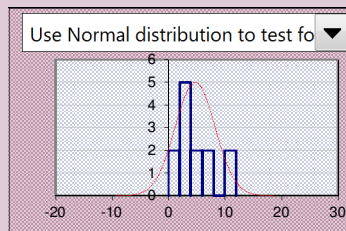
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Date: 01-Sep-2018

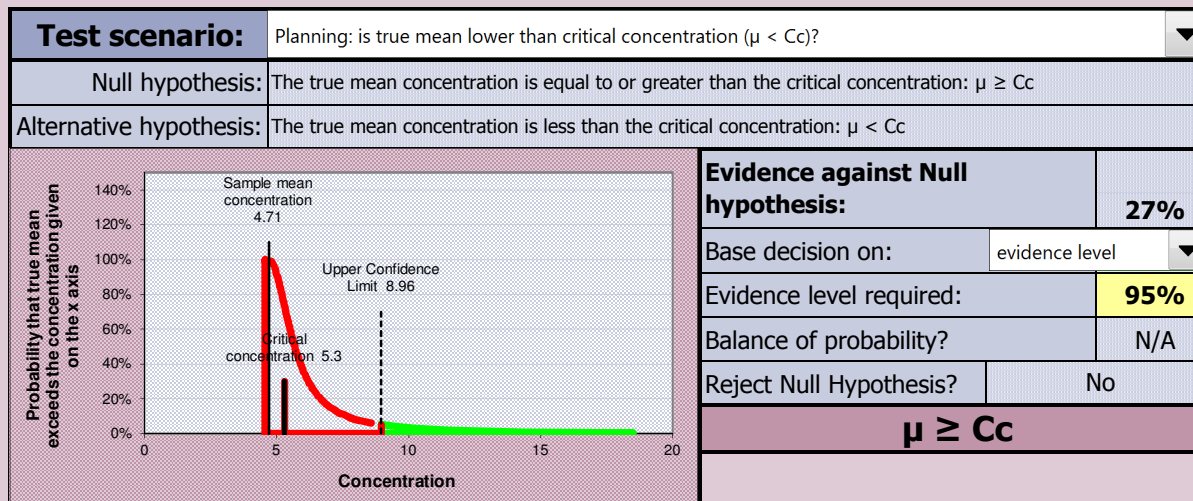
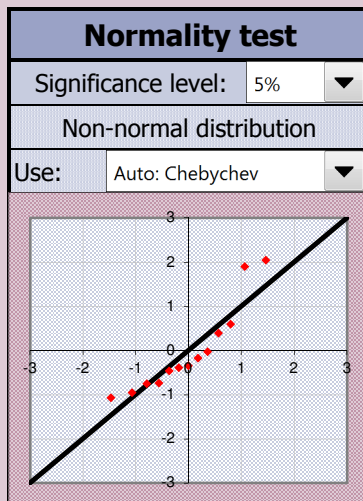
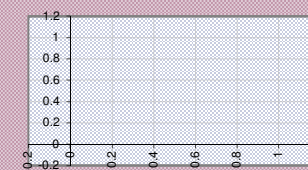
Project ref: 11151

Data description: RSK data for earth mounds. Con User details: JW

Dataset:	Benzo(a)pyrene ▼
Sample mean, $\bar{x}$	4.7085
Sample standard deviation, s	3.5206
Sample size, n	13
Critical concentration, Cc	5.3



Outliers & non-detects	
Outliers present?	NO
Significance level	5% ▼
Outliers removed?	0
Non-detects	0



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Test Results

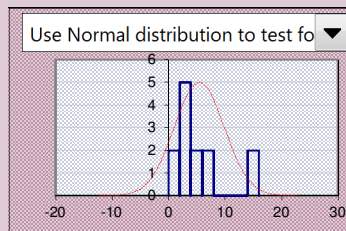
Client/client ref: Six Town Housi Site ref: Travellers Site, Bury

Date: 01-Sep-2018

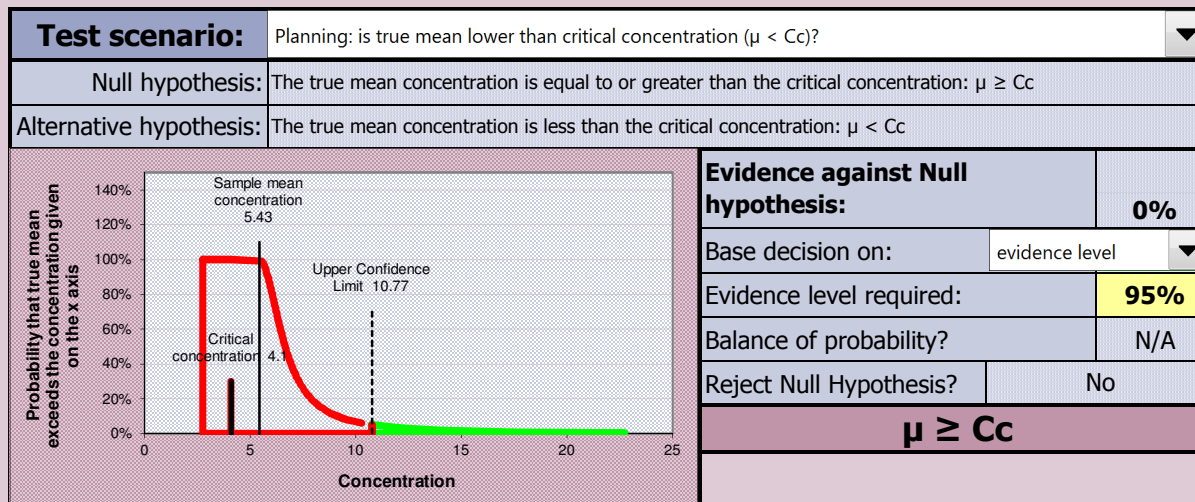
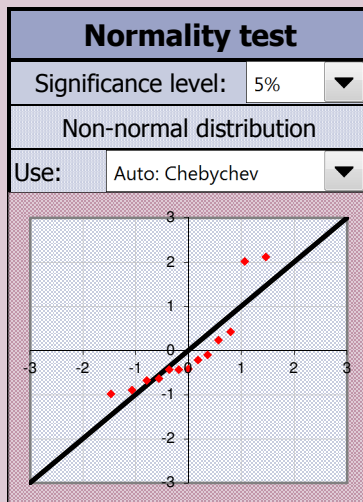
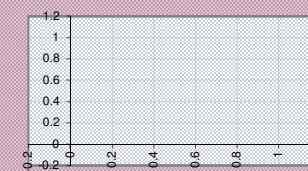
Project ref: 11151

