

# PHASE II GEO-ENVIRONMENTAL ASSESSMENT REPORT

The Homestead, Hurst Knowle

December 2020



CIVIL | STRUCTURAL | GEOTECHNICAL & ENVIRONMENTAL | TRAFFIC AND TRANSPORT

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# Proposed Site at The Homestead Hurst Knowle Huddersfield

## Phase II Geo-Environmental Assessment Report

This report was produced by HSP Consulting Engineers Ltd for Frank Shaw Associates Ltd on behalf of Kirklees Council as the Phase II Geo-environmental Assessment Report for the proposed redevelopment of The Homestead, Hurst Knowle, Huddersfield to identify possible areas of contamination and provide an assessment of potential ground related development constraints.

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## Executive Summary

HSP Consulting has been commissioned by Frank Shaw Associates Ltd on behalf of Kirklees Council to provide a Phase II Geo-environmental Assessment report providing information on likely constraints to the development of the site, parameters for design and recommendations for any mitigation measures should they be required.

The site is called 'The Homestead' located on land off Hurst Knowle Road approximately 2km south east of Huddersfield town centre. The proposals for the site are to replace the existing building with a 25 place facility for Dementia day care. There will be no change of use to the site.

Some Made Ground materials were anticipated across the site area based on the current site profile and use. The site is shown on the BGS mapping to be devoid of superficial deposits and underlain by the bedrock of the Pennine Lower Coal Measures Group which is designated as a Secondary A Aquifer.

The ground investigation has proved Made Ground materials in all exploratory holes to a maximum depth of 2.4m bgl in the south of the site and to shallower depths of 0.5m bgl in the north of the site. Underlying the Made Ground, very stiff slightly sandy clay (weathered bedrock) was encountered in the eastern and southern section of the site and proved to depths of 0.9m and 2.6m bgl. Extremely weak brown and grey mottled mudstone or yellowish brown sandstone was encountered below any Made Ground materials or clay deposits and proved to 3.18m bgl in WS7.

No groundwater strikes were recorded during drilling. Groundwater monitoring results indicate groundwater levels range from 0.43m and 2.77m bgl within the natural deposits and are likely to be perched water.

No development layout plans have been provided at this stage. It is unlikely that the Made Ground materials are suitable as a founding horizon due to the variation in strength and composition. Traditional strip or pad foundations could be utilised within the underlying natural deposits of the Pennine Lower Coal Measures within the mudstone/sandstone rock to a net allowable bearing pressure of 200kN/m<sup>2</sup> to limit total settlements to less than 25mm. Alternatively, the stiff to very stiff clays of the weathered Pennine Coal Measures could be utilised in the northern section of the site to a reduced allowable bearing pressure of 150kN/m<sup>2</sup> to limit total settlements to less than 25mm.

The concentrations of potential contaminants recorded at the site indicates an acceptably low risk and therefore mitigation measures are not required as part of the development. Proposed soft landscaping is likely to require topsoil import as materials on site are unlikely to meet the requirements of the British Standards / Landscape Architect.

Results of sulphate testing in accordance with BRE Special Digest 1 indicate a Design Sulphate Class for the site of DS-1 together with an Aggressive Chemical Environment for Concrete (ACEC) of AC-1.



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Based on the chemical analysis report it is considered that specialist materials are unlikely to be required for water supply pipes. However, confirmation of water supply pipes should be sought from utility providers.

Ground gas concentrations have been monitored on six occasions over a twelve week period. Comparison of the steady state gas screening value with Table 8.5 of the CIRIA document indicates the site falls in a Characteristic Situation 2 due to carbon dioxide concentrations greater than 5% and methane concentrations greater than 1%. Based on a classification of CS2, ground gas protection measures are required for the proposed redevelopment. Once all ground gas monitoring phases has been completed the report will be updated advising on the requirements for ground gas measures on the site.

The executive summary contains an overview of key findings and conclusions. However, no reliance should be placed on the executive summary until the whole of the report has been read. Other sections of the report may contain information which puts into context the findings noted within the executive summary.

## 1. Introduction

### 1.1 Background

Frank Shaw Associates are assessing the feasibility of a new dementia day care facility on the site. It is understood proposals are to replace the existing building with a 25 place facility for Dementia day care. There will be no change of use to the site.

### 1.2 Client Brief & Scope

HSP Consulting has been commissioned by Frank Shaw Associates Limited to undertake an intrusive ground investigation at the site to investigate the existing ground conditions and provide information on likely constraints to the redevelopment, parameters for design and recommendations for any mitigation measures.

The report presents the following information:

- details of the ground investigation undertaken and the ground conditions encountered,
- details and results of the geotechnical testing and contamination analysis,
- recommendations for mitigating constraints to the proposed development where appropriate and providing parameters for foundation design.

Where applicable, the fieldwork was undertaken in accordance with BS5930:2015 Code of Practice for Site Investigations and BS10175:2011+A1:2013 Investigation of Potentially Contaminated Sites.

### 1.3 Report Objectives

The objectives of this report are to:

- establish the geological and hydrogeological conditions using existing available/published information;
- summarise available information and identify site specific geotechnical and environmental hazards which may place a constraint upon the proposed site use;
- produce an updated Conceptual Site Model identifying potential pollution linkages between sources of contamination, pathways and receptors.

### 1.4 Limitations

The recommendations made in this report are based on the findings of the intrusive ground investigation undertaken by HSP Consulting Ltd on the 2<sup>nd</sup> September 2020.

## 2. Review of Existing Information & Geoenvironmental Setting

### 2.1 Previous Reports

HSP Consulting Ltd has previously produced a Phase I Desk Study report for the site:

- C3257/PI – The Homestead, Hurst Knowle, Huddersfield - Phase I Geo-Environmental Desk Study Report, September 2020. (Ref. 1)

### 2.2 The Site

#### 2.2.1 Location

The site is located off Hurst Knowle road, approximately 2km east of Huddersfield town centre. The approximate National Grid Reference for the centre of the site is (NGR) 417229, 415786. A Site Location Plan is included in Appendix I.

#### 2.2.2 Description

The site is broadly rectangular in shape and is approximately 0.63Ha in area. Access is gained off Hurst Knowle Road to the east.

The site is currently used as a day care centre for Dementia care and comprises one large building 'The Homestead' located centrally surrounded by communal gardens and two small parking areas. The building occupies approximately  $\frac{1}{4}$  of the site area and is a traditional 2 storey brick building with tiled roof. The two small carparks are located adjacent to the north and south of the building. Both are accessed from Hurst Knowle Road via separate driveways. The driveways and carparks are laid to tarmac which were noted to be in good condition with some patched areas noted on the driveway to the southern carpark. Paving slabs are located around the perimeter of the building providing pathways and patio areas and plastic and metal waste bins are located to the north of the building.

The majority of the remaining site area is occupied by communal landscaping and comprises an extensive grassed area in the south of the site behind a row of mature trees. A further raised grassed area is located in the northeast corner of the site which slopes down to the northern car park. Several bushes and shrubs are located adjacent to the southern carpark.

No sign of staining was noted around the site.

The northern and western site boundaries of the site are marked by a 0.3m barrier. The southern boundary is marked by a 1.3m high hedge or 0.5m fence/stone wall. A brick wall defines the eastern site boundary. A 3m hedge is noted along the northern and part of the western site boundary.

A topographical survey of the site shows levels fall from the west to the east varying from 115.42m AOD to 111.94m AOD a fall of approximately 3.5m. Some reprofiling of the site has taken place to provide a level platform for the existing building. A raised grass area is located

in the northwest corner with levels around 116m AOD falling to 113.65m AOD within the carpark located at the bottom of the slope.

### 2.2.3 Surrounding Land Use

The main features of interest identified are:

|        |   |
|--------|---|
| North: | Residential housing and gardens             |
| East:  | Hurst Knowle Road with Fernside Park beyond |
| South: | Residential housing and gardens             |
| West:  | Residential housing and gardens             |

### 2.2.4 Proposed End Use

Kirklees Council propose to replace the existing building on site to provide a 25 place facility for Dementia day care. At the time of writing this report no plans have been made available. It is assumed there will be no change of use to the site.

## 2.3 Geology

### 2.3.1 Made Ground

The BGS mapping does not indicate any Made Ground/Artificial Ground on site. However, the site appears to have been reprofiled and therefore some Made Ground may be encountered.

### 2.3.2 Superficial Deposits

The BGS superficial mapping indicates no superficial deposits beneath the site.

### 2.3.3 Bedrock Geology

BGS bedrock mapping indicates the site is underlain by mudstones, siltstone and sandstone of the Pennine Lower Coal Measures Group of the Westphalian age. The eastern half of the site is shown to be underlain by the Pennine Lower Coal Measures Formation described by the BGS as '*interbedded grey mudstone, siltstone and pale grey sandstone, commonly with mudstones containing marine fossils in the lower part and more numerous and thicker coal seams in the upper part*', and the western half of the site is shown to be underlain by the Greenmoor Rock described as '*fine-grained thinly bedded, ripple cross laminated sandstone.*'

## 2.4 Pertinent Site Sensitivity Information

Based on the information collated for the desk study, the geo-environmental setting of the site is summarised as follows:

- The site was undeveloped, being shown as fields with a stream (southern section) on historical mapping until 1957 where the site became a vacant parcel of land. A possible stream shown on earlier mapping is no longer shown. By this time residential development had taken place within the immediate surrounding area to the north, south and west. Sometime between 1961 and 1968 the site was developed where it was occupied by The Homestead. The current layout has not changed since this time with a building occupying the central section of site with communal gardens surrounding to

the north and south. Some reprofiling of the ground in the north western corner of the site was shown on the 1968 historical map.

- Historically the surrounding land use has been residential.
- Made Ground is not indicated within the site boundary on the published geological mapping. However, given the site is occupied by a building some Made Ground is likely to be encountered.
- It is unlikely any coal mining related features will impact the stability of the site.
- No superficial deposits are expected on site. The site is underlain by bedrock geology of mudstone, siltstone and sandstone of the Pennine Lower Coal Measures Group comprising the Greenmoor Rock in the west and the Pennine Lower Coal Measures Formation in the east.
- The Pennine Lower Coal Measures Group bedrock geology is designated as a Secondary A Aquifer with soils classified as high vulnerability. The site is not located within a Source Protection Zone and there are no groundwater abstraction licences within 500m of the site.
- The site is at low to high risk of surface water flooding in the southern section only. There is negligible risk to the site from groundwater flooding.
- No Historical or Active Landfill Sites or Licensed Waste Management Facilities have been recorded within a 1000m radius of the site.

Based on the above, the environmental sensitivity of the site can be considered to be Low at this stage.

### 3. Fieldwork & Factual Information

Site work was carried out on the 2<sup>nd</sup> September 2020. Where applicable, the fieldwork was undertaken in accordance with BS5930:2015 Code of Practice for Site Investigations (Ref. 5) and BS10175:2011+A1:2013 Investigation of Potentially Contaminated Sites (Ref. 7).

The exploratory holes were positioned to provide general coverage across the site area, to provide information for foundation design and obtain representative soil samples for geotechnical and geo-environmental analysis.

#### 3.1 Exploratory Methods

The exploratory methods are detailed in the table below.

Table 1 – Exploratory Hole Methods

| Type                         | Quantity | Maximum Depth (m) | Details          |
|------------------------------|----------|-------------------|------------------|
| Windowless Sampling Borehole | 2        | 2.05 - 3.18       | WS1, WS2 and WS4 |
|                              | 4        | 0.56 - 1.28       | WS3, WS5 – WS7   |
| Mexecone Probe               | 2        | 0.45              | MP1 to MP2       |

The exploratory holes were logged and sampled by an Engineer from HSP Consulting Ltd and the logs are presented in Appendix II. The exploratory hole locations are shown on the Site Investigation Layout Plan presented in Appendix III.

Fragmentary bulk disturbed, and undisturbed samples were recovered from materials revealed within all the exploratory holes. Geo-environmental samples, placed in plastic tubs and glass jars supplied by the laboratory, were also obtained specifically for chemical analysis. The samples were taken to UKAS accredited laboratories for further examination and testing.

#### 3.2 In-situ Testing

##### 3.2.1 Standard Penetration Tests

Standard Penetration Tests (SPTs) were carried out at 1.00m intervals and at the base in the windowless sample boreholes. The SPTs were undertaken in accordance with BS 1377:1990 and the results are included on the appended borehole logs (Appendix II).

#### 3.3 Laboratory Testing

The laboratory testing schedules were prepared by HSP Consulting Ltd.

##### 3.3.1 Geotechnical Testing

Geotechnical testing has been scheduled to be undertaken by a UKAS accredited laboratory as part of the works at the site:

- Plasticity indexes
- Natural moisture content

The laboratory testing was carried out by Professional Soils Laboratory Ltd (UKAS accredited, laboratory No.4043) in accordance with BS1377:1990 using calibrated equipment specifically for the British Standard.

### 3.3.2 Chemical Analysis

The geo-environmental samples retained specifically for chemical analysis were stored in cooled containers until delivery to the laboratory by courier.

