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**PHASE 2 GROUND INVESTIGATION**  
**FOR RESIDENTIAL CARE DEVELOPMENT**  
**OFF BACK LANE**  
**SKELMERSDALE**  
**WN8 9BX**

**CARRIED OUT FOR:**

**CLIENT:** SAFE AS HOUSES LIMITED  
**DESIGN CONSULTANTS:** ARCHITECTURAL DESIGN CONSULTANCY  
LIMITED

**DATE:** FEBRUARY 2023      **REPORT NO:** 2444

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**1.0 INTRODUCTION**

In January 2023 Ground Investigation Specialists Limited (GIS) was instructed by Safe as Houses Limited to carry out a Phase 2 investigation for a new residential care development which is to be built on land adjacent to Back Lane in Skelmersdale, Lancashire, WN8 9BX. The Design Consultants for the project were Architectural Design Consultancy Limited based in Sutton Coldfield. The National Grid Reference for the approximate centre of the building plot is 350050 E 404960 N.

In February 2020 L K Consult Ltd (LKC) prepared a Phase 1 Preliminary Risk Assessment for the site and a proposed residential development. Report Number: LKC 20 1267 identified a number of potential sources of contamination on the site and recommended a Phase 2 Intrusive Ground Investigation be undertaken prior to re-development of the site to obtain further information on the contamination status prevailing ground conditions.

The intrusive investigation was undertaken in January 2023 and comprised sinking five boreholes with a percussive windowless sampling rig and mechanically excavating two trial pits for infiltration tests. Standpipes were installed in three of the boreholes for groundwater and ground gas monitoring purposes.

This report presents a review of the more pertinent points contained in the Phase 1 Preliminary Risk Assessment report carried out by LKC and a factual account of the work undertaken by GIS. A risk-based assessment is also provided of the soil and ground gas contamination on the site with respect to a suite of contaminants, selected in the context of the sites history and environmental setting previously identified by LKC. A geotechnical appraisal is given of the ground conditions relating primarily to the design of foundations and soakaways for the new housing plots.

This report has been produced for the sole use of Safe as Houses Limited and their advisors in support of the new residential care development. No liability can be accepted for its use by other parties or for other development proposals.

## **2.0 PHASE 1 ENVIRONMENTAL SITE ASSESSMENT REPORT**

GIS were provided with a copy of the Phase 1 Preliminary Risk Assessment Report for Back Lane, Skelmersdale prepared by LKC in February 2020; Report Ref: LKC 20 1267.

The following provides a brief summary of the pertinent data contained within the report.

- From available geological information, the site is anticipated to be underlain by glacial till in the southern half of the site and glaciofluvial sheet deposits (sand and gravel) in the northern half. The underlying bedrock is expected to belong to the Rosendale Formation (of the Millstone Grit Group) and comprise grey siltstones and mudstones interbedded with thick sandstone units (including the Lower Haslingden Flags) which all dip gently to the east.

- Boreholes previously drilled on or close to the site (and archived on the BGS GeoIndex) found brown sand to a depth of 1.8 – 2.0 m, containing a thin band of peat at the base. Underlying these glaciofluvial sheet deposits were soft to firm and firm grey-brown silty clays (glacial till) to about 6 m onto grey-blue clayey shale.
- The historical Ordnance Survey maps confirmed that up to at least 1967 small buildings were at the southern end of the site fronting Back Lane. These were subsequently demolished to be replaced by the church and associated halls which were built in 1982, but have now become derelict following a recent fire. The rest of the site in the northern half has remained undeveloped and reverted to allotment gardens.
- Surrounding the site up to a distance of 250 m away were several ponds which by 1927 were no longer present (presumably infilled). Housing appeared to the west of the site by 1969. By 1973 Digmoor Road had been constructed in a cutting to the east of the site, linked at the same time to the large housing estates that were also built further to the east and south.
- The site is deemed to lie within an area where it is estimated < 1 % of homes are above the action level, in respect of radon. Consequently no radon protective measures are deemed necessary in the new properties.
- The superficial glacial deposits and underlying bedrock are both designated as Secondary A Aquifers by the Environment Agency (EA).
- The site is not located within a Groundwater Source Protection Zone and there are no known Groundwater Abstraction Licenses held within 0.5 km of the site.
- There are no significant surface water courses located within 250 m of the site. The nearest, a drainage ditch lies 490 m to the south.

- The site is not considered at risk of flooding from rivers. There is a limited potential for groundwater flooding to occur.
- The nearest Site of a Designated environmental sensitive nature is the area of Adopted Green Belt 680 m to the east.
- The Preliminary Environmental Assessment and Conceptual Model concluded the site can be classified as low/moderate risk in terms of contamination and the risks to human health, controlled waters and the new houses following redevelopment. A number of potential sources of contamination were identified on the site, (primarily ash, clinker and other made ground from levelling works and small scale fly tipping), Asbestos Containing Materials (ACMs) from former buildings, Pesticides and Herbicides from use in the allotments and ground gases from made ground and significant thicknesses of peat, which all could have resulted in contamination being present in the ground. Potential contaminants of concern included heavy metals, petroleum hydrocarbons, polycyclic aromatic hydrocarbons, asbestos, pesticides, herbicides and ground gas (methane and carbon dioxide). It was recommended a Phase 2 intrusive ground investigation be carried out to obtain information on the ground conditions and its contamination status.

### **3.0 INTRUSIVE INVESTIGATION**

#### **3.1 Fieldwork**

Fieldwork was carried out on 5<sup>th</sup> and 24<sup>th</sup> January 2023 and consisted of sinking five percussive windowless sampling boreholes and excavating two trial pits. The scope of the works along with the positions of the exploratory holes was decided by GIS. Their positions are shown on the site plan included in section 7.0.

A fully tracked percussive windowless sampling rig was mobilised to sink boreholes WS1-WS5 to depths varying between 1.0 and 5.5 m below existing ground level.

From ground level, continuous 1.0 m long undisturbed samples, of decreasing diameter from 100 to 80 mm, were taken to ensure a complete soil profile to the base of each borehole. The samples were then described and sub-sampled on site by a senior ground engineer who produced the logs appended to this report in section 8.0.

In-situ Standard Penetration Tests (SPTs) were carried at approximately 1.0 m intervals in order to determine the strength or relative density of the underlying strata, from an initial depth of 1.0 m.

On completion of drilling boreholes WS2A and WS4 were backfilled with arisings. Standpipes were installed to depths of 3.5 m, 4.5 m and 3.5 m in boreholes WS1, WS3 and WS5 respectively to record the water table and levels of ground gas over an extended period, as presented in section 11.0.

On the 24<sup>th</sup> January 2023 test pits S1 and S2 were excavated using a micro-digger to depths of 1.2 and 1.0 m for the purpose of carrying out in-situ infiltration tests. The results are presented in section 9.0.

## **3.2 Laboratory Analysis**

GIS specified the following schedule of laboratory testing and the results are presented in sections 10.0 and 12.0.

### **3.2.1 Contamination**

Five samples of topsoil recovered from the boreholes have been tested for a general suite of likely contaminants including arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, speciated PAH, TPH (CWG) and asbestos, along with their soil organic matter (SOM). The two samples of topsoil recovered from WS4 and WS5, located in the area of the former allotment gardens were also tested for pesticides and herbicides.

Samples of sand recovered from WS4 and WS5 were subjected to the Full Suite of Waste Acceptance Criteria (WAC) tests, in order to confirm their Waste Classification for disposal to landfill.

### **3.2.2 Geotechnical**

In order to aid in their classification and determine their shrinkability, six samples of the shallow natural clay have undergone determinations of their Atterberg Limits and moisture content. Particle Size Distribution Analysis (using B.S. Sieves) was carried out on two samples of sand.

With regards to conditions considered aggressive to buried concrete, three samples of the natural soil were tested for water soluble sulphate and pH value.



## **4.0 GROUND CONDITIONS**

### **4.1 Strata Encountered**

Full details of the strata encountered are presented on the exploratory hole logs included in sections 8.0 and 9.0. However, as a brief guide, the main engineering geology horizons are described below.

#### **Topsoil over pockets of Made Ground**

Boreholes WS1, WS2/2A, WS3 and test pit S1 all excavated in the southern previously developed half of the site, recorded a layer of disturbed topsoil (0.3 to 0.6 m thick) over pockets of brown clay and grey clayey sand containing blocks of sandstone, which extended to a depth of 0.3 m in WS1 and over 1.0 m in WS2A.

In the northern undeveloped half of the site (formerly occupied by allotment gardens) topsoil was proved to depths varying between 0.2 and 0.55 m.

#### **Glacio-fluvial Sheet Deposits**

All the exploratory holes encountered a loose becoming very loose brown sand directly below the surface layers of topsoil/made ground, which extended to depths of 1.45, 1.3, 1.4 and 1.25 m in WS1, WS3, WS4 and WS5 respectively. At the base was a thin band of soft dark brown silty peat, 0.1 m thick.

### **Glacial Till**

Underlying the glacio-fluvial sheet deposits was glacial till materials and a soft becoming stiff brown, slightly gravelly, silty sandy clay containing at a depth of about 4 m a distinct band of loose brown sand.

The deepest borehole WS3 refused at a depth of 5.5m on either a boulder within the glacial till deposits or bedrock, presumably associated with the Rosendale Formation.

### **4.2 Groundwater**

From the available information the site is underlain by a high water table, with levels of 1.3, 1.5 and 2.2 m recorded in WS1, WS3 and WS5 when they were monitored in January and February 2023.

## **5.0 CONTAMINATION ASSESSMENT**

### **5.1 Soil Contamination**

Following demolition of the existing church buildings, the proposed development is for the construction of 12 No, two-storey housing units for people with disabilities, along with private gardens and other areas of communal gardens. The access road at the southern end of the site will be extended to include 4 No car parking spaces.

Five samples of topsoil recovered from WS1 - WS5 have all been tested for asbestos, metals/metalloids, PAHs, TPH CWG and SOM. All the test results are included in section 10.0.

The results have been compared with Generic Assessment Criteria (GAC) for residential without homegrown produce use known as "Suitable 4 Use Levels-S4ULs", derived using the Contaminated Land Environmental Assessment 'CLEA' v1.06 software methodology by the Land Quality Management (LQM)/Chartered Institute of Environmental Health (CIEH), with the exception of lead for which the DEFRA Category 4 Screening Level (C4SL) has been utilised.

Table 1 (overleaf) provides a summary of the solid suite analysis data and comparison with the appropriate residential screening values. All the S4UL's for the organic contaminants are appropriate to a SOM content of 6 %, based on the mean of the results.

For the purposes of clarity, all but one of the hydrocarbon groupings (namely Aromatic >EC21 – EC35) have been omitted, where all the concentrations recorded were below detection limit.

**Table 1: Summary of Topsoil Analysis Data for Metals,  
Metalloids, PAH and TPH**

Determinand	Units	WS1 0.00	WS2 0.00	WS3 0.20m	WS4 0.00m	WS5 0.30m	Screen	Source
Arsenic	mg/kg	10	8.7	7.2	6.5	7.4	40	S4UL
Cadmium	mg/kg	0.3	0.3	<0.2	0.4	0.2	85	S4UL
Chromium	mg/kg	26	44	34	26	24	910	S4UL
Copper	mg/kg	44	39	31	24	26	7100	S4UL
Lead	mg/kg	84	60	49	52	50	310	C4SL
Mercury	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	56	S4UL
Nickel	mg/kg	20	12	30	14	11	180	S4UL
Selenium	mg/kg	0.7	0.7	0.7	0.3	0.5	430	S4UL
Zinc	mg/kg	103	62	64	56	8.2	40000	S4UL
Naphthalene	mg/kg	0.03	<0.02	0.02	<0.02	<0.02	13	S4UL
Acenaphthylene	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	6000	S4UL
Acenaphthene	mg/kg	0.03	<0.02	0.02	<0.02	<0.02	6000	S4UL
Fluorene	mg/kg	0.02	<0.02	<0.02	<0.02	<0.02	4500	S4UL
Phenanthrene	mg/kg	0.67	0.17	0.28	0.12	0.23	1500	S4UL
Anthracene	mg/kg	0.13	0.04	0.08	0.04	0.08	37000	S4UL
Fluoranthene	mg/kg	2.07	0.41	0.59	0.31	0.55	1600	S4UL
Pyrene	mg/kg	1.95	0.37	0.55	0.27	0.50	3800	S4UL
Benzo[a]anthracene	mg/kg	1.01	0.22	0.29	0.16	0.31	15	S4UL
Chrysene	mg/kg	0.93	0.19	0.26	0.14	0.26	32	S4UL
Benzo[b]fluoranthene	mg/kg	1.32	0.29	0.39	0.20	0.38	4.0	S4UL
Benzo[k]fluoranthene	mg/kg	0.48	0.13	0.15	0.08	0.17	110	S4UL
Benzo[a]pyrene	mg/kg	1.19	0.26	0.33	0.17	0.33	3.2	S4UL
Indeno[1,2,3-cd]pyrene	mg/kg	0.79	0.17	0.23	0.10	0.22	46	S4UL
Dibenzo[a,h]anthracene	mg/kg	0.15	0.03	0.03	<0.02	0.03	0.32	S4UL
Benzo[g,h,i]perylene	mg/kg	0.8	0.16	0.23	0.10	0.22	360	S4UL
Aromatic >EC <sub>13</sub> -EC <sub>15</sub>	mg/kg	25	22	<1	17	28	1900	S4UL
Asbestos	mg/kg	NAD	NAD	NAD	NAD	NAD	-	S4UL

C4SL = DEFRA residential without homegrown produce use Category 4 Screening Level for Lead.  
S4UL = Suitable 4 USE Levels developed by LQM/CIH for residential without homegrown produce use (6 % SOM for organic contaminants).  
ARB = Arbitrary. NAD = No Asbestos Detected.  
Breaches are highlighted in yellow.

Reference to Table 1 shows that in all five samples none of the determinands tested had a concentration that exceeded the relevant residential screening values.

The five samples were also screened for the presence of asbestos and none was detected.

The two samples of topsoil recovered from the former allotment gardens (WS4 and WS5) were screened for Organo Chlorine (OCP), Organo Phosphorus (OPP) and Organo Nitrogen (ONP) pesticides and acid herbicides. None was detected.

In summary, no contaminants of concern have been identified by this investigation and no remedial action in terms of the risk to human health is considered necessary.

As a standard precautionary measure, groundworkers involved in the construction works should wear standard PPE as normal (i.e. gloves, overalls, boots, helmets etc). A good standard of personal hygiene should be adopted, with the regular washing of hands particularly before food is consumed.

## **5.2 Waste Classification for Landfill Disposal**

In respect of determining the suitability of the sand soils for disposal to landfill, waste classification software has been used to identify whether the material can be classified as hazardous or non-hazardous, as defined in the EWC (European Waste Catalogue 2002).

The solid suite determinands have been compared with the appropriate/ most likely chemical compounds as detailed in EWC Chapter 17 - Construction and demolition wastes. Full details of the classification are provided on the data sheets included in section 13.0.

Based on the total solid test results, the sand soil would be classified at this stage as "Non-Hazardous Waste". No asbestos was detected in the two samples tested at WS4 (0.6 m) and WS5 (0.9 m).

WAC testing was also then undertaken on the two samples to determine whether the material would be acceptable at an Inert Waste Landfill. The results of the WAC testing reveal the sand soil does not exceed any of the Inert Waste Limit Values and should be acceptable at an inert waste landfill site. Final agreement and tipping costs should be negotiated with the landfill operator.

### **5.3 Ground Gas Contamination**

The standpipes installed in boreholes WS1, WS3 and WS5 were monitored for ground gases on 3no. occasions on 24th January and 4<sup>th</sup> and 13<sup>th</sup> February 2023. A further three visits are scheduled for February and March 2023 and these results will be forwarded in a separate report. Table 2 (below) presents a summary of the current monitoring data.

**Table 2: Summary of Ground Gas Monitoring Data**

<u>Borehole</u>	<u>Response Zone (mbgl)</u>	<u>No. of Monitoring Occasions</u>	<u>Methane (% v/v)</u>	<u>Carbon Dioxide (% v/v)</u>	<u>Oxygen (% v/v)</u>	<u>Steady Positive Flow (l/hr)</u>	<u>Water Level (mbgl)</u>	<u>Atmospheric Pressure Range (mBar)</u>
<u>WS1</u>	1.0 – 3.5	3	<0.1	2.3 – 2.5	10.7 – 18.0	0	1.28 – 1.53	1022 - 1029
<u>WS3</u>	1.0 – 4.5	3	<0.1	3.6 – 3.9	14.0 – 15.4	0	1.45 – 1.70	1022 - 1029
<u>WS5</u>	1.0 – 3.5	3	<0.1	2.4 – 3.1	14.2 – 15.9	0	2.18 – 2.96	1022 - 1029

No methane, hydrogen sulphide or steady positive gas flow was detected on the three monitoring occasions. Borehole WS5 recorded a trace of carbon monoxide (10 ppm) on 24<sup>th</sup> January 2023.

