





EARTH ENVIRONMENTAL & GEOTECHNICAL

GeoEnvironmental Investigation

Eastlands Primary

Manchester

January 2021

On behalf of

electricity north west
Bringing energy to your door

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GEOENVIRONMENTAL INVESTIGATION

EASTLANDS PRIMARY

MANCHESTER

Report Ref: A3738/20

JANUARY 2021

Prepared on Behalf of:

Electricity North West Ltd

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Report Reference: A3738/20

Version B.1

Date: 20th January 2021

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D. Applied during initial drafting of the report before it has been reviewed.
C. Applied after the report has been reviewed but before it has been approved by the Project Manager.
B. Applied after the Project Manager has approved the report ready for issue to the client.
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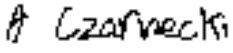
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1.0 EXECUTIVE SUMMARY

Appointment	A Site Investigation has been commissioned by Electricity North West Ltd to examine ground conditions for a proposed electrical substation at a site located at Eastlands, Manchester.
The Investigation	The investigation comprised 2no.cable percussive boreholes with associated sampling and in situ testing, laboratory geotechnical, gas monitoring and contamination testing.
The Site	The site is located in Manchester approximately 2.50km to the west of Manchester City Centre. The approximate National Grid Reference for the centre of the site is SJ 86467 98655 (X: 386468, Y: 398653). The site is underlain by deposits of Made Ground followed by superficial deposits of Devensian Diamicton Till Alluvium. This is underlain by the Pennine Upper Coal Measures Formation comprising of mudstone, siltstone and sandstone.
Ground Conditions Encountered	The exploratory holes encountered Made Ground (up to 5.80m thick, BH2) overlying clays with varying amounts of sand and gravel (up to 9.60m thick, BH2). Mudstone was also encountered in BH2 at a depth of 9.60m. Groundwater was encountered at 2.30m in BH1.
Ground Gas Assessment	A ground gas assessment has been undertaken and has identified an absence of any ground gases.
Geotechnical Assessment	Foundation options are ground improvement or piles, due to the deep Made Ground encountered. Pavement Design – preliminary design value = 1% in Made Ground. Design Sulphate Class = DS-2 ACEC Site Classification = AC-1s
This sheet is intended to provide a summary only of the report. It does not provide a definitive engineering analysis for the purposes of costing or construction and is subject to the limitation of the agreed brief.	

2.0 INTRODUCTION

2.1 Background

A Geo-Environmental Site Investigation has been commissioned by Electricity North West Ltd (the Client) to examine ground conditions for a new electrical substation facility.

2.2 Previous Investigations

No previous site investigations were known of at time of writing.

2.3 Terms of Reference

Earth Environmental and Geotechnical Ltd (EEG) have been commissioned by the Client, to undertake a Site Investigation of the site in accordance with proposal A3738/20 dated 24th September 2020. The objectives of this investigation are as follows:

- *Provide factual information on the work undertaken including sampling location plan, borehole logs, geotechnical and chemical testing.*
- *Tier 1 (semi-quantitative) risk assessment will be undertaken. This will compare the concentrations of soil and ground gas contaminants identified against current and appropriate published guidelines, in relation to identified receptors, e.g. existing/ future end users and site neighbours.*
- *Classification of soil for offsite disposal.*
- *Assessment of ground conditions for foundation design.*

2.4 Report Scope

This report presents full factual records of the site work carried out, the ground conditions encountered in the exploratory holes, the in situ and laboratory test results. All information collected has been used to provide an interpretation of the ground conditions, with recommendations on geotechnical design and potential ground contamination risks for the proposed development.

2.5 Limitations of the Study

The report is written in the context of an agreed scope of work and budget and should not be used in a different context. New information, improved practices or changes in legislation may require a reinterpretation of the report in whole or in part. EEG reserve the right to amend either conclusions or recommendations in light of any further information that may become available. The report is provided for the sole use by the client and is confidential to them.

Recommendations within this report are also based on exploratory records and examination of samples and, where applicable, laboratory tests. No liability can be accepted for conditions not revealed by the boreholes particularly at intervening locations. Whilst every effort is made to ensure accuracy of data supplied, all opinions expressed as to the spatial distribution of strata between sampling locations is for guidance only and no responsibility is accepted as to its accuracy.

3.0 SITE LOCATION & DESCRIPTION

The site is located in Manchester approximately 2.5km west of Manchester city centre. . The National Grid Reference for the centre of the site is SJ 86467 98655 with the closest postcode being M11 3JJ.

The site is located adjacent to the existing Eastlands Primary Substation.

The site is an irregular shaped parcel of land accessible from Rowsley Street with maximum dimensions of 25m north to south and 25m east to west and an area of less than 0.01ha.

The topography of the site is varied. There is a raised area towards the east with a retaining wall running along the road on site towards the western boundary. The grassy area is the centre of the site slopes towards the west.

The raised area of site stores bins on a hardstanding surface. There is a grassy area in the centre of the site with a lamppost and mobile office towards the east. There is also a road which runs around the south and western boundaries.

To the north of the site are railway tracks beyond which is a canal and a carpark. To the east is a recreational sports field. To the south is a road followed by commercial units. To the west of the site is a road beyond which are industrial units.

The site location is shown in the aerial photograph presented as Figure 1, below.

Figure 1: Aerial Photograph Showing Site Location



Access is from Rowsley Street to the south of the site.

General site photographs are presented in Figure 2 overleaf.

Figure 2: General Site Photographs

View of NW corner of the site, looking N



View of site, looking NW



3.1 Proposed Development

It is understood that the Client intends to build an electricity substation in the central part of the site. Access will be provided via Rowsley Street.

The proposed development plan was not available at the time of writing.

4.0 SITE INVESTIGATION

4.1 Exploratory Fieldwork

The fieldwork was carried out by EEG on 12th and 13th November 2020 and comprised:

- 2no. 150mm diameter boreholes (designated BH1 and BH2 inclusive) were sunk to depths of between 10.00m and 11.45m below existing ground level, using a light cable percussion boring rig. With this type of rig boreholes are advanced by the percussive action of drill tools suspended on a winch-driven steel cable. The tools generally include a clay-cutter for penetrating fine-grained soils, and a shell for use in coarse-grained, or "granular", soils. Representative disturbed samples were recovered as boring proceeded. In addition, "undisturbed" 100mm diameter samples (U100's) were recovered, as appropriate, using standard thick-walled, open-drive samplers, with a steel cutting shoe, dynamically driven by a sliding hammer. Standard Penetration Tests (SPTs) were undertaken in the boreholes in accordance with BS EN ISO 22476-3. Chiselling techniques, using a chisel or shell, were employed where necessary, to advance the boreholes through obstructions or into hard strata. Details of groundwater conditions were noted and are indicated on the attached borehole logs. These observations relate only to the time of boring, and do not necessarily reflect possible seasonal fluctuations. They may have been affected by the installation of casing, or the addition of water to aid boring. Borehole logs are included in Appendix 1.

- 50mm diameter standpipes were installed in both sample boreholes to a depth of 7.00m below ground level. Installation and backfill details are shown with the appropriate borehole log sheet. EEG carried out ground gas monitoring in standpipes after the fieldwork period, the results of which are presented in Appendix 5.

Exploratory hole locations were selected on-site by an EEG engineer based on the proposed development layout and avoiding known services.

The locations were also agreed on site with the client representative.

Each exploratory location was scanned using a Cable Avoidance Tool (CAT) in order to locate unrecorded underground services, and the exploratory locations were repositioned if necessary.

On completion, samples recovered from the site were taken to specialist laboratories for chemical and geotechnical testing.

All site investigation work was supervised full time by a representative of EEG. The logging of soils and rocks has been carried out in accordance with BS5930(2015) except where superseded by the soil and rock description methodology in BS EN14688-1(2002), BS EN 14688-2(2004) and BS EN 14689-1(2003).

An Exploratory Hole Location Plan is presented as Figure 3, overleaf.

Figure 3: Exploratory Hole Location Plan



A summary of exploratory holes undertaken during the investigation are presented in Table 1 below.

Table 1: Summary of Exploratory Holes Undertaken

Hole	Type*	Depth (m)	Date Started	Date Finished	Easting (m)	Northing (m)	Backfill Details**
BH1	CP	9.40	12/11/20	12/11/20	386458	398662	SP
BH2	CP	10.10	13/11/20	13/11/20	386469	398642	SP

*CP = Cable Percussive Borehole
**SP = Standpipe

4.2 Laboratory Testing

4.2.1 *Geotechnical Testing*

A programme of laboratory testing was carried out on samples taken from the various strata to assist in classification and determine the engineering properties of the materials underlying the site. The tests were scheduled by EEG and carried out by Murray Rix. The test procedures used were generally in accordance with the methods described in BS1377:1990. Details of the specific tests used in each case are given in Table 2, below.

Table 2: Summary of Laboratory Geotechnical Tests Undertaken

TEST	STANDARD	No.
Moisture Content	BS1377:1990 Part 2, Clause 3.2	6
Liquid Limit, Plastic Limit, Plasticity Index	BS1377:1990 Part 2, Clause 4/5	6

pH value	BS1377:1990 Part 3, Clause 9	6
Triaxial tests Undrained with multistage loading	BS1377:1990 Part 7, Clause 9	5

The results of the laboratory geotechnical tests are discussed in Section 6 and included in Appendix 2.

4.2.2 *Environmental Testing*

The environmental chemistry of the ground was investigated by specialist chemical analysis of selected samples, scheduled by EEG and carried out by DETS.

Chemical analyses were carried out on six soil samples and were submitted for the following suite of determinants:

Asbestos Screen, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Vanadium, Zinc, Cyanide, Phenol, Sulphate (SO_4), Sulphide, pH, Soil Organic Matter, Speciated hydrocarbons and Speciated Polyaromatic Hydrocarbons (PAH).

The results of the laboratory contamination tests are discussed in Section 8 and included in Appendix 3.

5.0 GROUND CONDITIONS ENCOUNTERED

5.1 Soil Profile Encountered

BGS digital mapping shows the site is underlain by superficial deposits of Devensian Diamicton Till. The solid geology beneath the site is the Pennine Upper Coal Measures Formation, comprising sandstone, coal seams, mudstone and siltstone. The sequence of strata encountered beneath the site was as follows:

- **Made Ground –** Variable Made Ground was encountered in all the exploratory holes, comprising:
  - MACADAM (BH1 and BH2)
  - Clayey gravelly SAND, containing quartzite, clinker and redbrick. (BH1)
  - CONCRETE cobbles (BH1)
  - Ashy clayey gravelly SAND, containing redbrick, clinker and concrete. (BH1)
  - Clayey sandy GRAVEL, containing concrete, redbrick and clinker. (BH2)
  - Gravelly CLAY, containing concrete, redbrick, sandstone and clinker. (BH2)
- **Superficial Deposits** –
  - Gravelly CLAY, containing mudstone, sandstone and anthracite (BH1, BH2)
  - Sandy CLAY (BH1)
  - Sandy Gravelly CLAY, containing mudstone, sandstone and anthracite (BH1, BH2)
- **Bedrock Deposits** –
  - Very weak red SANDSTONE recovered as clayey gravelly SAND. (BH2)

The depths of the various materials encountered in the exploratory holes are summarised in Table 3 below.

Table 3: Summary of Ground Conditions Encountered

Hole	Depth to Stratum (m bgl)					GROUNDWATER (m bgl)
	MADE GROUND	Gravelly CLAY	Sandy CLAY	Sandy Gravelly CLAY	SANDSTONE	
BH1	0.00-2.60	2.60-6.40	6.40-6.60	6.60-9.40	-	2.30
BH2	0.00-5.80	5.80-7.40	-	7.40-9.60	9.60-10.10	-

5.2 Observable Indications of Contamination

Clinker gravel was encountered within the Made Ground of both exploratory holes.

Red brick and concrete were also observed in the Made Ground material, however these materials are generally considered inert.

A hydrocarbon odour was detected in BH1.

No other visual or olfactory contamination was encountered during the fieldwork.

5.3 Obstructions

Man Made obstructions were not encountered in any of the other exploratory hole locations.

5.4 Groundwater

Groundwater was encountered in BH1 at a depth of 2.30m during the fieldwork.

Further monitoring of groundwater is ongoing.

5.5 Land Gas

Results obtained during the initial monitoring visit on 4th December 2020 indicated Methane (CH_4) levels of 0.2%, Carbon Dioxide (CO_2) levels ranging from 0.2% to 6.3% by volume, and Oxygen (O_2) levels ranging from 0.7% to 22.3% by volume. Gas flows of 0.0l/hr were recorded, together with an atmospheric pressure of 969mb.

Results obtained during subsequent monitoring visits on the 10th, 16th and 18th December 2020 indicated Methane levels ranging from 0.1% to 0.2% by volume, Carbon Dioxide levels ranging from 0.2% to 5.7% by volume, and Oxygen levels ranging from 1.2% to 21.8% by volume. Gas flows of 0.0l/hr were recorded, together with an atmospheric pressure ranging from 993mb to 997mb.

It should be noted that the concentrations and levels of mobile liquid and gaseous materials are likely to vary with time. The results obtained may therefore be representative of the conditions only at the time of sampling.

6.0 ENGINEERING PROPERTIES OF SOILS ENCOUNTERED

6.1 General

The following sections discuss the engineering properties of the strata encountered, based on results of in situ testing and laboratory testing obtained during this investigation.

The results of laboratory geotechnical testing are summarised in the following table.

Table 4: Summary of Laboratory Geotechnical Test Results

Location	Depth (m)	Strata	CLASSIFICATION						STRENGTH	CHEMICAL	
			Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Bulk Density Mg/m³)	Dry Density (Mg/m³)	Multi-Stage Undrained Shear Strength (kN/m²)	pH Value	Water Soluble Sulphate SO_4 (mg/l)
BH1	1.10	MG	-	-	-	-	-	-	-	6.8	180
BH1	2.60-3.00	Co	-	-	-	-	-	-	-	7.1	70
BH1	3.00-3.45	Co	-	-	-	-	2.21	1.97	113	-	-
BH1	3.50-4.00	Co	13	39	14	25	-	-	-	-	-
BH1	5.00-5.45	Co	-	-	-	-	2.19	1.90	119	-	-
BH1	6.50-7.00	Co	19	40	15	25	-	-	-	-	-
BH1	8.00-8.45	Co	8.9	35	12	23	2.25	2.07	51	7.0	190
BH2	1.50-2.00	MG	-	-	-	-	-	-	-	6.9	270
BH2	3.50-4.00	MG	29	46	17	29	-	-	-	-	-
BH2	4.00-4.45	MG	-	-	-	-	-	-	-	7.0	200
BH2	6.50-6.95	Co	-	-	-	-	2.23	1.95	107	-	-
BH2	7.50-8.00	Co	15	38	15	23	-	-	-	-	-
BH2	9.00-9.45	Co	-	-	-	-	2.14	1.96	122	-	-
BH2	9.50-10.00	Co	15	27	11	16	-	-	-	-	-
BH2	10.00-10.45	Sst	-	-	-	-	-	-	-	7.0	150
Gr – Granular Superficial Deposits, Co – Cohesive Superficial Deposits Sst - Sandstone											

6.2 Made Ground

Made Ground was encountered in both exploratory hole locations between ground level and 5.80m below ground level (BH2).

SPT tests carried out in the deeper Made Ground resulted in **SPT N values** of between 8 and 33, as shown on the SPT v Depth Plot, in Figure 5 (overleaf).

The **water-soluble sulphate** content of 3no. samples ranged from 180-270mg/l SO_4, with a **pH value** of 6.8-7.0.

6.3 Cohesive Superficial Deposits

Laboratory testing has given a value of water-soluble sulphate in the range 180mg/l to 270mg/l, together with pH Values in the range 7.0 to 7.1.

As discussed in Section 5, soils interpreted to represent the Superficial deposits of Devensian Diamicton Till were encountered as gravelly Clay with varying amounts of gravel, and clayey Sand up to depths of 9.60m.

SPT tests carried out in the cohesive superficial deposits resulted in **SPT N values** of 50 as shown on the SPT v Depth Plot in Figure 5 (overleaf). The results suggest the deposits are very stiff.

In-situ **hand penetrometer** (HP) test was undertaken giving a shear strength of between 120kN/m^2 and 215kN/m^2, also suggesting the clay is stiff to very stiff.

Figure 6, overleaf, shows the **shear strengths** of the superficial soils based on in-situ hand penetrometer tests alongside equivalent shear strength from SPT N values based on correlations by Stroud and Butler (1975).

The **undrained shear strength** in triaxial compression (U100) was carried out on 5no. samples of clay. Results of the test showed an undrained shear strength in the range 51kN/m^2 to 122kN/m^2 at depths of between 3.00m and 9.45m, suggesting the clay is stiff.

Recommended N values and derived design values for the cohesive soils are summarised in Table 5, below.