Chemical analysis was scheduled on eleven soil samples for the presence of a selected suite of potential contaminants as outlined in the tables below:

Table 2 – Scheduled chemical analyses on soils

| Exploratory Hole Location & Depth (m) | Sample Description         |
|---------------------------------------|----------------------------|
| WS1 - 0.60                            | MADE GROUND <sup>1</sup>   |
| WS2 - 0.35                            | MADE GROUND <sup>1</sup>   |
| WS3 - 0.25                            | MADE GROUND <sup>1,3</sup> |
| WS4 - 0.1                             | MADE GROUND <sup>1,3</sup> |
| WS7 - 0.4                             | MADE GROUND <sup>1,4</sup> |
| WS5 - 0.25                            | SANDSTONE <sup>3</sup>     |
| WS6 – 0.2                             | MADE GROUND <sup>3</sup>   |
| WS7 – 0.45                            | MADE GROUND <sup>2</sup>   |
| WS2 – 0.8                             | MADE GROUND <sup>2</sup>   |
| WS4 – 0.45                            | CLAY <sup>2</sup>          |
| WS6 – 0.5                             | CLAY <sup>2</sup>          |

<sup>1</sup> HSP Standard Suite, <sup>2</sup> BRE Short Suite, <sup>3</sup> Asbestos Screen, <sup>4</sup> Organic Matter

|                                   |                 |                     |          |
|-----------------------------------|-----------------|---------------------|----------|
| <b>Metals</b>                     | Cadmium         | Chromium (III & VI) | Copper   |
|                                   | Lead            | Mercury             | Nickel   |
|                                   | Zinc            |                     |          |
| <b>Semi Metals and Non-metals</b> | Arsenic         | Boron               | Selenium |
| <b>Others</b>                     | pH              |                     |          |
| <b>Inorganic Chemicals</b>        | Cyanide         | Sulphate            | Sulphide |
| <b>Organic Chemicals</b>          | PAH (US EPA 16) | TPH (CWG)           | Phenol   |

The contamination analysis was carried out by Chemtest Ltd (UKAS accredited, laboratory No. 2183) during the period 8th and 14<sup>th</sup> September 2020. The results are presented in Appendix IV.

## 3.4 Ground Conditions

### 3.4.1 Published Geology

The published geology indicates the site is underlain by bedrock deposits of the Pennine Lower Coal Measures Group as described in section 2.3 above.

### 3.4.2 Ground Conditions on site or General Geology & Revealed Strata

The exploratory hole data confirms the published information. The strata generally comprises:

Table 3 – Encountered Ground Conditions

| Strata        |   | Depth Range (mbegl) | Maximum Thickness (m) | Description  |
|---------------|---|---------------------|-----------------------|--|
| Anthropogenic | MADE GROUND                                 | G.L – 0.35          | 0.35                  | MADE GROUND – sandy gravelly clayey topsoil. Gravel is fine to coarse angular to subrounded mixed lithology, brick, occasional porcelain and concrete. |
|               |   | 0.25 – 1.85         | 1.50                  | MADE GROUND – sandy gravelly CLAY. Gravel is fine to medium angular to subrounded brick, concrete, porcelain   |
|               |   | 0.60 – 0.75         | 0.15                  | MADE GROUND – sandy GRAVEL   |
|               |   | 0.10 – 0.40         | 0.30                  | MADE GROUND – sandy gravel of concrete and tarmac.   |
| Bedrock       | WEATHERED PENNINE LOWER COAL MEASURES GROUP | 0.35 – 2.60         | 1.50                  | Stiff greyish brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular mudstone.   |
|               | PENNINE LOWER COAL MEASURES GROUP           | 0.45 - >3.18        | >0.50                 | Extremely weak weathered MUDSTONE or SANDSTONE   |

### 3.5 Groundwater Levels

No groundwater was encountered in any of the boreholes during drilling.

Groundwater levels were recorded between 0.43m and 2.77m begl within the window sample borehole monitoring standpipes during the gas monitoring visit between the 19<sup>th</sup> September and 3<sup>rd</sup> November 2020.

### 3.6 Ground Gas Monitoring

Sources of potential ground gas have been identified (Ref. 1) locally including Made Ground on site. Gas monitoring installations were constructed within three of the boreholes at the site (WS1, WS2, WS4). Each well has been constructed using 50mm diameter HDPE pipe. All of the borehole installations have a 6mm pea gravel surround to the slotted pipe with a bentonite seal above and a gas tap. The covers are cemented flush with ground level and are lockable stopcock covers.

HSP Consulting uses a GFM 430 Gas Analyser. Prior to its use a calibration check can be performed against gas readings in air. It is recommended that this check is undertaken once on each day the analyser is used.

The results of the ground gas monitoring undertaken are discussed in Section 5.5 below.

### 3.7 Visual and Olfactory Evidence of Contamination

There was no obvious visual or olfactory contamination noted during the ground investigation.

## 4. Geotechnical Assessment

### 4.1 Detailed Ground Model

For the purpose of this foundation assessment the information gained from the windowless sample boreholes has been utilised. The borehole logs are presented in Appendix II.

#### 4.1.1 Made Ground

Made Ground materials were encountered in all exploratory locations and proved to a maximum depth of 2.4m bgl. In the north of the site the Made Ground materials were encountered to shallower depths of 0.5m bgl. The Made Ground materials varied in strength and composition across the site but in general the materials in the north of the site comprised dark brown sandy gravelly topsoil with gravel of brick, porcelain and concrete or asphalt concrete overlying yellowish sandy gravel subbase.

In the south of the site Made Ground materials generally comprised brown and grey slightly sandy gravelly clay with gravel of fine to medium angular to subrounded mixed lithology and coal fragments proved to a maximum depth of 2.4m bgl. Rootlets were encountered throughout from 1.7m to 2.0m bgl in WS1.

#### 4.1.2 Pennine Lower Coal Measures Group

Bedrock deposits of the Pennine Lower Coal Measures Group were encountered below the Made Ground in all the exploratory locations. In boreholes WS1, WS2, WS4 and WS7 (eastern and southern section) the deposits comprised an upper weathered section of very stiff yellowish brown slightly sandy clay with gravel of fine to coarse sandstone or mudstone proved to depths of 0.9m and 2.6m bgl. The weathered section was absent in the remaining boreholes.

Extremely weak brown and grey mottled mudstone or yellowish brown sandstone was encountered below any Made Ground materials or clay deposits and proved to 3.18m bgl in WS7.

#### 4.1.3 In-situ Testing and Assessment

A series of Standard Penetration Tests (SPT's) were undertaken within all the boreholes. Where tests have been within the Made Ground materials these have been omitted from the foundation assessment. The following table summarises the N values at depth across the site within the natural strata.

Table 4 – SPT N Values

| Depth (m) | Range of 'N' Values | Description   |
|-----------|---------------------|---|
| 1         | N/A                 | MADE GROUND   |
| 1 - 2     | 19 - 20             | CLAY<br>(WEATHERED PENNINE LOWER COAL MEASURES)     |
| 0.45 - 3  | 50                  | MUDSTONE/SANDSTONE<br>(PENNINE LOWER COAL MEASURES) |

Four Plasticity Index tests have been undertaken to confirm the visual description and engineering behaviour of the soils. The results are included in Appendix V.

The results indicate compliance with the definition of soils of low to very high plasticity (CL - CV) for soils which plot above the A-Line after the classification system of BS5930: 2015. These soils are generally considered to be of Low to Medium Volume Change Potential in accordance with the National House Building Council (NHBC) Standards, Chapter 4.2: 2007.

Table 5 - Plasticity and Volume Change Potential

| Sample Ref: | Laboratory Material Descriptions | LL (%) | PL (%) | PI (%) | % passing 425µm | Modified PI (%)* | Soil Class | MC (%) |
|-------------|----------------------------------|--------|--------|--------|-----------------|------------------|------------|--------|
| WS1 1.3m    | Gravelly sandy very silty CLAY   | 41     | 26     | 15     | 80              | 12               | CI         | 22     |
| WS2 1.6m    | Very silty CLAY                  | 71     | 34     | 37     | 100             | 37               | CV         | 37     |
| WS4 1.1m    | Silty CLAY                       | 38     | 21     | 17     | 98              | 17               | CI         | 15     |
| WS6 0.8m    | Gravelly very sandy CLAY         | 34     | 19     | 15     | 60              | 9                | CL         | 17     |

The results are included in Appendix V.

## 4.2 Earthworks

Significant earthworks operations are not expected at the site. Any Made Ground arisings generated on site may be suitable for use as non-structural fill (ie beneath suspended floor slab) subject to appropriate testing and assessment.

## 4.3 Excavations

Excavations to proposed formation level for new foundations and infrastructure should be feasible using standard excavation plant and equipment. Random and potentially severe falls should be anticipated in Made Ground materials from the faces of near vertically sided unsupported excavations carried out at the site. Where personnel are required to enter near vertically sided excavations, it is considered that full support should be provided to the full depth of all excavations. Please see Section 5.5 below for ground gas monitoring recommendations with regards depleted oxygen.

It is recommended that all support systems are continually assessed by fully trained or experienced personnel.

No groundwater strikes were recorded in any of the boreholes during their formation. Groundwater monitoring results indicate groundwater levels range from 0.43m and 2.77m bgl within the natural deposits and are likely to be perched water within the gravelly clay. It should be noted that groundwater levels may vary due to seasonal variations or other effects.

Groundwater issues may occur at shallow depths within the Made Ground materials and shallow natural deposits as slight inflows that would be best dealt with by traditional sump and pump dewatering.

## 4.4 Foundations

The proposals for the site are to replace the existing building with a 25 place facility for Dementia day care with some carparking and soft landscaping. No development layout plans have been provide at this stage.

All foundations will need to be taken down below any Made Ground as in its current state it is not considered a suitable founding stratum due to its variability in composition and state of compaction therefore implying unacceptable total and differential settlements likely to occur under loaded conditions.

Traditional strip or pad foundations could be utilised within the underlying natural deposits of the Pennine Lower Coal Measures within the mudstone/sandstone rock. It is recommended that foundations are placed at least 200mm into the sandstone/mudstone encountered at minimum depths of between 0.5m to 1.0m begl in the centre of the site and minimum depths of 1.5m to 2.6m begl in the north east corner and south of the site. A net allowable bearing pressure of 200kN/m<sup>2</sup> could be utilised for foundations placed 200mm into the mudstone/sandstone bedrock to limit total settlements to less than 25mm and to maintain differential settlements to acceptable limits.

Alternatively the stiff to very stiff clays of the weathered Pennine Lower Coal Measures could be utilised in the northern section of the site although a reduced allowable bearing pressure of 150kN/m<sup>2</sup> would be recommended at a minimum founding depth of 0.75m begl to limit total settlements to less than 25mm and to maintain differential settlement to acceptable limits.

Foundations should be suitably reinforced where they straddle a clay/rock boundary to minimise differential settlement. Locally foundations may need to be deepened/stepped should localised softer clay deposits be encountered, subject to the selected founding strata.

The table below shows the indicative allowable bearing pressure (ABP) that could be achieved using strip or pad foundations.

A number of the tests were advanced in Made Ground and therefore have been omitted from the assessment. An ABP has been calculated using an average of the SPT results in the natural soils excluding anomalies.

Table 6 – Allowable Bearing Capacity

| Depth (m) | SPT (N <sub>1</sub> ) <sub>60</sub> Value | Eurocode 7 Soil Strength Description | Consistency (BS5930) Description | Approximate ABP (kN/m <sup>2</sup> ) – 0.60m wide strip footing | Approximate ABP (kN/m <sup>2</sup> ) – 2x2m pad footing |
|-----------|---|--------------------------------------|----------------------------------|---|---|
| 1.0 – 2.0 | 19-20                                     | High                                 | Stiff                            | 150   | 150   |
| 2.6 – 3.0 | 50  | Very High                            | Hard/Extremely Weak              | 200   | 200   |

#### 4.5 Ground Floor Slab

In the central area of the site where Made Ground materials have been encountered at depths less than 600mm, a ground bearing floor slab could be utilised.

Where Made Ground materials are more than 600mm it is recommended that Made Ground is removed, re-laid and compacted in layers, if considered suitable, or replaced with granular fill or a suspended floor slab is recommended.

#### 4.6 Concrete Classification

The results of sulphate and pH testing carried out on selected soil samples taken during this investigation have been compared with the recommendations outlined in BRE Special Digest 1, Part 1: 2005.

The guidelines given in BRE Special Digest 1 are based upon a site classification relating to its previous usage. It is considered appropriate to define this site as a 'brownfield site' location for the purposes of concrete classification.

On the basis of the above, it is considered appropriate to adopt a basic Design Sulphate Class for the Made Ground and underlying natural soils of DS-1 together with an Aggressive Chemical Environment for Concrete (ACEC) of AC-1.

#### 4.7 Pavement Design

Two in-situ MEXE probe tests were conducted across the site. From this an indicative California Bearing Ratio (CBR) can be provided. The results can be found in Appendix VI.

Following guidance provided within 'Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 2' the CBR value chosen for design should be the minimum measured value, not the average.

The MEXE results were variable due to the near surface soils being Made Ground and therefore the maximum readings could be overstated due to gravels and cobbles, with the CBR values recorded ranging between 2% and 14%. The results of plasticity tests on the cohesive materials indicate a CBR Value of 4 - 5%. This should be confirmed by further testing once the development is at formation level.