Data description: RSK data for earth mounds. Con User details: JW

Dataset:	Benzo(b)fluoranthene
Sample mean, $\bar{x}$	5.4315
Sample standard deviation, s	4.4171
Sample size, n	13
Critical concentration, Cc	4.1



Outliers & non-detects	
Outliers present?	NO
Significance level	5%
Outliers removed?	0
Non-detects	0



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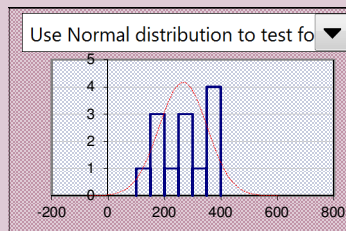
Test Results

Client/client ref: Six Town Housi Site ref: Travellers Site, Bury
Project ref: 11151

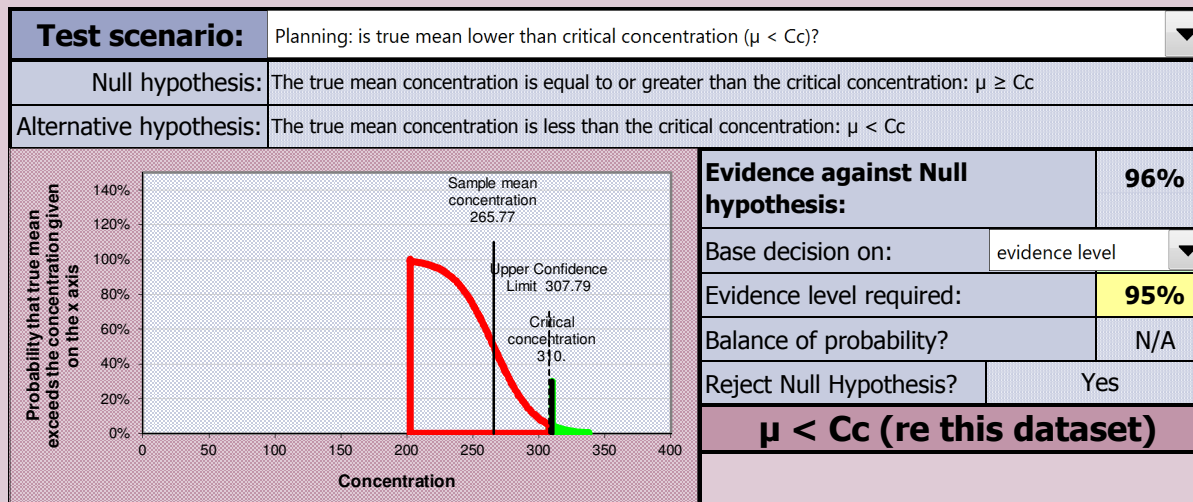
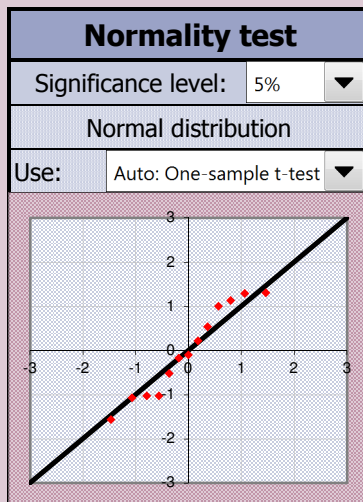
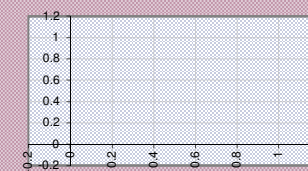
Date: 01-Sep-2018

Data description: RSK data for earth mounds. Con User details: JW

Dataset:	Lead ▼
Sample mean, $\bar{x}$	265.77
Sample standard deviation, s	85.014
Sample size, n	13
Critical concentration, Cc	310



Outliers & non-detects	
Outliers present?	NO
Significance level	5% ▼
Outliers removed?	0
Non-detects	0



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