Table 5: Summary of Design Strength Values (Cohesive Superficial Deposits)

Depth	SPT N Value Range	Average N Value	Design N Value*	Undrained Shear Strength** (kN/m^2)	Coefficient of Volume Compressibility** (mv)
4-5	50	50	50	116 (2)	-
6-7	50	50	50	107 (1)	-
7-8	50	50	50	86 (2)	-

*Based on lower quartile N value and correlations by Peck Hanson and Thornburn(1974)
**Based on multi-stage undrained shear strength testing

Figure 5: SPT v Depth Plot

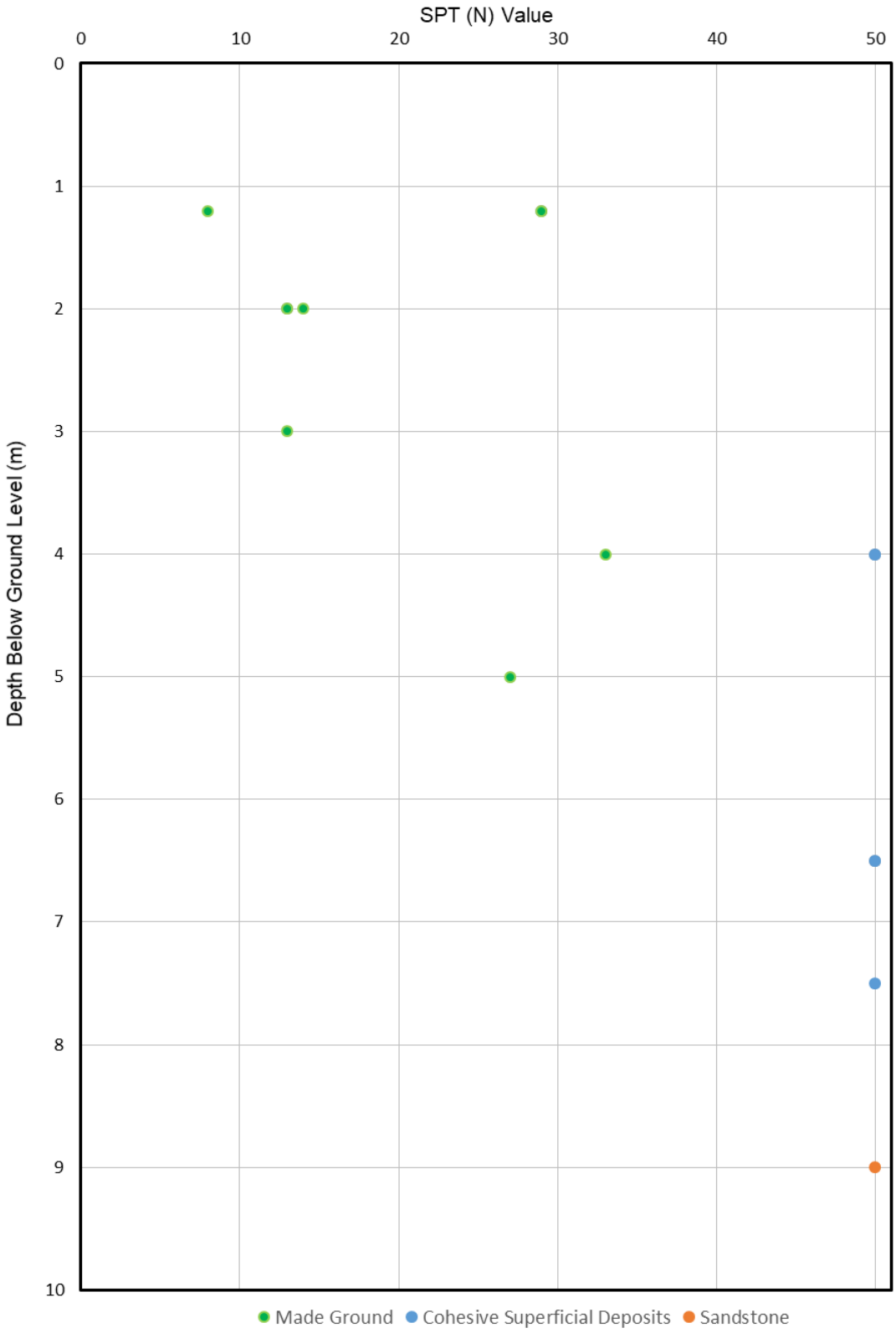
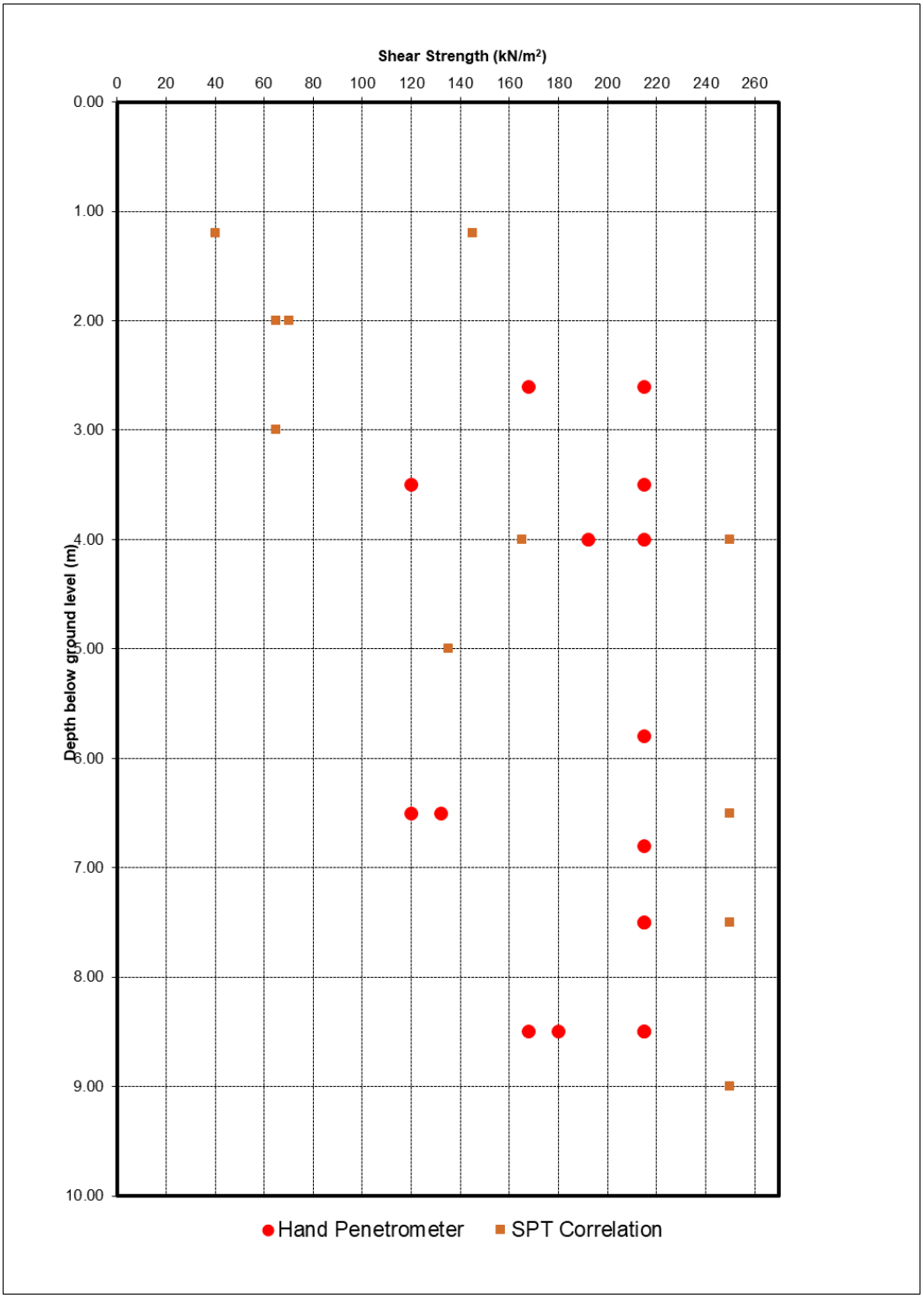
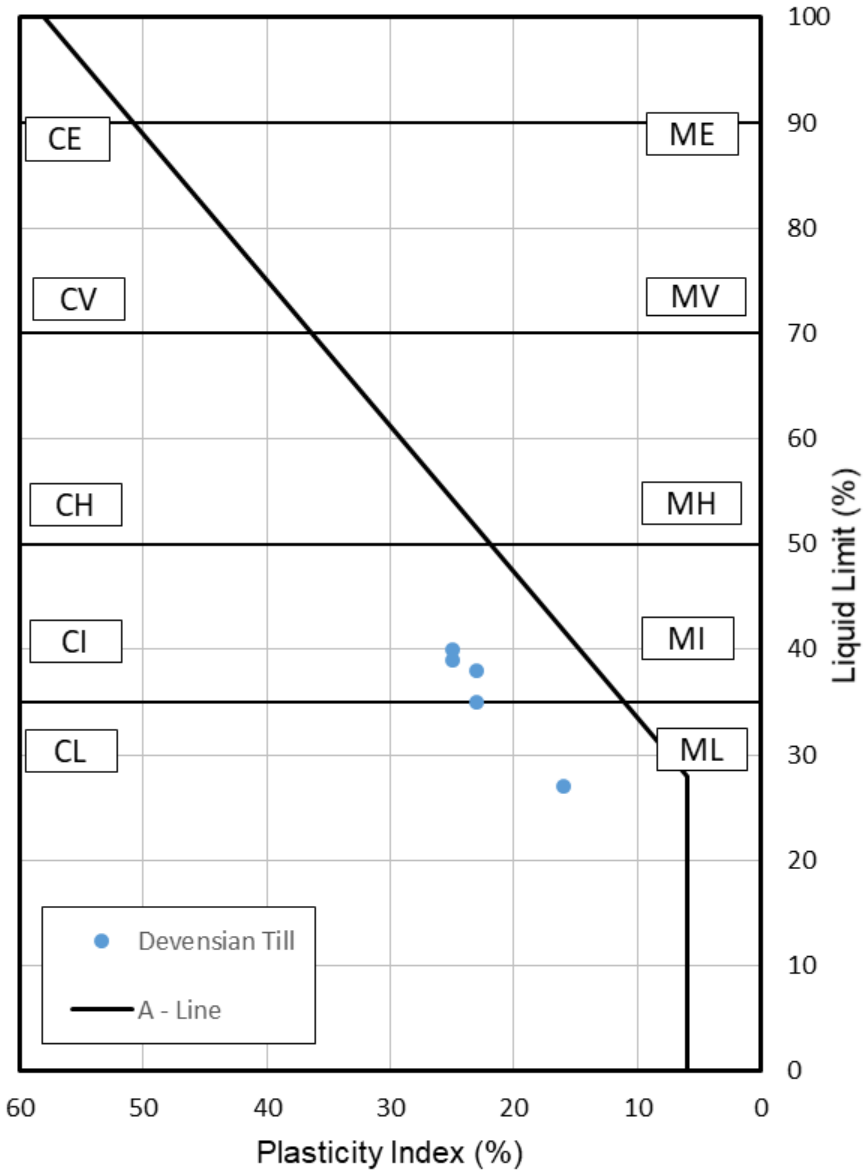


Figure 6 Strength v Depth Plot (Cohesive Superficial Deposits)



Atterberg Limit tests were carried out on 6no. samples of the clay. Results of the test reported **liquid limit** values in the range 27% to 46% and **plastic limit** values in the range 11% to 17%, resulting in values of **plasticity index** in the range 16% to 29%, with an average of 23.5%. These results suggest the samples of superficial deposits tested are of **intermediate plasticity** as shown on the Plasticity Chart in Figure 7, overleaf.

Figure 7: Plasticity Chart



For design purposes, a value of plasticity index = 23% is recommended, based on the upper quartile of the results.

The **coefficient of volume compressibility (mv)** has been estimated using the following correlation by Stroud and Butler [(1975)]: for a clay with a plasticity index of 23%, mv = 1 / (0.50 x N value). This correlation gives values of coefficient of volume compressibility in the range 0.02m^2/MN, as shown in Table 5, above. The results suggest the clay has a **very low compressibility**.

6.4 Sandstone Bedrock

Laboratory testing has given a value of water-soluble sulphate of 150mg/l together with a pH Values of 7.0.

7.0 GEOTECHNICAL ASSESSMENT

7.1 Proposed Development

It is understood that the Client intends to build an electrical substation. Access will be from Rowsley road to the south. Detailed information regarding structural loadings and proposed foundation type was not available at the time of writing the report.

7.2 Ground Conditions Encountered

The exploratory holes generally encountered Made Ground to a maximum depth of 5.80 bgl (BH2). Underlying the Made Ground BH1 and BH2 were the superficial deposits of Devensian Diamicton Till comprising clay with varying amounts of sand and gravel.

Exploratory hole BH2 also encountered bedrock at 9.60m, which is thought to be the Pennine Upper Coal Measures.

Groundwater was encountered during the fieldwork in exploratory hole BH1 at 2.30m.

7.3 Foundation Considerations

Based on the ground conditions encountered, conventional shallow strip/pad foundations are not considered suitable for site due to Made Ground encountered to depths of 5.80m bgl (BH2). Therefore, alternative ground improvement, controlled modulus columns and pile foundations should be considered.

The foundation options are discussed below.

7.3.1 *Ground Improvement*

Ground treatment (e.g. vibro displacement) may be an option, subject to environmental and noise/vibration constraints.

For example, vibro stone columns are often used to solve a wide range of static, dynamic and seismic foundation problems by using powerful depth vibrators to densify soils of form stone columns that compact or reinforce soils in situ. Vibro systems can be used to treat granular deposits, fills, made ground and soft clays/silts.

Soils treated by vibro could offer an allowable bearing pressure in the range 100kN/m^2 to 200kN/m^2, depending on column spacings and ground encountered.

Once the treatment has been carried out, spread foundations may be adopted across the site, and designed to the loadings given above. Providing that any imported fill material between the tops of the columns and the underside of the floor slab is placed in a controlled manner, floor slabs may be ground bearing. Positive assurances should be sought from an experienced specialist contractor that the proprietary system proposed is capable of providing the required working loads in the ground conditions encountered, with a guarantee on maximum settlement for both footings and floor slabs.

7.3.2 *Piled Foundations*

The proposed structure may be founded on piles taken down to depth to a suitable founding stratum, such as the firm to very stiff sandy gravelly clay, encountered in all exploratory locations.

A variety of pile types may be used, including bored and continuous flight auger (CFA) piles. Driven piles may be suitable, subject to environmental and noise/vibration constraints.

Because of the various advantages and limitations of each pile type, and the cost implications, advice should be sought from specialist piling contractors to determine the most suitable and cost-effective type. They should also be able to give recommended pile diameters and depths and likely pile capacities, with guaranteed performance. It is recommended a pile test be carried out to confirm pile capacities. In assessing the pile capacities, contractors should make an allowance for the effects of negative skin friction, particularly in the made ground and soft clays.

There may be differential settlement between piled structures and the surrounding ground level. Provision should, therefore, be made to make up ground levels at threshold positions, loading bays, vehicle access doorways, etc. Alternatively, these materials should be removed and replaced in a controlled manner by suitable existing materials or imported engineered fill.

It is essential the advice of a specialist piling contractor is sought and that positive assurances are provided by the piling contractor that their proprietary system is capable of providing the required working loads in the ground conditions encountered.

7.4 Chemical Attack on Buried Concrete

Chemical tests (see Appendices) show moderate to low levels of water-soluble sulphates and alkaline conditions. Based on these conditions, it is recommended that for concrete placed in natural strata the Design Sulphate Class for the site, as defined in BRE Special Digest 1[(2005)], be taken as DS-2, and the Aggressive Chemical Environment for Concrete (ACEC) site classification be taken as AC-1s. The recommendations of BRE Special Digest 1 should be followed for concrete foundations and ground bearing floor slabs.

7.5 Temporary Works

Formations will be susceptible to damage both by weather and trafficking, and should be protected immediately on exposure, particularly in areas where construction plant will access the site.

Excavations in Made Ground are likely to be unstable and should be battered back to an angle of 1 in 2, or a system of close sheeting and shoring adopted to ensure stability, and in particular where personnel are required to enter excavations. All excavations should be adequately supported where personnel are required to enter.

Groundwater seepages could be encountered near surface within excavations, particularly during the wetter months of the year. Pumping of excavations from a suitable located sump is likely to be required to keep excavations dry.

All-natural materials on site should be capable of being excavated using conventional excavating machinery.