#### 4.8 Infiltration Drainage

No infiltration testing has been undertaken as part of this investigation. The intrusive works have confirmed stiff clay overlying mudstone/sandstone bedrock below any Made Ground.

Made Ground was encountered across the site at variable depths between 1.5m and 2.6m. Infiltration drainage would not be considered suitable within the Made Ground materials. Additionally, the natural fine deposits of the Pennine Lower Coal Measures Group observed on site are unlikely to be suitable for infiltration drainage.

## 5. Environmental Assessment

### 5.1 Introduction

The approach to the human health risk assessment reported here follows the principals given in the Land Contamination Risk Management (LCRM) Guidance <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm> i.e. application of the following assessment hierarchy:

- Tier 1 risk screening by establishment of potential pollutant linkages, i.e. the preliminary conceptual site model (PCSM), or
- Tier 2 generic quantitative assessment using generic assessment criteria (GACs) that represent 'acceptably low' risk, or
- Tier 3 quantitative risk assessment using site specific assessment criteria (SSACs) that represent 'unacceptable risk', or where generic assessment criteria are not available, or they are not applicable to the CSM.

The results of laboratory analysis have been screened against GACs including the Defra Category 4 Screening Levels (C4SL) and LQM and CIEH S4ULs for Human Health Risk Assessment (Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3180. All rights reserved). (Refs 13 and 12 respectively).

The standard exposure scenario of residential without plant uptake has been used to identify potential exposure pathways for human health receptors. Controlled water, flora and fauna and property receptors have also been included within the CSM. Once final development plans have been submitted a review of the data may be required to ensure the most relevant exposure scenario has been used.

It should be noted that organic contamination (PAH, TPH and BTEX) have been screened against the GAC for 1% Soil Organic Matter (SOM).

The assessment of PAHs is undertaken using the surrogate marker approach; recommended by Health Protection Agency (2010) guidance, providing the PAH profile is sufficiently similar to the coal tars tested by Culp et al (1998). Where PAH profile is not sufficiently coal tar like the TEF method is adopted using the LQM and CIEH S4ULs. Prior to assessment a PAH profile is generated for all samples analysed for PAH using the LQM PAH Profiling Tool v1.3, the graphical output is presented in Appendix IV.

### 5.2 Assessment of Soil Analysis Results

Five samples, as detailed in section 3.3.2, were scheduled for analysis from the development area. These provide a basis for characterising the soils to outline the potential impacts on human health and any environmental receptors from any contamination found.

The screening process for on-site human health receptors show that the GACs for a residential without plant uptake setting were not exceeded.

Four of the soil samples were submitted for an asbestos screen and identification. No asbestos has been identified.

The concentrations of potential contaminants recorded within the soils at the site indicates an acceptably low risk and therefore mitigation measures are not required as part of the development. In areas of any soft landscaping topsoil will need to be imported as materials on site are unlikely to meet the requirements of the British Standards / Landscape Architect. Any soils imported to site for landscaping purposes should be suitable for the intended use and accompanied by the appropriate analysis and assessment, which will depend on the source site.

Should any obvious evidence of unexpected contamination be encountered during the redevelopment works it should be reported to HSP so that an inspection can be made and appropriate sampling and assessment work be carried out.

Appropriate health and safety precautions should be adopted during any excavation works to avoid exposure to potentially contaminated soils and dust. Consideration should be given to the HSE document HSG 66 'Protection of workers and the General Public during Redevelopment of Contaminated Land'.

The approval of the local Environmental Health Officer should be sought with respect to the soil contamination assessment and mitigation proposals.

### 5.3 Water Supply

The environmental testing for the site has been compared to the following document in order to assess the most appropriate pipe material that should be used upon the site for mains water supply:

'Guidance for the selection of water supply pipes to be used in Brownfield sites – UK Water Industry Research – Ref: 10/WM/03/21.'

Based on the chemical analysis report it is considered that specialist materials are unlikely to be required for water supply pipes at the site due to the low levels of contaminants recorded. However, confirmation of supply pipes should be sought from utility providers.

### 5.4 Waste Classification

The results of the chemical testing have been assessed using web-based software for classifying hazardous waste, using HazWasteOnline™. The materials tested are likely to be classified as non-hazardous waste.

---

Please note the above classification provides an indication of how the material should be classified for removal off site; however, this should be used at your approved waste handler's discretion and further testing may be required prior to any offsite disposal.

The results are included in Appendix VIII.

## 5.5 Ground Gas Risk Assessment

Sources of potential ground gases have been identified in the desktop report and during the ground investigation in the form of Made Ground in excess of 1m on site. Ground gas concentrations have been monitored on six times over a twelve week period in order to obtain an indication of the ground gas regime at the site.

The results identified one elevated methane concentration in (WS2) during the 2nd visit. This result was atypical with previous and later events recording negligible concentrations in the same standpipe.

Carbon dioxide has been recorded at a maximum steady concentration of between 0.4% and 16.8% vol in air. Boreholes WS1 and WS2 recorded steady state oxygen concentrations ranging from 0.1% (depleted) to 20.6% during the six monitoring visits. Oxygen concentrations were recorded near atmospheric in WS4 during the fourth monitoring visit. Carbon Monoxide was recorded at a peak concentration of 4ppm and Hydrogen Sulphide was recorded at a peak concentration of 1ppm. No positive gas flows have been recorded during the monitoring visits.

From the results above, the maximum steady state gas screening value for the site is 0.0168 l/hr.

The results have been assessed in line with the guidance provided in BS8485:2015 + A1:2019 Code of Practice of the design of protective measures for methane and carbon dioxide ground gas for new buildings (Ref 15) and CIRIA Document C665 'Assessing Risks Posed by Hazardous Ground Gases to Buildings' (Ref 16). Comparison of the steady state gas screening value with Table 8.5 of the CIRIA document indicates the site falls in a Characteristic Situation 2.

Depleted oxygen levels were observed within a number of the boreholes during the monitoring. This poses a risk of asphyxiation to construction and maintenance workers in confined spaces such as excavations or manhole chambers. A confined spaces risk assessment should be carried out prior to working in any buried structures or excavations.

## 5.6 Updated Conceptual Site Model

Based on the findings of this site investigation and information freely available online, a conceptual site model has been produced and is presented in the table below.

Table 8 - Updated Conceptual Site Model.

| Source   | Pathway  | Receptor   | Consequence | Probability | Risk     | Comments  |
|--|--|--|-------------|-------------|----------|---|
| <b>On site</b><br><b>S1:</b> Historical and Contemporary land use: Made Ground associated with development and reprofiling of the site for the care unit | <b>P1:</b> Human uptake pathways   | <b>R1:</b> End Users<br><b>R2:</b> Construction and maintenance workers                                  | Mild        | Low         | Very Low | Concentrations of contaminants of concern are below the relevant GACs within the near surface deposits sampled across the site and therefore the risk is considered to be VERY LOW.   |
|  | <b>P2:</b> Horizontal and vertical migration of contaminants through potentially permeable soils and rocks.<br><b>P3:</b> Migration of contaminants along preferential pathways (man- made).<br><b>P4:</b> Surface runoff.   | <b>R3:</b> Controlled Water: Groundwater<br><b>R4:</b> Controlled Water: Surface Water                   | Mild        | Low         | Low      | The bedrock geology is classified as Secondary A Aquifer. No surface water features on site or in the immediate surrounding area. Surface water flooding possible in the south of site. No concentrations above the relevant GACs have been identified within the soils. The risk is considered to be LOW.  |
|  | <b>P2:</b> Horizontal and vertical migration of contaminants through potentially permeable soils and rocks.<br><b>P3:</b> Migration of contaminants along preferential pathways (man- made).<br><b>P4:</b> Surface runoff.   | <b>R1:</b> End Users<br><b>R2:</b> Construction and maintenance workers                                  | Minor       | Unlikely    | Very Low | Due to the low concentration of recorded contaminants and the distance of potential off-site sources, the risk is considered to be VERY LOW.  |
| <b>Off site</b><br><b>S2:</b> Historical and Contemporary land use: Nurseries  | <b>P5:</b> Vertical and lateral migration of ground gases and/or vapour.   | <b>R1:</b> End Users   | Mild        | Low         | Low      | Ground gas concentrations have been monitored on six occasions over a twelve week period. The results indicate the site is characterised as CS2 as outlined in BS8485:2015+A1 2019. The risk is considered to be LOW where gas protection measures are adopted. *   |
|  | <b>P2:</b> Horizontal and vertical migration of contaminants through potentially permeable soils and rocks.<br><b>P3:</b> Migration of contaminants along preferential pathways (man- made).<br><b>P4:</b> Surface runoff.<br><b>P5:</b> Vertical and lateral migration of ground gases and/or vapour. | <b>R5:</b> Property, services and substructures<br><b>R6:</b> Adjacent Residential/Commercial Properties | Mild        | Low         | Low      | Testing indicates the soils are not aggressive to concrete with a Design Sulphate Class of DS-1 together with an Aggressive Chemical Environment for Concrete (ACEC) of AC-1. The risk is considered to be VERY LOW.<br><br>The chemical analysis of the soils indicate specialist materials are unlikely to be required for water supply pipes at the site. The risk is considered to be VERY LOW.<br><br>*See above comment regarding ground gas protection measures. |
|  | <b>P6:</b> Root uptake.  | <b>R6:</b> Proposed Flora and fauna  | Mild        | Low         | Low      | Minimal landscaping is anticipated on site. The risk at this stage of uptake to proposed flora and fauna is LOW.  |

## **6. Development Constraints and Recommendations for Further Work**

### **6.1 Development Constraints**

The desk study and ground investigation have identified the following development constraints at the site:

Comparison of the steady state gas screening value with Table 8.5 of the CIRIA document (Ref 16) indicates the site falls in a Characteristic Situation 2. Based on a classification of CS2 ground gas protection measures are required in accordance with BS8485:2015 + A1:2019 (Ref 15) for the proposed redevelopment, subject to Local Authority approval.

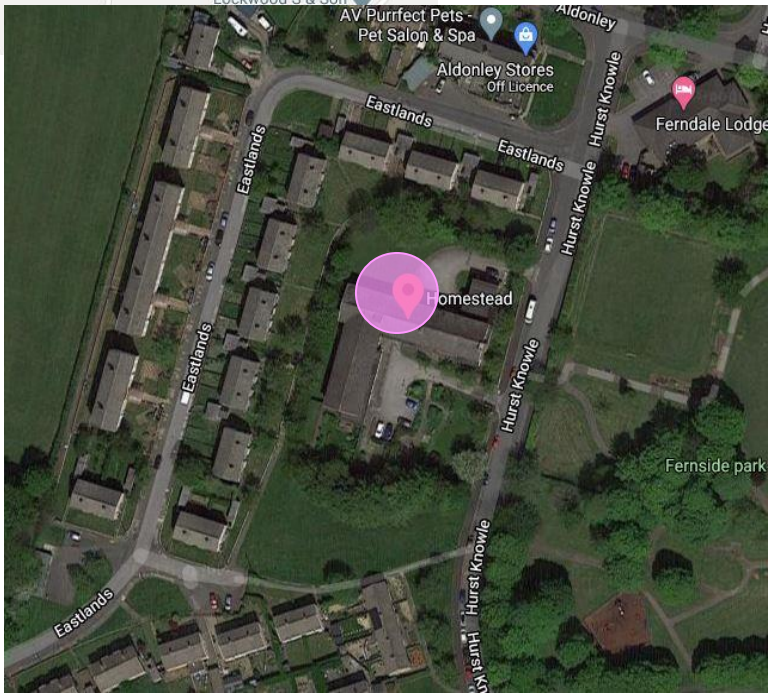
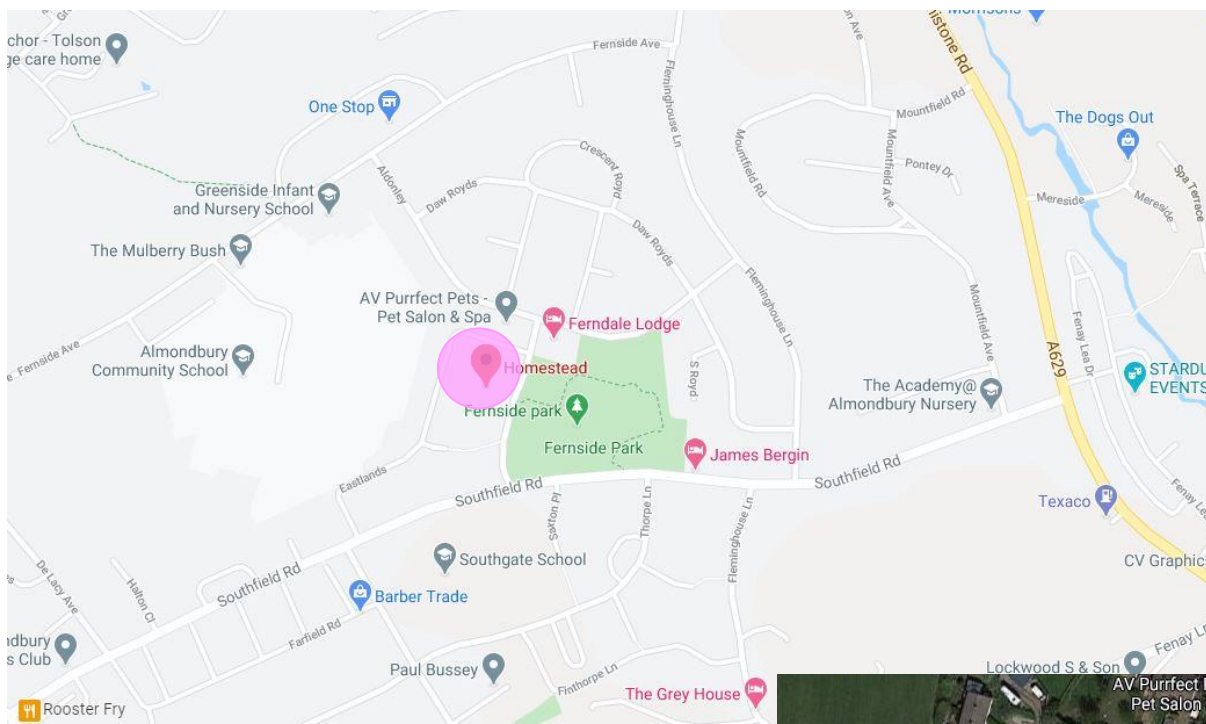
Proposed soft landscaping is likely to require topsoil import as materials on site are unlikely to meet the requirements of the British Standards / Landscape Architect.