Low normal levels of carbon dioxide (2.4 – 3.9% v/v) were recorded throughout the monitoring period. Corresponding oxygen concentrations were slightly depleted on occasions.

Based on the GIS data, and referring to the guidance set out in BS 8485:2015, a Borehole Hazardous Gas Flow Rate ( $Q_{hg}$ ) should be derived using the following equation:-

$$Q_{hg} = q \frac{(C_{hg})}{100} \text{ l/h}$$

Where q is the measured flow rate (in litres per hour);

And  $C_{hg}$  is the measured hazardous gas concentration (in percentage volume/volume).

Assuming a worst case steady positive of flow of 0.1 l/hr, the  $Q_{hg}$ 's for methane and carbon dioxide are calculated below:-

Methane:

$$Q_{hg}CH_4 = 0.1 \left( \frac{0.1}{100} \right) = 0.0001 \text{ l/h}$$

Carbon Dioxide:

$$Q_{hg}CO_2 = 0.1 \left( \frac{3.9}{100} \right) = 0.0039 \text{ l/h}$$

A typical gas screening value (GSV) of 0.004 l/hr can be assigned based on the  $Q_{hg}$  for carbon dioxide. This GSV would put the site in the lowest “Characteristic Gas Situation” (CS1) from the Modified Wilson & Card classification.

Table 4 of the guidance shows that on CS1 sites specialist gas protective measures are not considered necessary in new buildings. The further monitoring which is due to be carried out in February and March 2023 will either endorse this view or confirm that the new residences require some ground gas protection.

## **6.0 ENGINEERING COMMENTS**

### **6.1 Introduction**

The site plan included in section 7.0 shows the layout of the proposed residential care development, which will comprise 12 No units arranged in four separate two-storey housing blocks.

The desk study carried out by LKC highlighted the proposed development to be in a Coal Mining Reporting Area, and as such it would be prudent to obtain a mining report from the Coal Authority, if this has not been already undertaken.

### **6.2 Foundations**

The exploratory holes recorded a little made ground and topsoil to depths of 0.2 to 1.1 m, underlain by loose to very loose sand containing a thin band of peat at the base, and then from about 1.4 m a soft to firm becoming stiff brown silty sandy gravelly clay containing pockets of sand and then a thicker band at about 4 m depth.



The standard penetration tests carried out in the boreholes recorded low to very low uncorrected 'N' values at depths of 1.0 and 2.0 m, ranging from 10 to the test rods sinking under their own a distance of 0.45 m. From the eight tests undertaken the mean 'N' value was calculated as 5.

Below a depth of 3.0 m the SPT results showed a general improvement with depth, with uncorrected N values ranging from 7 to 20 in the glacial drift deposits, before recording a much higher extrapolated value of 429 (based on 50 blows for 35 mm penetration) at 5.45 m in WS3 where possible bedrock was encountered.

Groundwater was recorded as lying at a depth of between 1.2 and 1.4 m below the main areas of the development, away from the crest of the slope forming the eastern site boundary.

With regards to foundation design, the near surface soils of glacio-fluvial sheet deposits and glacial till are not considered suitable load bearing strata. Foundations should, therefore, be taken deeper into the natural strata be either i) the standard pile and beam solution or ii) the use of vibro stone columns installed to improve the load bearing and settlement characteristics of the soils down to a depth of 3 – 4 m.

Reference should be made to the specialist contractors, who from knowledge of the individual design and the information contained in this report would best be able to advise on the detailed construction. For additional information, reference could be made to the engineering logs for the three boreholes previously drilled on or close to the site in July 1972 and which can be found on BGS GeoIndex <http://mapapps2.bgs.ac.uk/geoindex/home.html>. Copies are presented in section 14.0 and show the boulder clay (glacial till) to be underlain by grey-blue clayey shale at depths of between 4.9 and 6.0 m.

### 6.3 Slope Stability

Forming the eastern boundary of the site is Digmaor Road, which was constructed in a cutting over 50 years ago, creating slopes either side. Between the site and the road is a bank which is between approximately 1.5 and 3.5 m high, increasing in a southerly direction. It is well vegetated and studded with a number of semi-mature to mature trees. The slope dips at angles ranging from 15 to 20° to the horizontal, and does not appear to be displaying any noticeable signs of movement.

Near housing units 6 and 12 the slope is approximately 2.5 m and 1.5 m high. Boreholes WS3 and WS5 indicated it to be comprised mostly of loose sand over soft to firm silty sandy clay close to its base. Standpipe readings revealed the slope to be partially drained in the area of WS3 and probably fully drained at the northern end of the site near WS5.

From the available information there appears to be a reasonable factor of safety for the continued stability of the slope, particularly in those areas where the two housing units are to be constructed. Housing unit 6 is to be located approximately 6 m from the crest of the slope and unit 12 approximately 2 m away, although here the slope is only about 1.5 m high. Construction of the two properties is unlikely to instigate failure of the bank, particularly given the preferred methods of construction involving transmitting foundation loads deep into the natural soils and below the level commensurate with the base of the slope.

### 6.4 Soil Infiltration Test

Soil infiltration testing was carried out within the near surface layer of glacio-fluvial sand encountered in S1 and S2.

Test pit S1 was excavated to a depth of 1.2 m below existing ground level (begL) and was filled with water to a depth of 1.01 begL and the subsequent fall in water level monitored versus time. For the two test runs achieved during the day, the soil infiltration rates ( $f$ ) were calculated as  $7.3 \times 10^{-6}$  m/s and  $6.6 \times 10^{-6}$  m/s.

Test pit S2 was excavated to a depth of 1.02 m begL and was filled with water to a depth of 0.76 m begL, producing a soil infiltration rate ( $f$ ) of  $4.0 \times 10^{-6}$  m/s.

Trench-type soakaways constructed at very shallow depth of about 1m within the soil horizon could be used to dispose of surface water from the buildings and car park. Based on the in-situ testing carried out, a soil infiltration rate ( $f$ ) =  $4 \times 10^{-6}$  m/s could be used for design purposes.

#### 6.5 Buried Concrete

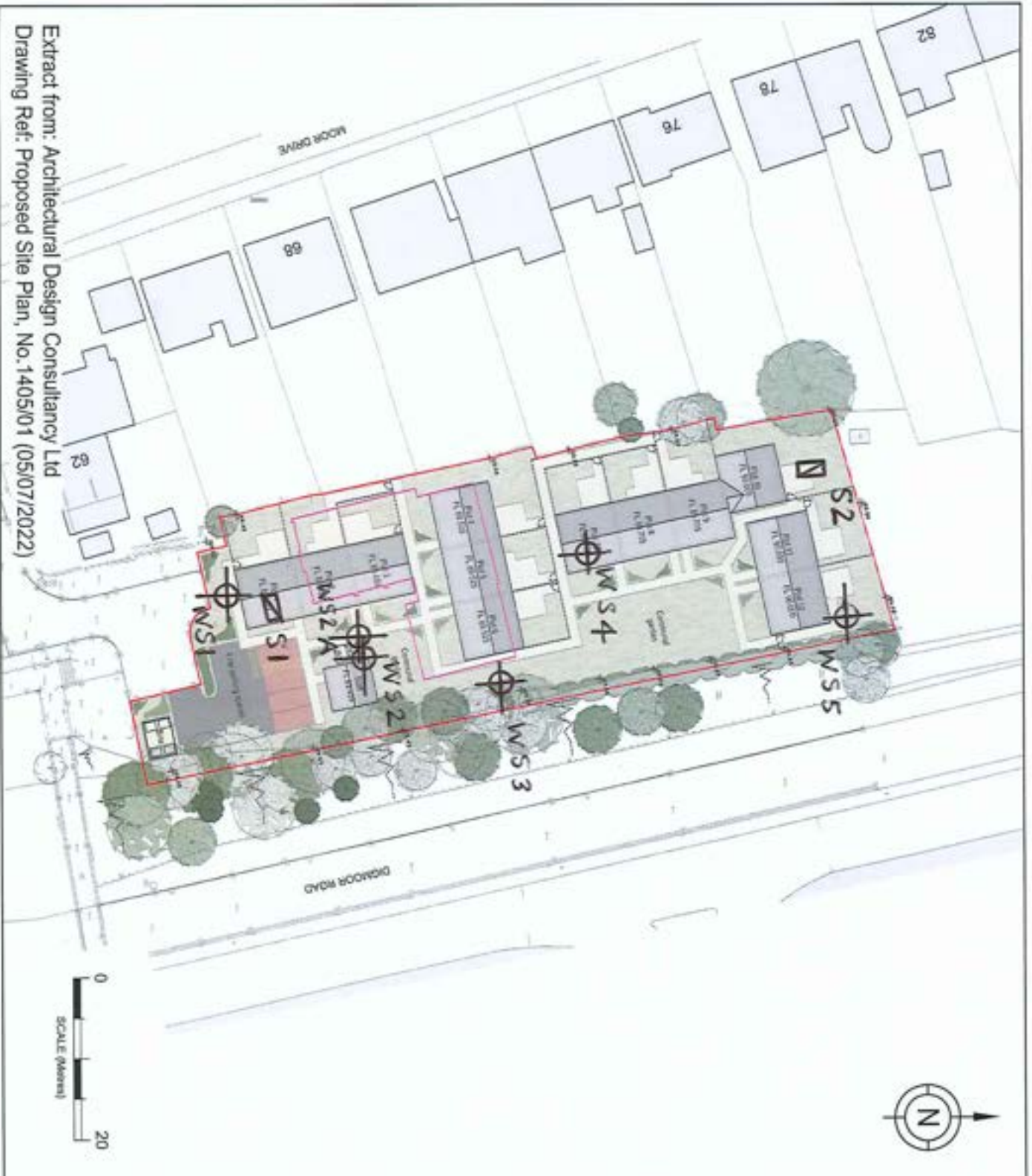
Reference to BRE Special Digest 1: 2005 and the chemical testing carried out on the selected samples of soil would indicate that in terms of buried concrete and classifying the site as to its Design Sulphate Class (DS) and Aggressive Chemical Environment for Concrete Class (ACEC), the site could be considered to have a DS class of DS-1 and ACEC Class of AC-1.

**H.S. Lister, BSc., C. Geol., C Sci., FGS.,  
Director**

**Ground Investigation Specialists Limited**

7.0 SITE PLAN

2



Extract from: Architectural Design Consultancy Ltd  
 Drawing Ref: Proposed Site Plan, No.1405/01 (05/07/2022)

**KEY**  
 Site Boundary

Planning Location and features provided by UK Council Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from master drawings only. All dimensions and features should be confirmed on site by the Contractor. Where the Survey indicates information provided to UK Council Ltd by others, UK Council Ltd gives no warranty, representation or assurance as to the accuracy of such information.



**Safe As Houses Investment PLC**  
 Back Lane, Skelmersdale

**Proposed Site Use**

Drawn by	Checked by	Scale	Date	Revision
AC	PW	See Scale Bar	Nov 2022	3 A

## 8.0 BOREHOLE LOGS



# GROUND INVESTIGATION SPECIALISTS LIMITED

<b>BOREHOLE RECORD</b>	BORING COMMENCED: 05.01.23 BORING COMPLETED: 05.01.23 GROUND LEVEL:	TYPE OF BORING: Percutaneous Winchless DIAMETER OF HOLE: 100 mm BOREHOLE CASING: Used to 1.00 m	CLIENT: Safe as Houses Investments ARCHITECT: ADC Limited CONTRACT: Back Lane, Skelmersdale	BOREHOLE: WS2 A SHEET: 1 OF 1 JOB NO: 2444
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## DRILLING

## SAMPLES

## RESULTS OF TESTS

DESCRIPTION OF STRATA	LEGEND	WATER LEVEL	THICKNESS	DEPTH	REDUCED LEVEL	DEPTH	TYPE	INDEX PROPERTIES				DENSITIES			STRENGTH TESTS			IN-SITU TESTS AND REMARKS
								W	MAC	LL	PL	PI	WET	DRY	TYPE	COHESION	ANGLE OF FRICTION	
Made ground (grey-brown SANDY TOPSOIL).	XXXXXX		0.30	0.30	GL		GL	E1										Borehole WS2 hit sandstone at 0.50m, moved over 2 m to borehole WS2A.
Made ground ( SANDSTONE block at 0.30 m onto dark grey SANDY TOPSOIL, with occasional pieces of plastic).	XXXXXX		0.30	0.80														
Made ground (grey silty CLAY SAND with much fine to coarse sub-rounded to sub-angular assorted gravel, occasional sandstone cobbles and brick ends).	XXXXXX		0.45															
Borehole aborted at 1.05 m on cobble.	XXXXXX			1.05														



<b>GROUNDWATER OBSERVATIONS</b>  I - Final groundwater level II - Groundwater first struck A - Standpipe * - Piezometer	<b>W - Water Sample</b> B - Bulk Sample T - Tub Sample E - Environmental Sample  <b>M/C - Natural Moisture Content</b> LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index  <b>N' - Standard or Cone Penetration Test Result</b> T - Undrained Triaxial M - Multi-stage Undrained Triaxial  <b>S - Standard Penetration Test</b> C - Standard Penetration Test with Cone V - Pocket Penetrometer Test
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# GROUND INVESTIGATION SPECIALISTS LIMITED

<b>BOREHOLE RECORD</b>	BORING COMMENCED: 05.01.23	TYPE OF BORING: <small>Percussive Windows</small>	CLIENT: Safe as Houses Investments
	BORING COMPLETED: 05.01.23	DIAMETER OF HOLE: 100 - 80 mm	ARCHITECT: ADC Limited
	GROUND LEVEL:	BOREHOLE CASING: Used to 3.00 m	CONTRACT: Back Lane, Skelmersdale
			BOREHOLE: WS3
			SHEET: 1 OF 2
			JOB NO: 2444

DESCRIPTION OF STRATA	LEGEND	WATER LEVEL	THICKNESS	DEPTH	REDUCED LEVEL	DEPTH	TYPE	INDEX PROPERTIES					DENSITIES			STRENGTH TESTS		IN-SITU TESTS AND REMARKS
								w	MAC %	LL %	PL %	PI %	WET (kgm <sup>-3</sup> )	DRY (kgm <sup>-3</sup> )	TYPE	COHESION (kN/m <sup>2</sup> )	ANGLE OF INTERNAL FRICTION	
Fill (above CHEPPING 0.50 layer of kerb)	[Diagonal Hatching]		0.10	0.10														
Made ground (dark grey-brown SANDY TOPSOIL with some pockets of silt light brown silty clay)	[Dotted]		0.45	0.55		0.20	E1											
Loose dark brown becoming light brown silty SAND with some dark grey-brown pockets. A thin band of soft dark brown slightly fibrous silty PEAT from 1.20 - 1.30 m. (GLACIO-FLUVIAL SHEET DEPOSITS)	[Stippled]		0.75	1.30		1.00	S2	4										(1.1.1.1.1)
Soft to firm and soft in part to 2.00 m, light brown silty sandy gravelly CLAY. ..... very sandy above 1.45 m. (GLACIAL TILL)	[Cross-hatched]		2.45	2.80		1.80	T3	17.0	28	19	19							pH = 8.4 2.1 w/s Sw < 0.01 g/L (-1.1.1.2.2)
CLAY becoming firm to silt from 2.80 m and silt from 3.50 m.	[Horizontal Lines]			2.80		2.90	T5											(2.3.2.3.4)
Loose slightly grey-brown and brown silty SAND with some thin bands of brown laminated sandy silt. (GLACIAL TILL)	[Vertical Lines]		0.55	3.75		3.00	S6	12	14.1	28	19	15						
Borehole continued ... /	[Vertical Lines]			4.00														

<b>GROUNDWATER OBSERVATIONS</b>  Water at 2.80 m on completion of borehole.  • - Final groundwater level ▾ - Groundwater first struck ▲ - Standpipe • - Piezometer	<b>WATER SAMPLES</b> W - Water Sample B - Bulk Sample T - Tub Sample E - Environmental Sample  <b>MATURITY</b> MC - Natural Moisture Content LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index  <b>TESTS</b> W - Standard or Cone Penetration Test Result T - Undrained Triaxial M - Multi-stage Undrained Triaxial  S - Standard Penetration Test C - Standard Penetration Test with Cone V - Pocket Penetrometer Test
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# GROUND INVESTIGATION SPECIALISTS LIMITED