8.0 SOIL CONTAMINATION RISK ASSESSMENT

8.1 Tier I Human Health Soil Risk Assessment – Groundworkers During Development

To assess the risk of soil contamination to construction and ground workers during development, guidelines from the HSE Document 'Protection of workers and the general public during development of contaminated land'(1991) are used. The document assesses soil contamination test results and classifies the site as being uncontaminated or contaminated with varying degrees of contamination from 'slight' to 'unusually heavy'. The guideline values and laboratory test results are summarised in the following table:

Table 7: Summary of Guideline Values for Protection of Workers and the General Public During Development of Contaminated Land

Contaminant	Typical Values* for:					Test Results	Class
	Uncontaminated Soils	Slight Contamination	Contaminated	Heavy Contamination	Unusually Heavy Contamination		
	Class A	Class B	Class C	Class D	Class E		
pH (alkaline)	7 - 8	8 - 9	9 - 10	10 - 12	12	9.9-10.7	C-D
Arsenic	0 - 30	30 - 50	50 - 100	100 - 500	500	3-39	A-B
Cadmium	0 - 1	1 - 3	3 - 10	10 - 50	50	0.4-1.4	A-B
Chromium	0 - 100	100 - 200	200 - 500	500 - 2500	2500	11-21	A
Copper	0 - 100	100 - 200	200 - 500	500 - 2500	2500	19-285	A-C
Lead	0 - 500	500 - 1000	1000 - 2000	2000 – 1%	1.0%	23-368	A
Mercury	0 - 1	1 - 3	3 - 10	10 - 50	50	<1	A
Nickel	0 - 20	20 - 50	50 - 200	200 - 1000	1000	8-35	A-B
Zinc	0 - 250	250 - 500	500 - 1000	1000 - 5000	5000	47-313	A-B
Boron	0 - 2	2 - 5	5 - 50	50 - 250	250	<1	A
Selenium	0 - 1	1 - 3	3 - 10	10 - 50	50	<3	A-B
Barium	0-500	500-1000	1000-2000	2000-1.0%	1.0%	37-413	A
Beryllium	0 - 5	5 - 10	10 - 20	20 - 50	50	<0.5-2.4	A
Vanadium	0 - 100	100 - 200	200 - 500	500 - 2500	2500	20-47	A
Sulphate	0 - 2000	2000 - 5000	5000 – 1%	1% - 5%	5.05%	1455-4235	A-B
Sulphide	0 - 10	10 - 20	20 - 100	100 - 500	500	<5	A
Cyanide (free)	0 - 1	1 - 5	5 - 50	50 - 100	100	<2	A
Phenol	0 - 2	2 - 5	5 - 50	50 - 250	250	<2-2.4	A-B

Based on the above results the soils are predominantly slightly contaminated. However the pH was classified as heavily contaminated. Therefore, there is a **MODERATE to LOW** potential risk from soil contamination to construction workers, ground workers and members of the public during construction. Appropriate measures, such as PPE, site health plans, and appropriate disposal of material arisings will be required to mitigate this risk.

8.2 Tier I Human Health Soil Risk Assessment – Future Site Users

The following section provides a Human Health Soil Assessment for future site users. Based on the proposed development type, the following section compares the results of contamination analyses to residential types of end development as specified by Defra/LQM/CIEH. As part of the contamination assessment, the chemical results obtained by EEG have been screened against accepted compliance criteria, namely:

- Defra C4SL Health Criteria Values (March 2014), where available; and
- Tier 1 assessment values - based on LQM/CIEH Suitable 4 Use Levels(2015) (S4ULs).

The soil chemical testing results are summarised in Table 8, below.

Table 8: Soil Results Comparison with C4SL/S4UL Values

Parameter	C4SL/S4UL Levels Commercial (mg/kg)	BH1 ES1 0.40m	BH1 ES2 0.50m	BH1 ES4 1.50-2.00m	BH2 ES1 0.20m	BH2 ES2 0.30m	BH2 ES3 0.70m	No of Exceedances
Metals								
Arsenic	640	5	5	39	3	5	10	0
Beryllium	12	< 0.5	< 0.5	2.4	< 0.5	< 0.5	0.5	0
Boron	240000	< 1	< 1	< 1	< 1	< 1	< 1	0
Cadmium	410	0.7	0.6	0.8	0.5	0.4	1.4	0
Chromium	8600	14	13	21	11	18	20	0
Chromium VI	49	< 2	< 2	< 2	< 2	< 2	< 2	0
Copper	68000	22	20	285	19	24	154	0
Lead	2300	56	43	368	23	44	337	0
Mercury	1100	< 1	< 1	< 1	< 1	< 1	< 1	0
Nickel	980	10	10	35	8	11	10	0
Selenium	12000	< 3	< 3	< 3	< 3	< 3	< 3	0
Vanadium	9000	22	22	47	22	24	20	0
Zinc	730000	94	147	313	47	60	148	0
Benzene	27	< 2	< 2	< 2	< 2	< 2	< 2	0
Toluene	56000	< 5	< 5	< 5	< 5	54	< 5	0
Ethylbenzene	5700	< 2	< 2	< 2	< 2	< 2	11	0
o-xylenes	6600	< 2	< 2	< 2	< 2	38	17	0
m-xylenes	6200	< 2	< 2	17	< 2	65	26	0
p-xylenes	5900	< 2	< 2	17	< 2	65	26	0
Aliphatic EC >5-6	3200	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0
Aliphatic EC >6-8	7800	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0
Aliphatic EC >8-10	2000	< 2	< 2	11	< 2	< 2	< 2	0
Aliphatic EC >10-12	9700	< 2	< 2	< 2	< 2	6	2	0
Aliphatic EC >12-16	59000	23	18	6	20	41	11	0
Aliphatic EC >16-21	1600000	49	44	< 3	96	81	16	0
Aliphatic EC >21-35	1600000	410	361	17	914	664	96	0
Aromatic EC >5-7	26000	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0
Aromatic EC >7-8	56000	< 0.05	< 0.05	< 0.05	< 0.05	0.05	< 0.05	0
Aromatic EC >8-10	3500	< 2	< 2	6	4	3	3	0
Aromatic EC >10-12	16000	< 2	< 2	9	< 2	12	127	0
Aromatic EC >12-16	36000	17	12	77	16	41	399	0
Aromatic EC >16-21	28000	100	71	315	81	167	1397	0
Aromatic EC >21-35	28000	541	498	274	1176	681	940	0
Naphthalene	190	0.33	0.16	4.08	0.24	7	87.60	0
Acenaphthylene	83000	< 0.1	< 0.1	0.23	0.20	0.60	0.34	0
Acenaphthene	84000	0.77	0.25	9.27	< 0.1	1.16	68.60	0
Fluorene	63000	0.70	0.23	7.44	0.22	1.81	63.70	0
Phenanthrene	22000	7.20	2.35	79.50	1.10	18.90	389	0
Anthracene	520000	1.85	0.61	17	0.20	3.53	71.90	0
Fluoranthene	2300	10.40	4.37	80.30	0.63	22.70	300	0
Pyrene	54000	15.80	5.92	73.90	0.93	24.40	245	0
Benzo(a)anthracene	170	6.25	3.02	31.10	0.36	7.82	94	0
Chrysene	350	5.04	2.86	26.40	0.52	6.79	64.30	0
Benzo(a)pyrene	77	6.49	3.87	23.60	0.50	8.18	66.40	0
Benzo(b)fluoranthene	44	7.05	4.20	27.50	0.53	8.48	66	1
Benzo(k)fluoranthene	1200	2.04	1.07	6.82	0.18	2.37	25.30	0
Indeno(1,2,3-cd)pyrene	500	2.53	1.62	8.18	0.26	2.76	22	0
Dibenz(a,h)anthracene	3.5	0.48	0.48	1.65	< 0.1	0.57	3.49	0
Benzo(ghi)perylene	77	2.12	1.35	7.08	0.29	2.23	18.10	0
Phenol	760	< 2	< 2	< 2	< 2	< 2	2.4	0

Benzo(b)fluoranthene was found in exceedance of the screening criteria relevant to a Commercial End Use at sampling location BH2 at a depth of 0.70m. This has however been attributed to the presence of clinker in the soil matrix and not to any contamination.

Asbestos fibre and fragments were not identified in any of the samples collected.

8.3 Soil Waste Assessment

An assessment of the disposal characteristics of the soil in accordance with Environment Agency guidance WM3.1, edition of June 2018, "Guidance on the classification and assessment of waste" has been carried out on soils recovered from the site, using HazWasteOnline.

The results are summarised in Table 9 below and presented in full in Appendix 4.

Table 9: Waste Classification of Soils

Location	Depth (m bgl)	WM3.1 Classification	WAC Testing	Comments
BH1 ES1	0.40	Hazardous	-	Elevated hydrocarbons
BH1 ES2	0.50	Non-Hazardous	Non-Hazardous	-
BH1 ES4	1.50-2.00	Non-Hazardous	-	-
BH2 ES1	0.20	Hazardous	-	Elevated hydrocarbons
BH2 ES2	0.30	Hazardous	Can only be hazardous	Elevated hydrocarbons
BH2 ES3	0.40	Hazardous	-	Elevated hydrocarbons

4no. samples were classified as BH1 ES1, BH2 ES1, BH2 ES2 and BH2 ES3 were classified as Hazardous in accordance with Environment Agency guidance WM3.1. This was due to elevated hydrocarbons. Further assessment of the testing results by use of PAH double ratio plots may downgrade the hazardous classification to non-hazardous.

BH1 ES2 and BH1 ES4 were classified as Non-hazardous in accordance with Environment Agency guidance WM3.1.

10.0 GROUND GAS ASSESSMENT

10.1 Ground Gas

The potential risk associated with gases being generated in the ground (whether from natural or man-made sources) depends on the concentrations of gas and its flow rate to the surface. These factors are assessed by monitoring of the gas installations in the boreholes. The variable nature of gas generation and the effect of barometric pressure on gas flow, means that the volume of gas potentially reaching the ground surface is normally inconsistent over time.

Four gas monitoring visits have been completed by Earth Environmental & Geotechnical Ltd. The monitoring visits were conducted between the 4th and 18th December 2020. The results recorded methane (CH_4) levels of between 0.1% and 0.2% v/v and carbon dioxide (CO_2) levels ranging from 0.1% to 6.3% v/v. Oxygen concentrations of between 0.7% and 22.3% v/v were also recorded.

An absence of gas flows was recorded, therefore a flow rate of 0.1l/hr has been adopted for the below calculations. Atmospheric pressure was recorded to be between 969mb and 997mb.

Full results of the monitoring to date are presented in Appendix 2.

Table 13 overleaf, adapted from Table 1 of the technical paper Risk and Reliability in Gas Protection Design by Card et al. 2019, shows a summary of the current UK practice with respect to appropriate gas protection measures based upon a Gas Screening Value (GSV).

A GSV for the site has been obtained by multiplying the maximum concentration of gas by the maximum flow rate, which represents worst-case scenario conditions.

- Carbon dioxide: maximum flow rate = 0.1l/hr, max concentration = 6.3%
- Methane: maximum flow rate = 0.1l/hr, max concentration = 0.2%.

Based on the above figures, the GSV is calculated as:

- **Carbon dioxide**: GSV = 0.1 x 6.3 / 100 = **0.0063litres/hr**
- **Methane**: GSV = 0.1 x 0.2 / 100 = **0.0002 litres/hr**

The above results suggest the site can be given a Gas Regime A Classification, i.e. '**NEGLIGIBLE** to **VERY LOW** risk', in accordance with Table 10, overleaf.

Table 10: Modified Ground Gas Classification Table (Risk and Reliability in Gas Protection Design, 2019)

Characteristic Situation	*Pathway vertical permeability (m/s)*	*GSV CH_4 (l/hr)*	*GSV CO_2 (l/h)*	*GSV oxygen deficient gas (Nitrogen) (l/h)*	*Maximum borehole gauge pressure (Pa)*	*Limiting sustained gas concentrations in unsaturated zone within 10m of surface*	*Limitations*	*Risk level*
Gas Regime A	$\leq 1 \times 10^{-7}$ $1 \times 10^{-7} < k < 1 \times 10^{-5}$ $\geq 1 \times 10^{-5}$	< 2 < 1.5 <1.3	< 12 < 9 <7	< 217 for all permeability (care when using this value. Usually oxygen deficient gas emissions are sporadic, and monitoring should cover suitable conditions)	500 (50mm water) – ASTM (2016)	< 30% methane < 21% carbon dioxide Not applicable where municipal solid waste landfills, mine workings or similar credible sources with credible pathways for migration are present. Not applicable where potential ground gas reservoirs are connected to buildings.	No limit on oxygen depletion because it is widespread in natural soils and fill materials due chemical and biological processes Consider whether pressurisation could realistically occur and over what timescales where potential ground gas reservoirs are connected to buildings.	Negligible to very low
Gas Regime B	$\leq 1 \times 10^{-7}$ $1 \times 10^{-7} < k < 1 \times 10^{-5}$ $\geq 1 \times 10^{-5}$	≤ 10 ≤ 7.5 ≤ 6	< 140 < 100 < 85	No Limit	No limit			Low to moderate
Gas Regime C	$\leq 1 \times 10^{-7}$ $1 \times 10^{-7} < k < 1 \times 10^{-5}$ $\geq 1 \times 10^{-5}$	≤ 100 ≤ 75 ≤ 60	No limiting values	No Limit	No limit	No limit	Where oxygen deficient ground gas or carbon dioxide is likely to be emitted from shafts, fractured rock or ground where k> 1 x 10-4m/s undertake DQRA	Moderate to high
Gas Regime D	-	N/A	N/A	N/A	-	-	DQRA required	Very high

11.0 CONCLUSIONS & RECOMMENDATIONS

11.1 Soil Contamination

Based on the results of the chemical testing, a contaminant concentration was found in exceedance of the screening criteria relevant to a Commercial End Use in BH2 at a depth of 0.70m. The chemical exceedance is for Benzo(b)fluoranthene which can be attributed to the presence of clinker in the soil matrix and not to contamination.

There is a moderate to low potential risk from soil contamination to construction workers and ground workers during development, and appropriate measures such as PPE, site health plans, appropriate disposal of material arisings will be required to mitigate this risk. The groundworks contractor must provide a soil management plan including methods of dealing with unanticipated soil contamination encountered during groundworks.

11.2 Foundations

Due to the depth of the Made Ground encountered across the site, alternative foundations such as ground improvement, controlled modulus columns or piles should be considered.

11.3 Asbestos

Asbestos fibres and fragments were not identified in any of the samples collected.

11.4 Soil Disposal

Excess soils will need to be taken to an appropriate landfill facility. The soils have been classified as a mixture of hazardous and non-hazardous waste. Further assessment of the testing results may allow downgrading of the hazardous classification.

11.5 Ground Gas

Based on results of the gas monitoring, the risk of ground gas is considered to be negligible to very low and protection against the ingress of ground gas will not be required at the site.

11.6 Risk to Buried (Water) Services

It is considered that non-standard materials are not likely to be required for new water pipes. Although if elevated hydrocarbon levels are found in other areas of the site further advice should be sought from the local water company.

Previous guidance on buried water pipes was contained in Water Regulations Advisory Scheme (WRAS) Guidance Note No. 9-04-03$^{(2002)}$, however this has been superseded by the UK Water Industry Research Report 'Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites' Ref 10/WM/03/21 (January 2011).

11.7 Site Personnel

As with all construction sites, personnel working on the site during the construction period should be encouraged to maintain a high standard of personal hygiene and on-site washing facilities should be available.

11.8 Other Matters

Due diligence is required during the construction period, and should any further evidence of contamination be found, appropriate investigation and / or action should be taken. The significance of any contamination not discovered by this investigation is outside the scope of this

APPENDIX 1

EXPLORATORY HOLE LOGS

EARTH ENVIRONMENTAL & GEOTECHNICAL

Borehole Log

Borehole No. **BH1**

Sheet 1 of 2

Project Name: Eastlands Primary	Project No. A3738	Co-ords: 386458.00 - 398662.00	Hole Type CP
Location: Manchester		Level: 0.00	Scale 1:25
Client: Electricity North West Ltd		Dates: 12/11/2020 - 12/11/2020	Logged By AB

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	-0.20		MACADAM. (MADE GROUND)
					0.60	-0.60		Grey clayey gravelly fine to coarse SAND. Gravel is angular to rounded fine to coarse of quartzite, clinker and redbrick. (MADE GROUND)
		1.10	D		1.10	-1.10		Angular concrete cobble. (MADE GROUND) *Cobble pushed down.*
		1.20		N=29 (3,4/6,6,7,10)				Medium dense black ashy clayey gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of redbrick, clinker and concrete. Occasional glass fragments. (MADE GROUND)
		1.50 - 2.00	B					*300mm wooden fragments. Strong hydrocarbon odour.*
		2.00		N=13 (2,2/3,3,4,3)				
		2.60 - 3.00	B		2.60	-2.60		Stiff brownish grey mottled orangish brown and grey slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to medium of mudstone, sandstone and anthracite.
		2.80 - 3.00	D					*HP of between 168 and 215 kN/m2.*
		3.00 - 3.45	U					
		3.50 - 4.00	B					*HP of between 120 and 215 kN/m2.*
		4.00		N=50 (5,6/9,10,15,16)				*HP of between 192 and 215 kN/m2.*
		4.00 - 4.45	D					*No orange mottling.*
		4.50 - 5.00	B					
		4.75	D					
		5.00 - 5.45	U					

Continued on next sheet

Remarks

Location scanned with a CAT prior to excavation.

Hand dug pit excavated to 1.20m bgl.
Monitoring standpipe installed.