---

## 7. References


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16. CIRIA C665 'Assessing Risks Posed by Hazardous Ground Gases to Buildings'
17. Department for Environment, Food and Rural Affairs and Contaminated Land: Applications in Real Environments (CL:AIRE) (December 2013). SP1010: Appendix E Provisional C4SLs for Benzo(a)pyrene as a surrogate marker for PAHs.
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19. Environment Agency, Freshwater Environmental Quality Standards (EQS) contained in the Hydrogeological Risk Assessment for Landfills and the Derivation of Groundwater Control and Trigger Levels, 2015.
20. HMSO, Water Supply (Water Quality) Regulations, 2002.
21. CIRIA C735 'Good practice on the testing verification of protection systems for buildings against hazardous ground gas

# Appendix I



DO NOT SCALE  
NOTES:



 - Approximate Site Location



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Eastwood, Nottingham, NG16 3SB  
Tel: 01773 535 555 Fax: 0870 600 6091  
[www.hspconsulting.com](http://www.hspconsulting.com)

CLIENT:  
**Frank Shaw Associates Ltd**

PROJECT:  
**The Homestead Hurst Knowle Road, Huddersfield**

TITLE:  
**Site Location Plan**

|              |        |
|--------------|--------|
| SCALE@SIZE : | ISSUE: |
| NTS          | FINAL  |

|               |          |
|---------------|----------|
| DESIGN/DRAWN: | DATE:    |
| KM            | Sep 2020 |

|             |             |
|-------------|-------------|
| PROJECT No: | DRAWING No: |
| C3257       | 001         |

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# Appendix II

# Borehole Log

Borehole No.

**WS01**

Sheet 1 of 1

Project Name: Homestead

 Project No.  
C3257

Co-ords: -

 Hole Type  
WS

Location: Hurst Knowle Road

Level:

 Scale  
1:50

Client: Frank Shaw Associates

Dates: 02/09/2020 -

 Logged By  
HEB

| Well | Water Strikes | Samples and In Situ Testing |                               |                    | Depth (m) | Level (m)                 | Legend  | Stratum Description |
|------|---------------|-----------------------------|-------------------------------|--------------------|-----------|---------------------------|---|---------------------|
|      |               | Depth (m)                   | Type                          | Results            |           |                           |   |                     |
|      |               | 0.10                        | TJ                            |                    | 0.25      |                           | MADE GROUND - Brown sandy gravelly clayey topsoil. Gravel is fine to coarse and subrounded to angular of mixed lithology, brick, occasional porcelain and concrete.                     |                     |
|      |               | 0.60                        | TJ                            |                    |           |                           |   |                     |
|      |               | 0.90                        | B                             | N=7 (2,2/1,2,2,2)  |           |                           | MADE GROUND - Brown and slightly grey mottled slightly sandy gravelly clay. Gravel is fine to medium and subrounded to angular of mixed lithology and coal fragments. (reworked ground) |                     |
|      |               | 1.00                        | B                             |                    |           |                           |   |                     |
|      |               | 1.30                        | B                             |                    |           |                           |   |                     |
|      |               | 1.80                        | D                             |                    | 1.70      |                           | MADE GROUND - Grey slightly sandy clay. Rootlets throughout.  |                     |
|      |               | 2.00                        | D                             | N=20 (0,2/3,3,6,8) | 2.00      |                           | Stiff greyish brown slightly sandy gravelly CLAY. Gravel is fine to coarse and angular of mudstone.   |                     |
|      |               | 2.70                        | D                             |                    | 2.50      |                           | Extremely weak brown and grey mottled weathered MUDSTONE. Recovered as very gravelly CLAY.  |                     |
|      | 3.00          | D                           | 50 (25 for 105mm/50 for 80mm) | 3.18               |           | End of borehole at 3.18 m |   |                     |

**Remarks**

1. Borehole terminated on SPT refusal at 3.00m depth.

# Borehole Log

Borehole No.

**WS02**

Sheet 1 of 1

Project Name: Homestead

 Project No.  
C3257

Co-ords: -

 Hole Type  
WS

Location: Hurst Knowle Road

Level:

 Scale  
1:50

Client: Frank Shaw Associates

Dates: 02/09/2020 -

 Logged By  
HEB

| Well | Water Strikes | Samples and In Situ Testing |      |                    | Depth (m)             | Level (m) | Legend  | Stratum Description   |
|------|---------------|-----------------------------|------|--------------------|-----------------------|-----------|---|---|
|      |               | Depth (m)                   | Type | Results            |                       |           |   |   |
|      |               | 0.35                        | TJ   |                    | 0.25                  |           | MADE GROUND - Brown sandy gravelly clayey topsoil. Gravel is fine to coarse and subrounded to angular of mixed lithology, brick, occasional porcelain and concrete. |   |
|      |               | 0.80                        | TJ   |                    | 0.60                  |           | MADE GROUND - Grey sandy gravel. Gravel is fine to coarse and angular of mixed lithology, brick and concrete.   |   |
|      |               | 0.90                        | B    |                    | 0.75                  |           |   |   |
|      |               | 1.00                        |      | N=8 (3,2/1,3,2,2)  |                       |           |   |   |
|      |               | 1.25                        | D    |                    | 1.30                  |           | MADE GROUND - Dark brown sandy gravelly clay. Gravel is fine to coarse and subrounded to angular of mixed lithology. (reworked ground)                              |   |
|      |               | 1.60                        | B    |                    |                       |           | MADE GROUND - Brown and grey mottled gravelly sandy clay. Gravel is fine to coarse and subrounded to angular of sandstone.  |   |
|      |               | 2.00                        |      | N=10 (0,0/0,1,2,7) |                       |           | MADE GROUND - Grey slightly gravelly sandy clay. Gravel is fine to medium and subrounded to angular of mudstone, sandstone and porcelain.                           |   |
|      |               |                             |      |                    | 2.40                  |           | Very stiff yellowish brown sandy gravelly CLAY. Gravel is fine to coarse and angular of sandstone.  |   |
|      |               |                             |      |                    | 2.60                  |           |   |   |
|      |               |                             | 2.70 |                    | 50 (25,/50 for 150mm) | 2.85      |   | Extremely weak yellowish brown SANDSTONE. Recovered as sandy gravel.<br>End of borehole at 2.85 m |

**Remarks**

1. Borehole terminated on SPT refusal at 2.70m depth.

# Borehole Log

Borehole No.

**WS03**

Sheet 1 of 1

Project Name: Homestead

Project No.  
C3257

Co-ords: -

Hole Type  
WS

Location: Hurst Knowle Road





Level:

Scale  
1:50

Client: Frank Shaw Associates

Dates: 02/09/2020 -

Logged By  
HEB

| Well  | Water Strikes | Samples and In Situ Testing |      |                      | Depth (m) | Level (m) | Legend  | Stratum Description   |
|---|---------------|-----------------------------|------|----------------------|-----------|-----------|---|---|
|   |               | Depth (m)                   | Type | Results              |           |           |   |   |
|  |               | 0.25                        | TJ   |                      | 0.15      |           |  | MADE GROUND - Dark grey asphalt concrete.   |
|   |               |                             |      |                      | 0.35      |           |   |    |
|   |               | 1.00                        |      | 50 (25,/50 for 50mm) | 1.05      |           |  | Extremely weak brown and grey mottled MUDSTONE. Recovered as brown and grey mottled sandy gravel.<br>-----<br>End of borehole at 1.05 m |



Remarks  
1. Borehole terminated on SPT refusal at 0.50m depth.



# Borehole Log

Borehole No.

**WS04**

Sheet 1 of 1

Project Name: Homestead

Project No.  
C3257

Co-ords: -

Hole Type  
WS

Location: Hurst Knowle Road

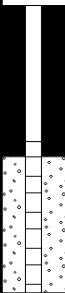



Level:

Scale  
1:50

Client: Frank Shaw Associates

Dates: 02/09/2020 -

Logged By  
HEB

| Well  | Water Strikes | Samples and In Situ Testing |      |                               | Depth (m) | Level (m)   | Legend   | Stratum Description  |
|---|---------------|-----------------------------|------|-------------------------------|-----------|---|--|--|
|   |               | Depth (m)                   | Type | Results                       |           |   |  |  |
|  |               | 0.10                        | TJ   |                               | 0.35      |  | MADE GROUND - Dark brown slightly sandy gravelly topsoil. Gravel is fine to coarse and subrounded to angular of mixed lithology, brick and concrete. |  |
|   |               | 0.45                        | TJ   |                               |           |   |   | Firm light brown and grey mottled slightly sandy gravelly CLAY. Gravel is fine to coarse and sub angular to angular of mudstone. |
|   |               | 1.00                        | B    | N=19 (3,4/4,4,5,6)            | 1.85      |  |  | Extremely weak yellowish brown MUDSTONE. Recovered as sandy gravel.  |
|   |               | 1.10                        |      |                               |           |   |  |  |
|   |               | 1.80                        | D    | 50 (25 for 105mm/50 for 70mm) |           |   |  |  |
|   | 1.90          |                             |      |                               |           |   |  |  |



Remarks

1. Borehole terminated on SPT refusal at 1.90m depth.



# Borehole Log

Borehole No.

**WS05**

Sheet 1 of 1

Project Name: Homestead

Project No.  
C3257

Co-ords: -

Hole Type  
WS

Location: Hurst Knowle Road

Level:

Scale  
1:50

Client: Frank Shaw Associates

Dates: 02/09/2020 -

Logged By  
HEB

| Well | Water Strikes | Samples and In Situ Testing |      |                              | Depth (m) | Level (m) | Legend  | Stratum Description |
|------|---------------|-----------------------------|------|------------------------------|-----------|-----------|---|---------------------|
|      |               | Depth (m)                   | Type | Results                      |           |           |   |                     |
|      |               | 0.10                        | TJ   |                              |           |           | <p>MADE GROUND - Brown sandy gravelly clayey topsoil. Gravel is fine to coarse and subrounded to angular of mixed lithology, brick and occasional porcelain.</p> <p>Extremely weak yellowish brown SANDSTONE. Recovered as sandy gravel.</p> <p>End of borehole at 0.57 m</p> |                     |
|      |               | 0.35                        | TJ   |                              | 0.25      |           |   |                     |
|      |               | 0.45                        |      | 50 (25 for 75mm/50 for 40mm) | 0.57      |           |   |                     |



Remarks

1. Borehole terminated on SPT refusal at 0.45m depth.



# Borehole Log

Borehole No.

**WS06**

Sheet 1 of 1

Project Name: Homestead

Project No.  
C3257

Co-ords: -

Hole Type  
WS

Location: Hurst Knowle Road

Level:

Scale  
1:50

Client: Frank Shaw Associates

Dates: 02/09/2020 -

Logged By  
HEB

| Well      | Water Strikes | Samples and In Situ Testing |      |                        | Depth (m) | Level (m) | Legend  | Stratum Description |
|-----------|---------------|-----------------------------|------|------------------------|-----------|-----------|---|---------------------|
|           |               | Depth (m)                   | Type | Results                |           |           |   |                     |
| [Pattern] |               | 0.20                        | TJ   |                        | 0.10      |           | MADE GROUND - Grey concrete asphalt.  |                     |
|           |               | 0.50                        | TJ   |                        | 0.40      |           | MADE GROUND - Black sandy gravel of concrete and tarmac.  |                     |
|           |               | 0.80                        | B    |                        |           |           | Firm to very stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse and subrounded to angular of mudstone.  |                     |
|           |               | 1.00                        | D    |                        | 0.95      |           | Extremely weak brown and grey mottled MUDSTONE. Recovered as slightly clayey sandy gravel.<br>End of borehole at 1.04 m |                     |
|           |               | 1.00                        |      | 50 (12,13/50 for 40mm) | 1.04      |           |   |                     |



Remarks  
1. Borehole terminated on SPT refusal at 1.00m depth.