<b>BOREHOLE RECORD</b>	BORING COMMENCED: 05.01.23	TYPE OF BORING: Percussive Windows	CLIENT: Safe as Houses Investments
	BORING COMPLETED: 05.01.23	DIAMETER OF HOLE: 100 - 80 mm	ARCHITECT: ADC Limited
	GROUND LEVEL:	BOREHOLE CASING: Used to 1.00 m	CONTRACT: Back Lane, Skelmersdale
			BOREHOLE: WS3
			SHEET: 2 OF 2
			JOB NO: 2444

**DRILLING**

**SAMPLES**

**RESULTS OF TESTS**

DESCRIPTION OF STRATA	LEGEND	WATER LEVEL	THICKNESS	DEPTH	REDUCED LEVEL	DEPTH	TYPE	INDEX PROPERTIES				DENSITIES		STRENGTH TESTS		TESTS AND REMARKS	
								N <sub>v</sub> value	MC %	LL %	PL %	PI %	WET (kgm <sup>-3</sup> )	DRY (kgm <sup>-3</sup> )	TYPE		COHESION (kN/m <sup>2</sup> )
Borehole contained ... Loose brown silty SAND with some thin bands of brown laminated sandy silt. (GLACIAL TILL)				4.00		4.00	S7										(1.1.1.2.2.2.)
Firm to stiff becoming stiff brown slightly gravelly silty CLAY. (GLACIAL TILL)		▲	222	4.50		5.00	S8		20								(3.3.4.5.5.6.)
Borehole refused on boulder or possible bedrock. Ground gas monitoring standpipe installed at 4.50 m.				5.52		5.45	S9										(25 blows for 35 mm, 50 blows for 35 mm penetration)

<b>GROUNDWATER OBSERVATIONS</b>  Water at 2.50 m on completion of borehole.  ● - Piezometer ▲ - Standpipe ▽ - Groundwater first struck ▮ - Final groundwater level	<b>W - Water Sample</b> <b>B - Bulk Sample</b> <b>T - Tub Sample</b> <b>E - Environmental Sample</b>  <b>MC - Natural Moisture Content</b> <b>LL - Liquid Limit</b> <b>PL - Plastic Limit</b> <b>PI - Plasticity Index</b>  <b>W - Standard or Cone Penetration Test Result</b> <b>T - Undrained Triaxial</b> <b>M - Multi-stage Undrained Triaxial</b>  <b>S - Standard Penetration Test</b> <b>C - Standard Penetration Test with Cone</b> <b>V - Pocket Penetrometer Test</b>
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# GROUND INVESTIGATION SPECIALISTS LIMITED

<b>BOREHOLE RECORD</b>	BORING COMMENCED: 05.01.23 BORING COMPLETED: 05.01.23 GROUND LEVEL:	TYPE OF BORING: <small>Perussive Windows</small> DIAMETER OF HOLE: 100 - 90 mm BOREHOLE CASING: Used to 3.00 m	CLIENT: Safe as Houses Investments ARCHITECT: ADC Limited CONTRACT: Back Lane, Skelmersdale
			BOREHOLE: WS4 SHEET: 1 OF 1 JOB NO: 2444

DESCRIPTION OF STRATA	LEGEND	WATER LEVEL	THICKNESS	DEPTH	REDUCED LEVEL	DEPTH	TYPE	INDEX PROPERTIES				DENSITIES				STRENGTH TESTS		TESTS AND REMARKS (SPT Blows)
								W	MC	LL	PL	PI	WET	DRY	TYPE	COHESION	MOULD	
Dark grey SANDY TOPSOIL			0.20	0.20		0.20	E1											
Loose becoming very loose brown becoming light brown silty medium - coarse SAND with occasional thin (15 mm thick) dark brown organic sand bands. (GLACIO-FLUVIAL SHEET DEPOSITS)			1.20	1.20		1.00	C3	2										(1.1.1.1)
..... A thin band of soft dark brown slightly fibrous amorphous peat from 1.3 - 1.4 m.				1.40														
Soft becoming very soft to soft brown silty sandy gravelly CLAY. (GLACIAL TILL)				1.70		1.70	T4		18.2	26	12	14						(1.1.1.1)
..... firm from 2.8 m.				2.00		2.00	C5	4										
..... firm to stiff from 3.30 m.				2.90		2.90	T6											
Loose light brown silty medium to coarse SAND with occasional thin dark grey carbonaceous bands (GLACIAL TILL)			0.20	3.80		3.00	C7	12										
Borehole terminated due to sand blowing up borehole.				4.00		4.00	C8											
GROUNDWATER OBSERVATIONS:		<input checked="" type="checkbox"/> Final groundwater level <input checked="" type="checkbox"/> Groundwater first struck at 1.20 m <input type="checkbox"/> Standpipe <input type="checkbox"/> Piezometer		W - Water Sample B - Bulk Sample T - Tub Sample E - Environmental Sample		MC - Natural Moisture Content LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index		W - Standard or Cone Penetration Test Result T - Undrained Triaxial M - Multi-stage Undrained Triaxial		S - Standard Penetration Test C - Standard Penetration Test with Cone V - Pocket Penetrometer Test								

(1.1.1.1) suspected very low blow counts due to sand 'boiling' conditions.

# GROUND INVESTIGATION SPECIALISTS LIMITED

<b>BOREHOLE RECORD</b>	BORING COMMENCED: 05.01.23 BORING COMPLETED: 05.01.23 GROUND LEVEL:	TYPE OF BORING: Percussive Washdown DIAMETER OF HOLE: 100 - 90 mm BOREHOLE CASING: Used to 3.00 m	CLIENT: Safe as Houses Investments ARCHITECT: ADC Limited CONTRACT: Back Lane, Skelmersdale
			BOREHOLE: WSS SHEET: 1 OF 1 JOB NO: 2444

## DRILLING

## SAMPLES

## RESULTS OF TESTS

DESCRIPTION OF STRATA	LEGEND	WATER LEVEL	THICKNESS	DEPTH	REDUCED LEVEL	DEPTH	TYPE	INDEX PROPERTIES				DENSITIES		STRENGTH TESTS		TESTS AND REMARKS			
								W	MLC	LL	PL	PI	WET	DRY	COHESION		ANGLE OF INTERNAL FRICTION		
				GL				value	%	%	%	(g/cm <sup>3</sup> )	(g/cm <sup>3</sup> )	(kN/m <sup>2</sup> )	(degrees)				
Dark grey SANDY TOPSOIL with some rootlets.			0.55	0.55		0.30	E1												
Loose brown becoming light brown silty medium-coarse SAND. A thin band of soft dark grey silty slightly fibrous amorphous peat from 1.20 - 1.25 m. (GLACIO-FLUVIAL SHEET DEPOSITS)			0.70	1.26		0.90	E2	4									(2.1.1.1.1.)		
						1.00	C3												
Soft to firm slightly grey-brown becoming firm and brown from 1.70 m silty sandy gravelly CLAY.			3.45			1.70	T4	14.6	24	12	12							pH = 8.2-2.1 with SO <sub>4</sub> <0.01 g/L (1.1.2.2.3.3.)	
						2.00	C5												10
						2.50	T6												13.1
CLAY becoming stiff from 2.60 m. (GLACIAL TILL)						3.00	C7	18										(2.3.3.5.5.6.)	
						2.60	T6												
Firm thinly laminated brown clayey sandy SILT and interbedded silty medium SAND. (GLACIAL TILL)			0.30	4.00		3.50		11										(2.3.3.2.3.3.)	
						3.70													
Borehole terminated due to sand blowing up borehole up to 3.50 m.																			
Ground gas monitoring standpipe installed at 3.50 m.																			

<b>GROUNDWATER OBSERVATIONS:</b> W - Final groundwater level B - Bulk Sample T - Tub Sample E - Environmental Sample Y - Groundwater first struck A - Standpipe P - Piezometer	W - Water Sample MLC - Natural Moisture Content LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index N - Standard or Cone Penetration Test Result T - Undrained Triaxial M - Multi-stage Undrained Triaxial S - Standard Penetration Test C - Standard Penetration Test with Cone V - Pocket Penetrometer Test
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## 9.0 INFILTRATION TEST RESULTS

# GROUND INVESTIGATION SPECIALISTS LIMITED

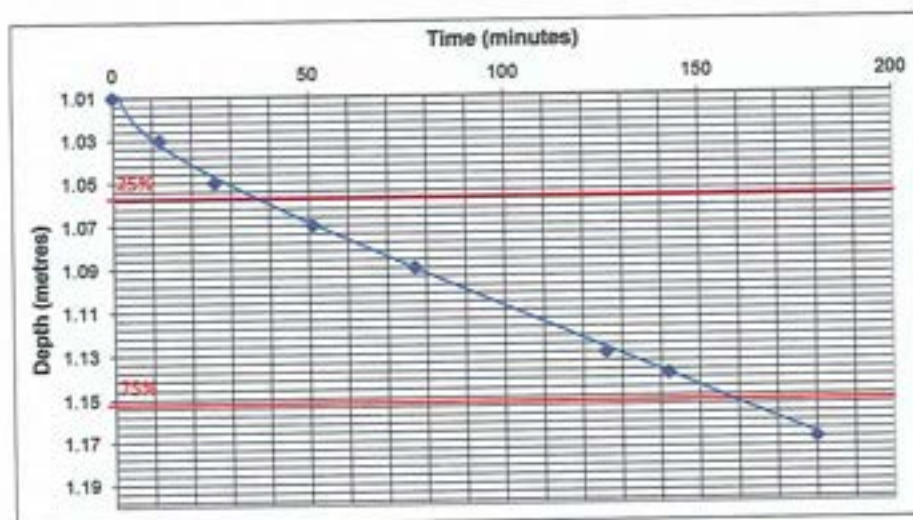
## SOIL INFILTRATION TEST

CONTRACT: Black Lane, Skelmersdale	JOB No: 2444
CLIENT: Safe as Houses Investments	
ENGINEER: A D C Limited	

TRIAL PIT: S1	DATE: 24.01.23
TEST No: Run 1	WEATHER: Dry
EXCAVATION METHOD: Micro - digger	TECHNICIAN: HSL
TEST PIT DIMENSIONS: 0.45 x 0.70 x 1.20 m deep	SAMPLES: Bulk at 1.10 m

WATER LEVEL:	
Depth (m)	Time (min)
1.01	0
1.03	12
1.05	26
1.07	51
1.09	77
1.13	126
1.14	142
1.17	180

STRATA DESCRIPTION:
<p>GL</p> <p>Made ground (dark grey SANDY TOPSOIL with a few brick fragments).</p> <hr/> <p>Loose light brown and cream silty fine to medium SAND with dark grey-brown SAND pockets. (GLACIO-FLUVIAL SHEET DEPOSITS)</p> <p>0.80</p> <hr/> <p>Loose light brown and a little light grey slightly silty fine to medium SAND. (GLACIO-FLUVIAL SHEET DEPOSITS)</p> <p>1.20</p> <hr/> <p style="text-align: center;">Trial Pit Complete.</p>



Width (m)	0.45
Length (m)	0.70
Depth (m)	1.20
Effective Storage Depth 75%-25% (m)	0.095
Time to fall to 75 % (minutes)	160
Time to fall to 25 % (minutes)	32
Volume 75%-25% (m <sup>3</sup> )	0.030
Surface Area 75%-25% (m <sup>2</sup> )	0.534
Time 75%-25% (minutes)	128
<b>Soil Infiltration Rate (m/s)</b>	<b>7.3E-06</b>

REMARKS:

# GROUND INVESTIGATION SPECIALISTS LIMITED

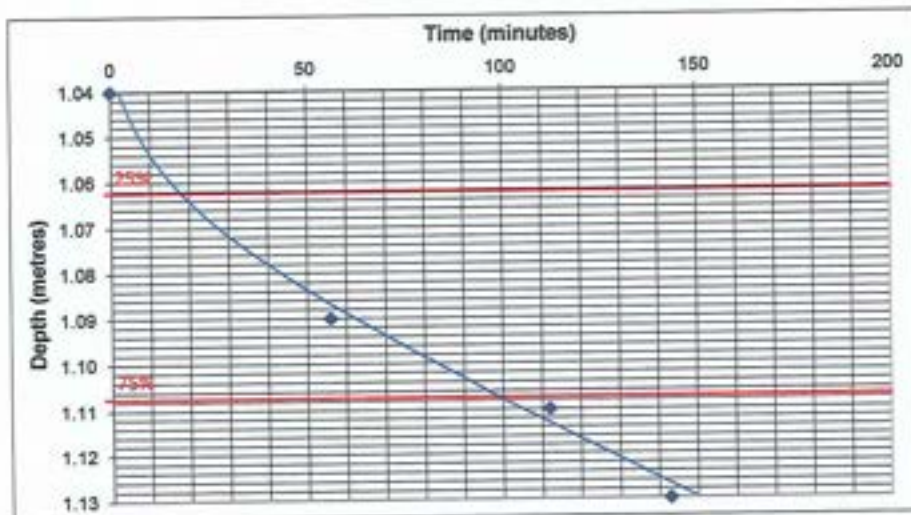
## SOIL INFILTRATION TEST

CONTRACT: Black Lane, Skelmersdale	JOB No: 2444
CLIENT: Safe as Houses Investments	
ENGINEER: A D C Limited	

TRIAL PIT: S1	DATE: 24.01.23
TEST No: Run 2	WEATHER: Dry
EXCAVATION METHOD: Micro - digger	TECHNICIAN: HSL
TEST PIT DIMENSIONS: 0.45 x 0.70 x 1.20 m deep	SAMPLES: Bulk at 1.10 m

WATER LEVEL:	
Depth (m)	Time (min)
1.04	0
1.09	56
1.11	112
1.13	143

STRATA DESCRIPTION:
<p>GL</p> <p>Made ground (dark grey SANDY TOPSOIL with a few brick fragments).</p> <hr/> <p>Loose light brown and cream silty fine to medium SAND with dark grey-brown SAND pockets. (GLACIO-FLUVIAL SHEET DEPOSITS)</p> <p>0.80</p> <hr/> <p>Loose light brown and a little light grey slightly silty fine to medium SAND. (GLACIO-FLUVIAL SHEET DEPOSITS)</p> <p>1.20</p> <hr/> <p style="text-align: center;">Trial Pit Complete.</p>



Width (m)	0.45
Length (m)	0.70
Depth (m)	1.13
Effective Storage Depth 75%-25% (m)	0.045
Time to fall to 75 % (minutes)	100
Time to fall to 25 % (minutes)	15
Volume 75%-25% (m <sup>3</sup> )	0.014
Surface Area 75%-25% (m <sup>2</sup> )	0.419
Time 75%-25% (minutes)	85
<b>Soil Infiltration Rate (m/s)</b>	<b>6.6E-06</b>

**REMARKS:**

Infiltration rate determined from maximum depth achieved during test.