EARTH ENVIRONMENTAL & GEOTECHNICAL

EARTH ENVIRONMENTAL & GEOTECHNICAL

Borehole Log

Borehole No. **BH1** Sheet 2 of 2

Project Name: Eastlands Primary	Project No. A3738	Co-ords: 386458.00 - 398662.00	Hole Type CP
Location: Manchester		Level: 0.00	Scale 1:25
Client: Electricity North West Ltd		Dates: 12/11/2020 - 12/11/2020	Logged By AB

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					6.40	-6.40		Dense reddish brown clayey medium SAND.
		6.50		N=50 (4,4/6,10,16,18)				*HP of between 120 and 132 kN/m2.*
		6.50 - 7.00	B		6.60	-6.60		Very stiff brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to medium of mudstone, sandstone and occasional anthracite. Occasional reddish brown medium coarse sand lenses.
		7.50 - 8.00	B					*HP of 215 kN/m2.*
		7.50 - 8.00	B					
		8.00 - 8.45	U					
		8.50	B					*HP of between 180 and 215 kN/m2.*
					9.40	-9.40		End of borehole at 9.40 m

6 7 8 9 10

Remarks

Location scanned with a CAT prior to excavation.

Hand dug pit excavated to 1.20m bgl.
Monitoring standpipe installed.

EARTH ENVIRONMENTAL & GEOTECHNICAL

EARTH ENVIRONMENTAL & GEOTECHNICAL

Borehole Log

Borehole No. **BH2**

Sheet 1 of 3

Project Name: Eastlands Primary	Project No. A3738	Co-ords: 386469.00 - 398642.00	Hole Type CP
Location: Manchester		Level: 0.00	Scale 1:25
Client: Electricity North West Ltd		Dates: 13/11/2020 - 13/11/2020	Logged By AB

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								MACADAM. (MADE GROUND)	
					0.50	-0.50		Loose to medium dense brown clayey sandy angular to subangular fine to coarse GRAVEL of concrete, redbrick and clinker. Sand is fine to coarse. Occasional wood fragments (70mm). (MADE GROUND)	1
		1.20 1.20 1.20 - 1.65	D D	N=8 (2,2/2,2,2,2)					
		1.50 - 2.00	B						
		2.00 2.00 - 2.45	 D	N=14 (3,3/3,3,4,4)					2
		2.50 - 3.00	B						
		3.00 3.00 - 3.45	 D	N=13 (2,2/3,3,4,3)					3
		3.50 - 4.00	B		3.50	-3.50		Stiff brown mottled light brown and black slightly sandy gravelly CLAY. Gravel is angular to subangular fine to coarse of redbrick, concrete, sandstone and occasional clinker. Occasional subangular sandstone cobble. (MADE GROUND)	
		4.00 4.00 - 4.45	 D	N=33 (3,3/6,16,6,5)					4
		4.50 - 5.00	B						
		5.00		N=27 (2,1/7,7,6,7)					5
								Continued on next sheet	

Remarks

Location scanned with a CAT prior to excavation.

Hand dug pit excavated to 1.20m bgl.
Monitoring standpipe installed.

EARTH ENVIRONMENTAL & GEOTECHNICAL

EARTH ENVIRONMENTAL & GEOTECHNICAL

Borehole Log

Borehole No. **BH2**

Sheet 2 of 3

Project Name: Eastlands Primary	Project No. A3738	Co-ords: 386469.00 - 398642.00	Hole Type CP
Location: Manchester		Level: 0.00	Scale 1:25
Client: Electricity North West Ltd		Dates: 13/11/2020 - 13/11/2020	Logged By AB

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 - 5.45	B					
					5.80	-5.80		Very stiff brown mottled grey slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to medium of mudstone and sandstone. *HP of 215 kN/m2.*
		6.50 - 6.95	U					
		6.80 - 7.00	B					*HP of 215 kN/m2.*
					7.40	-7.40		Very stiff brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
		7.50		N=50 (6,7/50 for 200mm)				
		7.50 - 7.95	D					
		7.50 - 8.00	B					*HP of 215 kN/m2.*
		8.50 - 9.00	B					*HP of 168 and 215 kN/m2.*
		9.00 - 9.45	U					
		9.50 - 10.00	B					
					9.60	-9.60		Very weak red sandstone recovered as clayey gravelly fine to coarse SAND. Gravel is angular to subangular fine to medium of sandstone. *Becoming less clayey with depth.*
		10.00 - 10.45	D					

Continued on next sheet

6 7 8 9 10

Remarks

Location scanned with a CAT prior to excavation.

Hand dug pit excavated to 1.20m bgl.
Monitoring standpipe installed.

EARTH ENVIRONMENTAL & GEOTECHNICAL

EARTH ENVIRONMENTAL & GEOTECHNICAL

Borehole Log

Borehole No.
BH2
Sheet 3 of 3

Project Name:	Eastlands Primary	Project No. A3738	Co-ords:	386469.00 - 398642.00	Hole Type CP
Location:	Manchester		Level:	0.00	Scale 1:25
Client:	Electricity North West Ltd		Dates:	13/11/2020 - 13/11/2020	Logged By AB

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					10.10	-10.10		End of borehole at 10.10 m

11
12
13
14
15

Remarks
Location scanned with a CAT prior to excavation.

Hand dug pit excavated to 1.20m bgl.
Monitoring standpipe installed.

EARTH ENVIRONMENTAL & GEOTECHNICAL

APPENDIX 2

GEOTECHNICAL TESTING RESULTS

TEST REPORT

Client	Earth Environmental & Geotechnical Ltd
Address	Houldsworth Mills Business & Arts Centre Houldsworth Street Reddish Stockport SK5 6DA
Contract	A3738 - Eastlands
Job Number	MRN 3787/81
Date of Issue	02 December 2020
Page	**1 of 18**

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted. This does not, however, guarantee the balance of the materials from which the tested samples have been taken to be of equal quality.

MURRAY RIX
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

pH and Sulphate as SO_4
BS 1377: PART 3: 1990

CLIENT	Earth Environmental & Geotechnical Ltd
SITE	A3738 – Eastlands
JOB NUMBER	MRN 3787/81

SAMPLE LABEL	BH1 D3 1.10	DATE SAMPLED	12 November 2020
LAB SAMPLE No	94113	DATE RECEIVED	16 November 2020
DATE TESTED	20 November 2020	SAMPLED BY	Client

ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried

PH Value	6.8	
Sulphate as SO_4 (2:1 Water Extract)	0.18	g/l

REMARKS

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 02 December 2020

MURRAY RIX
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

pH and Sulphate as SO_4
BS 1377: PART 3: 1990

CLIENT	Earth Environmental & Geotechnical Ltd
SITE	A3738 – Eastlands
JOB NUMBER	MRN 3787/81

SAMPLE LABEL	BH1 B7 2.60 - 3.00	DATE SAMPLED	12 November 2020
LAB SAMPLE No	94115	DATE RECEIVED	16 November 2020
DATE TESTED	20 November 2020	SAMPLED BY	Client

ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried

PH Value	7.1	
Sulphate as SO_4 (2:1 Water Extract)	0.07	g/l

REMARKS

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 02 December 2020

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING
1580

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

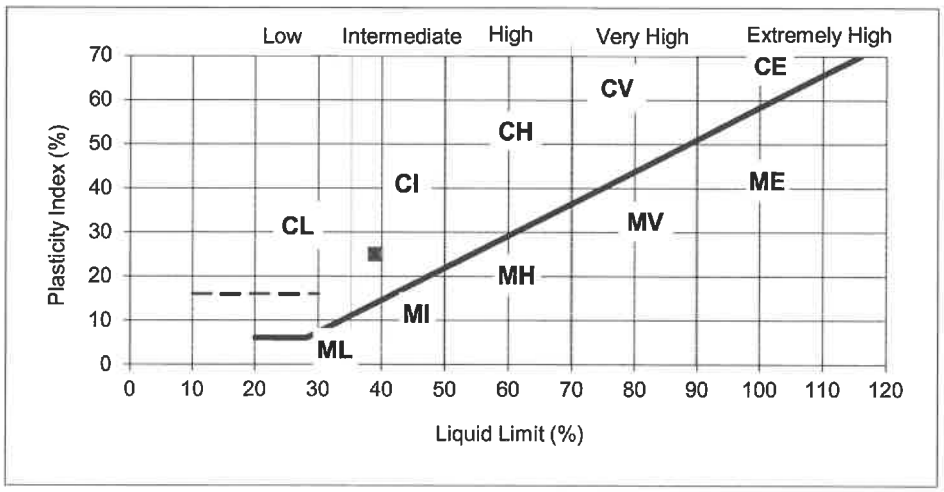
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	Earth Environmetal & Geotechnical Ltd
SITE	A3738 - Eastlands
JOB NUMBER	MRN 3787/81

SAMPLE LABEL	BH1 B9 3.50-4.00	DATE SAMPLED	12-Nov-20
SAMPLE No.	93117	DATE RECEIVED	16-Nov-20
DATE TESTED	20-Nov-20	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation Sample

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
13	39	14	25	93



REMARKS
Sample tested in natural condition

SIGNED

NAME O.P. Davies BA (Hons) DATE 02-Dec-20
(Laboratory Manager)

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
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TEL 0161 475 0870

UKAS TESTING
1580

TEST CERTIFICATE

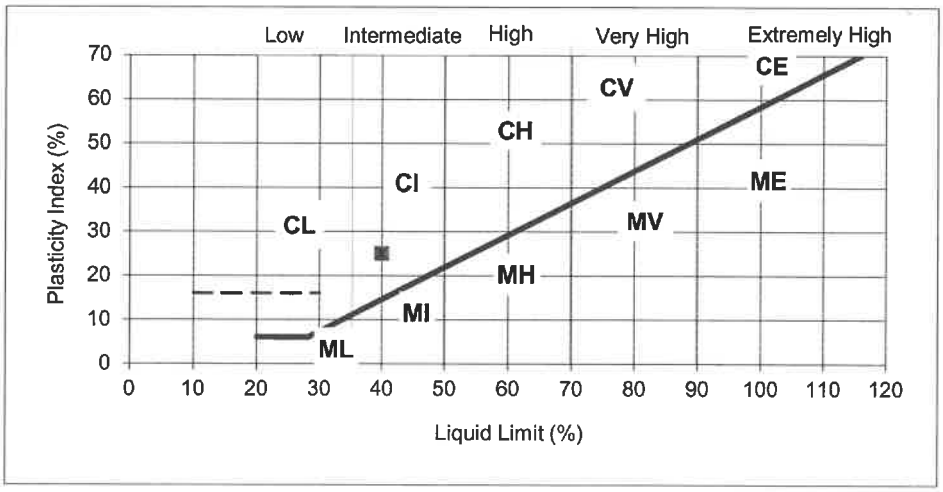
LIQUID AND PLASTIC LIMIT
BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	Earth Environmetal & Geotechnical Ltd
SITE	A3738 - Eastlands
JOB NUMBER	MRN 3787/81

SAMPLE LABEL	BH1 B15 6.50-7.00	DATE SAMPLED	12-Nov-20
SAMPLE No.	93121	DATE RECEIVED	16-Nov-20
DATE TESTED	20-Nov-20	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation Sample

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
19	40	15	25	95



REMARKS
Sample tested in natural condition

SIGNED

NAME O.P. Davies BA (Hons) DATE 02-Dec-20
(Laboratory Manager)

MURRAY RIX
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

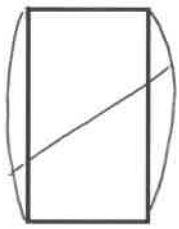
CLIENT	Earth Environmental & Geotechnical Ltd
SITE	A3738 - Eastlands
JOB NUMBER	MRN 3787/81

SAMPLE LABEL	BH1 U 3.00-3.45	DATE SAMPLED	12 November 2020
LAB SAMPLE No	94125	DATE RECEIVED	16 November 2020
DATE TESTED	23 November 2020	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation sample

SPECIMEN LENGTH	76	mm
SPECIMEN DIAMETER	38	mm
MOISTURE CONTENT OF SAMPLE	12	%
BULK DENSITY	2.21	Mg/m^3
DRY DENSITY	1.97	Mg/m^3
DEPTH OF TOP OF SPECIMEN	3.10	m
RATE OF STRAIN	2	%/min
RUBBER MEMBRANE THICKNESS	0.6	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
50	15	2.0	239.8	120
100	16	2.0	244.1	122
200	17	2.0	249.7	125

REMARKS
U38 sub-sample taken to give required length/diameter ratio

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 02 December 2020

MURRAY RIX
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

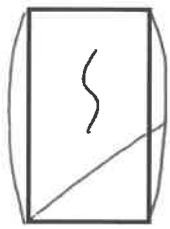
CLIENT	Earth Environmental & Geotechnical Ltd
SITE	A3738 - Eastlands
JOB NUMBER	MRN 3787/81

SAMPLE LABEL	BH1 U 5.00-5.45	DATE SAMPLED	12 November 2020
LAB SAMPLE No	94126	DATE RECEIVED	16 November 2020
DATE TESTED	23 November 2020	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation sample

SPECIMEN LENGTH	76	mm
SPECIMEN DIAMETER	38	mm
MOISTURE CONTENT OF SAMPLE	15	%
BULK DENSITY	2.19	Mg/m^3
DRY DENSITY	1.90	Mg/m^3
DEPTH OF TOP OF SPECIMEN	5.10	m
RATE OF STRAIN	2	%/min
RUBBER MEMBRANE THICKNESS	0.6	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
100	14	2.0	248.3	124
200	16	2.0	252.1	126
400	18	2.0	256.3	128

REMARKS
U38 sub-sample taken to give required length/diameter ratio

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 02 December 2020

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING
1580

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

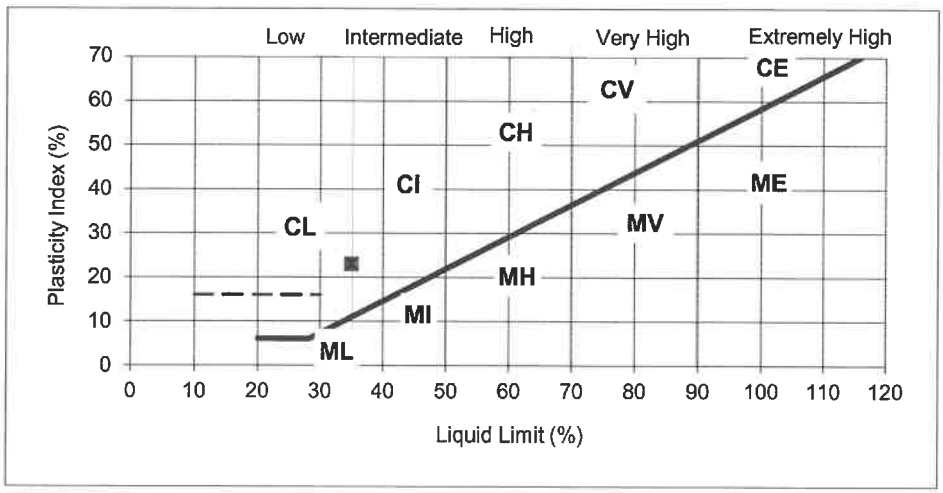
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	Earth Environmetal & Geotechnical Ltd
SITE	A3738 - Eastlands
JOB NUMBER	MRN 3787/81

SAMPLE LABEL	BH1 U 8.00-8.45	DATE SAMPLED	12-Nov-20
SAMPLE No.	93127	DATE RECEIVED	16-Nov-20
DATE TESTED	20-Nov-20	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation Sample

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
8.9	35	12	23	95



REMARKS
Sample tested in natural condition

SIGNED

NAME O.P. Davies BA (Hons) DATE 02-Dec-20
(Laboratory Manager)

MURRAY RIX
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

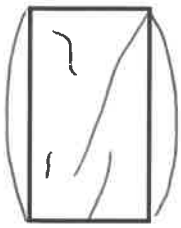
CLIENT	Earth Environmental & Geotechnical Ltd
SITE	A3738 - Eastlands
JOB NUMBER	MRN 3787/81

SAMPLE LABEL	BH1 U 8.00-8.45	DATE SAMPLED	12 November 2020
LAB SAMPLE No	94127	DATE RECEIVED	16 November 2020
DATE TESTED	23 November 2020	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation sample

SPECIMEN LENGTH	76	mm
SPECIMEN DIAMETER	38	mm
MOISTURE CONTENT OF SAMPLE	8.9	%
BULK DENSITY	2.25	Mg/m^3
DRY DENSITY	2.07	Mg/m^3
DEPTH OF TOP OF SPECIMEN	8.10	m
RATE OF STRAIN	2	%/min
RUBBER MEMBRANE THICKNESS	0.6	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
100	16	2.0	136.2	118
200	18	2.0	241.8	121
400	20	2.0	247.8	124

REMARKS
U38 sub-sample taken to give required length/diameter ratio

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 02 December 2020

MURRAY RIX
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

pH and Sulphate as SO_4
BS 1377: PART 3: 1990

CLIENT	Earth Environmental & Geotechnical Ltd
SITE	A3738 – Eastlands
JOB NUMBER	MRN 3787/81

SAMPLE LABEL	BH1 U 8.00-8.45	DATE SAMPLED	12 November 2020
LAB SAMPLE No	94127	DATE RECEIVED	16 November 2020
DATE TESTED	20 November 2020	SAMPLED BY	Client

ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried

PH Value	7.0	
Sulphate as SO_4 (2:1 Water Extract)	0.19	g/l

REMARKS

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 02 December 2020

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

pH and Sulphate as SO_4
BS 1377: PART 3: 1990

CLIENT	Earth Environmental & Geotechnical Ltd
SITE	A3738 – Eastlands
JOB NUMBER	MRN 3787/81

SAMPLE LABEL	BH2 B5 1.50-2.00	DATE SAMPLED	13 November 2020
LAB SAMPLE No	94130	DATE RECEIVED	16 November 2020
DATE TESTED	20 November 2020	SAMPLED BY	Client

ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried

PH Value	6.9	
Sulphate as SO_4 (2:1 Water Extract)	0.27	g/l

REMARKS

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 02 December 2020

MURRAY RIX

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TEL 0161 475 0870

UKAS TESTING
1580

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

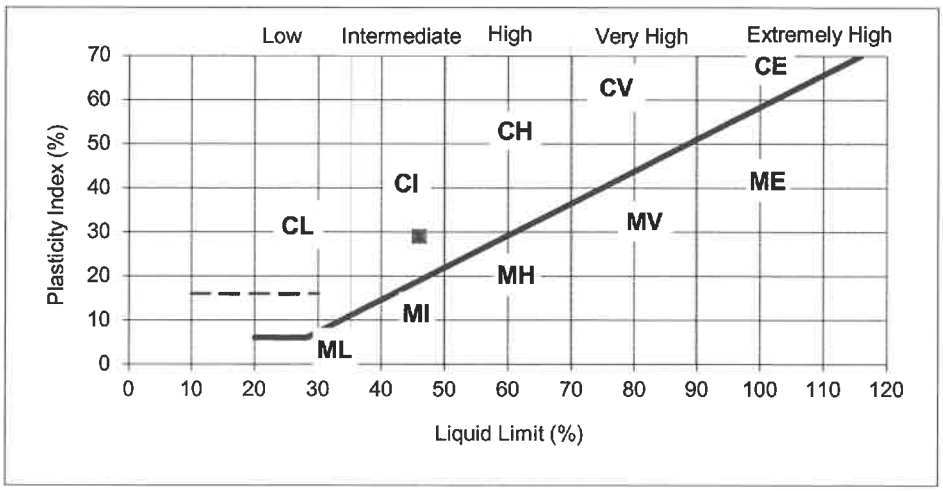
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	Earth Environmetal & Geotechnical Ltd
SITE	A3738 - Eastlands
JOB NUMBER	MRN 3787/81

SAMPLE LABEL	BH2 B9 3.50-4.00	DATE SAMPLED	13-Nov-20
SAMPLE No.	93134	DATE RECEIVED	16-Nov-20
DATE TESTED	20-Nov-20	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation Sample

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
29	46	17	29	94



REMARKS
Sample tested in natural condition

SIGNED

NAME O.P. Davies BA (Hons) DATE 02-Dec-20
(Laboratory Manager)

MURRAY RIX
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

pH and Sulphate as SO_4
BS 1377: PART 3: 1990

CLIENT	Earth Environmental & Geotechnical Ltd
SITE	A3738 – Eastlands
JOB NUMBER	MRN 3787/81

SAMPLE LABEL	BH2 D10 4.00-4.45	DATE SAMPLED	13 November 2020
LAB SAMPLE No	94135	DATE RECEIVED	16 November 2020
DATE TESTED	20 November 2020	SAMPLED BY	Client

ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried

PH Value	7.0	
Sulphate as SO_4 (2:1 Water Extract)	0.20	g/l

REMARKS

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 02 December 2020

MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING
1580

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

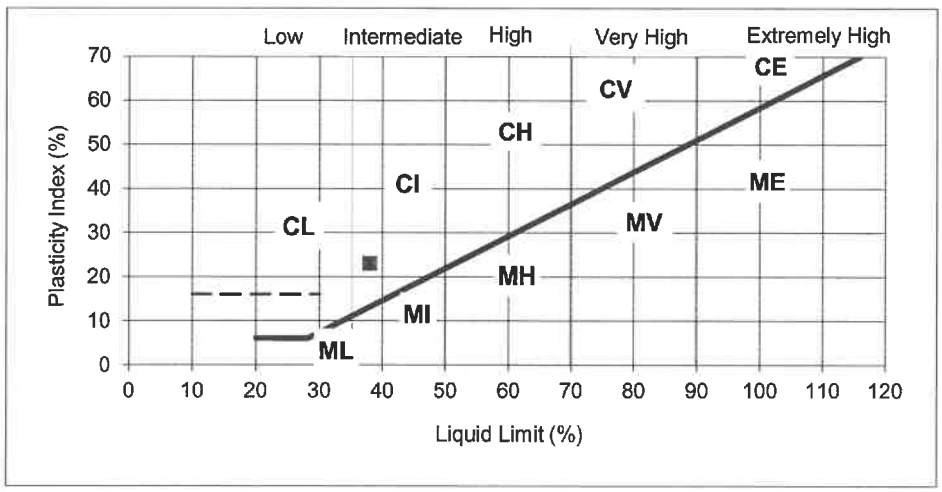
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	Earth Environmetal & Geotechnical Ltd
SITE	A3738 - Eastlands
JOB NUMBER	MRN 3787/81

SAMPLE LABEL	BH2 B18 7.50-8.00	DATE SAMPLED	13-Nov-20
SAMPLE No.	93139	DATE RECEIVED	16-Nov-20
DATE TESTED	20-Nov-20	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation Sample

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
15	38	15	23	94



REMARKS
Sample tested in natural condition

SIGNED

NAME O.P. Davies BA (Hons) DATE 02-Dec-20
(Laboratory Manager)

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING
1580

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

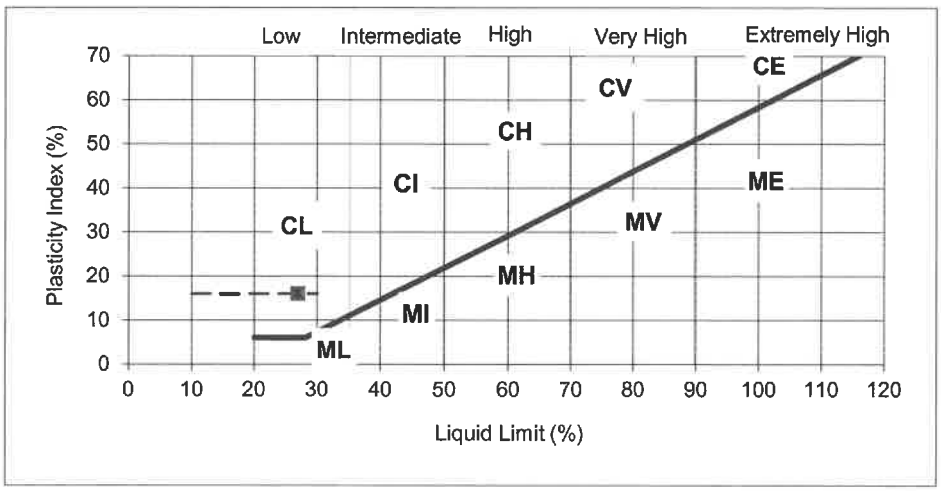
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	Earth Environmetal & Geotechnical Ltd
SITE	A3738 - Eastlands
JOB NUMBER	MRN 3787/81

SAMPLE LABEL	BH2 B21 9.50-10.00	DATE SAMPLED	13-Nov-20
SAMPLE No.	93141	DATE RECEIVED	16-Nov-20
DATE TESTED	20-Nov-20	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation Sample

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
15	27	11	16	87



REMARKS
Sample tested in natural condition

SIGNED

NAME O.P. Davies BA (Hons) DATE 02-Dec-20
(Laboratory Manager)

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

pH and Sulphate as SO_4
BS 1377: PART 3: 1990

CLIENT	Earth Environmental & Geotechnical Ltd
SITE	A3738 – Eastlands
JOB NUMBER	MRN 3787/81

SAMPLE LABEL	BH2 D22 10.00-10.45	DATE SAMPLED	13 November 2020
LAB SAMPLE No	94142	DATE RECEIVED	16 November 2020
DATE TESTED	20 November 2020	SAMPLED BY	Client

ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried

PH Value	7.0	
Sulphate as SO_4 (2:1 Water Extract)	0.15	g/l

REMARKS

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 02 December 2020

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

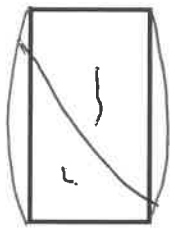
CLIENT	Earth Environmental & Geotechnical Ltd
SITE	A3738 - Eastlands
JOB NUMBER	MRN 3787/81

SAMPLE LABEL	BH2 U 6.50-6.95	DATE SAMPLED	13 November 2020
LAB SAMPLE No	94143	DATE RECEIVED	16 November 2020
DATE TESTED	23 November 2020	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation sample

SPECIMEN LENGTH	76	mm
SPECIMEN DIAMETER	38	mm
MOISTURE CONTENT OF SAMPLE	14	%
BULK DENSITY	2.23	Mg/m^3
DRY DENSITY	1.95	Mg/m^3
DEPTH OF TOP OF SPECIMEN	6.60	m
RATE OF STRAIN	2	%/min
RUBBER MEMBRANE THICKNESS	0.6	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
100	17	2.0	223.9	112
200	18	2.0	228.4	114
400	19	2.0	232.2	116

REMARKS
U38 sub-sample taken to give required length/diameter ratio

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 02 December 2020

MURRAY RIX
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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

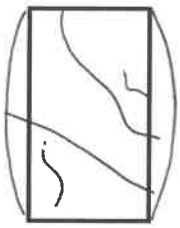
CLIENT	Earth Environmental & Geotechnical Ltd
SITE	A3738 - Eastlands
JOB NUMBER	MRN 3787/81

SAMPLE LABEL	BH2 U 9.00-9.45	DATE SAMPLED	13 November 2020
LAB SAMPLE No	94144	DATE RECEIVED	16 November 2020
DATE TESTED	23 November 2020	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation sample

SPECIMEN LENGTH	76	mm
SPECIMEN DIAMETER	38	mm
MOISTURE CONTENT OF SAMPLE	9.2	%
BULK DENSITY	2.14	Mg/m^3
DRY DENSITY	1.96	Mg/m^3
DEPTH OF TOP OF SPECIMEN	9:10	m
RATE OF STRAIN	2	%/min
RUBBER MEMBRANE THICKNESS	0.6	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
100	16	2.0	254.1	127
200	18	2.0	258.4	129
400	20	2.0	264.4	132

REMARKS
U38 sub-sample taken to give required length/diameter ratio

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 02 December 2020

APPENDIX 3

CHEMICAL TESTING RESULTS

Alice Barrington
Earth Environmental & Geotechnical Ltd
Houldsworth Mill Business Centre
Houldsworth Street
Reddish
Stockport
Cheshire
SK5 6DA

DETS Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 20-13684

Site Reference:	Eastlands
Project / Job Ref:	A3738
Order No:	A3738/20
Sample Receipt Date:	19/11/2020
Sample Scheduled Date:	19/11/2020
Report Issue Number:	1
Reporting Date:	26/11/2020

Authorised by:

Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

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

4480

Soil Analysis Certificate						
DETS Report No: 20-13684	**Date Sampled**	12/11/20	12/11/20	12/11/20	13/11/20	13/11/20
Earth Environmental & Geotechnical Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Eastlands	**TP / BH No**	BH1 ES1	BH1 ES2	BH1 ES4	BH2 ES1	BH2 ES2
Project / Job Ref: A3738	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: A3738/20	**Depth (m)**	0.40	0.50	1.50 - 2.00	0.20	0.30
Reporting Date: 26/11/2020	**DETS Sample No**	511803	511804	511805	511806	511807

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	9.9	10.0	9.9	10.1	10.7
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Complex Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Free Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Total Sulphate as SO_4	mg/kg	< 200	MCERTS	2445	1670	1455	1806	4235
Total Sulphate as SO_4	%	< 0.02	MCERTS	0.24	0.17	0.15	0.18	0.42
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	551	301	265	232	189
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	0.55	0.30	0.27	0.23	0.19
Sulphide	mg/kg	< 5	NONE	< 5	< 5	< 5	< 5	< 5
Organic Matter	%	< 0.1	MCERTS	4.7	5.5	7.6	5.2	3.8
Arsenic (As)	mg/kg	< 2	MCERTS	5	5	39	3	5
Barium (Ba)	mg/kg	< 2.5	MCERTS	127	122	179	67	153
Beryllium (Be)	mg/kg	< 0.5	MCERTS	< 0.5	< 0.5	2.4	< 0.5	< 0.5
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.7	0.6	0.8	0.5	0.4
Chromium (Cr)	mg/kg	< 2	MCERTS	14	13	21	11	18
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	22	20	285	19	24
Lead (Pb)	mg/kg	< 3	MCERTS	56	43	368	23	44
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	10	10	35	8	11
Selenium (Se)	mg/kg	< 2	MCERTS	< 3	< 3	< 3	< 3	< 3
Vanadium (V)	mg/kg	< 1	MCERTS	22	22	47	22	24
Zinc (Zn)	mg/kg	< 3	MCERTS	94	147	313	47	60
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
EPH (C10 - C40)	mg/kg	< 6	MCERTS	1900	1720	919	3300	2380

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

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Soil Analysis Certificate						
DETS Report No: 20-13684	**Date Sampled**	13/11/20				
Earth Environmental & Geotechnical Ltd	**Time Sampled**	None Supplied				
Site Reference: Eastlands	**TP / BH No**	BH2 ES3				
Project / Job Ref: A3738	**Additional Refs**	None Supplied				
Order No: A3738/20	**Depth (m)**	0.70				
Reporting Date: 26/11/2020	**DETS Sample No**	511808				

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected				
pH	pH Units	N/a	MCERTS	10.4				
Total Cyanide	mg/kg	< 2	NONE	< 2				
Complex Cyanide	mg/kg	< 2	NONE	< 2				
Free Cyanide	mg/kg	< 2	NONE	< 2				
Total Sulphate as SO_4	mg/kg	< 200	MCERTS	2022				
Total Sulphate as SO_4	%	< 0.02	MCERTS	0.20				
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	263				
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	0.26				
Sulphide	mg/kg	< 5	NONE	< 5				
Organic Matter	%	< 0.1	MCERTS	3.4				
Arsenic (As)	mg/kg	< 2	MCERTS	10				
Barium (Ba)	mg/kg	< 2.5	MCERTS	413				
Beryllium (Be)	mg/kg	< 0.5	MCERTS	0.5				
W/S Boron	mg/kg	< 1	NONE	< 1				
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	1.4				
Chromium (Cr)	mg/kg	< 2	MCERTS	20				
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2				
Copper (Cu)	mg/kg	< 4	MCERTS	154				
Lead (Pb)	mg/kg	< 3	MCERTS	337				
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1				
Nickel (Ni)	mg/kg	< 3	MCERTS	10				
Selenium (Se)	mg/kg	< 2	MCERTS	< 3				
Vanadium (V)	mg/kg	< 1	MCERTS	20				
Zinc (Zn)	mg/kg	< 3	MCERTS	148				
Total Phenols (monohydric)	mg/kg	< 2	NONE	2.4				
EPH (C10 - C40)	mg/kg	< 6	MCERTS	3630				

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 20-13684	**Date Sampled**	12/11/20	12/11/20	12/11/20	13/11/20	13/11/20
Earth Environmental & Geotechnical Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Eastlands	**TP / BH No**	BH1 ES1	BH1 ES2	BH1 ES4	BH2 ES1	BH2 ES2
Project / Job Ref: A3738	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: A3738/20	**Depth (m)**	0.40	0.50	1.50 - 2.00	0.20	0.30
Reporting Date: 26/11/2020	**DETS Sample No**	511803	511804	511805	511806	511807

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	0.33	0.16	4.08	0.24	7
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.23	0.20	0.60
Acenaphthene	mg/kg	< 0.1	MCERTS	0.77	0.25	9.27	< 0.1	1.16
Fluorene	mg/kg	< 0.1	MCERTS	0.70	0.23	7.44	0.22	1.81
Phenanthrene	mg/kg	< 0.1	MCERTS	7.20	2.35	79.50	1.10	18.90
Anthracene	mg/kg	< 0.1	MCERTS	1.85	0.61	17	0.20	3.53
Fluoranthene	mg/kg	< 0.1	MCERTS	10.40	4.37	80.30	0.63	22.70
Pyrene	mg/kg	< 0.1	MCERTS	15.80	5.92	73.90	0.93	24.40
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	6.25	3.02	31.10	0.36	7.82
Chrysene	mg/kg	< 0.1	MCERTS	5.04	2.86	26.40	0.52	6.79
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	7.05	4.20	27.50	0.53	8.48
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	2.04	1.07	6.82	0.18	2.37
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	6.49	3.87	23.60	0.50	8.18
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	2.53	1.62	8.18	0.26	2.76
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	0.48	0.48	1.65	< 0.1	0.57
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	2.12	1.35	7.08	0.29	2.23
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	69.1	32.4	404	6.2	119