# Borehole Log

Borehole No.

**WS07**

Sheet 1 of 1

Project Name: Homestead

Project No.  
C3257

Co-ords: -

Hole Type  
WS

Location: Hurst Knowle Road

Level:

Scale  
1:50

Client: Frank Shaw Associates

Dates: 02/09/2020 -

Logged By  
HEB

| Well      | Water Strikes | Samples and In Situ Testing |      |                                | Depth (m) | Level (m) | Legend    | Stratum Description  |
|-----------|---------------|-----------------------------|------|--------------------------------|-----------|-----------|-----------|--|
|           |               | Depth (m)                   | Type | Results                        |           |           |           |  |
| [Pattern] |               | 0.40                        | TJ   | 50 (25 for 145mm/50 for 135mm) | 0.25      |           | [Pattern] | <p>MADE GROUND - Brown sandy gravelly clayey topsoil. Gravel is fine to coarse and subrounded to angular of mixed lithology, brick, occasional porcelain and concrete.</p> <p>MADE GROUND - Brown slightly sandy gravelly clay. Gravel is fine to coarse and subrounded to angular of mixed lithology, brick and concrete fragments.</p> <p>Stiff to very stiff yellowish brown slightly sandy gravelly CLAY. Gravel is fine to coarse and subangular to angular of sandstone.</p> <p>Extremely weak yellowish brown SANDSTONE. Recovered as sandy gravel.</p> <p style="text-align: right;">End of borehole at 1.28 m</p> |
|           |               | 0.60                        | B    |                                | 0.50      |           |           |  |
|           |               | 0.75                        | TJ   |                                | 0.90      |           |           |  |
|           |               | 1.00                        |      |                                | 1.28      |           |           |  |


Remarks  
1. Borehole terminated on SPT refusal at 1.00m depth.


# Appendix III



DO NOT SCALE  
NOTES:



 - Approximate Red Line Boundary

 - Proposed Window Sample Location



Lawrence House, Meadowbank Way,  
Eastwood, Nottingham, NG16 3SB  
Tel: 01773 535 555 Fax: 0870 600 6091  
[www.hspconsulting.com](http://www.hspconsulting.com)

CLIENT:

Frank Shaw Associates Ltd

PROJECT:

The Homestead – Kirklees  
Dementia Care homes

TITLE:

Proposed Exploratory  
Layout Plan

SCALE@SIZE :

NTS

ISSUE:

FINAL

DESIGN/DRAWN:

HEB

DATE:

Sept. 2020

PROJECT No:

C3257

DRAWING No:

502

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# Appendix IV



# Final Report

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**Report No.:** 20-23576-1  
**Initial Date of Issue:** 15-Sep-2020  
**Client:** HSP Consulting Engineers Limited  
**Client Address:** Lawrence House  
Meadowbank Way  
Eastwood  
Nottinghamshire  
NG16 3SB  
**Contact(s):** Karen Murray  
**Project:** C3257 - The Homestead, Hurst Knowle  
Road, Huddersfield  
**Quotation No.:** **Date Received:** 04-Sep-2020  
**Order No.:** SC13457 **Date Instructed:** 08-Sep-2020  
**No. of Samples:** 11  
**Turnaround (Wkdays):** 5 **Results Due:** 14-Sep-2020  
**Date Approved:** 15-Sep-2020

**Approved By:**

**Details:** Glynn Harvey, Technical Manager

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# Results - Soil

**Project: C3257 - The Homestead, Hurst Knowle Road, Huddersfield**

| Client: HSP Consulting Engineers Limited |         | Chemtest Job No.:    |       | 20-23576    | 20-23576    | 20-23576    | 20-23576    | 20-23576             | 20-23576             | 20-23576    | 20-23576             | 20-23576             |
|--|---------|----------------------|-------|-------------|-------------|-------------|-------------|----------------------|----------------------|-------------|----------------------|----------------------|
| Quotation No.:                           |         | Chemtest Sample ID.: |       | 1059009     | 1059012     | 1059013     | 1059015     | 1059016              | 1059017              | 1059020     | 1059021              | 1059022              |
|  |         | Sample Location:     |       | WS01        | WS02        | WS02        | WS03        | WS04                 | WS04                 | WS05        | WS06                 | WS06                 |
|  |         | Sample Type:         |       | SOIL        | SOIL        | SOIL        | SOIL        | SOIL                 | SOIL                 | SOIL        | SOIL                 | SOIL                 |
|  |         | Top Depth (m):       |       | 0.6         | 0.35        | 0.80        | 0.25        | 0.10                 | 0.45                 | 0.25        | 0.20                 | 0.50                 |
|  |         | Date Sampled:        |       | 02-Sep-2020 | 02-Sep-2020 | 02-Sep-2020 | 02-Sep-2020 | 02-Sep-2020          | 02-Sep-2020          | 02-Sep-2020 | 02-Sep-2020          | 02-Sep-2020          |
|  |         | Asbestos Lab:        |       |             |             |             | DURHAM      | DURHAM               |                      | DURHAM      | DURHAM               |                      |
| Determinand                              | Accred. | SOP                  | Units | LOD         |             |             |             |                      |                      |             |                      |                      |
| ACM Type                                 | U       | 2192                 |       | N/A         |             |             |             | -                    | -                    |             | -                    | -                    |
| Asbestos Identification                  | U       | 2192                 | %     | 0.001       |             |             |             | No Asbestos Detected | No Asbestos Detected |             | No Asbestos Detected | No Asbestos Detected |
| ACM Detection Stage                      | U       | 2192                 |       | N/A         |             |             |             | -                    | -                    |             | -                    | -                    |
| Moisture                                 | N       | 2030                 | %     | 0.020       | 15          | 13          | 12          | 8.2                  | 20                   | 17          |                      | 18                   |
| Soil Colour                              | N       | 2040                 |       | N/A         | Brown       | Brown       | Brown       | Brown                | Brown                | Brown       |                      | Grey                 |
| Other Material                           | N       | 2040                 |       | N/A         | None        | Stones      | None        | Stones               | Stones               | None        |                      | None                 |
| Soil Texture                             | N       | 2040                 |       | N/A         | Clay        | Sand        | Clay        | Sand                 | Sand                 | Clay        |                      | Clay                 |
| pH                                       | M       | 2010                 |       | 4.0         | 7.6         | > 12.0      | 9.0         | 8.8                  | 7.0                  | 7.5         |                      | 7.8                  |
| Boron (Hot Water Soluble)                | M       | 2120                 | mg/kg | 0.40        | [B] 0.45    | [B] 0.60    |             | [B] < 0.40           | [B] 1.1              |             |                      |                      |
| Sulphate (2:1 Water Soluble) as SO4      | M       | 2120                 | g/l   | 0.010       | [B] < 0.010 | [B] 0.16    | [B] 0.037   | [B] < 0.010          | [B] < 0.010          | [B] 0.018   |                      | [B] 0.016            |
| Total Sulphur                            | M       | 2175                 | %     | 0.010       |             |             | 0.029       |                      |                      | 0.012       |                      | 0.044                |
| Sulphur (Elemental)                      | M       | 2180                 | mg/kg | 1.0         | 8.1         | 1.6         |             | < 1.0                | 10                   |             |                      |                      |
| Cyanide (Free)                           | M       | 2300                 | mg/kg | 0.50        | < 0.50      | < 0.50      |             | < 0.50               | < 0.50               |             |                      |                      |
| Cyanide (Total)                          | M       | 2300                 | mg/kg | 0.50        | < 0.50      | < 0.50      |             | < 0.50               | 0.60                 |             |                      |                      |
| Sulphide (Easily Liberatable)            | N       | 2325                 | mg/kg | 0.50        | 22          | 5.6         |             | 3.5                  | 27                   |             |                      |                      |
| Sulphate (Acid Soluble)                  | M       | 2430                 | %     | 0.010       |             |             | 0.072       |                      |                      | 0.015       |                      | 0.039                |
| Arsenic                                  | M       | 2450                 | mg/kg | 1.0         | 18          | 16          |             | 8.1                  | 19                   |             |                      |                      |
| Cadmium                                  | M       | 2450                 | mg/kg | 0.10        | 0.14        | < 0.10      |             | 0.14                 | 0.28                 |             |                      |                      |
| Chromium                                 | M       | 2450                 | mg/kg | 1.0         | 35          | 20          |             | 31                   | 36                   |             |                      |                      |
| Copper                                   | M       | 2450                 | mg/kg | 0.50        | 34          | 14          |             | 28                   | 28                   |             |                      |                      |
| Mercury                                  | M       | 2450                 | mg/kg | 0.10        | 0.13        | < 0.10      |             | < 0.10               | 0.19                 |             |                      |                      |
| Nickel                                   | M       | 2450                 | mg/kg | 0.50        | 36          | 20          |             | 44                   | 23                   |             |                      |                      |
| Lead                                     | M       | 2450                 | mg/kg | 0.50        | 40          | 5.9         |             | 16                   | 47                   |             |                      |                      |
| Selenium                                 | M       | 2450                 | mg/kg | 0.20        | 0.46        | < 0.20      |             | < 0.20               | 0.50                 |             |                      |                      |
| Zinc                                     | M       | 2450                 | mg/kg | 0.50        | 84          | 30          |             | 77                   | 78                   |             |                      |                      |
| Chromium (Hexavalent)                    | N       | 2490                 | mg/kg | 0.50        | < 0.50      | < 0.50      |             | < 0.50               | < 0.50               |             |                      |                      |
| Organic Matter                           | M       | 2625                 | %     | 0.40        |             |             |             |                      |                      |             |                      |                      |
| Aliphatic TPH >C5-C6                     | N       | 2680                 | mg/kg | 1.0         | < 1.0       | < 1.0       |             | < 1.0                | < 1.0                |             |                      |                      |
| Aliphatic TPH >C6-C8                     | N       | 2680                 | mg/kg | 1.0         | < 1.0       | < 1.0       |             | < 1.0                | < 1.0                |             |                      |                      |
| Aliphatic TPH >C8-C10                    | M       | 2680                 | mg/kg | 1.0         | < 1.0       | < 1.0       |             | < 1.0                | < 1.0                |             |                      |                      |
| Aliphatic TPH >C10-C12                   | M       | 2680                 | mg/kg | 1.0         | < 1.0       | < 1.0       |             | < 1.0                | < 1.0                |             |                      |                      |
| Aliphatic TPH >C12-C16                   | M       | 2680                 | mg/kg | 1.0         | < 1.0       | < 1.0       |             | < 1.0                | < 1.0                |             |                      |                      |
| Aliphatic TPH >C16-C21                   | M       | 2680                 | mg/kg | 1.0         | < 1.0       | < 1.0       |             | < 1.0                | < 1.0                |             |                      |                      |
| Aliphatic TPH >C21-C35                   | M       | 2680                 | mg/kg | 1.0         | < 1.0       | < 1.0       |             | < 1.0                | < 1.0                |             |                      |                      |
| Aliphatic TPH >C35-C44                   | N       | 2680                 | mg/kg | 1.0         | < 1.0       | < 1.0       |             | < 1.0                | < 1.0                |             |                      |                      |
| Total Aliphatic Hydrocarbons             | N       | 2680                 | mg/kg | 5.0         | < 5.0       | < 5.0       |             | < 5.0                | < 5.0                |             |                      |                      |