# GROUND INVESTIGATION SPECIALISTS LIMITED

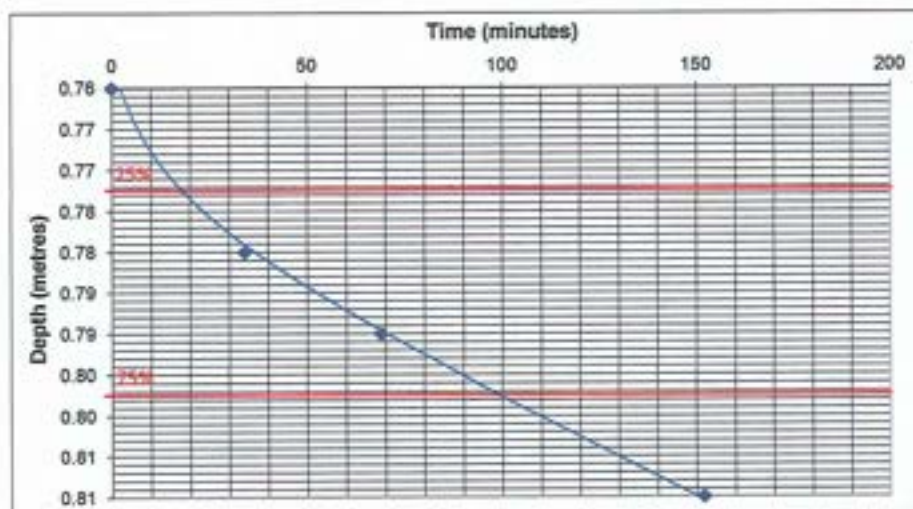
## SOIL INFILTRATION TEST

CONTRACT: Black Lane, Skelmersdale	JOB No: 2444
CLIENT: Safe as Houses Investments	
ENGINEER: A D C Limited	

TRIAL PIT: S2	DATE: 24.01.23
TEST No: Run 1	WEATHER: Dry
EXCAVATION METHOD: Micro - digger	TECHNICIAN: HSL
TEST PIT DIMENSIONS: 0.45 x 0.36 x 1.02 m deep	SAMPLES: Bulk at 0.90 m

WATER LEVEL:	
Depth (m)	Time (min)
0.76	0
0.78	34
0.79	69
0.81	152

STRATA DESCRIPTION:
<p>GL _____</p> <p>Dark grey SANDY TOPSOIL with some roots and rootlets.</p> <p>0.50 _____</p> <p>Loose brown slightly silty medium SAND intermixed with light brown slightly silty medium SAND and some dark grey pockets. ... from 0.8 m becoming more compact, brown and light brown.</p> <p>1.02 (GLACIO-FLUVIAL SHEET DEPOSITS) _____</p> <p style="text-align: center;">Trial Pit Complete.</p>



Width (m)	0.45
Length (m)	0.36
Depth (m)	0.81
Effective Storage Depth 75%-25% (m)	0.025
Time to fall to 75 % (minutes)	100
Time to fall to 25 % (minutes)	17
Volume 75%-25% (m <sup>3</sup> )	0.004
Surface Area 75%-25% (m <sup>2</sup> )	0.203
Time 75%-25% (minutes)	83
<b>Soil Infiltration Rate (m/s)</b>	<b>4.0E-06</b>

### REMARKS:

Infiltration test carried out in test pit dug from 0.65 - 1.02 m (i.e. 0.37 m deep of dimensions 0.45 x 0.36 m).  
Soil infiltration rate determined from maximum depth achieved during test.



## 10.0 SOIL CONTAMINATION TEST RESULTS



## ANALYTICAL TEST REPORT

**Contract no:** 117682(1)  
**Contract name:** Skelmersdale  
**Client reference:** J.2444  
**Clients name:** Ground Investigation Specialists  
**Clients address:** 43 Bell Place  
Dudley Road  
Wolverhampton  
WV2 4LY

**Samples received:** 13 January 2023

**Analysis started:** 13 January 2023

**Analysis completed:** 16 February 2023

**Report issued:** 16 February 2023

This is a supplementary report to report number 117682 issued 20 January 2023.

**Key**

- U UKAS accredited test
- M MCERTS & UKAS accredited test
- \$ Test carried out by an approved subcontractor
- I/S Insufficient sample to carry out test
- N/S Sample not suitable for testing
- NAD No Asbestos Detected

**Approved by:**

Abbie Neasham-Bourn  
Senior Reporting Administrator

# Chemtech Environmental Limited

## SAMPLE INFORMATION

### MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
117682-1	WS1	-	Loamy Clay with Roots	-	-	21.9
117682-3	WS2	0.00-0.30	Loamy Clay with Gravel	-	-	16.3
117682-4	WS3	0.20-0.40	Loamy Clay with Roots	-	-	17
117682-5	WS4	0.00-0.20	Clay	-	-	9.7
117682-6	WS4	0.60	Sandy Loamy Clay with Roots	-	-	18
117682-7	WS5	0.30-0.40	Sand	-	-	12.9
117682-8	WS5	0.90	Sandy Clay with Roots	-	-	12.8

# Chemtech Environmental Limited

## SOILS

Lab number			117682-1	117682-2	117682-3	117682-4	117682-5	117682-6
Sample id			WS1	WS1	WS2	WS3	WS4	WS4
Depth (m)			-	0.30-0.55	0.00-0.30	0.20-0.40	0.00-0.20	0.60
Date sampled			-	-	-	-	-	-
Test	Method	Units						
Antimony (total)	CE127 <sup>W</sup>	mg/kg Sb	-	-	-	-	-	<0.2
Arsenic (total)	CE127 <sup>M</sup>	mg/kg As	10	-	8.7	7.2	6.5	<1
Barium (total)	CE127 <sup>M</sup>	mg/kg Ba	-	-	-	-	-	9.7
Cadmium (total)	CE127 <sup>M</sup>	mg/kg Cd	0.3	-	0.3	<0.2	0.4	<0.2
Chromium (total)	CE127 <sup>M</sup>	mg/kg Cr	26	-	44	34	26	18
Copper (total)	CE127 <sup>M</sup>	mg/kg Cu	44	-	39	31	24	7.3
Lead (total)	CE127 <sup>M</sup>	mg/kg Pb	84	-	60	49	52	2.2
Mercury (total)	CE127 <sup>M</sup>	mg/kg Hg	<0.5	-	<0.5	<0.5	<0.5	<0.5
Molybdenum (total)	CE127 <sup>M</sup>	mg/kg Mo	-	-	-	-	-	<1
Nickel (total)	CE127 <sup>M</sup>	mg/kg Ni	20	-	12	30	14	2.5
Selenium (total)	CE127 <sup>M</sup>	mg/kg Se	0.7	-	0.7	0.7	0.3	<0.3
Zinc (total)	CE127 <sup>M</sup>	mg/kg Zn	103	-	62	64	56	<5
Total Organic Carbon (TOC)	CE197	% w/w C	5.3	3.5	4.3	1.6	3.6	-
Estimate of OMC (calculated from TOC)	CE197	% w/w	9.1	6.1	7.4	2.7	6.2	-
<b>PAH</b>								
Naphthalene	CE087 <sup>M</sup>	mg/kg	0.03	-	<0.02	0.02	<0.02	<0.02
Acenaphthylene	CE087 <sup>M</sup>	mg/kg	<0.02	-	<0.02	<0.02	<0.02	<0.02
Acenaphthene	CE087 <sup>M</sup>	mg/kg	0.03	-	<0.02	0.02	<0.02	<0.02
Fluorene	CE087 <sup>U</sup>	mg/kg	0.02	-	<0.02	<0.02	<0.02	<0.02
Phenanthrene	CE087 <sup>M</sup>	mg/kg	0.67	-	0.17	0.28	0.12	<0.02
Anthracene	CE087 <sup>U</sup>	mg/kg	0.13	-	0.04	0.08	0.04	<0.02
Fluoranthene	CE087 <sup>M</sup>	mg/kg	2.07	-	0.41	0.59	0.31	<0.02
Pyrene	CE087 <sup>M</sup>	mg/kg	1.95	-	0.37	0.55	0.27	<0.02
Benzo(a)anthracene	CE087 <sup>U</sup>	mg/kg	1.01	-	0.22	0.29	0.16	<0.02
Chrysene	CE087 <sup>M</sup>	mg/kg	0.93	-	0.19	0.26	0.14	<0.03
Benzo(b)fluoranthene	CE087 <sup>M</sup>	mg/kg	1.32	-	0.29	0.39	0.20	<0.02
Benzo(k)fluoranthene	CE087 <sup>M</sup>	mg/kg	0.48	-	0.13	0.15	0.08	<0.03
Benzo(a)pyrene	CE087 <sup>U</sup>	mg/kg	1.19	-	0.26	0.33	0.17	<0.02
Indeno(1,2,3-cd)pyrene	CE087 <sup>M</sup>	mg/kg	0.79	-	0.17	0.23	0.10	<0.02
Dibenz(ah)anthracene	CE087 <sup>M</sup>	mg/kg	0.15	-	0.03	0.03	<0.02	<0.02
Benzo(ghi)perylene	CE087 <sup>M</sup>	mg/kg	0.80	-	0.16	0.23	0.10	<0.02
PAH (total of USEPA 16)	CE087	mg/kg	11.6	-	2.45	3.45	1.69	<0.34
<b>TPH</b>								
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	-	<0.01	<0.01	<0.01	-
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01	-	<0.01	<0.01	<0.01	-
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	-	<0.01	<0.01	<0.01	-
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<10	-	<10	<10	<10	-
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	<10	-	<10	<10	<10	-
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	<1	-	<1	<1	<1	-
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	25	-	22	<1	17	-
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	<1	-	<1	<1	<1	-

# Chemtech Environmental Limited

## SOILS

Lab number	117682-1	117682-2	117682-3	117682-4	117682-5	117682-6		
Sample id	WS1	WS1	WS2	WS3	WS4	WS4		
Depth (m)	-	0.30-0.55	0.00-0.30	0.20-0.40	0.00-0.20	0.60		
Date sampled	-	-	-	-	-	-		
Test	Method	Units						
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	-	<0.1	<0.1	<0.1	-
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1	-	<0.1	<0.1	<0.1	-
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1	-	<0.1	<0.1	<0.1	-
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<6	-	<6	<6	<6	-
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<6	-	<6	<6	<6	-
EPH Aliphatic (>C16-C35)	CE250	mg/kg	<15	-	<15	<15	<15	-
EPH Aliphatic (>C35-C44)	CE250	mg/kg	<10	-	<10	<10	<10	-
<b>Subcontracted analysis</b>								
Asbestos (qualitative)	\$	-	NAD	-	NAD	NAD	NAD	NAD
<b>Pesticides</b>								
2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	\$	mg/kg AR	-	-	-	-	< 0.10	-
2,4,5-TP (Fenoprop)	\$	mg/kg AR	-	-	-	-	< 0.10	-
2,4-dichlorophenoxyacetic acid (2,4-D)	\$	mg/kg AR	-	-	-	-	< 0.10	-
acifluorfen	\$	mg/kg AR	-	-	-	-	< 0.10	-
bentazone	\$	mg/kg AR	-	-	-	-	< 0.10	-
clopyralid	\$	mg/kg AR	-	-	-	-	< 0.10	-
dichlorprop (2,4-DP)	\$	mg/kg AR	-	-	-	-	< 0.10	-
dinoseb (DNBP)	\$	mg/kg AR	-	-	-	-	< 0.10	-
2-methyl-4-chlorophenoxyacetic acid (MCP)	\$	mg/kg AR	-	-	-	-	< 0.10	-
mecoprop (MCP)	\$	mg/kg AR	-	-	-	-	< 0.10	-
pentachlorophenol (PCP)	\$	mg/kg AR	-	-	-	-	< 0.10	-
2,3,6-trichlorobenzoic acid (2,3,6-TBA)	\$	mg/kg AR	-	-	-	-	< 0.10	-
4-(2,4-dichlorophenoxy)butanoic acid (2,4-D)	\$	mg/kg AR	-	-	-	-	< 0.10	-
4-chlorophenoxyacetic acid (4-CPA)	\$	mg/kg AR	-	-	-	-	< 0.10	-
benazolin	\$	mg/kg AR	-	-	-	-	< 0.10	-
bromoxynil	\$	mg/kg AR	-	-	-	-	< 0.10	-
dicamba	\$	mg/kg AR	-	-	-	-	< 0.10	-
diclofop	\$	mg/kg AR	-	-	-	-	< 0.10	-
2-methyl-4,6-dinitrophenol (DNOC)	\$	mg/kg AR	-	-	-	-	< 0.10	-
flamprop	\$	mg/kg AR	-	-	-	-	< 0.10	-
fluroxypyr	\$	mg/kg AR	-	-	-	-	< 0.10	-
loxynil	\$	mg/kg AR	-	-	-	-	< 0.10	-
MCPB	\$	mg/kg AR	-	-	-	-	< 0.10	-
picloram	\$	mg/kg AR	-	-	-	-	< 0.10	-
triclopyr	\$	mg/kg AR	-	-	-	-	< 0.10	-
atrazine	\$	mg/kg DW	-	-	-	-	< 0.02	-
cyanazine	\$	mg/kg DW	-	-	-	-	< 0.02	-
prometryn	\$	mg/kg DW	-	-	-	-	< 0.02	-
propazine	\$	mg/kg DW	-	-	-	-	< 0.02	-
simazine	\$	mg/kg DW	-	-	-	-	< 0.02	-
terbuthylazine	\$	mg/kg DW	-	-	-	-	< 0.02	-
terbutryn	\$	mg/kg DW	-	-	-	-	< 0.02	-

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## SOILS

Lab number	117682-1	117682-2	117682-3	117682-4	117682-5	117682-6	
Sample id	WS1	WS1	WS2	WS3	WS4	WS4	
Depth (m)	-	0.30-0.55	0.00-0.30	0.20-0.40	0.00-0.20	0.60	
Date sampled	-	-	-	-	-	-	
Test	Method	Units					
trietazine	\$	mg/kg DW	-	-	-	< 0.02	-
azinphos-methyl	\$	mg/kg DW	-	-	-	< 0.10	-
chlorpyrifos-methyl	\$	mg/kg DW	-	-	-	< 0.10	-
cis-chlorfenvinphos (alpha)	\$	mg/kg DW	-	-	-	< 0.10	-
diazinon	\$	mg/kg DW	-	-	-	< 0.10	-
dichlorvos	\$	mg/kg DW	-	-	-	< 0.10	-
dimethoate	\$	mg/kg DW	-	-	-	< 0.10	-
fenitrothion	\$	mg/kg DW	-	-	-	< 0.10	-
fenthion	\$	mg/kg DW	-	-	-	< 0.10	-
malathion	\$	mg/kg DW	-	-	-	< 0.10	-
mevinphos (mixture of isomers)	\$	mg/kg DW	-	-	-	< 0.10	-
parathion-ethyl	\$	mg/kg DW	-	-	-	< 0.10	-
parathion-methyl	\$	mg/kg DW	-	-	-	< 0.10	-
phorate	\$	mg/kg DW	-	-	-	< 0.10	-
trans-chlorfenvinphos (beta)	\$	mg/kg DW	-	-	-	< 0.10	-

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## SOILS

Lab number			117682-7	117682-8
Sample id			WS5	WS5
Depth (m)			0.30-0.40	0.90
Date sampled			-	-
Test	Method	Units		
Antimony (total)	CE127 <sup>M</sup>	mg/kg Sb	-	<0.2
Arsenic (total)	CE127 <sup>M</sup>	mg/kg As	7.4	<1
Barium (total)	CE127 <sup>M</sup>	mg/kg Ba	-	12
Cadmium (total)	CE127 <sup>M</sup>	mg/kg Cd	0.2	<0.2
Chromium (total)	CE127 <sup>M</sup>	mg/kg Cr	24	18
Copper (total)	CE127 <sup>M</sup>	mg/kg Cu	26	5.2
Lead (total)	CE127 <sup>M</sup>	mg/kg Pb	50	2.1
Mercury (total)	CE127 <sup>M</sup>	mg/kg Hg	<0.5	<0.5
Molybdenum (total)	CE127 <sup>M</sup>	mg/kg Mo	-	<1
Nickel (total)	CE127 <sup>M</sup>	mg/kg Ni	11	3.2
Selenium (total)	CE127 <sup>M</sup>	mg/kg Se	0.5	<0.3
Zinc (total)	CE127 <sup>M</sup>	mg/kg Zn	82	<5
Total Organic Carbon (TOC)	CE197	% w/w C	3.4	-
Estimate of OMC (calculated from TOC)	CE197	% w/w	5.9	-
<b>PAH</b>				
Naphthalene	CE087 <sup>M</sup>	mg/kg	<0.02	0.03
Acenaphthylene	CE087 <sup>M</sup>	mg/kg	<0.02	<0.02
Acenaphthene	CE087 <sup>M</sup>	mg/kg	<0.02	0.08
Fluorene	CE087 <sup>U</sup>	mg/kg	<0.02	0.06
Phenanthrene	CE087 <sup>M</sup>	mg/kg	0.23	0.56
Anthracene	CE087 <sup>U</sup>	mg/kg	0.08	0.17
Fluoranthene	CE087 <sup>M</sup>	mg/kg	0.55	1.16
Pyrene	CE087 <sup>M</sup>	mg/kg	0.50	1.05
Benzo(a)anthracene	CE087 <sup>U</sup>	mg/kg	0.31	0.62
Chrysene	CE087 <sup>M</sup>	mg/kg	0.26	0.50
Benzo(b)fluoranthene	CE087 <sup>M</sup>	mg/kg	0.38	0.73
Benzo(k)fluoranthene	CE087 <sup>M</sup>	mg/kg	0.17	0.32
Benzo(a)pyrene	CE087 <sup>U</sup>	mg/kg	0.33	0.68
Indeno(123cd)pyrene	CE087 <sup>M</sup>	mg/kg	0.22	0.44
Dibenz(ah)anthracene	CE087 <sup>M</sup>	mg/kg	0.03	0.08
Benzo(ghi)perylene	CE087 <sup>M</sup>	mg/kg	0.22	0.43
PAH (total of USEPA 16)	CE087	mg/kg	3.26	6.93
<b>TPH</b>				
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	-
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01	-
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	-
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<10	-
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	<10	-
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	<1	-
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	28	-
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	<1	-