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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 20-13684	**Date Sampled**	13/11/20				
Earth Environmental & Geotechnical Ltd	**Time Sampled**	None Supplied				
Site Reference: Eastlands	**TP / BH No**	BH2 ES3				
Project / Job Ref: A3738	**Additional Refs**	None Supplied				
Order No: A3738/20	**Depth (m)**	0.70				
Reporting Date: 26/11/2020	**DETS Sample No**	511808				

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	87.60				
Acenaphthylene	mg/kg	< 0.1	MCERTS	0.34				
Acenaphthene	mg/kg	< 0.1	MCERTS	68.60				
Fluorene	mg/kg	< 0.1	MCERTS	63.70				
Phenanthrene	mg/kg	< 0.1	MCERTS	389				
Anthracene	mg/kg	< 0.1	MCERTS	71.90				
Fluoranthene	mg/kg	< 0.1	MCERTS	300				
Pyrene	mg/kg	< 0.1	MCERTS	245				
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	94				
Chrysene	mg/kg	< 0.1	MCERTS	64.30				
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	66				
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	25.30				
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	66.40				
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	22				
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	3.49				
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	18.10				
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	1590				

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Soil Analysis Certificate - TPH CWG Banded							
DETS Report No: 20-13684	**Date Sampled**	12/11/20	12/11/20	12/11/20	13/11/20	13/11/20
Earth Environmental & Geotechnical Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Eastlands	**TP / BH No**	BH1 ES1	BH1 ES2	BH1 ES4	BH2 ES1	BH2 ES2
Project / Job Ref: A3738	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: A3738/20	**Depth (m)**	0.40	0.50	1.50 - 2.00	0.20	0.30
Reporting Date: 26/11/2020	**DETS Sample No**	511803	511804	511805	511806	511807

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	11	< 2	< 2
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	6
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	23	18	6	20	41
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	49	44	< 3	96	81
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	410	361	17	914	664
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	483	424	33	1030	792
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	6	4	3
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	9	< 2	12
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	17	12	77	16	41
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	100	71	315	81	167
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	541	498	274	1176	681
Aromatic (C5 - C35)	mg/kg	< 21	NONE	658	580	680	1278	904
Total >C5 - C35	mg/kg	< 42	NONE	1141	1004	713	2307	1696

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Soil Analysis Certificate - TPH CWG Banded						
DETS Report No: 20-13684	**Date Sampled**	13/11/20				
Earth Environmental & Geotechnical Ltd	**Time Sampled**	None Supplied				
Site Reference: Eastlands	**TP / BH No**	BH2 ES3				
Project / Job Ref: A3738	**Additional Refs**	None Supplied				
Order No: A3738/20	**Depth (m)**	0.70				
Reporting Date: 26/11/2020	**DETS Sample No**	511808				

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01				
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05				
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2				
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	2				
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	11				
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	16				
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	96				
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	126				
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01				
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05				
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	3				
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	127				
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	399				
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	1397				
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	940				
Aromatic (C5 - C35)	mg/kg	< 21	NONE	2866				
Total >C5 - C35	mg/kg	< 42	NONE	2992				

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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 20-13684	**Date Sampled**	12/11/20	12/11/20	12/11/20	13/11/20	13/11/20
Earth Environmental & Geotechnical Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Eastlands	**TP / BH No**	BH1 ES1	BH1 ES2	BH1 ES4	BH2 ES1	BH2 ES2
Project / Job Ref: A3738	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: A3738/20	**Depth (m)**	0.40	0.50	1.50 - 2.00	0.20	0.30
Reporting Date: 26/11/2020	**DETS Sample No**	511803	511804	511805	511806	511807

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	54
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	17	< 2	65
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	38
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

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Soil Analysis Certificate - BTEX / MTBE							
DETS Report No: 20-13684	Date Sampled	13/11/20					
Earth Environmental & Geotechnical Ltd	Time Sampled	None Supplied					
Site Reference: Eastlands	TP / BH No	BH2 ES3					
Project / Job Ref: A3738	Additional Refs	None Supplied					
Order No: A3738/20	Depth (m)	0.70					
Reporting Date: 26/11/2020	DETS Sample No	511808					

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2				
Toluene	ug/kg	< 5	MCERTS	< 5				
Ethylbenzene	ug/kg	< 2	MCERTS	11				
p & m-xylene	ug/kg	< 2	MCERTS	26				
o-xylene	ug/kg	< 2	MCERTS	17				
MTBE	ug/kg	< 5	MCERTS	< 5				

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MCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING 4480

Waste Acceptance Criteria Analytical Certificate - BS EN 12457/3

DETS Report No: 20-13684		**Date Sampled**	12/11/20		**Landfill Waste Acceptance Criteria Limits**		
Earth Environmental & Geotechnical Ltd		**Time Sampled**	None Supplied		**Inert Waste Landfill**	**Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Site Reference: Eastlands		**TP / BH No**	BH1 ES2				
Project / Job Ref: A3738		**Additional Refs**	None Supplied				
Order No: A3738/20		**Depth (m)**	0.50				
Reporting Date: 26/11/2020		**DETS Sample No**	511804				
Determinand	**Unit**	**MDL**					
TOC[MU]	%	< 0.1	3.2		**3%**	5%	6%
Loss on Ignition	%	< 0.01	4.90		--	--	10%
BTEX[MU]	mg/kg	< 0.05	< 0.05		6	--	--
Sum of PCBs	mg/kg	< 0.1	< 0.1		1	--	--
Mineral Oil[MU]	mg/kg	< 10	530		**500**	--	--
Total PAH[MU]	mg/kg	< 1.7	33		100	--	--
pH[MU]	pH Units	N/a	10.0		--	>6	--
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	4.7		--	To be evaluated	To be evaluated

Eluate Analysis	**2:1 mg/l**	**8:1 mg/l**		**Cumulative 10:1 mg/kg**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
Arsenic[U]	< 0.01	< 0.01		< 0.2	0.5	2	25
Barium[U]	0.02	< 0.02		0.2	20	100	300
Cadmium[U]	< 0.0005	< 0.0005		< 0.02	0.04	1	5
Chromium[U]	0.007	< 0.005		< 0.20	0.5	10	70
Copper[U]	0.03	0.04		< 0.5	2	50	100
Mercury[U]	< 0.0005	< 0.0005		< 0.005	0.01	0.2	2
Molybdenum[U]	0.009	0.003		< 0.1	0.5	10	30
Nickel[U]	< 0.007	< 0.007		< 0.2	0.4	10	40
Lead[U]	< 0.005	< 0.005		< 0.2	0.5	10	50
Antimony[U]	0.005	< 0.005		< 0.05	0.06	0.7	5
Selenium[U]	< 0.005	< 0.005		< 0.05	0.1	0.5	7
Zinc[U]	< 0.005	< 0.005		< 0.2	4	50	200
Chloride[U]	5	4		42	800	15000	25000
Fluoride[U]	< 0.5	< 0.5		< 1	10	150	500
Sulphate[U]	79	36		416	1000	20000	50000
TDS	175	98		1073	4000	60000	100000
Phenol Index	< 0.01	< 0.01		< 0.5	1	-	-
DOC	11.8	12.3		122	500	800	1000
Leach Test Information							
Sample Mass (kg)	0.20						
Dry Matter (%)	88						
Moisture (%)	13.6						
Stage 1							
Volume Eluate L2 (litres)	0.33						
Filtered Eluate VE1 (litres)	0.21						

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
Stated limits are for guidance only and DETS Ltd cannot be held responsible for any discrepencies with current legislation
M Denotes MCERTS accredited test
U Denotes ISO17025 accredited test

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MCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING 4480

Waste Acceptance Criteria Analytical Certificate - BS EN 12457/3

DETS Report No: 20-13684		**Date Sampled**	13/11/20		**Landfill Waste Acceptance Criteria Limits**		
Earth Environmental & Geotechnical Ltd		**Time Sampled**	None Supplied		**Inert Waste Landfill**	**Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Site Reference: Eastlands		**TP / BH No**	BH2 ES2				
Project / Job Ref: A3738		**Additional Refs**	None Supplied				
Order No: A3738/20		**Depth (m)**	0.30				
Reporting Date: 26/11/2020		**DETS Sample No**	511807				
Determinand	**Unit**	**MDL**					
TOC[MU]	%	< 0.1	2.2		3%	5%	6%
Loss on Ignition	%	< 0.01	4.30		--	--	10%
BTEX[MU]	mg/kg	< 0.05	0.16		6	--	--
Sum of PCBs	mg/kg	< 0.1	< 0.1		1	--	--
Mineral Oil[MU]	mg/kg	< 10	1080		**500**	--	--
Total PAH[MU]	mg/kg	< 1.7	120		**100**	--	--
pH[MU]	pH Units	N/a	10.7		--	>6	--
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	5		--	To be evaluated	To be evaluated

Eluate Analysis	**2:1 mg/l**	**8:1 mg/l**		**Cumulative 10:1 mg/kg**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
Arsenic[U]	< 0.01	< 0.01		< 0.2	0.5	2	25
Barium[U]	0.02	0.03		0.3	20	100	300
Cadmium[U]	< 0.0005	< 0.0005		< 0.02	0.04	1	5
Chromium[U]	0.018	0.006		< 0.20	0.5	10	70
Copper[U]	0.04	0.02		< 0.5	2	50	100
Mercury[U]	< 0.0005	< 0.0005		< 0.005	0.01	0.2	2
Molybdenum[U]	0.010	0.003		< 0.1	0.5	10	30
Nickel[U]	< 0.007	< 0.007		< 0.2	0.4	10	40
Lead[U]	< 0.005	< 0.005		< 0.2	0.5	10	50
Antimony[U]	< 0.005	< 0.005		< 0.05	0.06	0.7	5
Selenium[U]	< 0.005	< 0.005		< 0.05	0.1	0.5	7
Zinc[U]	< 0.005	< 0.005		< 0.2	4	50	200
Chloride[U]	7	2		25	800	15000	25000
Fluoride[U]	< 0.5	< 0.5		< 1	10	150	500
Sulphate[U]	57	43		446	1000	20000	50000
TDS	144	142		1422	4000	60000	100000
Phenol Index	< 0.01	< 0.01		< 0.5	1	-	-
DOC	15.1	10.8		112	500	800	1000
Leach Test Information							
Sample Mass (kg)	0.19						
Dry Matter (%)	90.7						
Moisture (%)	10.4						
Stage 1							
Volume Eluate L2 (litres)	0.33						
Filtered Eluate VE1 (litres)	0.15						

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
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Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 20-13684	
Earth Environmental & Geotechnical Ltd	
Site Reference: Eastlands	
Project / Job Ref: A3738	
Order No: A3738/20	
Reporting Date: 26/11/2020	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
511803	BH1 ES1	None Supplied	0.40	10.3	Brown loamy sand with stones and concrete
511804	BH1 ES2	None Supplied	0.50	12	Brown loamy sand with stones
511805	BH1 ES4	None Supplied	1.50 - 2.00	16.2	Black loamy sand with stones and concrete
511806	BH2 ES1	None Supplied	0.20	6.1	Brown loamy sand with stones and concrete
511807	BH2 ES2	None Supplied	0.30	9.3	Brown loamy sand with stones and concrete
511808	BH2 ES3	None Supplied	0.70	10	Brown loamy sand with stones and concrete

Moisture content is part of procedure E003 & is not an accredited test
Insufficient Sample I/S
Unsuitable Sample U/S

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

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING 4480

Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 20-13684
Earth Environmental & Geotechnical Ltd
Site Reference: Eastlands
Project / Job Ref: A3738
Order No: A3738/20
Reporting Date: 26/11/2020

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

D Dried
AR As Received

Parameter	Matrix Type	Suite Reference	Expanded Uncertainity Measurement	Unit
TOC	Soil	BS EN 12457	13.49	%
Loss on Ignition	Soil	BS EN 12457	17	%
BTEX	Soil	BS EN 12457	14	%
Sum of PCBs	Soil	BS EN 12457	23	%
Mineral Oil	Soil	BS EN 12457	9	%
Total PAH	Soil	BS EN 12457	20	%
pH	Soil	BS EN 12457	0.399	Units
Acid Neutralisation Capacity	Soil	BS EN 12457	18	%
Arsenic	Leachate	BS EN 12457	16.63	%
Barium	Leachate	BS EN 12457	14.29	%
Cadmium	Leachate	BS EN 12457	14.44	%
Chromium	Leachate	BS EN 12457	18.06	%
Copper	Leachate	BS EN 12457	21.27	%
Mercury	Leachate	BS EN 12457	24.13	%
Molybdenum	Leachate	BS EN 12457	12.55	%
Nickel	Leachate	BS EN 12457	20.08	%
Lead	Leachate	BS EN 12457	13.43	%
Antimony	Leachate	BS EN 12457	18.85	%
Selenium	Leachate	BS EN 12457	18.91	%
Zinc	Leachate	BS EN 12457	13.71	%
Chloride	Leachate	BS EN 12457	16	%
Fluoride	Leachate	BS EN 12457	19.4	%
Sulphate	Leachate	BS EN 12457	19.63	%
TDS	Leachate	BS EN 12457	12	%
Phenol Index	Leachate	BS EN 12457	14	%
DOC	Leachate	BS EN 12457	10	%
Clay Content	Soil	BS 3882: 2015	15	%
Silt Content	Soil	BS 3882: 2015	14	%
Sand Content	Soil	BS 3882: 2015	13	%
Loss on Ignition	Soil	BS 3882: 2015	17	%
pH	Soil	BS 3882: 2015	0.399	Units
Carbonate	Soil	BS 3882: 2015	16	%
Total Nitrogen	Soil	BS 3882: 2015	12	%
Phosphorus (Extractable)	Soil	BS 3882: 2015	24	%
Potassium (Extractable)	Soil	BS 3882: 2015	20	%
Magnesium (Extractable)	Soil	BS 3882: 2015	26	%
Zinc	Soil	BS 3882: 2015	14.9	%
Copper	Soil	BS 3882: 2015	16	%
Nickel	Soil	BS 3882: 2015	17.7	%
Available Sodium	Soil	BS 3882: 2015	23	%
Available Calcium	Soil	BS 3882: 2015	23	%
Electrical Conductivity	Soil	BS 3882: 2015	10	%

APPENDIX 4

SOIL WASTE ASSESSMENT

Waste Classification Report

7T24Q-GX7FK-SNS8H

Job name

A3738

Description/Comments

Project

Site

Related Documents

#	Name	Description
None		

Waste Stream Template

Example waste stream template for contaminated soils

Classified by

Name:
Adam Czarnecki
Date:
07 Dec 2020 15:20 GMT
Telephone:
0161 975 6088

Company:
Earth Environmental & Geotechnical Ltd
Houldsworth Mill Business & Arts Centre
Houldsworth Street
Stockport
SK5 6DA

HazWasteOnline™ Training Record:

Course	Date
Hazardous Waste Classification	-
Advanced Hazardous Waste Classification	-

Report

Created by: Adam Czarnecki
Created date: 07 Dec 2020 15:20 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	BH1 ES1	0.4	Hazardous	HP 7, HP 11	2
2	BH1 ES2	0.5	Non Hazardous		5
3	BH1 ES4	1.50-2.00	Non Hazardous		8
4	BH2 ES1	0.2	Hazardous	HP 7, HP 11	11
5	BH2 ES2	0.3	Hazardous	HP 7, HP 11	14
6	BH2 ES3	0.7	Hazardous	HP 7, HP 11	17

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	20
Appendix B: Rationale for selection of metal species	21
Appendix C: Version	22

Classification of sample: BH1 ES1

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample Name:
BH1 ES1
Sample Depth:
0.4 m
Moisture content:
10.3%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.103%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.103%)