# Results - Soil

**Project: C3257 - The Homestead, Hurst Knowle Road, Huddersfield**

| Client: HSP Consulting Engineers Limited |         | Chemtest Job No.:    |             |             |             |             |             |             |             |             |
|--|---------|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|  |         | 20-23576             | 20-23576    | 20-23576    | 20-23576    | 20-23576    | 20-23576    | 20-23576    | 20-23576    | 20-23576    |
| Quotation No.:                           |         | Chemtest Sample ID.: |             |             |             |             |             |             |             |             |
|  |         | 1059009              | 1059012     | 1059013     | 1059015     | 1059016     | 1059017     | 1059020     | 1059021     | 1059022     |
| Sample Location:                         |         | WS01                 | WS02        | WS02        | WS03        | WS04        | WS04        | WS05        | WS06        | WS06        |
| Sample Type:                             |         | SOIL                 | SOIL        | SOIL        | SOIL        | SOIL        | SOIL        | SOIL        | SOIL        | SOIL        |
| Top Depth (m):                           |         | 0.6                  | 0.35        | 0.80        | 0.25        | 0.10        | 0.45        | 0.25        | 0.20        | 0.50        |
| Date Sampled:                            |         | 02-Sep-2020          | 02-Sep-2020 | 02-Sep-2020 | 02-Sep-2020 | 02-Sep-2020 | 02-Sep-2020 | 02-Sep-2020 | 02-Sep-2020 | 02-Sep-2020 |
| Asbestos Lab:                            |         |                      |             |             | DURHAM      | DURHAM      |             | DURHAM      | DURHAM      |             |
| Determinand                              | Accred. | SOP                  | Units       | LOD         |             |             |             |             |             |             |
| Aromatic TPH >C5-C7                      | N       | 2680                 | mg/kg       | 1.0         | < 1.0       | < 1.0       |             | < 1.0       | < 1.0       |             |
| Aromatic TPH >C7-C8                      | N       | 2680                 | mg/kg       | 1.0         | < 1.0       | < 1.0       |             | < 1.0       | < 1.0       |             |
| Aromatic TPH >C8-C10                     | M       | 2680                 | mg/kg       | 1.0         | < 1.0       | < 1.0       |             | < 1.0       | < 1.0       |             |
| Aromatic TPH >C10-C12                    | M       | 2680                 | mg/kg       | 1.0         | < 1.0       | < 1.0       |             | < 1.0       | < 1.0       |             |
| Aromatic TPH >C12-C16                    | M       | 2680                 | mg/kg       | 1.0         | < 1.0       | < 1.0       |             | < 1.0       | < 1.0       |             |
| Aromatic TPH >C16-C21                    | U       | 2680                 | mg/kg       | 1.0         | < 1.0       | < 1.0       |             | < 1.0       | < 1.0       |             |
| Aromatic TPH >C21-C35                    | M       | 2680                 | mg/kg       | 1.0         | < 1.0       | < 1.0       |             | < 1.0       | < 1.0       |             |
| Aromatic TPH >C35-C44                    | N       | 2680                 | mg/kg       | 1.0         | < 1.0       | < 1.0       |             | < 1.0       | < 1.0       |             |
| Total Aromatic Hydrocarbons              | N       | 2680                 | mg/kg       | 5.0         | < 5.0       | < 5.0       |             | < 5.0       | < 5.0       |             |
| Total Petroleum Hydrocarbons             | N       | 2680                 | mg/kg       | 10.0        | < 10        | < 10        |             | < 10        | < 10        |             |
| Naphthalene                              | M       | 2700                 | mg/kg       | 0.10        | < 0.10      | < 0.10      |             | < 0.10      | < 0.10      |             |
| Acenaphthylene                           | M       | 2700                 | mg/kg       | 0.10        | < 0.10      | < 0.10      |             | < 0.10      | < 0.10      |             |
| Acenaphthene                             | M       | 2700                 | mg/kg       | 0.10        | < 0.10      | < 0.10      |             | < 0.10      | < 0.10      |             |
| Fluorene                                 | M       | 2700                 | mg/kg       | 0.10        | < 0.10      | < 0.10      |             | < 0.10      | < 0.10      |             |
| Phenanthrene                             | M       | 2700                 | mg/kg       | 0.10        | 2.7         | < 0.10      |             | < 0.10      | 5.3         |             |
| Anthracene                               | M       | 2700                 | mg/kg       | 0.10        | 0.63        | < 0.10      |             | < 0.10      | 1.2         |             |
| Fluoranthene                             | M       | 2700                 | mg/kg       | 0.10        | 3.2         | < 0.10      |             | < 0.10      | 6.0         |             |
| Pyrene                                   | M       | 2700                 | mg/kg       | 0.10        | 3.3         | < 0.10      |             | < 0.10      | 5.8         |             |
| Benzo[a]anthracene                       | M       | 2700                 | mg/kg       | 0.10        | 1.0         | < 0.10      |             | < 0.10      | 2.2         |             |
| Chrysene                                 | M       | 2700                 | mg/kg       | 0.10        | 1.6         | < 0.10      |             | < 0.10      | 2.5         |             |
| Benzo[b]fluoranthene                     | M       | 2700                 | mg/kg       | 0.10        | < 0.10      | < 0.10      |             | < 0.10      | 2.7         |             |
| Benzo[k]fluoranthene                     | M       | 2700                 | mg/kg       | 0.10        | < 0.10      | < 0.10      |             | < 0.10      | 1.4         |             |
| Benzo[a]pyrene                           | M       | 2700                 | mg/kg       | 0.10        | < 0.10      | < 0.10      |             | < 0.10      | 2.1         |             |
| Indeno(1,2,3-c,d)Pyrene                  | M       | 2700                 | mg/kg       | 0.10        | < 0.10      | < 0.10      |             | < 0.10      | 1.2         |             |
| Dibenz(a,h)Anthracene                    | M       | 2700                 | mg/kg       | 0.10        | < 0.10      | < 0.10      |             | < 0.10      | 0.30        |             |
| Benzo[g,h,i]perylene                     | M       | 2700                 | mg/kg       | 0.10        | < 0.10      | < 0.10      |             | < 0.10      | 1.9         |             |
| Total Of 16 PAH's                        | M       | 2700                 | mg/kg       | 2.0         | 12          | < 2.0       |             | < 2.0       | 33          |             |
| Benzene                                  | M       | 2760                 | µg/kg       | 1.0         | < 1.0       | < 1.0       |             | < 1.0       | < 1.0       |             |
| Toluene                                  | M       | 2760                 | µg/kg       | 1.0         | < 1.0       | < 1.0       |             | < 1.0       | < 1.0       |             |
| Ethylbenzene                             | M       | 2760                 | µg/kg       | 1.0         | < 1.0       | < 1.0       |             | < 1.0       | < 1.0       |             |
| m & p-Xylene                             | M       | 2760                 | µg/kg       | 1.0         | < 1.0       | < 1.0       |             | < 1.0       | < 1.0       |             |
| o-Xylene                                 | M       | 2760                 | µg/kg       | 1.0         | < 1.0       | < 1.0       |             | < 1.0       | < 1.0       |             |
| Methyl Tert-Butyl Ether                  | M       | 2760                 | µg/kg       | 1.0         | < 1.0       | < 1.0       |             | < 1.0       | < 1.0       |             |
| Total Phenols                            | M       | 2920                 | mg/kg       | 0.30        | < 0.30      | < 0.30      |             | < 0.30      | < 0.30      |             |

## Results - Soil

**Project: C3257 - The Homestead, Hurst Knowle Road, Huddersfield**

|   |                             |            |              |             |             |             |
|---|-----------------------------|------------|--------------|-------------|-------------|-------------|
| <b>Client: HSP Consulting Engineers Limited</b> | <b>Chemtest Job No.:</b>    |            | 20-23576     | 20-23576    |             |             |
| Quotation No.:                                  | <b>Chemtest Sample ID.:</b> |            | 1059024      | 1059025     |             |             |
|   | Sample Location:            |            | WS07         | WS07        |             |             |
|   | Sample Type:                |            | SOIL         | SOIL        |             |             |
|   | Top Depth (m):              |            | 0.40         | 0.45        |             |             |
|   | Date Sampled:               |            | 02-Sep-2020  | 02-Sep-2020 |             |             |
|   | Asbestos Lab:               |            |              |             |             |             |
| <b>Determinand</b>                              | <b>Accred.</b>              | <b>SOP</b> | <b>Units</b> | <b>LOD</b>  |             |             |
| ACM Type  | U                           | 2192       |              | N/A         |             |             |
| Asbestos Identification                         | U                           | 2192       | %            | 0.001       |             |             |
| ACM Detection Stage                             | U                           | 2192       |              | N/A         |             |             |
| Moisture  | N                           | 2030       | %            | 0.020       | 17          | 8.3         |
| Soil Colour                                     | N                           | 2040       |              | N/A         | Brown       | Brown       |
| Other Material                                  | N                           | 2040       |              | N/A         | None        | None        |
| Soil Texture                                    | N                           | 2040       |              | N/A         | Clay        | Clay        |
| pH  | M                           | 2010       |              | 4.0         | 6.5         | 7.0         |
| Boron (Hot Water Soluble)                       | M                           | 2120       | mg/kg        | 0.40        | [B] 0.42    |             |
| Sulphate (2:1 Water Soluble) as SO4             | M                           | 2120       | g/l          | 0.010       | [B] < 0.010 | [B] < 0.010 |
| Total Sulphur                                   | M                           | 2175       | %            | 0.010       |             | < 0.010     |
| Sulphur (Elemental)                             | M                           | 2180       | mg/kg        | 1.0         | 1.5         |             |
| Cyanide (Free)                                  | M                           | 2300       | mg/kg        | 0.50        | < 0.50      |             |
| Cyanide (Total)                                 | M                           | 2300       | mg/kg        | 0.50        | < 0.50      |             |
| Sulphide (Easily Liberatable)                   | N                           | 2325       | mg/kg        | 0.50        | 1.8         |             |
| Sulphate (Acid Soluble)                         | M                           | 2430       | %            | 0.010       |             | < 0.010     |
| Arsenic   | M                           | 2450       | mg/kg        | 1.0         | 14          |             |
| Cadmium   | M                           | 2450       | mg/kg        | 0.10        | 0.17        |             |
| Chromium  | M                           | 2450       | mg/kg        | 1.0         | 26          |             |
| Copper  | M                           | 2450       | mg/kg        | 0.50        | 22          |             |
| Mercury   | M                           | 2450       | mg/kg        | 0.10        | < 0.10      |             |
| Nickel  | M                           | 2450       | mg/kg        | 0.50        | 23          |             |
| Lead  | M                           | 2450       | mg/kg        | 0.50        | 25          |             |
| Selenium  | M                           | 2450       | mg/kg        | 0.20        | 0.29        |             |
| Zinc  | M                           | 2450       | mg/kg        | 0.50        | 60          |             |
| Chromium (Hexavalent)                           | N                           | 2490       | mg/kg        | 0.50        | < 0.50      |             |
| Organic Matter                                  | M                           | 2625       | %            | 0.40        | 2.4         |             |
| Aliphatic TPH >C5-C6                            | N                           | 2680       | mg/kg        | 1.0         | < 1.0       |             |
| Aliphatic TPH >C6-C8                            | N                           | 2680       | mg/kg        | 1.0         | < 1.0       |             |
| Aliphatic TPH >C8-C10                           | M                           | 2680       | mg/kg        | 1.0         | < 1.0       |             |
| Aliphatic TPH >C10-C12                          | M                           | 2680       | mg/kg        | 1.0         | < 1.0       |             |
| Aliphatic TPH >C12-C16                          | M                           | 2680       | mg/kg        | 1.0         | < 1.0       |             |
| Aliphatic TPH >C16-C21                          | M                           | 2680       | mg/kg        | 1.0         | < 1.0       |             |
| Aliphatic TPH >C21-C35                          | M                           | 2680       | mg/kg        | 1.0         | < 1.0       |             |
| Aliphatic TPH >C35-C44                          | N                           | 2680       | mg/kg        | 1.0         | < 1.0       |             |
| Total Aliphatic Hydrocarbons                    | N                           | 2680       | mg/kg        | 5.0         | < 5.0       |             |

## Results - Soil

**Project: C3257 - The Homestead, Hurst Knowle Road, Huddersfield**

|   |                             |            |              |             |        |
|---|-----------------------------|------------|--------------|-------------|--------|
| <b>Client: HSP Consulting Engineers Limited</b> | <b>Chemtest Job No.:</b>    |            | 20-23576     | 20-23576    |        |
| Quotation No.:                                  | <b>Chemtest Sample ID.:</b> |            | 1059024      | 1059025     |        |
|   | Sample Location:            |            | WS07         | WS07        |        |
|   | Sample Type:                |            | SOIL         | SOIL        |        |
|   | Top Depth (m):              |            | 0.40         | 0.45        |        |
|   | Date Sampled:               |            | 02-Sep-2020  | 02-Sep-2020 |        |
|   | Asbestos Lab:               |            |              |             |        |
| <b>Determinand</b>                              | <b>Accred.</b>              | <b>SOP</b> | <b>Units</b> | <b>LOD</b>  |        |
| Aromatic TPH >C5-C7                             | N                           | 2680       | mg/kg        | 1.0         | < 1.0  |
| Aromatic TPH >C7-C8                             | N                           | 2680       | mg/kg        | 1.0         | < 1.0  |
| Aromatic TPH >C8-C10                            | M                           | 2680       | mg/kg        | 1.0         | < 1.0  |
| Aromatic TPH >C10-C12                           | M                           | 2680       | mg/kg        | 1.0         | < 1.0  |
| Aromatic TPH >C12-C16                           | M                           | 2680       | mg/kg        | 1.0         | < 1.0  |
| Aromatic TPH >C16-C21                           | U                           | 2680       | mg/kg        | 1.0         | < 1.0  |
| Aromatic TPH >C21-C35                           | M                           | 2680       | mg/kg        | 1.0         | < 1.0  |
| Aromatic TPH >C35-C44                           | N                           | 2680       | mg/kg        | 1.0         | < 1.0  |
| Total Aromatic Hydrocarbons                     | N                           | 2680       | mg/kg        | 5.0         | < 5.0  |
| Total Petroleum Hydrocarbons                    | N                           | 2680       | mg/kg        | 10.0        | < 10   |
| Naphthalene                                     | M                           | 2700       | mg/kg        | 0.10        | < 0.10 |
| Acenaphthylene                                  | M                           | 2700       | mg/kg        | 0.10        | < 0.10 |
| Acenaphthene                                    | M                           | 2700       | mg/kg        | 0.10        | < 0.10 |
| Fluorene  | M                           | 2700       | mg/kg        | 0.10        | < 0.10 |
| Phenanthrene                                    | M                           | 2700       | mg/kg        | 0.10        | < 0.10 |
| Anthracene                                      | M                           | 2700       | mg/kg        | 0.10        | < 0.10 |
| Fluoranthene                                    | M                           | 2700       | mg/kg        | 0.10        | < 0.10 |
| Pyrene  | M                           | 2700       | mg/kg        | 0.10        | < 0.10 |
| Benzo[a]anthracene                              | M                           | 2700       | mg/kg        | 0.10        | < 0.10 |
| Chrysene  | M                           | 2700       | mg/kg        | 0.10        | < 0.10 |
| Benzo[b]fluoranthene                            | M                           | 2700       | mg/kg        | 0.10        | < 0.10 |
| Benzo[k]fluoranthene                            | M                           | 2700       | mg/kg        | 0.10        | < 0.10 |
| Benzo[a]pyrene                                  | M                           | 2700       | mg/kg        | 0.10        | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene                         | M                           | 2700       | mg/kg        | 0.10        | < 0.10 |
| Dibenz(a,h)Anthracene                           | M                           | 2700       | mg/kg        | 0.10        | < 0.10 |
| Benzo[g,h,i]perylene                            | M                           | 2700       | mg/kg        | 0.10        | < 0.10 |
| Total Of 16 PAH's                               | M                           | 2700       | mg/kg        | 2.0         | < 2.0  |
| Benzene   | M                           | 2760       | µg/kg        | 1.0         | < 1.0  |
| Toluene   | M                           | 2760       | µg/kg        | 1.0         | < 1.0  |
| Ethylbenzene                                    | M                           | 2760       | µg/kg        | 1.0         | < 1.0  |
| m & p-Xylene                                    | M                           | 2760       | µg/kg        | 1.0         | < 1.0  |
| o-Xylene  | M                           | 2760       | µg/kg        | 1.0         | < 1.0  |
| Methyl Tert-Butyl Ether                         | M                           | 2760       | µg/kg        | 1.0         | < 1.0  |
| Total Phenols                                   | M                           | 2920       | mg/kg        | 0.30        | < 0.30 |

## Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

| Sample: | Sample Ref: | Sample ID: | Sample Location: | Sampled Date: | Deviation Code(s): | Containers Received: |
|---------|-------------|------------|------------------|---------------|--------------------|----------------------|
| 1059009 |             |            | WS01             | 02-Sep-2020   | B                  | Amber Glass<br>250ml |
| 1059009 |             |            | WS01             | 02-Sep-2020   | B                  | Plastic Tub<br>500g  |
| 1059012 |             |            | WS02             | 02-Sep-2020   | B                  | Amber Glass<br>250ml |
| 1059012 |             |            | WS02             | 02-Sep-2020   | B                  | Plastic Tub<br>500g  |
| 1059013 |             |            | WS02             | 02-Sep-2020   | B                  | Amber Glass<br>250ml |
| 1059013 |             |            | WS02             | 02-Sep-2020   | B                  | Plastic Tub<br>500g  |
| 1059015 |             |            | WS03             | 02-Sep-2020   | B                  | Amber Glass<br>250ml |
| 1059015 |             |            | WS03             | 02-Sep-2020   | B                  | Plastic Tub<br>500g  |
| 1059016 |             |            | WS04             | 02-Sep-2020   | B                  | Amber Glass<br>250ml |
| 1059016 |             |            | WS04             | 02-Sep-2020   | B                  | Plastic Tub<br>500g  |
| 1059017 |             |            | WS04             | 02-Sep-2020   | B                  | Amber Glass<br>250ml |
| 1059017 |             |            | WS04             | 02-Sep-2020   | B                  | Plastic Tub<br>500g  |
| 1059022 |             |            | WS06             | 02-Sep-2020   | B                  | Amber Glass<br>250ml |
| 1059022 |             |            | WS06             | 02-Sep-2020   | B                  | Plastic Tub<br>500g  |
| 1059024 |             |            | WS07             | 02-Sep-2020   | B                  | Amber Glass<br>250ml |
| 1059024 |             |            | WS07             | 02-Sep-2020   | B                  | Plastic Tub<br>500g  |
| 1059025 |             |            | WS07             | 02-Sep-2020   | B                  | Amber Glass<br>250ml |
| 1059025 |             |            | WS07             | 02-Sep-2020   | B                  | Plastic Tub<br>500g  |

## Test Methods

| SOP  | Title   | Parameters included  | Method summary   |
|------|---|--|--|
| 2010 | pH Value of Soils   | pH   | pH Meter   |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS)          | Moisture content   | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.   |
| 2040 | Soil Description(Requirement of MCERTS)                             | Soil description   | As received soil is described based upon BS5930  |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium                 | Boron; Sulphate; Magnesium; Chromium   | Aqueous extraction / ICP-OES   |
| 2175 | Total Sulphur in Soils  | Total Sulphur  | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.   |
| 2180 | Sulphur (Elemental) in Soils by HPLC                                | Sulphur  | Dichloromethane extraction / HPLC with UV detection  |
| 2192 | Asbestos  | Asbestos   | Polarised light microscopy / Gravimetry  |
| 2300 | Cyanides & Thiocyanate in Soils                                     | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate  | Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.  |
| 2325 | Sulphide in Soils   | Sulphide   | Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.   |
| 2430 | Total Sulphate in soils   | Total Sulphate   | Acid digestion followed by determination of sulphate in extract by ICP-OES.  |
| 2450 | Acid Soluble Metals in Soils  | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc   | Acid digestion followed by determination of metals in extract by ICP-MS.   |
| 2490 | Hexavalent Chromium in Soils  | Chromium [VI]  | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2625 | Total Organic Carbon in Soils                                       | Total organic Carbon (TOC)   | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.   |
| 2680 | TPH A/A Split   | Aliphatics: >C5-C6, >C6-C8,>C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21-C35, >C35- C44Aromatics: >C5-C7, >C7-C8, >C8- C10, >C10-C12, >C12-C16, >C16- C21, >C21- C35, >C35- C44  | Dichloromethane extraction / GCxGC FID detection   |
| 2700 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)   |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS       | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule   | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.                             |
| 2920 | Phenols in Soils by HPLC  | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.  | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.   |

## **Report Information**

### **Key**

---

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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

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

All Asbestos testing is performed at the indicated laboratory

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

### **Sample Deviation Codes**

---

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

### **Sample Retention and Disposal**

---

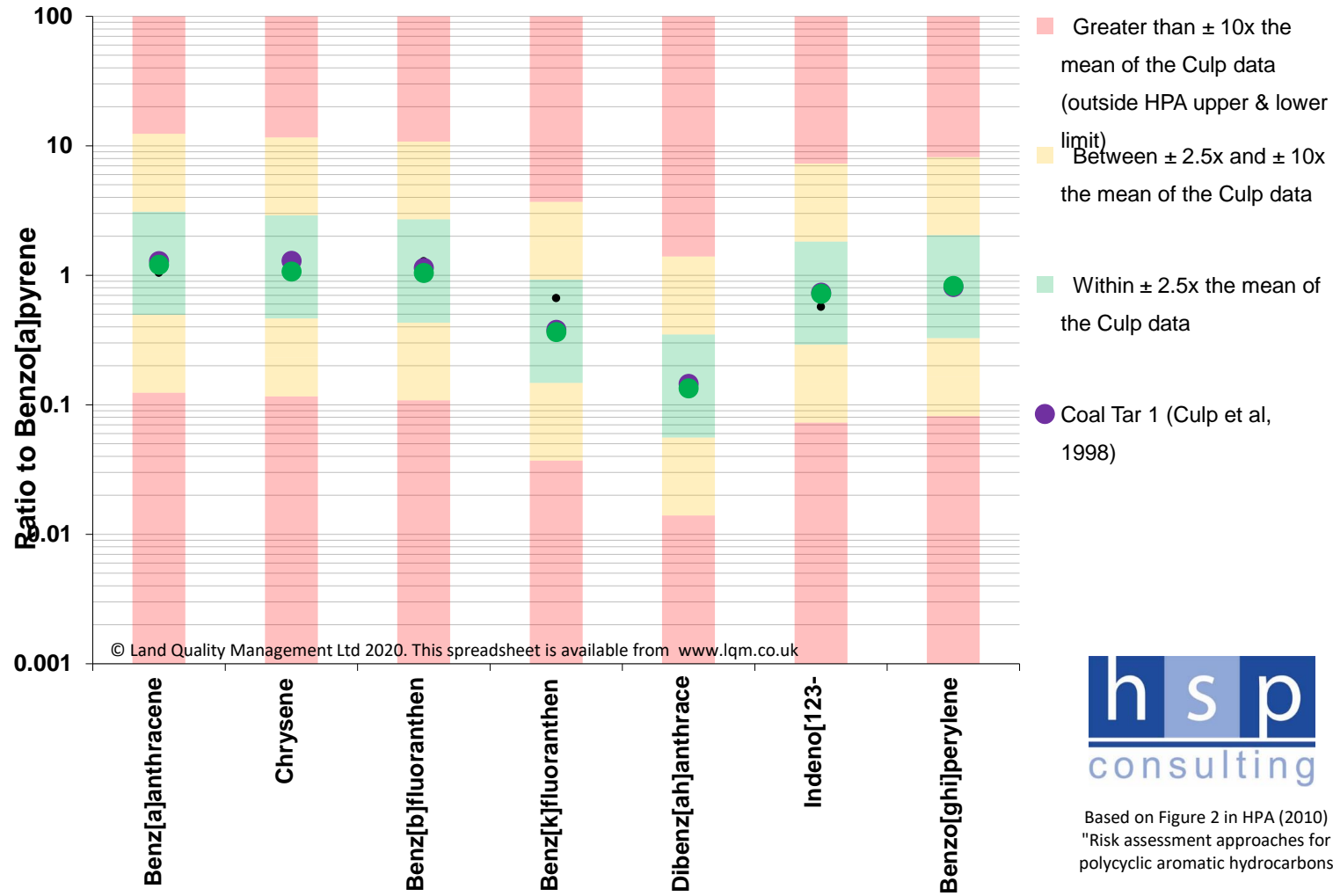
All soil samples will be retained for a period of 45 days from the date of receipt

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

Charges may apply to extended sample storage

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

[customerservices@chemtest.com](mailto:customerservices@chemtest.com)



# Appendix V



# LABORATORY REPORT



4043

**Contract Number: PSL20/4804**

Report Date: 02 October 2020  
Client's Reference: C3257  
Client Name: HSP Consulting  
Lawrence House  
4 Meadowbank Way  
Eastwood  
Nottingham  
NG16 3SB

**For the attention of: Karen Murray**

Contract Title: The Homestead, Hurst Knowle, Huddersfield  
Date Received: 10/9/2020  
Date Commenced: 10/9/2020  
Date Completed: 2/10/2020

**Notes: Opinions and Interpretations are outside the UKAS Accreditation**

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. 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 other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson  
(Director)

A Watkins  
(Director)

R Berriman  
(Quality Manager)

L Knight  
(Senior Technician)

  
S Eyre  
(Senior Technician)

S Royle  
(Laboratory Manager)

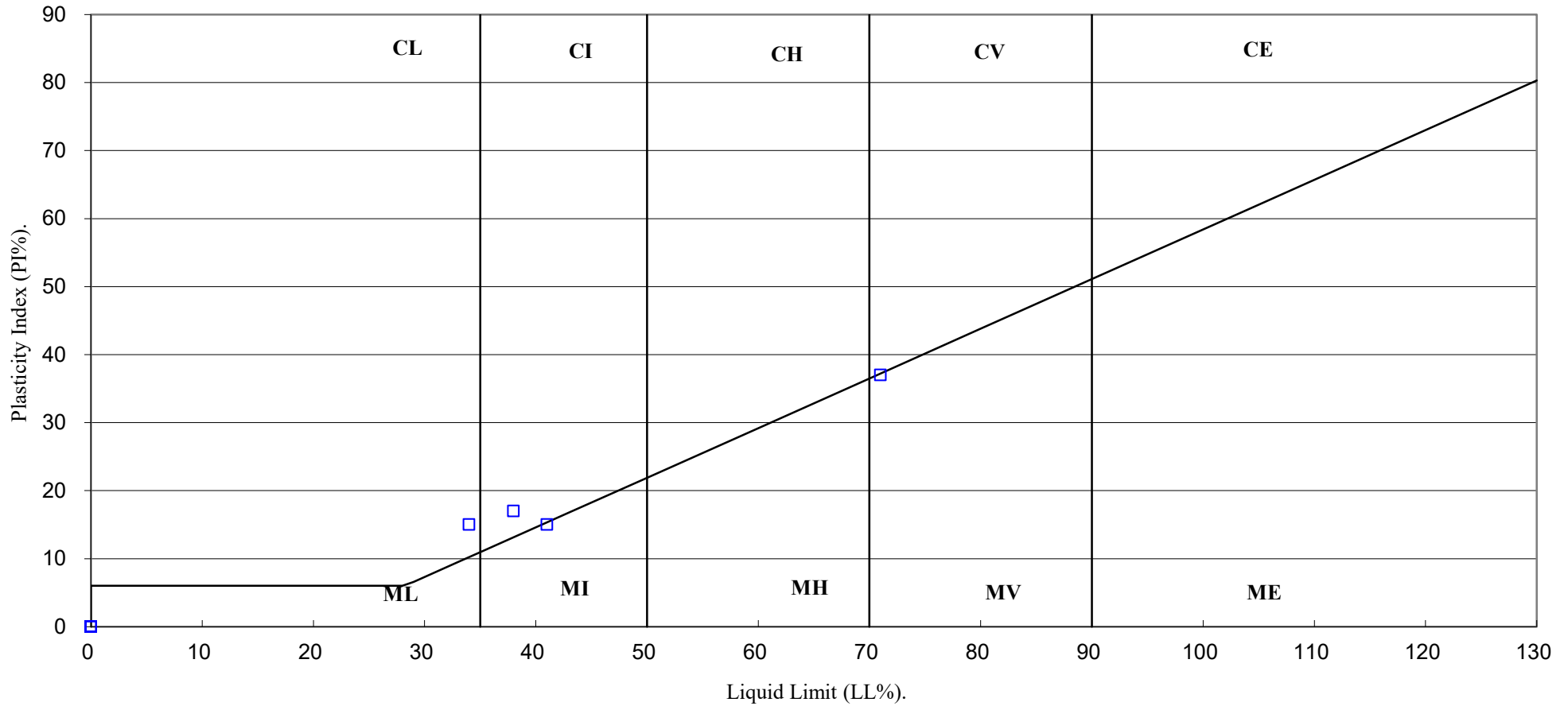
5 – 7 Hexthorpe Road, Hexthorpe,  
Doncaster DN4 0AR  
tel: +44 (0)844 815 6641  
fax: +44 (0)844 815 6642  
e-mail: [rgunson@prosoils.co.uk](mailto:rgunson@prosoils.co.uk)  
[awatkins@prosoils.co.uk](mailto:awatkins@prosoils.co.uk)