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## SOILS

Lab number			117682-7	117682-8
Sample id			WS5	WS5
Depth (m)			0.30-0.40	0.90
Date sampled			-	-
Test	Method	Units		
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	-
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1	-
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1	-
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<5	-
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<5	-
EPH Aliphatic (>C16-C35)	CE250	mg/kg	<15	-
EPH Aliphatic (>C35-C44)	CE250	mg/kg	<10	-
<b>Subcontracted analysis</b>				
Asbestos (qualitative)	\$	-	NAD	NAD
<b>Pesticides</b>				
2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	\$	mg/kg AR	< 0.10	-
2,4,5-TP (Fenoprop)	\$	mg/kg AR	< 0.10	-
2,4-dichlorophenoxyacetic acid (2,4-D)	\$	mg/kg AR	< 0.10	-
acifluorfen	\$	mg/kg AR	< 0.10	-
bentazone	\$	mg/kg AR	< 0.10	-
clopyralid	\$	mg/kg AR	< 0.10	-
dichlorprop (2,4-DP)	\$	mg/kg AR	< 0.10	-
dinoseb (DNBP)	\$	mg/kg AR	< 0.10	-
2-methyl-4-chlorophenoxyacetic acid (MCP)	\$	mg/kg AR	< 0.10	-
mecoprop (MCPP)	\$	mg/kg AR	< 0.10	-
pentachlorophenol (PCP)	\$	mg/kg AR	< 0.10	-
2,3,6-trichlorobenzoic acid (2,3,6-TBA)	\$	mg/kg AR	< 0.10	-
4-(2,4-dichlorophenoxy)butanoic acid (2,4	\$	mg/kg AR	< 0.10	-
4-chlorophenoxyacetic acid (4-CPA)	\$	mg/kg AR	< 0.10	-
benazolin	\$	mg/kg AR	< 0.10	-
bromoxynil	\$	mg/kg AR	< 0.10	-
dicamba	\$	mg/kg AR	< 0.10	-
diclofop	\$	mg/kg AR	< 0.10	-
2-methyl-4,6-dinitrophenol (DNOC)	\$	mg/kg AR	< 0.10	-
flamprop	\$	mg/kg AR	< 0.10	-
fluroxypyr	\$	mg/kg AR	< 0.10	-
loxynil	\$	mg/kg AR	< 0.10	-
MCPB	\$	mg/kg AR	< 0.10	-
picloram	\$	mg/kg AR	< 0.10	-
triclopyr	\$	mg/kg AR	< 0.10	-
atrazine	\$	mg/kg DW	< 0.02	-
cyanazine	\$	mg/kg DW	< 0.02	-
prometryn	\$	mg/kg DW	< 0.02	-
propazine	\$	mg/kg DW	< 0.02	-
simazine	\$	mg/kg DW	< 0.02	-
terbutylazine	\$	mg/kg DW	< 0.02	-
terbutryn	\$	mg/kg DW	< 0.02	-



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## SOILS

Lab number			117682-7	117682-8
Sample id			W55	W55
Depth (m)			0.30-0.40	0.90
Date sampled			-	-
Test	Method	Units		
trietazine	\$	mg/kg DW	< 0.02	-
azinphos-methyl	\$	mg/kg DW	< 0.10	-
chlorpyrifos-methyl	\$	mg/kg DW	< 0.10	-
cis-chlorfenvinphos (alpha)	\$	mg/kg DW	< 0.10	-
diazinon	\$	mg/kg DW	< 0.10	-
dichlorvos	\$	mg/kg DW	< 0.10	-
dimethoate	\$	mg/kg DW	< 0.10	-
fenitrothion	\$	mg/kg DW	< 0.10	-
fenthion	\$	mg/kg DW	< 0.10	-
malathion	\$	mg/kg DW	< 0.10	-
mevinphos (mixture of isomers)	\$	mg/kg DW	< 0.10	-
parathion-ethyl	\$	mg/kg DW	< 0.10	-
parathion-methyl	\$	mg/kg DW	< 0.10	-
phorate	\$	mg/kg DW	< 0.10	-
trans-chlorfenvinphos (beta)	\$	mg/kg DW	< 0.10	-

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## METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE127	Antimony (total)	Aqua regia digest, ICP-MS	Dry	U	0.2	mg/kg Sb
CE127	Arsenic (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg As
CE127	Barium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Ba
CE127	Cadmium (total)	Aqua regia digest, ICP-MS	Dry	M	0.2	mg/kg Cd
CE127	Chromium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cr
CE127	Copper (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cu
CE127	Lead (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Pb
CE127	Mercury (total)	Aqua regia digest, ICP-MS	Dry	M	0.5	mg/kg Hg
CE127	Molybdenum (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Mo
CE127	Nickel (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Ni
CE127	Selenium (total)	Aqua regia digest, ICP-MS	Dry	M	0.3	mg/kg Se
CE127	Zinc (total)	Aqua regia digest, ICP-MS	Dry	M	5	mg/kg Zn
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE197	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry		0.1	% w/w
CE087	Naphthalene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Indeno(1,2,3-cd)pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	As received		0.34	mg/kg
CE067	VPH Aromatic (>EC5-EC7)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC7-EC8)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC8-EC10)	Headspace GC-FID	As received		0.01	mg/kg
CE250	EPH Aromatic (>EC10-EC12)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC12-EC16)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC16-EC21)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC21-EC35)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE250	EPH Aromatic (>EC35-EC44)	Solvent extraction, GCxGC-FID	As received		1	mg/kg
CE067	VPH Aliphatic (>C5-C6)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C6-C8)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C8-C10)	Headspace GC-FID	As received		0.1	mg/kg
CE250	EPH Aliphatic (>C10-C12)	Solvent extraction, GCxGC-FID	As received		6	mg/kg
CE250	EPH Aliphatic (>C12-C16)	Solvent extraction, GCxGC-FID	As received		6	mg/kg

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## METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE250	EPH Aliphatic (>C16-C35)	Solvent extraction, GCxGC-FID	As received		15	mg/kg
CE250	EPH Aliphatic (>C35-C44)	Solvent extraction, GCxGC-FID	As received		10	mg/kg
\$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-
\$	2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	Details on request	As received		0.1	mg/kg AR
\$	2,4,5-TP (Fenoprop)	Details on request	As received		0.1	mg/kg AR
\$	2,4-dichlorophenoxyacetic acid (2,4-D)	Details on request	As received		0.1	mg/kg AR
\$	acifluorfen	Details on request	As received		0.1	mg/kg AR
\$	bentazone	Details on request	As received		0.1	mg/kg AR
\$	clopyralid	Details on request	As received		0.1	mg/kg AR
\$	dichlorprop (2,4-DP)	Details on request	As received		0.1	mg/kg AR
\$	dinoseb (DNBP)	Details on request	As received		0.1	mg/kg AR
\$	2-methyl-4-chlorophenoxyacetic acid (MCPA)	Details on request	As received		0.1	mg/kg AR
\$	mecoprop (MCPFP)	Details on request	As received		0.1	mg/kg AR
\$	pentachlorophenol (PCP)	Details on request	As received		0.1	mg/kg AR
\$	2,3,6-trichlorobenzoic acid (2,3,6-TBA)	Details on request	As received		0.1	mg/kg AR
\$	4-(2,4-dichlorophenoxy)butanoic acid (2,4-D)	Details on request	As received		0.1	mg/kg AR
\$	4-chlorophenoxyacetic acid (4-CPA)	Details on request	As received		0.1	mg/kg AR
\$	benazolin	Details on request	As received		0.1	mg/kg AR
\$	bromoxynil	Details on request	As received		0.1	mg/kg AR
\$	dicamba	Details on request	As received		0.1	mg/kg AR
\$	diclofop	Details on request	As received		0.1	mg/kg AR
\$	2-methyl-4,6-dinitrophenol (DNOC)	Details on request	As received		0.1	mg/kg AR
\$	flamprop	Details on request	As received		0.1	mg/kg AR
\$	fluroxypyr	Details on request	As received		0.1	mg/kg AR
\$	loxynil	Details on request	As received		0.1	mg/kg AR
\$	MCPB	Details on request	As received		0.1	mg/kg AR
\$	picloram	Details on request	As received		0.1	mg/kg AR
\$	triclopyr	Details on request	As received		0.1	mg/kg AR
\$	atrazine	Details on request	As received		0.1	mg/kg DW
\$	cyanazine	Details on request	As received		0.1	mg/kg DW
\$	prometryn	Details on request	As received		0.1	mg/kg DW
\$	propazine	Details on request	As received		0.1	mg/kg DW
\$	simazine	Details on request	As received		0.1	mg/kg DW
\$	terbuthylazine	Details on request	As received		0.1	mg/kg DW
\$	terbutryn	Details on request	As received		0.1	mg/kg DW
\$	trietazine	Details on request	As received		0.1	mg/kg DW
\$	azinphos-methyl	Details on request	As received		0.1	mg/kg DW
\$	chlorpyrifos-methyl	Details on request	As received		0.1	mg/kg DW
\$	cis-chlorfenvinphos (alpha)	Details on request	As received		0.1	mg/kg DW
\$	diazinon	Details on request	As received		0.1	mg/kg DW
\$	dichlorvos	Details on request	As received		0.1	mg/kg DW
\$	dimethoate	Details on request	As received		0.1	mg/kg DW
\$	fenitrothion	Details on request	As received		0.1	mg/kg DW
\$	fenthion	Details on request	As received		0.1	mg/kg DW

# Chemtech Environmental Limited

## METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
\$	malathion	Details on request	As received		0.1	mg/kg DW
\$	mevinphos (mixture of isomers)	Details on request	As received		0.1	mg/kg DW
\$	parathion-ethyl	Details on request	As received		0.1	mg/kg DW
\$	parathion-methyl	Details on request	As received		0.1	mg/kg DW
\$	phorate	Details on request	As received		0.1	mg/kg DW
\$	trans-chlorfenvinphos (beta)	Details on request	As received		0.1	mg/kg DW

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## DEVIATING SAMPLE INFORMATION

### Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

### Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
117682-1	WS1	-	N	
117682-3	WS2	0.00-0.30	N	
117682-4	WS3	0.20-0.40	N	
117682-5	WS4	0.00-0.20	N	
117682-6	WS4	0.60	N	
117682-7	WS5	0.30-0.40	N	
117682-8	WS5	0.90	N	

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## ADDITIONAL INFORMATION

### Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

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

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

For soils and solids, analytical results are inclusive of stones, where applicable.

# Chemtech Environmental Limited

## TEST REPORT REVISIONS

The table below identifies amendments that have been made to this test report for each revision.

Test Report Reference	Details of amendments to test report	Issue Date
117682	Original report issued	20 January 2023
117682(1)	Pesticides added to sample 117682-5,7	16 February 2023

# Waste Acceptance Criteria Testing BS EN 12457-Part 3, 2 Stage Process

## Sample Details

Contract Name Skelmersdale  
Lab Number 117682-6 (1)  
Sample ID WS4 0.60m  
Date Sampled -  
Date Received 13 January 2023  
Particle Size (<4mm) -  
Method of size reduction N/A  
Non-crushable matter N/A

## Test Values

Mass of Raw Test Portion (MW) kg 0.201  
Mass of Dried Test Portion (MD) kg 0.175  
Moisture Content Ratio (MC) % 14.75  
Dry Matter Content Ratio (DR) % 87.14  
Leachant Volume (1) (L2) Litre 0.324  
Leachant Volume (2) (L8) Litre 1.400  
Eluate Volume (1) (VE1) Litre 0.215  
Eluate Volume (2) (VE2) Litre 1.160

Eluate Analysis	Conc in Eluate	
	2:1	8:1
Liquid : Waste Ratio	2:1	8:1
pH (units)	7.1	6.6
Temperature (°C)	20	20
Conductivity (µS/cm)	37	18
Antimony (µg/l Sb)	0.71	<0.1
Arsenic (µg/l As)	0.93	0.39
Barium (µg/l Ba)	6.2	2.9
Cadmium (µg/l Cd)	<0.07	<0.07
Chromium (µg/l Cr)	6.3	2.7
Copper (µg/l Cu)	7.5	2.1
Lead (µg/l Pb)	1.3	0.3
Mercury (µg/l Hg)	0.025	0.013
Molybdenum (µg/l Mo)	0.4	<0.3
Nickel (µg/l Ni)	2.1	0.5
Selenium (µg/l Se)	0.67	0.21
Zinc (µg/l Zn)	4	1
Chloride (mg/l Cl)	1.0	0.5
Fluoride (mg/l F)	0.4	0.2
Sulphate (mg/l SO <sub>4</sub> )	<1.7	<1.7
Total Dissolved Solids (mg/l TDS)	30	15
Phenol Index (µg/l PhOH)	<10	<10
Dissolved Organic Carbon (mg/l C)	15	<5

Amount Leached		Council Decision 2003/33/EC Limit Values mg/kg at L:S 10:1		
2:1 mg/kg	10:1 mg/kg	Inert Waste	Non-reactive Hazardous Waste	Hazardous Waste
0.001	<0.002	0.06	0.7	5
0.002	0.005	0.5	2	25
0.012	0.033	20	100	300
<0.0002	<0.0007	0.04	1	5
0.013	0.031	0.5	10	70
0.015	0.027	2	50	100
0.003	0.004	0.5	10	50
0.00005	0.00014	0.01	0.2	2
0.001	<0.003	0.5	10	30
0.004	0.007	0.4	10	40
0.001	0.003	0.1	0.5	7
0.009	0.017	4	50	200
2.1	6	800	15000	25000
0.9	2.6	10	150	500
<3.4	<17	1000	20000	50000
60	168	4000	60000	100000
<0.02	<0.1	1		
29	<62	500	800	1000

## Waste Analysis

Total Organic Carbon  
Loss on Ignition  
BTEX  
PCBs (7 congeners)  
Mineral Oil (C10 - C40)  
PAH (total)  
pH  
Acid Neutralisation Capacity (pH4)  
Acid Neutralisation Capacity (pH7)

Units	Result			
% w/w	0.4	3%	5%	6%
% w/w	1.1			10%
mg/kg	<0.06	6		
mg/kg	<0.045	1		
mg/kg	<10	500		
mg/kg	<0.36	100		
pH units	7.2		>6	
mol/kg	0.02		To be evaluated	
mol/kg	0.02		To be evaluated	

Disclaimer: The Landfill Waste Acceptance Criteria limits in this report are provided for guidance only and values are transcribed from the Council Decision annex 2003/33/EC. Chemtech Environmental Ltd does not take responsibility for any errors or omissions in the transcription, and all data should be verified by the end user. Results will be colour flagged to the lowest threshold value breached. Any assessments made are based on the published results from the Laboratory and make no assessment of uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. Method uncertainty levels can be provided. Waste Acceptance Criteria assessment is outside the scope of the laboratory's UKAS accreditation.