Determinands

Moisture content: 10.3% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		5 mg/kg	1.32	5.985 mg/kg	0.000599 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		<0.5 mg/kg	2.775	<1.388 mg/kg	<0.000139 %		<**LOD**
3	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %		<**LOD**
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.7 mg/kg	1.142	0.725 mg/kg	0.0000725 %	✓	
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		14 mg/kg	1.462	18.551 mg/kg	0.00186 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2 mg/kg	2.27	<4.54 mg/kg	<0.000454 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
7		copper { dicopper oxide; copper (I) oxide }				22	mg/kg	1.126	22.457	mg/kg	0.00225 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
8		lead { lead chromate }			1	56	mg/kg	1.56	79.193	mg/kg	0.00508 %	✓	
		082-004-00-2	231-846-0	7758-97-6									
9		mercury { mercury dichloride }				<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
10		nickel { nickel chromate }				10	mg/kg	2.976	26.983	mg/kg	0.0027 %	✓	
		028-035-00-7	238-766-5	14721-18-7									
11		selenium { nickel selenate }				<3	mg/kg	2.554	<7.662	mg/kg	<0.000766 %		<LOD
		028-031-00-5	239-125-2	15060-62-5									
12		zinc { zinc chromate }				94	mg/kg	2.774	236.419	mg/kg	0.0236 %	✓	
		024-007-00-3	236-878-9	13530-65-9									
13		TPH (C6 to C40) petroleum group				1141	mg/kg		1034.451	mg/kg	0.103 %	✓	
				TPH									
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
15		benzene				<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<2	mg/kg	1.884	<3.768	mg/kg	<0.000377 %		<LOD
		006-007-00-5											
20		pH				9.9	pH		9.9	pH	9.9 pH		
				PH									
21		naphthalene				0.33	mg/kg		0.299	mg/kg	0.0000299 %	✓	
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
23		acenaphthene				0.77	mg/kg		0.698	mg/kg	0.0000698 %	✓	
			201-469-6	83-32-9									
24		fluorene				0.7	mg/kg		0.635	mg/kg	0.0000635 %	✓	
			201-695-5	86-73-7									
25		phenanthrene				7.2	mg/kg		6.528	mg/kg	0.000653 %	✓	
			201-581-5	85-01-8									
26		anthracene				1.85	mg/kg		1.677	mg/kg	0.000168 %	✓	
			204-371-1	120-12-7									
27		fluoranthene				10.4	mg/kg		9.429	mg/kg	0.000943 %	✓	
			205-912-4	206-44-0									
28		pyrene				15.8	mg/kg		14.325	mg/kg	0.00143 %	✓	
			204-927-3	129-00-0									
29		benzo[a]anthracene				6.25	mg/kg		5.666	mg/kg	0.000567 %	✓	
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				5.04	mg/kg		4.569	mg/kg	0.000457 %	✓	
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				7.05	mg/kg		6.392	mg/kg	0.000639 %	✓	
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				2.04	mg/kg		1.85	mg/kg	0.000185 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				6.49	mg/kg		5.884	mg/kg	0.000588 %	✓	
		601-032-00-3	200-028-5	50-32-8									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
34		indeno[123-cd]pyrene				2.53	mg/kg		2.294	mg/kg	0.000229 %	✓	
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				0.48	mg/kg		0.435	mg/kg	0.0000435 %	✓	
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				2.12	mg/kg		1.922	mg/kg	0.000192 %	✓	
			205-883-8	191-24-2									
37		phenol				<2	mg/kg		<2	mg/kg	<0.0002 %		**<LOD**
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.15 %		

Key

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

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free phase

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.103%)

Classification of sample: BH1 ES2

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

Sample details

Sample Name:
BH1 ES2
Sample Depth:
0.5 m
Moisture content:
12%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		5 mg/kg	1.32	5.894 mg/kg	0.000589 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		<0.5 mg/kg	2.775	<1.388 mg/kg	<0.000139 %		<LOD
3	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %		<LOD
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.6 mg/kg	1.142	0.612 mg/kg	0.0000612 %	✓	
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		13 mg/kg	1.462	16.964 mg/kg	0.0017 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2 mg/kg	2.27	<4.54 mg/kg	<0.000454 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		20 mg/kg	1.126	20.105 mg/kg	0.00201 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	43 mg/kg	1.56	59.886 mg/kg	0.00384 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		10 mg/kg	2.976	26.574 mg/kg	0.00266 %	✓	
11	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<3 mg/kg	2.554	<7.662 mg/kg	<0.000766 %		<LOD
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		147 mg/kg	2.774	364.107 mg/kg	0.0364 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		1004 mg/kg		896.429 mg/kg	0.0896 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5 mg/kg		<5 mg/kg	<0.0005 %		<LOD

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		benzene	601-020-00-8	200-753-7	71-43-2		<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
16		toluene	601-021-00-3	203-625-9	108-88-3		<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
17		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
18		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<2	mg/kg	1.884	<3.768	mg/kg	<0.000377 %		<LOD
20		pH			PH		10	pH		10	pH	10pH		
21		naphthalene	601-052-00-2	202-049-5	91-20-3		0.16	mg/kg		0.143	mg/kg	0.0000143 %	✓	
22		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
23		acenaphthene		201-469-6	83-32-9		0.25	mg/kg		0.223	mg/kg	0.0000223 %	✓	
24		fluorene		201-695-5	86-73-7		0.23	mg/kg		0.205	mg/kg	0.0000205 %	✓	
25		phenanthrene		201-581-5	85-01-8		2.35	mg/kg		2.098	mg/kg	0.00021 %	✓	
26		anthracene		204-371-1	120-12-7		0.61	mg/kg		0.545	mg/kg	0.0000545 %	✓	
27		fluoranthene		205-912-4	206-44-0		4.37	mg/kg		3.902	mg/kg	0.00039 %	✓	
28		pyrene		204-927-3	129-00-0		5.92	mg/kg		5.286	mg/kg	0.000529 %	✓	
29		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		3.02	mg/kg		2.696	mg/kg	0.00027 %	✓	
30		chrysene	601-048-00-0	205-923-4	218-01-9		2.86	mg/kg		2.554	mg/kg	0.000255 %	✓	
31		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		4.2	mg/kg		3.75	mg/kg	0.000375 %	✓	
32		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		1.07	mg/kg		0.955	mg/kg	0.0000955 %	✓	
33		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		3.87	mg/kg		3.455	mg/kg	0.000346 %	✓	
34		indeno[123-cd]pyrene		205-893-2	193-39-5		1.62	mg/kg		1.446	mg/kg	0.000145 %	✓	
35		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.48	mg/kg		0.429	mg/kg	0.0000429 %	✓	
36		benzo[ghi]perylene		205-883-8	191-24-2		1.35	mg/kg		1.205	mg/kg	0.000121 %	✓	
37		phenol	604-001-00-2	203-632-7	108-95-2		<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
											Total:	0.144 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free phase

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0896%)

Classification of sample: BH1 ES4

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

Sample details

Sample Name:
BH1 ES4
Sample Depth:
1.50-2.00 m
Moisture content:
16.2%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16.2% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number / EC Number / CAS Number							
1	arsenic { arsenic trioxide }		39 mg/kg	1.32	44.314 mg/kg	0.00443 %	✓	
	033-003-00-0 / 215-481-4 / 1327-53-3							
2	beryllium { beryllium oxide }		2.4 mg/kg	2.775	5.732 mg/kg	0.000573 %	✓	
	004-003-00-8 / 215-133-1 / 1304-56-9							
3	boron { diboron trioxide; boric oxide }		<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %		<LOD
	005-008-00-8 / 215-125-8 / 1303-86-2							
4	cadmium { cadmium oxide }		0.8 mg/kg	1.142	0.786 mg/kg	0.0000786 %	✓	
	048-002-00-0 / 215-146-2 / 1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		21 mg/kg	1.462	26.414 mg/kg	0.00264 %	✓	
	/ 215-160-9 / 1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }		<2 mg/kg	2.27	<4.54 mg/kg	<0.000454 %		<LOD
	024-017-00-8 / /							
7	copper { dicopper oxide; copper (I) oxide }		285 mg/kg	1.126	276.143 mg/kg	0.0276 %	✓	
	029-002-00-X / 215-270-7 / 1317-39-1							
8	lead { lead chromate }	1	368 mg/kg	1.56	493.986 mg/kg	0.0317 %	✓	
	082-004-00-2 / 231-846-0 / 7758-97-6							
9	mercury { mercury dichloride }		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
	080-010-00-X / 231-299-8 / 7487-94-7							
10	nickel { nickel chromate }		35 mg/kg	2.976	89.647 mg/kg	0.00896 %	✓	
	028-035-00-7 / 238-766-5 / 14721-18-7							
11	selenium { nickel selenate }		<3 mg/kg	2.554	<7.662 mg/kg	<0.000766 %		<LOD
	028-031-00-5 / 239-125-2 / 15060-62-5							
12	zinc { zinc chromate }		313 mg/kg	2.774	747.253 mg/kg	0.0747 %	✓	
	024-007-00-3 / 236-878-9 / 13530-65-9							
13	TPH (C6 to C40) petroleum group		713 mg/kg		613.597 mg/kg	0.0614 %	✓	
	/ / TPH							
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane		<5 mg/kg		<5 mg/kg	<0.0005 %		<LOD
	603-181-00-X / 216-653-1 / 1634-04-4							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		benzene				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<5	mg/kg		<5	mg/kg	<0.0005 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
18		xylene				17	mg/kg		14.63	mg/kg	0.00146 %	✓	
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<2	mg/kg	1.884	<3.768	mg/kg	<0.000377 %		<**LOD**
		006-007-00-5											
20		pH				9.9	pH		9.9	pH	9.9 pH		
				PH									
21		naphthalene				4.08	mg/kg		3.511	mg/kg	0.000351 %	✓	
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				0.23	mg/kg		0.198	mg/kg	0.0000198 %	✓	
			205-917-1	208-96-8									
23		acenaphthene				9.27	mg/kg		7.978	mg/kg	0.000798 %	✓	
			201-469-6	83-32-9									
24		fluorene				7.44	mg/kg		6.403	mg/kg	0.00064 %	✓	
			201-695-5	86-73-7									
25		phenanthrene				79.5	mg/kg		68.417	mg/kg	0.00684 %	✓	
			201-581-5	85-01-8									
26		anthracene				17	mg/kg		14.63	mg/kg	0.00146 %	✓	
			204-371-1	120-12-7									
27		fluoranthene				80.3	mg/kg		69.105	mg/kg	0.00691 %	✓	
			205-912-4	206-44-0									
28		pyrene				73.9	mg/kg		63.597	mg/kg	0.00636 %	✓	
			204-927-3	129-00-0									
29		benzo[a]anthracene				31.1	mg/kg		26.764	mg/kg	0.00268 %	✓	
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				26.4	mg/kg		22.719	mg/kg	0.00227 %	✓	
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				27.5	mg/kg		23.666	mg/kg	0.00237 %	✓	
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				6.82	mg/kg		5.869	mg/kg	0.000587 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				23.6	mg/kg		20.31	mg/kg	0.00203 %	✓	
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				8.18	mg/kg		7.04	mg/kg	0.000704 %	✓	
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				1.65	mg/kg		1.42	mg/kg	0.000142 %	✓	
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				7.08	mg/kg		6.093	mg/kg	0.000609 %	✓	
			205-883-8	191-24-2									
37		phenol				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.252 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free phase

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.0614%)
xylene: (conc.: 0.00146%)

Classification of sample: BH2 ES1

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample Name:
BH2 ES1
Sample Depth:
0.2 m
Moisture content:
6.1%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.217%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.217%)

Determinands

Moisture content: 6.1% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		3 mg/kg	1.32	3.733 mg/kg	0.000373 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		<0.5 mg/kg	2.775	<1.388 mg/kg	<0.000139 %		<**LOD**
3	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %		<**LOD**
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.5 mg/kg	1.142	0.538 mg/kg	0.0000538 %	✓	
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		11 mg/kg	1.462	15.153 mg/kg	0.00152 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2 mg/kg	2.27	<4.54 mg/kg	<0.000454 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
7		copper { dicopper oxide; copper (I) oxide }				19	mg/kg	1.126	20.162	mg/kg	0.00202 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
8		lead { lead chromate }			1	23	mg/kg	1.56	33.813	mg/kg	0.00217 %	✓	
		082-004-00-2	231-846-0	7758-97-6									
9		mercury { mercury dichloride }				<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
10		nickel { nickel chromate }				8	mg/kg	2.976	22.441	mg/kg	0.00224 %	✓	
		028-035-00-7	238-766-5	14721-18-7									
11		selenium { nickel selenate }				<3	mg/kg	2.554	<7.662	mg/kg	<0.000766 %		<LOD
		028-031-00-5	239-125-2	15060-62-5									
12		zinc { zinc chromate }				47	mg/kg	2.774	122.889	mg/kg	0.0123 %	✓	
		024-007-00-3	236-878-9	13530-65-9									
13		TPH (C6 to C40) petroleum group				2307	mg/kg		2174.364	mg/kg	0.217 %	✓	
				TPH									
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
15		benzene				<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<2	mg/kg	1.884	<3.768	mg/kg	<0.000377 %		<LOD
		006-007-00-5											
20		pH				10.1	pH		10.1	pH	10.1 pH		
				PH									
21		naphthalene				0.24	mg/kg		0.226	mg/kg	0.0000226 %	✓	
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				0.2	mg/kg		0.189	mg/kg	0.0000189 %	✓	
			205-917-1	208-96-8									
23		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
24		fluorene				0.22	mg/kg		0.207	mg/kg	0.0000207 %	✓	
			201-695-5	86-73-7									
25		phenanthrene				1.1	mg/kg		1.037	mg/kg	0.000104 %	✓	
			201-581-5	85-01-8									
26		anthracene				0.2	mg/kg		0.189	mg/kg	0.0000189 %	✓	
			204-371-1	120-12-7									
27		fluoranthene				0.63	mg/kg		0.594	mg/kg	0.0000594 %	✓	
			205-912-4	206-44-0									
28		pyrene				0.93	mg/kg		0.877	mg/kg	0.0000877 %	✓	
			204-927-3	129-00-0									
29		benzo[a]anthracene				0.36	mg/kg		0.339	mg/kg	0.0000339 %	✓	
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				0.52	mg/kg		0.49	mg/kg	0.000049 %	✓	
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				0.53	mg/kg		0.5	mg/kg	0.00005 %	✓	
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				0.18	mg/kg		0.17	mg/kg	0.000017 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				0.5	mg/kg		0.471	mg/kg	0.0000471 %	✓	
		601-032-00-3	200-028-5	50-32-8									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
34		indeno[123-cd]pyrene				0.26	mg/kg		0.245	mg/kg	0.0000245 %	✓	
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				0.29	mg/kg		0.273	mg/kg	0.0000273 %	✓	
			205-883-8	191-24-2									
37		phenol				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.243 %		

Key

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

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free phase

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.217%)

Classification of sample: BH2 ES2

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample Name:
BH2 ES2
Sample Depth:
0.3 m
Moisture content:
9.3%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.155%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.155%)

Determinands

Moisture content: 9.3% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		5 mg/kg	1.32	6.04 mg/kg	0.000604 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		<0.5 mg/kg	2.775	<1.388 mg/kg	<0.000139 %		<**LOD**
3	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %		<**LOD**
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.4 mg/kg	1.142	0.418 mg/kg	0.0000418 %	✓	
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		18 mg/kg	1.462	24.07 mg/kg	0.00241 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2 mg/kg	2.27	<4.54 mg/kg	<0.000454 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
7		copper { dicopper oxide; copper (I) oxide }				24	mg/kg	1.126	24.722	mg/kg	0.00247 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
8		lead { lead chromate }			1	44	mg/kg	1.56	62.792	mg/kg	0.00403 %	✓	
		082-004-00-2	231-846-0	7758-97-6									
9		mercury { mercury dichloride }				<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
10		nickel { nickel chromate }				11	mg/kg	2.976	29.953	mg/kg	0.003 %	✓	
		028-035-00-7	238-766-5	14721-18-7									
11		selenium { nickel selenate }				<3	mg/kg	2.554	<7.662	mg/kg	<0.000766 %		<LOD
		028-031-00-5	239-125-2	15060-62-5									
12		zinc { zinc chromate }				60	mg/kg	2.774	152.286	mg/kg	0.0152 %	✓	
		024-007-00-3	236-878-9	13530-65-9									
13		TPH (C6 to C40) petroleum group				1696	mg/kg		1551.693	mg/kg	0.155 %	✓	
				TPH									
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
15		benzene				<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
16		toluene				54	mg/kg		49.405	mg/kg	0.00494 %	✓	
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
18		xylene				65	mg/kg		59.469	mg/kg	0.00595 %	✓	
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<2	mg/kg	1.884	<3.768	mg/kg	<0.000377 %		<LOD
		006-007-00-5											
20		pH				10.7	pH		10.7	pH	10.7 pH		
				PH									
21		naphthalene				7	mg/kg		6.404	mg/kg	0.00064 %	✓	
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				0.6	mg/kg		0.549	mg/kg	0.0000549 %	✓	
			205-917-1	208-96-8									
23		acenaphthene				1.16	mg/kg		1.061	mg/kg	0.000106 %	✓	
			201-469-6	83-32-9									
24		fluorene				1.81	mg/kg		1.656	mg/kg	0.000166 %	✓	
			201-695-5	86-73-7									
25		phenanthrene				18.9	mg/kg		17.292	mg/kg	0.00173 %	✓	
			201-581-5	85-01-8									
26		anthracene				3.53	mg/kg		3.23	mg/kg	0.000323 %	✓	
			204-371-1	120-12-7									
27		fluoranthene				22.7	mg/kg		20.769	mg/kg	0.00208 %	✓	
			205-912-4	206-44-0									
28		pyrene				24.4	mg/kg		22.324	mg/kg	0.00223 %	✓	
			204-927-3	129-00-0									
29		benzo[a]anthracene				7.82	mg/kg		7.155	mg/kg	0.000715 %	✓	
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				6.79	mg/kg		6.212	mg/kg	0.000621 %	✓	
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				8.48	mg/kg		7.758	mg/kg	0.000776 %	✓	
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				2.37	mg/kg		2.168	mg/kg	0.000217 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				8.18	mg/kg		7.484	mg/kg	0.000748 %	✓	
		601-032-00-3	200-028-5	50-32-8									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
34	●	indeno[123-cd]pyrene				2.76	mg/kg		2.525	mg/kg	0.000253 %	✓	
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				0.57	mg/kg		0.522	mg/kg	0.0000522 %	✓	
		601-041-00-2	200-181-8	53-70-3									
36	●	benzo[ghi]perylene				2.23	mg/kg		2.04	mg/kg	0.000204 %	✓	
			205-883-8	191-24-2									
37		phenol				<2	mg/kg		<2	mg/kg	<0.0002 %		**<LOD**
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.208 %		