## Comments

Authorised by:



Name:

Will Fardon

Report date:

26th January 2023

Position:

Technical Director

Unit 6 Parkhead, Greencroft Industrial Park, Stanley, County Durham, DH9 7YB  
Tel 01207 528578 Email customerservices@chemtech-env.co.uk  
Vat Reg No. 772 5703 18 Registered in England number 4284013



# Waste Acceptance Criteria Testing BS EN 12457-Part 3, 2 Stage Process

## Sample Details

Contract Name	Skeimersdale
Lab Number	117682-8 (1)
Sample ID	WS5 0.90m
Date Sampled	-
Date Received	13 January 2023
Particle Size (<4mm)	-
Method of size reduction	N/A
Non-crushable matter	N/A

## Test Values

Mass of Raw Test Portion (MW) kg	0.196
Mass of Dried Test Portion (MD) kg	0.175
Moisture Content Ratio (MC) %	12.11
Dry Matter Content Ratio (DR) %	89.20
Leachant Volume (1) (L2) Litre	0.329
Leachant Volume (2) (L8) Litre	1.400
Eluate Volume (1) (VE1) Litre	0.220
Eluate Volume (2) (VE2) Litre	1.180

Eluate Analysis	Conc in Eluate	
	2:1	8:1
Liquid : Waste Ratio	2:1	8:1
pH (units)	6.9	6.6
Temperature (°C)	20	20
Conductivity (µS/cm)	36	21
Antimony (µg/l Sb)	0.68	0.14
Arsenic (µg/l As)	2.20	0.74
Barium (µg/l Ba)	8.2	3.9
Cadmium (µg/l Cd)	<0.07	<0.07
Chromium (µg/l Cr)	5.0	2.4
Copper (µg/l Cu)	5.8	2.3
Lead (µg/l Pb)	1.6	0.6
Mercury (µg/l Hg)	0.014	0.009
Molybdenum (µg/l Mo)	0.7	<0.3
Nickel (µg/l Ni)	1.5	0.8
Selenium (µg/l Se)	0.49	0.13
Zinc (µg/l Zn)	3	2
Chloride (mg/l Cl)	1.7	0.6
Fluoride (mg/l F)	0.1	<0.1
Sulphate (mg/l SO <sub>4</sub> )	2.0	<1.7
Total Dissolved Solids (mg/l TDS)	25	15
Phenol Index (µg/l PhOH)	<10	<10
Dissolved Organic Carbon (mg/l C)	11	<5

Amount Leached		Council Decision 2003/33/EC Limit Values mg/kg at L:S 10:1		
2:1	10:1	Inert Waste	Non-reactive Hazardous Waste	Hazardous Waste
mg/kg	mg/kg			
0.001	<b>0.002</b>	0.06	0.7	5
0.004	<b>0.009</b>	0.5	2	25
0.016	<b>0.044</b>	20	100	300
<0.0002	<b>&lt;0.0007</b>	0.04	1	5
0.010	<b>0.028</b>	0.5	10	70
0.012	<b>0.028</b>	2	50	100
0.003	<b>0.007</b>	0.5	10	50
0.00003	<b>0.00010</b>	0.01	0.2	2
0.001	<b>&lt;0.003</b>	0.5	10	30
0.003	<b>0.009</b>	0.4	10	40
0.001	<b>0.002</b>	0.1	0.5	7
0.006	<b>0.018</b>	4	50	200
3.5	<b>7</b>	800	15000	25000
0.3	<b>&lt;1.0</b>	10	150	500
4	<b>&lt;17</b>	1000	20000	50000
50	<b>163</b>	4000	60000	100000
<0.02	<b>&lt;0.1</b>	1		
23	<b>&lt;58</b>	500	800	1000

## Waste Analysis

	Units	Result			
Total Organic Carbon	% w/w	<b>0.3</b>	3%	5%	6%
Loss on Ignition	% w/w	<b>0.9</b>			10%
BTEX	mg/kg	<b>&lt;0.06</b>	6		
PCBs (7 congeners)	mg/kg	<b>&lt;0.045</b>	1		
Mineral Oil (C10 - C40)	mg/kg	<b>74</b>	500		
PAH (total)	mg/kg	<b>7.01</b>	100		
pH	pH units	<b>8.1</b>		>6	
Acid Neutralisation Capacity (pH4)	mol/kg	<b>&lt;0.02</b>		To be evaluated	
Acid Neutralisation Capacity (pH7)	mol/kg	<b>&lt;0.02</b>		To be evaluated	

Disclaimer: The Landfill Waste Acceptance Criteria limits in this report are provided for guidance only and values are transcribed from the Council Decision annex 2003/33/EC. Chemtech Environmental Ltd does not take responsibility for any errors or omissions in the transcription, and all data should be verified by the end user. Results will be colour flagged to the lowest threshold value breached. Any assessments made are based on the published results from the Laboratory and make no assessment of uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. Method uncertainty levels can be provided. Waste Acceptance Criteria assessment is outside the scope of the laboratory's UKAS accreditation.

## Comments

Authorised by:



Name:

Will Fardon

Report date:

26th January 2023

Position:

Technical Director

Unit 6 Parkhead, Greencroft Industrial Park, Stanley, County Durham, DH9 7YB  
Tel 01207 528578 Email customerservices@chemtech-env.co.uk  
Vat Reg No. 772 5703 18 Registered in England number 4284013

## Statement of Conformity

### Statement of Conformity

Where Chemtech reports a statement of conformity to a specification, the decision rules applied are derived from the Ilac document ILAC G8:09/2019.

Acceptance limits (AL), applied are derived from the tolerance limits (TL) by you the client or applicable standard (e.g. 2003.33.EC Council Decision, BS3882, BS8601)

### Agreed and reported Decision Rule:

"PASS" if the result < TL, and the bias / precision values for the process meet the targets defined within the methodology and/or applied accreditation.

### Reported Decisions:

Result < TL for determinands: PASS

Result > TL for determinands: FAIL

### Definitions Used:

Acceptance limit (AL) Specified upper or lower bounds of permissible measured quantity values.

Tolerance limit (TL) Specified upper or lower bound of permissible values of a property.

## 11.0 WATER LEVELS AND GROUND GAS MONITORING TEST RESULTS

# GROUND INVESTIGATION SPECIALISTS LIMITED

CONTRACT: Back Lane, Skelmersdale	SHEET 1 OF 1
CLIENT: Safe as Houses Investments	JOB No. 2444
ENGINEER: ADC Limited	

DATE: 24.01.23	AIR TEMP: 4 °C	ATMOSPHERIC PRESSURE: 1029 – 1027 mb	TECHNICIAN: HSL
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### METEOROLOGICAL AND OUTSIDE SITE CONDITIONS

STATE OF GROUND	Dry	Moist	Wet	Saturated
WIND	Calm	Light	Moderate	Strong
CLOUD COVER	None	Scattered	Broken	Overcast
PRECIPITATION	None	Slight	Moderate	Heavy

BH ID	FLOW (l/hr)	START TIME	TIME ELAPSED (mins)	METHANE (% v/v)	CARBON DIOXIDE (% V/V)	OXYGEN (% v/v)	CARBON MONOXIDE (PPM)	HYDROGEN SULPHIDE (PPM)	WATER LEVEL (mbgl)
WS1	-10.40 rose to -3.3 after 3 mins	11:13	0.5	<0.1	1.2	19.3	0	0	1.28
			1	<0.1	2.1	18.5	0	0	
			2	<0.1	2.5	18.1	0	0	
			3	<0.1	2.5	18.0	0	0	
			4	<0.1	2.5	18.0	0	0	
			5						
WS3	-0.6 rose to -0.3 after 3 mins	11:41	0.5	<0.1	3.3	15.1	0	0	1.45
			1	<0.1	3.4	14.9	0	0	
			2	<0.1	3.5	14.8	0	0	
			3	<0.1	3.6	14.7	0	0	
			4	<0.1	3.6	14.0	0	0	
			5						
WS5	-12.6 rose to -3.4 after 3 mins	13:32	0.5	<0.1	1.8	17.6	10	0	2.18
			1	<0.1	2.2	16.8	10	0	
			2	<0.1	2.4	16.4	10	0	
			3	<0.1	2.3	16.3	10	0	
			4	<0.1	2.2	16.6	10	0	
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						

REMARKS:	FIG No.
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# GROUND INVESTIGATION SPECIALISTS LIMITED

<b>CONTRACT:</b> Back Lane, Skelmersdale	<b>SHEET 1 OF 1</b> <b>JOB No. 2444</b>
<b>CLIENT:</b> Safe as Houses Investments	
<b>ENGINEER:</b> ADC Limited	

<b>DATE:</b> 04.02.23	<b>AIR TEMP:</b> 8 °C	<b>ATMOSPHERIC PRESSURE:</b> 1025 mb	<b>TECHNICIAN:</b> HSL
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**METEOROLOGICAL AND OUTSIDE SITE CONDITIONS**

<b>STATE OF GROUND</b>	Dry	Moist	Wet	Saturated
<b>WIND</b>	Calm	Light	Moderate	Strong
<b>CLOUD COVER</b>	None	Scattered	Broken	Overcast
<b>PRECIPITATION</b>	None	Slight	Moderate	Heavy

BH ID	FLOW (l/hr)	START TIME	TIME ELAPSED (mins)	METHANE (% v/v)	CARBON DIOXIDE (% V/V)	OXYGEN (% v/v)	CARBON MONOXIDE (PPM)	HYDROGEN SULPHIDE (PPM)	WATER LEVEL (mbgl)	
WS1	-8.2 rose to -3.8 after 20 secs	11:00	0.5	<0.1	1.7	16.9	0	0	1.28	
			1	<0.1	2.2	15.6	0	0		
			2	<0.1	2.4	14.7	0	0		
			3	<0.1	2.4	14.6	0	0		
			4	<0.1	2.4	14.6	0	0		
			5							
WS3	-0.4 rose to -0 after 10 secs	11:14	0.5	<0.1	3.7	15.0	0	0	1.47	
			1	<0.1	3.8	14.9	0	0		
			2	<0.1	3.8	14.8	0	0		
			3	<0.1	3.8	14.8	0	0		
			4							
			5							
WSS	-0.1	11:35	0.5	<0.1	3.0	14.4	0	0	2.78	
			1	<0.1	3.0	14.2	0	0		
			2	<0.1	3.0	14.2	0	0		
			3	<0.1	3.0	14.2	0	0		
			4							
			5							
			0.5							
			1							
			2							
			3							
			4							
			5							
			0.5							
			1							
			2							
			3							
			4							
			5							
			0.5							
			1							
			2							
			3							
			4							
			5							

<b>REMARKS:</b>	<b>FIG No.</b>
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# GROUND INVESTIGATION SPECIALISTS LIMITED

<b>CONTRACT:</b> Back Lane, Skelmersdale	<b>SHEET 1 OF 1</b>
<b>CLIENT:</b> Safe as Houses Investments	<b>JOB No. 2444</b>
<b>ENGINEER:</b> ADC Limited	

<b>DATE:</b> 13.02.23	<b>AIR TEMP:</b> 8 °C	<b>ATMOSPHERIC PRESSURE:</b> 1024 - 1022 mb	<b>TECHNICIAN:</b> HSL
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**METEOROLOGICAL AND OUTSIDE SITE CONDITIONS**

<b>STATE OF GROUND</b>	Dry	Moist	Wet	Saturated
<b>WIND</b>	Calm	Light	Moderate	Strong
<b>CLOUD COVER</b>	None	Scattered	Broken	Overcast
<b>PRECIPITATION</b>	None	Slight	Moderate	Heavy

BH ID	FLOW (l/hr)	START TIME	TIME ELAPSED (mins)	METHANE (% v/v)	CARBON DIOXIDE (% V/V)	OXYGEN (% v/v)	CARBON MONOXIDE (PPM)	HYDROGEN SULPHIDE (PPM)	WATER LEVEL (mbgl)
WS1	-0.2 rose to 0 after 20 secs	10:10	0.5	<0.1	2.3	11.0	0	0	1.53
			1	<0.1	2.3	10.7	0	0	
			2	<0.1	2.3	10.7	0	0	
			3	<0.1	2.3	10.7	0	0	
			4						
			5						
WS3	-0.1	10:19	0.5	<0.1	3.8	15.6	0	0	1.70
			1	<0.1	3.9	15.4	0	0	
			2	<0.1	3.9	15.4	0	0	
			3	<0.1	3.9	15.4	0	0	
			4						
			5						
WSS	0	10:37	0.5	<0.1	3.1	16.0	0	0	2.96
			1	<0.1	3.1	15.9	0	0	
			2	<0.1	3.1	15.9	0	0	
			3	<0.1	3.1	15.9	0	0	
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						
			0.5						
			1						
			2						
			3						
			4						
			5						

<b>REMARKS:</b>	<b>FIG No.</b>
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## 12.0 GEOTECHNICAL TEST RESULTS





1220 - LLPL VMS1 01.70 T4 D - 37292-229511.XL5M

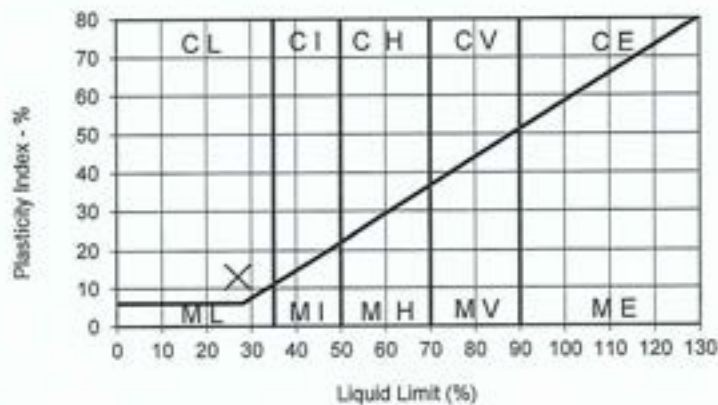
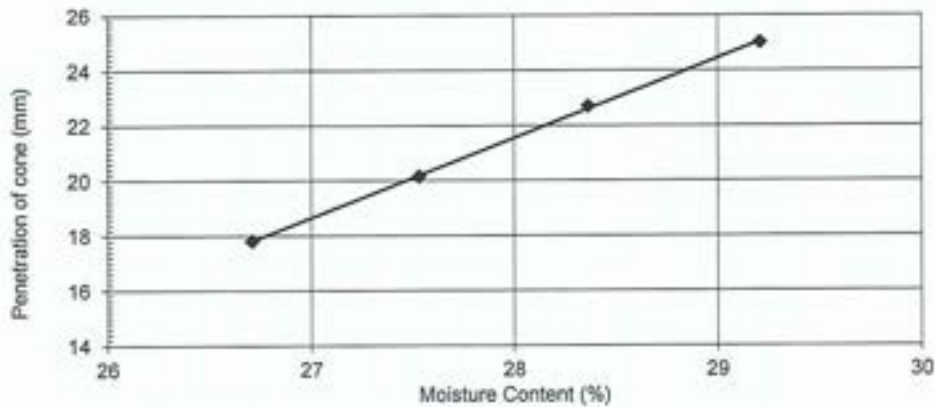
BS EN ISO 17892-12 : 2018 : Clause 5.3 & 5.5  
**LIQUID AND PLASTIC LIMITS**

Location	WS1
Sample Ref	T4
Depth (m)	1.70
Sample Type	D

Description:  
 Brownish grey very sandy CLAY with rare fine to medium gravel.

Preparation :                      Sample as received with discrete coarse particles removed by hand.

Water Content : (BS EN ISO 17892-1:2014)	14.9 %
Estimated percentage passing 425µm sieve :	98 %
Liquid Limit - Fall Cone 4 point Method (cone angle 30°) with increasing water content :	27 %
Plastic Limit :	14 %
Plasticity Index :	13 %
Equivalent Water Content of material passing 425µm sieve :	15.3 %
Liquidity Index :	0.10



GL Version 14D.220914-1220

Tested by AD  
 Checked and Approved by  
  
 J.A. Reynolds - Director  
 02/02/2023

Project Number:                      **GEO / 37292**  
 Project Name:                              **SKELMERSDALE  
 J.2444**



BS EN ISO 17892-12 : 2018 : Clause 5.3 & 5.5  
**LIQUID AND PLASTIC LIMITS**

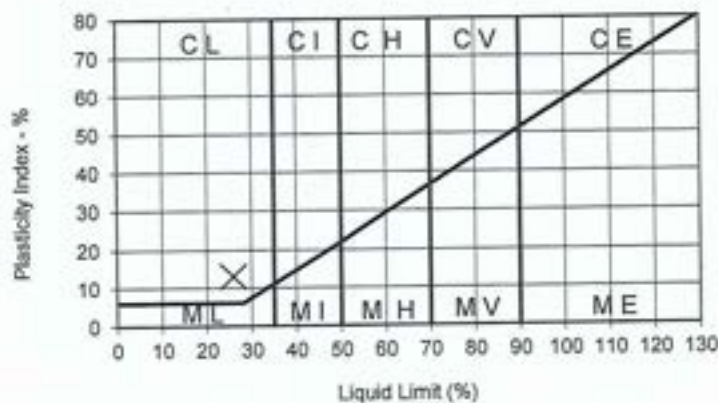
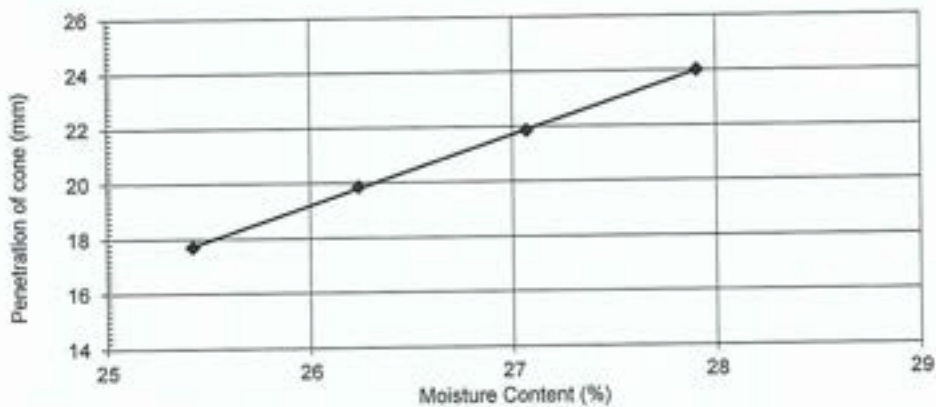
Location: WS3  
 Sample Ref: T3  
 Depth (m): 1.80  
 Sample Type: D

Description:

Dark brown very sandy CLAY with rare fine to medium gravel.

Preparation : Sample as received with discrete coarse particles removed by hand.

Water Content : (BS EN ISO 17892-1:2014)	17.0 %
Estimated percentage passing 425µm sieve :	98 %
Liquid Limit - Fall Cone 4 point Method (cone angle 30°) with increasing water content :	26 %
Plastic Limit :	13 %
Plasticity Index :	13 %
Equivalent Water Content of material passing 425µm sieve :	17.4 %
Liquidity Index :	0.34



Tested by AD  
 Checked and Approved by

*J.A. Reynolds*  
 J.A. Reynolds - Director  
 02/02/2023

Project Number:

**GEO / 37292**

Project Name:

**SKELMERSDALE  
 J.2444**



1220 - LLPL W63 02.90 T5 D - 37292-229613.XLSM

BS EN ISO 17892-12 : 2018 : Clause 5.3 & 5.5  
**LIQUID AND PLASTIC LIMITS**

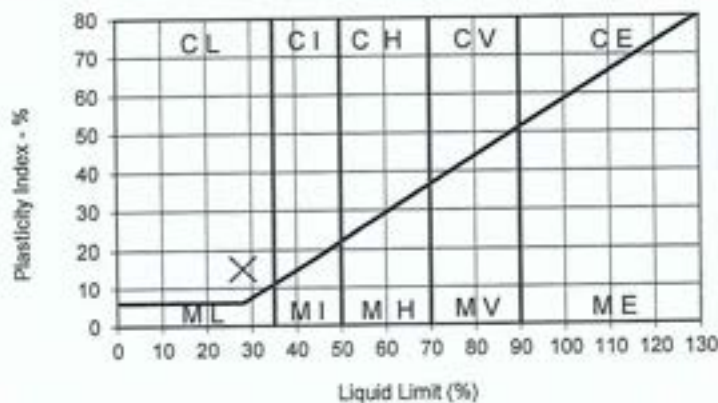
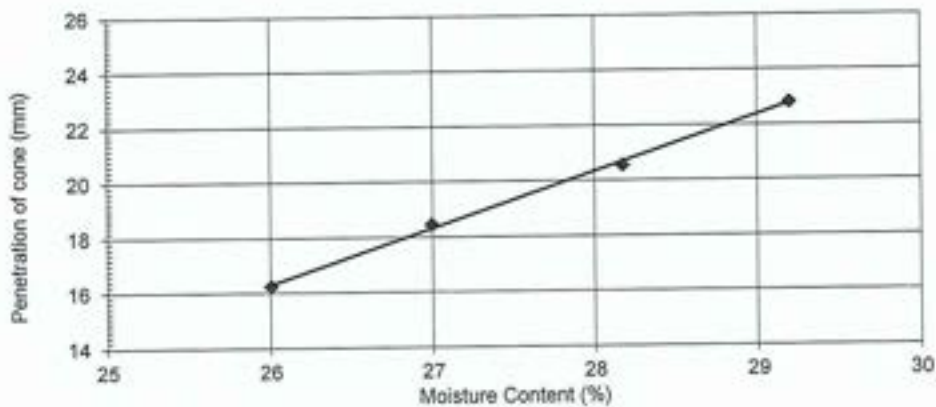
Location: WS3  
 Sample Ref: T5  
 Depth (m): 2.90  
 Sample Type: D

Description:

Dark brown very sandy CLAY with some fine to medium gravel.

Preparation : Sample as received with discrete coarse particles removed by hand.

Water Content : (BS EN ISO 17892-1:2014) 14.1 %  
 Estimated percentage passing 425µm sieve : 97 %  
 Liquid Limit - Fall Cone 4 point Method (cone angle 30°) with increasing water content : 28 %  
 Plastic Limit : 13 %  
 Plasticity Index : 15 %  
 Equivalent Water Content of material passing 425µm sieve : 14.6 %  
 Liquidity Index : 0.11



GL Version 140.220914-1220

Tested by AD  
 Checked and Approved by

*J.A. Reynolds*  
 J.A Reynolds - Director  
 02/02/2023

Project Number:

GEO / 37292

Project Name:

SKELMERSDALE  
 J.2444



1220 - LLPL WS4 01.70 T4 D - 37292-229514.XLSM

BS EN ISO 17892-12 : 2018 : Clause 5.3 & 5.5  
**LIQUID AND PLASTIC LIMITS**

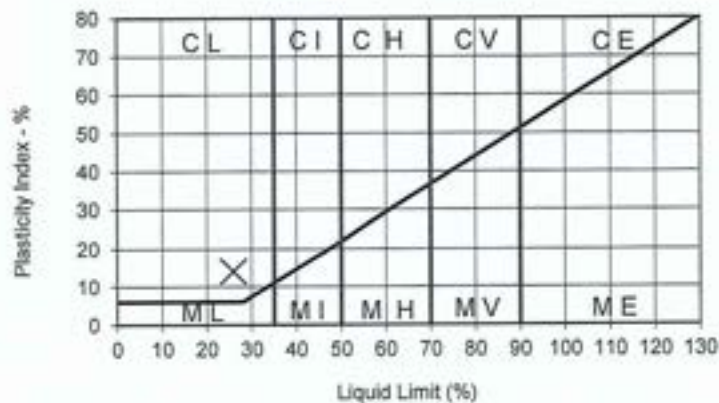
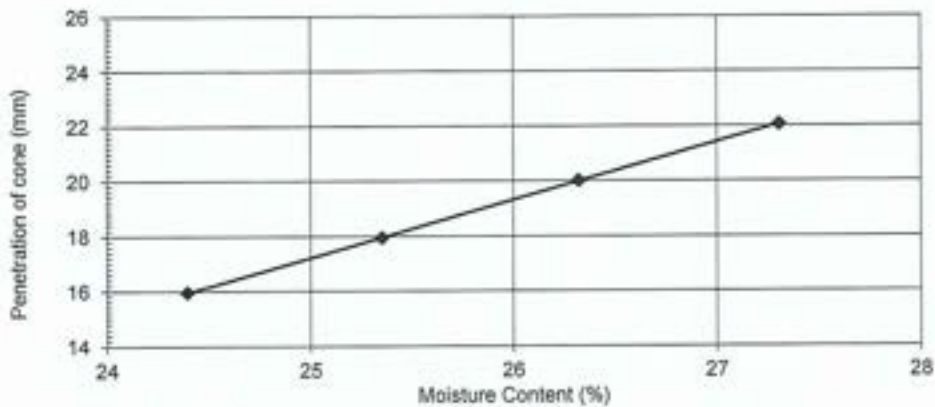
Location: WS4  
 Sample Ref: T4  
 Depth (m): 1.70  
 Sample Type: D

Description:

Greyish brown very sandy CLAY with rare fine to medium gravel.

Preparation : Sample as received with discrete coarse particles removed by hand.

Water Content : (BS EN ISO 17892-1:2014) 18.2 %  
 Estimated percentage passing 425µm sieve : 98 %  
 Liquid Limit - Fall Cone 4 point Method (cone angle 30°) with increasing water content : 26 %  
 Plastic Limit : 12 %  
 Plasticity Index : 14 %  
 Equivalent Water Content of material passing 425µm sieve : 18.6 %  
 Liquidity Index : 0.47



GL Version 140.220914-1220

Tested by AD  
 Checked and Approved by  
  
 J.A. Reynolds - Director  
 03/02/2023

Project Number: **GEO / 37292**  
 Project Name: **SKELMERSDALE J.2444**



BS EN ISO 17892-12 : 2018 : Clause 5.3 & 5.5  
**LIQUID AND PLASTIC LIMITS**

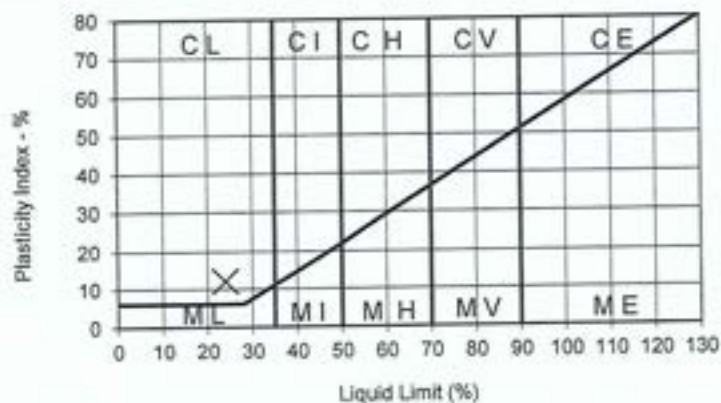
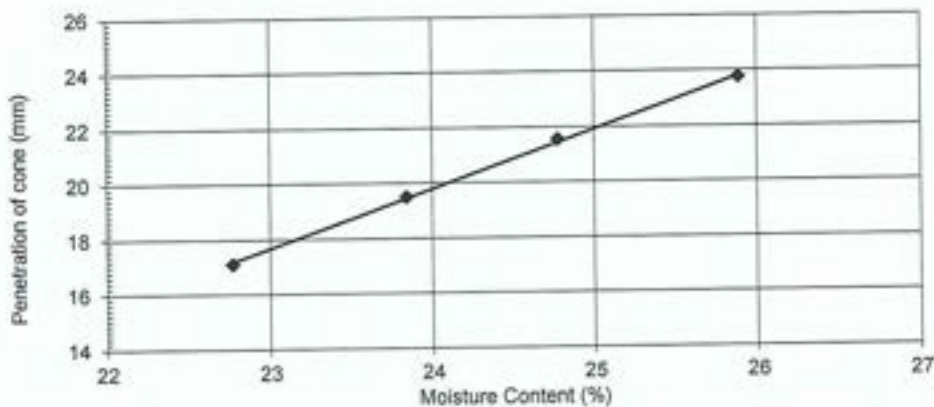
Location: WS5  
 Sample Ref: T4  
 Depth (m): 1.70  
 Sample Type: D

Description:

Dark brown very sandy CLAY with rare fine to medium gravel.

Preparation : Sample as received with discrete coarse particles removed by hand.

Water Content : (BS EN ISO 17892-1:2014) 14.6 %  
 Estimated percentage passing 425µm sieve : 98 %  
 Liquid Limit - Fall Cone 4 point Method (cone angle 30") with increasing water content : 24 %  
 Plastic Limit : 12 %  
 Plasticity Index : 12 %  
 Equivalent Water Content of material passing 425µm sieve : 14.9 %  
 Liquidity Index : 0.24



Tested by AD  
 Checked and Approved by

*J.A. Reynolds*  
 J.A. Reynolds - Director  
 03/02/2023

Project Number:

GEO / 37292

Project Name:

SKELMERSDALE  
 J.2444





1262 - PSD S1 01\_10 B Test WS - 37350-229625\_31.5M

BS EN ISO 17892-4 : 2016

## PARTICLE SIZE DISTRIBUTION

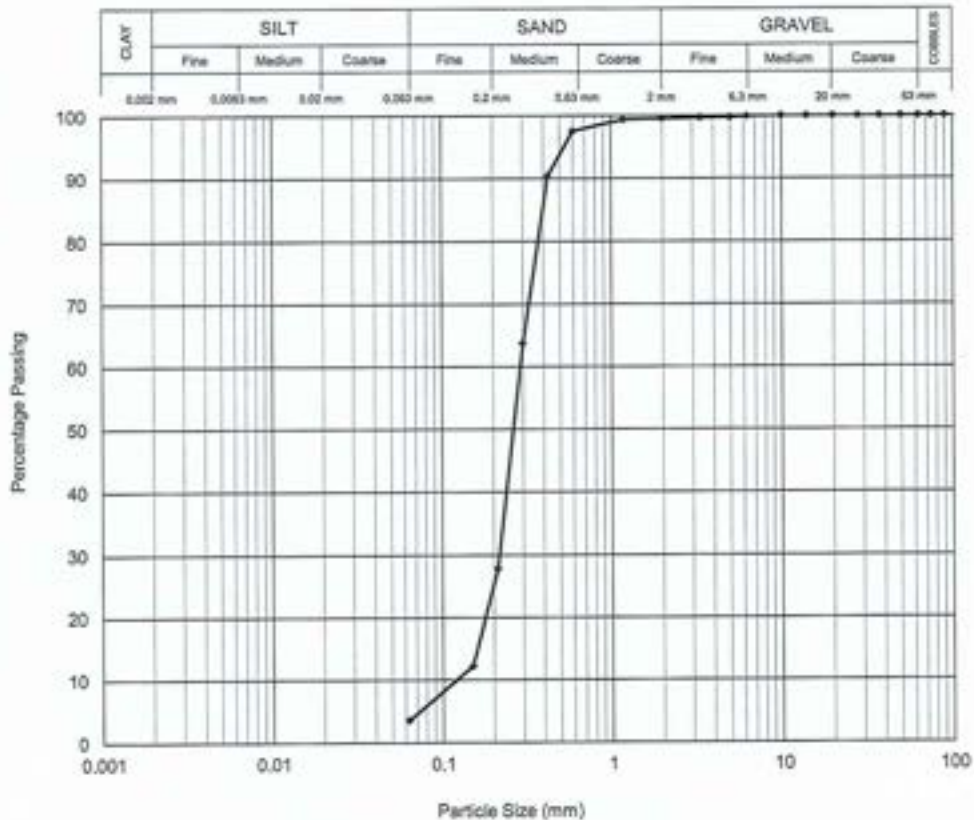
Location: S1  
 Depth (m): 1.10  
 Sample Type: B

**Description**

Dark brown slightly clayey SAND.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	99
600 µm	98
425 µm	90
300 µm	64
212 µm	28
150 µm	12
63 µm	4



Particle Proportions	
Cobbles	0.0
Gravel	0.4
Sand	95.9
Silt & Clay	3.7

GL Version 115.236118-1262

Tested by PK  
 Checked and Approved by

*J.A. Reynolds*

J.A. Reynolds - Director  
 13/02/2023

Project Number:

**GEO / 37350**

Project Name:

**SKELMERSDALE  
 J.2444**



BS EN ISO 17892-4 : 2016

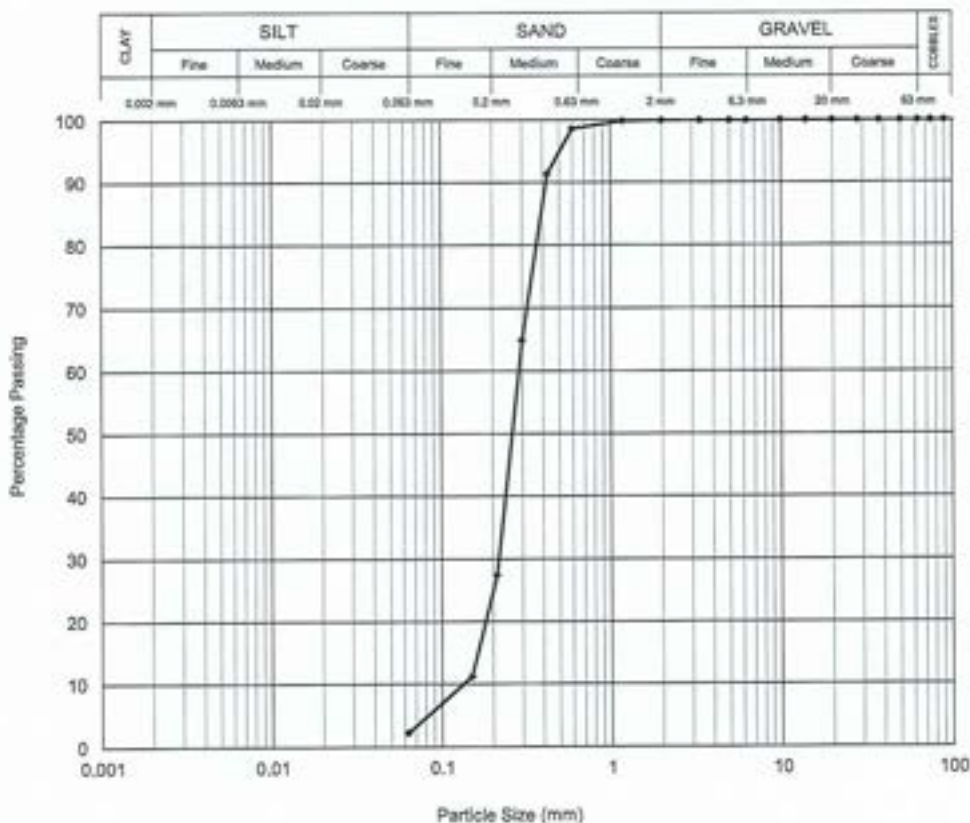
## PARTICLE SIZE DISTRIBUTION

Location: S2  
 Depth (m): 0.90  
 Sample Type: B

Description:  
 Dark brown slightly clayey SAND.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	100
1.18 mm	100
600 µm	99
425 µm	91
300 µm	65
212 µm	27
150 µm	11
63 µm	2