Key

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

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free phase

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene: (conc.: 0.00494%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.155%)
xylene: (conc.: 0.00595%)

Classification of sample: BH2 ES3

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample Name:
BH2 ES3
Sample Depth:
0.7 m
Moisture content:
10%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.272%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.272%)

Determinands

Moisture content: 10% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		10 mg/kg	1.32	12.003 mg/kg	0.0012 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.5 mg/kg	2.775	1.262 mg/kg	0.000126 %	✓	
3	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %		<**LOD**
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.4 mg/kg	1.142	1.454 mg/kg	0.000145 %	✓	
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		20 mg/kg	1.462	26.574 mg/kg	0.00266 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2 mg/kg	2.27	<4.54 mg/kg	<0.000454 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
7		copper { dicopper oxide; copper (I) oxide }				154	mg/kg	1.126	157.624	mg/kg	0.0158 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
8		lead { lead chromate }			1	337	mg/kg	1.56	477.871	mg/kg	0.0306 %	✓	
		082-004-00-2	231-846-0	7758-97-6									
9		mercury { mercury dichloride }				<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
10		nickel { nickel chromate }				10	mg/kg	2.976	27.057	mg/kg	0.00271 %	✓	
		028-035-00-7	238-766-5	14721-18-7									
11		selenium { nickel selenate }				<3	mg/kg	2.554	<7.662	mg/kg	<0.000766 %		<LOD
		028-031-00-5	239-125-2	15060-62-5									
12		zinc { zinc chromate }				148	mg/kg	2.774	373.249	mg/kg	0.0373 %	✓	
		024-007-00-3	236-878-9	13530-65-9									
13		TPH (C6 to C40) petroleum group				2992	mg/kg		2720	mg/kg	0.272 %	✓	
				TPH									
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
15		benzene				<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				11	mg/kg		10	mg/kg	0.001 %	✓	
		601-023-00-4	202-849-4	100-41-4									
18		xylene				26	mg/kg		23.636	mg/kg	0.00236 %	✓	
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<2	mg/kg	1.884	<3.768	mg/kg	<0.000377 %		<LOD
		006-007-00-5											
20		pH				10.4	pH		10.4	pH	10.4 pH		
				PH									
21		naphthalene				87.6	mg/kg		79.636	mg/kg	0.00796 %	✓	
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				0.34	mg/kg		0.309	mg/kg	0.0000309 %	✓	
			205-917-1	208-96-8									
23		acenaphthene				68.6	mg/kg		62.364	mg/kg	0.00624 %	✓	
			201-469-6	83-32-9									
24		fluorene				63.7	mg/kg		57.909	mg/kg	0.00579 %	✓	
			201-695-5	86-73-7									
25		phenanthrene				389	mg/kg		353.636	mg/kg	0.0354 %	✓	
			201-581-5	85-01-8									
26		anthracene				71.9	mg/kg		65.364	mg/kg	0.00654 %	✓	
			204-371-1	120-12-7									
27		fluoranthene				300	mg/kg		272.727	mg/kg	0.0273 %	✓	
			205-912-4	206-44-0									
28		pyrene				245	mg/kg		222.727	mg/kg	0.0223 %	✓	
			204-927-3	129-00-0									
29		benzo[a]anthracene				94	mg/kg		85.455	mg/kg	0.00855 %	✓	
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				64.3	mg/kg		58.455	mg/kg	0.00585 %	✓	
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				66	mg/kg		60	mg/kg	0.006 %	✓	
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				25.3	mg/kg		23	mg/kg	0.0023 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				66.4	mg/kg		60.364	mg/kg	0.00604 %	✓	
		601-032-00-3	200-028-5	50-32-8									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
34		indeno[123-cd]pyrene				22	mg/kg		20	mg/kg	0.002 %	✓	
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				3.49	mg/kg		3.173	mg/kg	0.000317 %	✓	
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				18.1	mg/kg		16.455	mg/kg	0.00165 %	✓	
			205-883-8	191-24-2									
37		phenol				2.4	mg/kg		2.182	mg/kg	0.000218 %	✓	
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.514 %		

Key

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

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free phase

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

ethylbenzene: (conc.: 0.001%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.272%)
xylene: (conc.: 0.00236%)

Appendix A: Classifier defined and non CLP determinands

- **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

- **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3 H226 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , Aquatic Chronic 2 H411

- **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4
Description/Comments:
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s):
03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

- **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

CLP index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

- **pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

- **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: 06 Aug 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 trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

beryllium {beryllium oxide}

Reasonable case CLP species based on hazard statements/molecular weight. Industrial sources include: most common (non alloy) form, used in ceramics (edit as required)

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2020.332.4553.8820 (28 Nov 2020)
HazWasteOnline Database: 2020.332.4553.8820 (28 Nov 2020)

This classification utilises the following guidance and legislation:
WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018
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
POPs Regulation 2019 - Regulation (EU) 2019/1021 of 20 June 2019

APPENDIX 5

GROUND GAS MONITORING

GAS MONITORING RECORD SHEET

JOB DETAILS

Site:	ENWL Eastlands	Job No:	A3738
Date:	04/12/2020	Engineer:	DS
Time:		Client	

METEOROLOGICAL & SITE INFORMATION

State of ground:	Dry		Moist	X	Wet			
Wind:	Calm	X	Light		Moderate		Strong	
Cloud cover:	None		Slight	X	Cloudy		Overcast	
Precipitation:	None	X	Slight		Moderate		Heavy	

Barometric pressure (mb): 969 Local pressure system*: Air temperature (°C):

Well No.	Time (s)	Flow (l/hr)	CH_4 (% vol. in air)	CO_2 (% vol. in air)	O_2 (% vol. in air)	PID (ppm)	Depth to GW (mbgl)	Total Depth (mbgl)	Comments
BH01	0	0.0	0.2	0.2	22.3		2.25	3.00	H2S: 0 CO: 6
	15	0.0	0.2	6.1	17.4				
	30	0.0	0.2	6.2	3.7				
	45	0.0	0.2	6.3	1.1				
	60	0.0	0.2	6.3	0.8				
	120	0.0	0.2	6.3	0.7				
	180	0.0	0.2	6.3	0.7				
	240								
	300								
	360								
	420								
	480								
	540								
	600								
BH02	0	0.0	0.2	0.2	21.7		5.50	6.17	H2S: 0 CO: 20
	15	0.0	0.2	0.9	21.2				
	30	0.0	0.2	0.9	20.8				
	45	0.0	0.2	0.9	20.7				
	60	0.0	0.2	0.9	20.7				
	120	0.0	0.2	0.9	20.8				
	180	0.0	0.2	0.9	20.8				
	240								
	300								
	360								
	420								
	480								
	540								
	600								

Notes: TOC = top of casing

The measurement of hydrogen sulphide and hydrocarbon free product is undertaken on a site specific basis, if deemed necessary.

** With reference to the Met Office rolling weather archive*

	Flow (l/hr)	CH4	CO2	O2
MIN	0.0	0.2	0.2	**0.7**
MAX	**0.0**	**0.2**	**6.3**	22.3
GSV		**0**	**0**	

GAS MONITORING RECORD SHEET

JOB DETAILS			
Site:	ENWL Eastlands	Job No:	A3738
Date:	10/12/2020	Engineer:	DS
Time:		Client	

METEOROLOGICAL & SITE INFORMATION

State of ground:		Dry		Moist	X	Wet			
Wind:		Calm	X	Light		Moderate		Strong	
Cloud cover:		None		Slight		Cloudy	X	Overcast	
Precipitation:		None	X	Slight		Moderate		Heavy	
Barometric pressure (mb):	993			Local pressure system*:			Air temperature (°C):		

Well No.	Time (s)	Flow (l/hr)	CH_4 (% vol. in air)	CO_2 (% vol. in air)	O_2 (% vol. in air)	PID (ppm)	Depth to GW (mbgl)	Total Depth (mbgl)	Comments
BH01	0	0.0	0.2	0.2	21.8		2.20	3.00	H2S: 0 CO: 3
	15	0.0	0.2	5.2	15.6				
	30	0.0	0.2	5.4	3.8				
	45	0.0	0.2	5.4	2.0				
	60	0.0	0.2	5.5	1.6				
	120	0.0	0.2	5.5	1.3				
	180	0.0	0.2	5.7	1.2				
	240								
	300								
	360								
	420								
	480								
	540								
	600								
BH02	0	0.0	0.2	0.3	21.3		5.40	6.20	H2S: 0 CO: 4
	15	0.0	0.2	5.4	17.5				
	30	0.0	0.2	0.9	20.4				
	45	0.0	0.2	0.9	21.3				
	60	0.0	0.2	0.9	21.4				
	120	0.0	0.2	0.9	21.4				
	180	0.0	0.2	0.9	21.4				
	240								
	300								
	360								
	420								
	480								
	540								
	600								

Notes: TOC = top of casing

The measurement of hydrogen sulphide and hydrocarbon free product is undertaken on a site specific basis, if deemed necessary.

** With reference to the Met Office rolling weather archive*

	Flow (l/hr)	CH4	CO2	O2
MIN	0.0	0.2	0.2	**1.2**
MAX	**0.0**	**0.2**	**5.7**	21.8
GSV		**0**	**0**	

GAS MONITORING RECORD SHEET

JOB DETAILS			
Site:	ENWL Eastlands	Job No:	A3738
Date:	16/12/2020	Engineer:	DS
Time:		Client	

METEOROLOGICAL & SITE INFORMATION

State of ground:	Dry		Moist		Wet	X			
Wind:	Calm		Light	X	Moderate		Strong		
Cloud cover:	None		Slight		Cloudy		Overcast	X	
Precipitation:	None		Slight		Moderate	X	Heavy		
Barometric pressure (mb):	995		Local pressure system*:				Air temperature (°C):		

Well No.	Time (s)	Flow (l/hr)	CH_4 (% vol. in air)	CO_2 (% vol. in air)	O_2 (% vol. in air)	PID (ppm)	Depth to GW (mbgl)	Total Depth (mbgl)	Comments
BH01	0	0.0	0.2	0.2	21.8		2.11	3.00	H2S: 0 CO: 11
	15	0.0	0.2	4.4	16.0				
	30	0.0	0.2	4.5	5.1				
	45	0.0	0.2	4.6	3.9				
	60	0.0	0.2	4.7	3.3				
	120	0.0	0.2	4.8	2.7				
	180	0.0	0.2	4.9	2.5				
	240								
	300								
	360								
	420								
	480								
	540								
	600								
BH02	0	0.0	0.2	0.3	21.7		5.45	6.17	H2S: 0 CO: 8
	15	0.0	0.2	0.3	16.2				
	30	0.0	0.2	0.3	19.7				
	45	0.0	0.2	0.3	21.0				
	60	0.0	0.2	0.3	21.3				
	120	0.0	0.2	0.4	21.4				
	180	0.0	0.2	0.5	21.5				
	240								
	300								
	360								
	420								
	480								
	540								
	600								

Notes: TOC = top of casing

The measurement of hydrogen sulphide and hydrocarbon free product is undertaken on a site specific basis, if deemed necessary.

** With reference to the Met Office rolling weather archive*

	Flow (l/hr)	CH4	CO2	O2
MIN	0.0	0.2	0.2	**2.5**
MAX	**0.0**	**0.2**	**4.9**	21.8
GSV		**0**	**0**	

GAS MONITORING RECORD SHEET

JOB DETAILS			
Site:	ENWL Eastlands	Job No:	A3738
Date:	18/12/2020	Engineer:	DS
Time:		Client	

METEOROLOGICAL & SITE INFORMATION

State of ground:	Dry		Moist	X	Wet			
Wind:	Calm		Light		Moderate	X	Strong	
Cloud cover:	None		Slight		Cloudy		Overcast	X
Precipitation:	None		Slight	X	Moderate		Heavy	

Barometric pressure (mb): 997 Local pressure system*: Air temperature (°C):

Well No.	Time (s)	Flow (l/hr)	CH_4 (% vol. in air)	CO_2 (% vol. in air)	O_2 (% vol. in air)	PID (ppm)	Depth to GW (mbgl)	Total Depth (mbgl)	Comments
BH01	0	0.0	0.2	0.1	21.8		2.22	3.00	H2S: 0 CO: 2
	15	0.0	0.2	2.9	18.0				
	30	0.0	0.1	3.1	11.0				
	45	0.0	0.1	3.7	8.7				
	60	0.0	0.1	4.0	7.5				
	120	0.0	0.1	4.8	4.3				
	180	0.0	0.1	5.0	3.6				
	240								
	300								
	360								
	420								
	480								
	540								
	600								
BH02	0	0.0	0.2	0.3	21.8		5.49	6.17	H2S: 0 CO: 1
	15	0.0	0.2	1.0	16.4				
	30	0.0	0.2	0.9	21.0				
	45	0.0	0.2	0.9	21.0				
	60	0.0	0.2	1.0	21.1				
	120	0.0	0.2	1.1	21.2				
	180	0.0	0.2	1.2	21.1				
	240								
	300								
	360								
	420								
	480								
	540								
	600								

Notes: TOC = top of casing

The measurement of hydrogen sulphide and hydrocarbon free product is undertaken on a site specific basis, if deemed necessary.

** With reference to the Met Office rolling weather archive*

	Flow (l/hr)	CH4	CO2	O2
MIN	0.0	0.1	0.1	**3.6**
MAX	**0.0**	**0.2**	**5.0**	21.8
GSV		**0**	**0**	

APPENDIX 6

REPORT LIMITATIONS

REPORT LIMITATIONS

This contract was completed by Earth Environmental & Geotechnical Ltd on the basis of a defined programme and scope of works and terms and conditions agreed with the client. This report was compiled with all reasonable skill, and care, bearing in mind the project objectives, the agreed scope of works, the prevailing site conditions, the budget and staff resources allocated to the project.

Other than that, expressly contained in the above paragraph, Earth Environmental & Geotechnical Ltd provides no other representation or warranty whether express or implied, is made in relation to the services. Unless otherwise agreed this report has been prepared exclusively for the use and reliance of the client in accordance with generally accepted consulting practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon, or transferred to, by any other party without the written agreement of a Director of Earth Environmental & Geotechnical Ltd.

If a third party relies on this report, it does so wholly at its own and sole risk and Earth Environmental & Geotechnical Ltd disclaims any liability to such parties.

It is Earth Environmental & Geotechnical Ltd understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was an important factor in determining the scope and level of the services. Should the purpose for which the report is used, or the proposed use of the site change, this report will no longer be valid and any further use of, or reliance upon the report in those circumstances by the client without Earth Environmental & Geotechnical Ltd review and advice shall be at the client's sole and own risk.

The report was written in 2021 and should be read in light of any subsequent changes in legislation, statutory requirements and industry best practices. Ground conditions can also change over time and further investigations or assessment should be made if there is any significant delay in acting on the findings of this report. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of Earth Environmental & Geotechnical Ltd. In the absence of such written advice of Earth Environmental & Geotechnical Ltd, reliance on the report in the future shall be at the client's own and sole risk. Should Earth Environmental & Geotechnical Ltd be requested to review the report in the future, Earth Environmental & Geotechnical Ltd shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between Earth Environmental & Geotechnical Ltd and the client.

The observations and conclusions described in this report are based solely upon the services that were provided pursuant to the agreement between the client and Earth Environmental & Geotechnical Ltd. Earth Environmental & Geotechnical Ltd has not performed any observations, investigations, studies or testing not specifically set out or mentioned within this report.

Earth Environmental & Geotechnical Ltd is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, Earth Environmental & Geotechnical Ltd did not seek to evaluate the presence on or off the site of electromagnetic fields, lead paint, radon gas or other radioactive materials.

The services are based upon Earth Environmental & Geotechnical Ltd observations of existing physical conditions at the site gained from a walkover survey of the site together with Earth Environmental & Geotechnical Ltd interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The findings and recommendations contained in this report are based in part upon information provided by third parties, and whilst Earth Environmental & Geotechnical Ltd have no reason to doubt the accuracy and that it has been provided in full from those it was requested from, the items relied on have not been verified.

No responsibility can be accepted for errors within third party items presented in this report. Further Earth Environmental & Geotechnical Ltd was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the services. Earth Environmental & Geotechnical Ltd is not liable for any inaccurate information, misrepresentation of data or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to Earth Environmental & Geotechnical Ltd and including the doing of any independent investigation of the information provided to Earth Environmental & Geotechnical Ltd save as otherwise provided in the terms of the contract between the client and Earth Environmental & Geotechnical Ltd.

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable and as investigation excavations only allow examination of the ground at discrete locations. The potential exists for ground conditions to be encountered which are different to those considered in this report. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and Earth Environmental & Geotechnical Ltd] based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

The groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The normal speed of investigation usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions and higher groundwater levels may occur at other times of the year than were recorded during this investigation.

Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site.