Particle Proportions	
Cobbles	0.0
Gravel	0.1
Sand	97.7
Silt & Clay	2.2

Tested by PK  
 Checked and Approved by  
  
 J.A. Reynolds - Director  
 13/02/2023

Project Number:  
**GEO / 37350**

Project Name:  
**SKELMERSDALE  
 J.2444**







## 13.0 WASTE CLASSIFICATION REPORT



# Waste Classification Report

HazWasteOnline™ classifies waste as either hazardous or non-hazardous based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- a) understand the origin of the waste
- b) select the correct List of Waste code(s)
- c) confirm that the list of determinands, results and sampling plan are fit for purpose
- d) select and justify the chosen metal species (Appendix B)
- e) correctly apply moisture correction and other available corrections
- f) add the meta data for their user-defined substances (Appendix A)
- g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



Q4DPA-9HCMD-84KOK

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

### Job name

Black Lane Skelmersdale

### Description/Comments

### Project

### Site

### Classified by

Name: Tom McLaren  
 Date: 16 Feb 2023 15:01 GMT  
 Telephone: 01902 717653

Company: Ground Investigation Specialists Limited  
 GIS

HazWasteOnline™ provides a two-day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

Course: Hazardous Waste Classification

Date

### Purpose of classification

4 - Classification of Waste Products

### Address of the waste

Post Code

### SIC for the process giving rise to the waste

### Description of industry/producer giving rise to the waste

### Description of the specific process, sub-process and/or activity that created the waste

### Description of the waste



### Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	Sand Max	0.6 - 0.9	Non Hazardous		3

### Related documents

#	Name	Description
1	General Soil Default Waste Stream	waste stream template used to create this Job

### Report

Created by: Tom McLaren

Created date: 16 Feb 2023 15:01 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	5
Appendix B: Rationale for selection of metal species	6
Appendix C: Version	6



Classification of sample: Sand Max

✔ **Non Hazardous Waste**  
Classified as **17 05 04**  
in the List of Waste

Sample details

Sample name:	LoW Code:	
<b>Sand Max</b>	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
<b>0.6 - 0.9 m</b>		

Hazard properties

None identified

Determinands

Moisture content: 0% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conc. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic ( * arsenic compounds, with the exception of those specified elsewhere in this Annex ) 033-002-00-5			1	<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
2	cadmium ( cadmium sulfide ) 048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
3	chromium(III) oxide (worst case) 215-160-9		1308-38-9		18	mg/kg		18	mg/kg	0.0018 %	✓	
4	copper ( dicopper oxide; copper (I) oxide ) 029-002-00-X	215-270-7	1317-39-1		7.3	mg/kg	1.126	8.219	mg/kg	0.000822 %	✓	
5	lead ( * lead compounds with the exception of those specified elsewhere in this Annex ) 082-001-00-6			1	2.2	mg/kg		2.2	mg/kg	0.00022 %	✓	
6	mercury ( compounds of mercury (with the exception of mercuric sulfide and those listed separately in this Annex ) 080-002-00-6			1	<0.5	mg/kg	1.39	<0.695	mg/kg	<0.00005 %		<LOD
7	nickel ( nickel dihydroxide ) 028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		3.2	mg/kg	1.579	5.054	mg/kg	0.000505 %	✓	
8	selenium ( selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex ) 034-002-00-8				<0.3	mg/kg	1.405	<0.422	mg/kg	<0.0000422 %		<LOD
9	zinc ( zinc oxide ) 030-013-00-7	215-222-5	1314-13-2		<5	mg/kg	1.245	<6.224	mg/kg	<0.000622 %		<LOD
10	naphthalene 801-052-00-2	202-049-5	91-20-3		0.03	mg/kg		0.03	mg/kg	0.000003 %	✓	
11	acenaphthylene 205-917-1		208-96-8		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
12	acenaphthene 201-489-8		83-32-9		0.08	mg/kg		0.08	mg/kg	0.000008 %	✓	
13	fluorene 201-695-5		86-73-7		0.06	mg/kg		0.06	mg/kg	0.000006 %	✓	
14	phenanthrene 201-581-5		85-01-8		0.56	mg/kg		0.56	mg/kg	0.000056 %	✓	
15	anthracene 204-371-1		120-12-7		0.17	mg/kg		0.17	mg/kg	0.000017 %	✓	



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	* fluoranthene				1.16 mg/kg		1.16 mg/kg	0.000116 %	✓	
		205-912-4	206-44-0							
17	* pyrene				1.05 mg/kg		1.05 mg/kg	0.000105 %	✓	
		204-927-3	129-00-0							
18	benzo[a]anthracene				0.62 mg/kg		0.62 mg/kg	0.000062 %	✓	
	801-033-00-9	200-280-8	56-55-3							
19	chrysene				0.5 mg/kg		0.5 mg/kg	0.00005 %	✓	
	801-048-00-0	205-923-4	218-01-9							
20	benzo[b]fluoranthene				0.73 mg/kg		0.73 mg/kg	0.000073 %	✓	
	801-034-00-4	205-911-9	205-99-2							
21	benzo[k]fluoranthene				0.32 mg/kg		0.32 mg/kg	0.000032 %	✓	
	801-036-00-5	205-916-6	207-08-9							
22	benzo[a]pyrene; benzo[def]chrysene				0.68 mg/kg		0.68 mg/kg	0.000068 %	✓	
	801-032-00-3	200-028-5	50-32-8							
23	* indeno[123-cd]pyrene				0.44 mg/kg		0.44 mg/kg	0.000044 %	✓	
		205-893-2	193-39-5							
24	dibenz[a,h]anthracene				0.08 mg/kg		0.08 mg/kg	0.000008 %	✓	
	801-041-00-2	200-181-8	53-70-3							
25	* benzo[ghi]perylene				0.43 mg/kg		0.43 mg/kg	0.000043 %	✓	
		205-883-8	191-24-2							
Total:								0.00487 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- \* Determinand defined or amended by HazWasteOnline (see Appendix A)
- & Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- This determinand is defined in the EU CLP Table 3
- <LOD Below limit of detection
- ND Not detected
- CLP: Note 1 Only the metal concentration has been used for classification



## Appendix A: Classifier defined and non GB MCL determinands

### \* arsenic compounds, with the exception of those specified elsewhere in this Annex

GB MCL index number: 033-002-00-5

Description/Comments: Worst Case: IARC considers arsenic compounds Group 1; Carcinogenic to humans

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

### \* chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H332, Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Resp. Sens. 1; H334, Skin Sens. 1; H317, Repr. 1B; H360FD, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

### \* lead compounds with the exception of those specified elsewhere in this Annex

GB MCL index number: 082-001-00-6

Description/Comments: Least-worst case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers many simple lead compounds to be Carcinogenic category 2

Additional Hazard Statement(s): Carc. 2; H351

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium [www.reach-lead.eu/substanceinformation.html](http://www.reach-lead.eu/substanceinformation.html), Review date 29/09/2015

### ■ compounds of mercury (with the exception of mercuric sulfide and those listed separately in this Annex)

EU CLP index number: 080-002-00-6

Description/Comments: Combines the average of the conversion factors for Mercury difulminate and Mercury (II) sulphide.

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Hazard Statements: Acute Tox. 2; H330, Acute Tox. 1; H310, Acute Tox. 2; H300, STOT RE 2; H373, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, STOT RE 2; H373 >= 0.1 %

### \* acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H302, Acute Tox. 1; H330, Acute Tox. 1; H310, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315

### \* acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Aquatic Chronic 2; H411

### \* fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1; H400, Aquatic Chronic 1; H410

### \* phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Carc. 2; H351, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Skin Irrit. 2; H315

### \* anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410



\* fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database  
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>  
Data source date: 21 Aug 2015  
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

\* pyrene (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014  
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>  
Data source date: 21 Aug 2015  
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

\* indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database  
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>  
Data source date: 06 Aug 2015  
Hazard Statements: Carc. 2; H351

\* benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015  
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>  
Data source date: 23 Jul 2015  
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

## Appendix B: Rationale for selection of metal species

### arsenic (arsenic compounds, with the exception of those specified elsewhere in this Annex)

Worst case species based on risk phrases

### cadmium (cadmium sulfide)

Worst case species based on risk phrases

### copper (dicopper oxide; copper (I) oxide)

Most likely common species

### lead (lead compounds with the exception of those specified elsewhere in this Annex)

Worst case species based on risk phrases

### mercury (compounds of mercury (with the exception of mercuric sulfide and those listed separately in this Annex))

Worst case species based on risk phrases

### nickel (nickel dihydroxide)

Worst case species based on risk phrases

### selenium (selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex)

Worst case species based on risk phrases

### zinc (zinc oxide)

Worst case species based on risk phrases

## Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021  
HazWasteOnline Classification Engine Version: 2023.25.5511.10206 (25 Jan 2023)  
HazWasteOnline Database: 2023.25.5511.10206 (25 Jan 2023)





This classification utilises the following guidance and legislation:

**WM3 v1.2.GB - Waste Classification** - 1st Edition v1.2.GB - Oct 2021

**CLP Regulation** - Regulation 1272/2008/EC of 16 December 2008

**1st ATP** - Regulation 790/2009/EC of 10 August 2009

**2nd ATP** - Regulation 286/2011/EC of 10 March 2011

**3rd ATP** - Regulation 618/2012/EU of 10 July 2012

**4th ATP** - Regulation 487/2013/EU of 8 May 2013

**Correction to 1st ATP** - Regulation 758/2013/EU of 7 August 2013

**5th ATP** - Regulation 944/2013/EU of 2 October 2013

**6th ATP** - Regulation 605/2014/EU of 5 June 2014

**WFD Annex III replacement** - Regulation 1357/2014/EU of 18 December 2014

**Revised List of Waste 2014** - Decision 2014/955/EU of 18 December 2014

**7th ATP** - Regulation 2015/1221/EU of 24 July 2015

**8th ATP** - Regulation (EU) 2016/918 of 19 May 2016

**9th ATP** - Regulation (EU) 2016/1179 of 19 July 2016

**10th ATP** - Regulation (EU) 2017/776 of 4 May 2017

**HP14 amendment** - Regulation (EU) 2017/997 of 8 June 2017

**13th ATP** - Regulation (EU) 2018/1480 of 4 October 2018

**14th ATP** - Regulation (EU) 2020/217 of 4 October 2019

**15th ATP** - Regulation (EU) 2020/1182 of 19 May 2020

**The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)**

**Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020**

**The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK:**

**2020 No. 1540 of 16th December 2020**

**GB MCL List - version 1.1 of 09 June 2021**

14.0 HISTORICAL BOREHOLE RECORDS

BGS Reference: SD 50 SW 422  
 NGR: 350050, 404920  
 BOREHOLE RECORD SHEET

HIGHWAY & FOUNDATION SURVEYS LTD.,  
 BROOK LANE, PEMBERTON, WIGAN, LANCs.

Date JULY 1972	Scale 1:50	Job No. 917	Location DIGMOOR ROAD WEST - SKELMERSDALE	Borehole <b>1</b>
Method SHELL and AUGER			Client SKELMERSDALE DEVELOPMENT CORP.	

Drilling & Casing Progress	Water Notes & Levels	Sample Type & Depths	S.P.T. 'N' value or Cohesion*	Description	O.D. Level	Legend	Depth
				TOPSOIL			0.0
4th		X 1.0 - 1.4	6	Dark Brown slightly Moist SAND			0.3
		U 1.5 - 2.0	19.6	Yellow-Brown, soft, silty, peaty CLAY changing to firm/soft, silty, sandy Grey CLAY			1.4
		U 3.0 - 3.5	85.5	Firm/soft, silty BOULDER CLAY			2.0
	small 4.9	U 4.7 - 5.1	87.9				4.9
4th	F.W.L. 3.5	X 5.5 - 5.9	109	Grey-Blue Clayey SHALE			6.0
				END OF BORE			






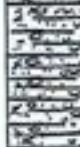


— Bore depth      U Undisturbed sample      X Standard penetration test  
 — Cased depth      D Disturbed sample      W Water sample  
 \* Cohesion in kN/m<sup>2</sup>      \* If none unless given in brackets



BGS Reference: SD 50SW 423  
 NGS: 350040, 404990

HIGHWAY & FOUNDATION SURVEYS LTD.,  
 BROOK LANE, PEMBERTON, WIGAN, LANCs.

BOREHOLE RECORD SHEET

Date JULY 1972	Scale 1:50	Job No. 917	Location DIGMOOR ROAD WEST - SKELMERSDALE	Borehole <b>2</b>
Method SHELL AND AUGER			Client SKELMERSDALE DEVELOPMENT CORP.	

Drilling & Casing Progress	Water Notes & Levels	Sample Type & Depths	S.P.T. 'N' value or Cohesion*	Description	O.D. Level	Legend	Depth
3rd				TOPSOIL and Medium/Fine SAND			0.0
		X 1.0 - 1.4	13	Dark Brown, Med/Fine SAND with occasional Brick Fill			0.9
				Moist, Light Brown, Med/Fine SAND			1.4
	slight 1.8 sealed 2.0			Dark, slightly clayey PEAT			1.8
		U 2.0 - 2.4	68.9 (6°)	Firm, silty, sandy, Grey-Brown CLAY			
	small 4.3	U 3.5 - 4.0	161.0	Firm/soft, silty CLAY with wet silty SAND Bands and occasional Gravel			4.0
	sealed 5.3	X 4.8 - 5.3	14	Firm/soft, silty BOULDER CLAY, with traces of Grey-Blue SHALE at 6.0m.			5.0
3rd	F.W.L. 3.3	U 5.6 - 6.0	127.3				6.1
				END OF BORE			

 Bore depth  
 Cased depth  
 U Undisturbed sample  
 D Disturbed sample  
 X Standard penetration test  
 W Water sample

BGS Reference: SD50NW 231  
 NGR: 350030, 405050

HIGHWAY & FOUNDATION SURVEYS LTD.,  
 BROOK LANE, PEMBERTON, WIGAN, LANCs.

BOREHOLE RECORD SHEET

Date JULY 1972	Scale 1:50	Job No. 917	Location DIGMOOR ROAD WEST - SKELMERSDALE	Borehole <b>3</b>
Method SHELL AND AUGER			Client SKELMERSDALE DEVELOPMENT CORP.	

Drilling & Casing Progress	Water Notes & Levels	Sample Type & Depths	S.P.T. 'N' value or Cohesion*	Description	O.D. Level	Legend	Depth
1st				TOPSOIL			0.0
		X 1.0 - 1.4	6	Moist, medium to fine Brown SAND			0.5
	slight 1.2 sealed 1.5	U 1.5 - 2.0	31.3	Yellow-Brown, slightly clayey PEAT			1.2
				Firm, soft, silty, sandy Grey-Brown CLAY			1.4
		U 3.0 - 3.5	165.7	Firm, soft, silty, sandy, BOULDER CLAY			2.6
	small 3.8	X 4.4 - 4.9	13	Wet, silty, clayey SAND, with bands of silty, sandy CLAY			3.8
	sealed 5.2	U 5.3 - 5.8	186.5	Firm, stiff, sandy BOULDER CLAY			5.1
1st	P.W.L. 2.1			Grey-blue clayey SLATE			6.0
				END OF BORE			6.1

— Bore depth      U Undisturbed sample      X Standard penetration test  
 — Cased depth    D Disturbed sample      W Water sample  
 \* Cohesion in kN/m<sup>2</sup>    @ in spec. unless shown in brackets