Page 1 of





# PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



4043

**PSL**  
Professional Soils Laboratory

The Homestead, Hurst Knowle, Huddersfield

Contract No:

PSL20/4804

Client Ref:

C3257

# Appendix VI

### CBR Test Results (MEXE Probe)



|          |                             |
|----------|-----------------------------|
| Job No.  | C3257                       |
| Job Name | The Homestead, Hurst Knowle |
| Date     | November 2020               |

| MP1               |            |      |     |     |
|-------------------|------------|------|-----|-----|
| Position          | Depth (mm) |      |     |     |
|                   | 150        | 300  | 450 | 600 |
| P1                | 5          | 14   |     |     |
| P2                | 14         |      |     |     |
| P3                | 14         |      |     |     |
| P4                | 14         |      |     |     |
| P5                | 14         |      |     |     |
| Minimum CBR Value | 5.0        | 14.0 |     |     |

| MP2               |            |     |     |     |
|-------------------|------------|-----|-----|-----|
| Position          | Depth (mm) |     |     |     |
|                   | 150        | 300 | 450 | 600 |
| P1                | 14         |     |     |     |
| P2                | 3          | 7   | 5   |     |
| P3                | 2          | 14  |     |     |
| P4                | 6          | 14  |     |     |
| P5                | 4          | 9   | 14  |     |
| Minimum CBR Value | 2.0        | 7.0 | 4.5 |     |

| MP3               |            |     |     |     |
|-------------------|------------|-----|-----|-----|
| Position          | Depth (mm) |     |     |     |
|                   | 150        | 300 | 450 | 600 |
| P1                |            |     |     |     |
| P2                |            |     |     |     |
| P3                |            |     |     |     |
| P4                |            |     |     |     |
| P5                |            |     |     |     |
| Minimum CBR Value |            |     |     |     |

| MP4               |            |     |     |     |
|-------------------|------------|-----|-----|-----|
| Position          | Depth (mm) |     |     |     |
|                   | 150        | 300 | 450 | 600 |
| P1                |            |     |     |     |
| P2                |            |     |     |     |
| P3                |            |     |     |     |
| P4                |            |     |     |     |
| P5                |            |     |     |     |
| Minimum CBR Value |            |     |     |     |

If Empty - Means unable to penetrate further due to strata strength

# Appendix VII





# Gas Testing Summary



|                |  |
|----------------|--|
| Project Number | C3257  |
| Project Name   | The Homestead, Hurst Knowle Rd, Huddersfield |
| Client         | 0  |

| Gas Flow Rate (l/hr) |     |     |     |     |     |     |
|----------------------|-----|-----|-----|-----|-----|-----|
| WS1                  | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| WS2                  | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| WS4                  | 0.1 | 0.1 | 0   | 0   | 0.1 | 0.1 |
|                      |     |     |     |     |     |     |
|                      |     |     |     |     |     |     |
|                      |     |     |     |     |     |     |
|                      |     |     |     |     |     |     |
|                      |     |     |     |     |     |     |
|                      |     |     |     |     |     |     |

| Volatile Organic Carbons (ppm) |  |  |  |  |  |  |
|--------------------------------|--|--|--|--|--|--|
|                                |  |  |  |  |  |  |
|                                |  |  |  |  |  |  |
|                                |  |  |  |  |  |  |
|                                |  |  |  |  |  |  |
|                                |  |  |  |  |  |  |
|                                |  |  |  |  |  |  |
|                                |  |  |  |  |  |  |
|                                |  |  |  |  |  |  |
|                                |  |  |  |  |  |  |

| Atmospheric Pressure Range |      |     |     |      |      |      |
|----------------------------|------|-----|-----|------|------|------|
|                            | 1015 | 977 | 983 | 1000 | 1000 | 1012 |

Max Methane Concentration (%vol) 1.4  
 Max Carbon Dioxide Concentration (%vol) 16.8  
 Max Carbon Monoxide Concentration (ppm) 1  
 Max Hydrogen Sulphide Concentration (ppm) 1  
 Max Flow Rate (l/hr) 0.1  
 Max Volatile Organic Carbon Concentration (ppm) 0

Methane Gas Screening Value 0.0014  
 Carbon Dioxide Gas Screening Value 0.0168

|                                       |        |
|---------------------------------------|--------|
| Carbon Monoxide Gas Screening Value   | 0.001  |
| Hydrogen Sulphide Gas Screening Value | 0.001  |
| Maximum Gas Screening Value           | 0.0168 |
| Characteristic Situation 1            | FAIL   |
| Characteristic Situation 2            | PASS   |
| Characteristic Situation 3            | PASS   |
| Characteristic Situation 4            | PASS   |
| Characteristic Situation 5            | PASS   |
| Characteristic Situation 6            | PASS   |
| Hydrocarbon Vapour Barrier Required?  | NO     |

# Appendix VIII

# Waste Classification Report



8UDT4-BJTSD-2UHGL

## Job name

C3257 - Homestead, Hurst Knowle, Huddersfield

## Description/Comments

## Project

C3257 - Homestead, Hurst Knowle, Huddersfield

## Site

Homestead, Hurst Knowle, Huddersfield

## Related Documents

| # | Name                               | Description                       |
|---|------------------------------------|-----------------------------------|
| 1 | HWOL_20-23576-20201020 111626.hwol | .hwol file used to create the Job |

## Waste Stream Template

Example waste stream template for contaminated soils

## Classified by

| <p>Name:<br/><b>Howard Daley</b><br/>Date:<br/><b>09 Nov 2020 09:45 GMT</b><br/>Telephone:<br/><b>01773 535555</b></p> | <p>Company:<br/><b>HSP Consulting Engineers Limited</b><br/><b>Lawrence House 4 Meadowbank Way</b><br/><b>Eastwood</b><br/><b>4 Meadowbank Way, Eastwood</b><br/><b>Nottingham</b><br/><b>NG16 3SB</b></p> | <p>HazWasteOnline™ Training Record:</p> <table border="0"> <thead> <tr> <th>Course</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td>Hazardous Waste Classification</td> <td>11 Feb 2020</td> </tr> <tr> <td>Advanced Hazardous Waste Classification</td> <td>12 Feb 2020</td> </tr> </tbody> </table> | Course | Date | Hazardous Waste Classification | 11 Feb 2020 | Advanced Hazardous Waste Classification | 12 Feb 2020 |
|--|--|---|--------|------|--------------------------------|-------------|---|-------------|
| Course   | Date   |   |        |      |                                |             |   |             |
| Hazardous Waste Classification   | 11 Feb 2020  |   |        |      |                                |             |   |             |
| Advanced Hazardous Waste Classification  | 12 Feb 2020  |   |        |      |                                |             |   |             |

## Report

Created by: Howard Daley  
Created date: 09 Nov 2020 09:45 GMT

## Job summary

| # | Sample Name | Depth [m] | Classification Result | Hazard properties | Page |
|---|-------------|-----------|-----------------------|-------------------|------|
| 1 | WS01 0.60m  | 0.6       | Non Hazardous         |                   | 3    |
| 2 | WS02 0.80m  | 0.80      | Non Hazardous         |                   | 6    |
| 3 | WS03 0.25m  | 0.25      | Non Hazardous         |                   | 7    |
| 4 | WS04 0.10m  | 0.10      | Non Hazardous         |                   | 10   |
| 5 | WS04 0.45m  | 0.45      | Non Hazardous         |                   | 13   |
| 6 | WS06 0.50m  | 0.50      | Non Hazardous         |                   | 14   |
| 7 | WS07 0.40m  | 0.40      | Non Hazardous         |                   | 15   |
| 8 | WS07 0.45m  | 0.45      | Non Hazardous         |                   | 18   |

## Appendices

| Appendix  | Page |
|---|------|
| Appendix A: Classifier defined and non CLP determinands | 19   |



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| Appendices   | Page |
|--|------|
| Appendix B: Rationale for selection of metal species | 20   |
| Appendix C: Version                                  | 21   |

---

Classification of sample: WS01 0.60m

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

Sample details

|                         |           |   |
|-------------------------|-----------|---|
| Sample Name:            | LoW Code: |   |
| <b>WS01 0.60m</b>       | Chapter:  | 17: Construction and Demolition Wastes (including excavated soil from contaminated sites) |
| Sample Depth:           | Entry:    | 17 05 04 (Soil and stones other than those mentioned in 17 05 03)                         |
| <b>0.6 m</b>            |           |   |
| Moisture content:       |           |   |
| <b>15%</b>              |           |   |
| (wet weight correction) |           |   |

Hazard properties

None identified

Determinands

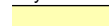



Moisture content: 15% Wet Weight Moisture Correction applied (MC)

| #  | 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 }   |           |            |          | 18 mg/kg          | 1.32         | 20.201 mg/kg   | 0.00202 %            | ✓          |                |
|    | 033-003-00-0   | 215-481-4 | 1327-53-3  |          |                   |              |                |                      |            |                |
| 2  | boron { diboron trioxide; boric oxide }  |           |            |          | 0.45 mg/kg        | 3.22         | 1.232 mg/kg    | 0.000123 %           | ✓          |                |
|    | 005-008-00-8   | 215-125-8 | 1303-86-2  |          |                   |              |                |                      |            |                |
| 3  | cadmium { cadmium oxide }  |           |            |          | 0.14 mg/kg        | 1.142        | 0.136 mg/kg    | 0.0000136 %          | ✓          |                |
|    | 048-002-00-0   | 215-146-2 | 1306-19-0  |          |                   |              |                |                      |            |                |
| 4  | chromium in chromium(III) compounds { chromium(III) oxide (worst case) }   |           |            |          | 35 mg/kg          | 1.462        | 43.481 mg/kg   | 0.00435 %            | ✓          |                |
|    |  | 215-160-9 | 1308-38-9  |          |                   |              |                |                      |            |                |
| 5  | chromium in chromium(VI) compounds { chromium(VI) oxide }  |           |            |          | <0.5 mg/kg        | 1.923        | <0.962 mg/kg   | <0.0000962 %         |            | <LOD           |
|    | 024-001-00-0   | 215-607-8 | 1333-82-0  |          |                   |              |                |                      |            |                |
| 6  | copper { dicopper oxide; copper (I) oxide }  |           |            |          | 34 mg/kg          | 1.126        | 32.538 mg/kg   | 0.00325 %            | ✓          |                |
|    | 029-002-00-X   | 215-270-7 | 1317-39-1  |          |                   |              |                |                      |            |                |
| 7  | lead { lead chromate }   |           |            | 1        | 40 mg/kg          | 1.56         | 53.034 mg/kg   | 0.0034 %             | ✓          |                |
|    | 082-004-00-2   | 231-846-0 | 7758-97-6  |          |                   |              |                |                      |            |                |
| 8  | mercury { mercury dichloride }   |           |            |          | 0.13 mg/kg        | 1.353        | 0.15 mg/kg     | 0.000015 %           | ✓          |                |
|    | 080-010-00-X   | 231-299-8 | 7487-94-7  |          |                   |              |                |                      |            |                |
| 9  | nickel { nickel chromate }   |           |            |          | 36 mg/kg          | 2.976        | 91.074 mg/kg   | 0.00911 %            | ✓          |                |
|    | 028-035-00-7   | 238-766-5 | 14721-18-7 |          |                   |              |                |                      |            |                |
| 10 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } |           |            |          | 0.46 mg/kg        | 1.405        | 0.549 mg/kg    | 0.0000549 %          | ✓          |                |
|    | 034-002-00-8   |           |            |          |                   |              |                |                      |            |                |
| 11 | zinc { zinc chromate }   |           |            |          | 84 mg/kg          | 2.774        | 198.074 mg/kg  | 0.0198 %             | ✓          |                |
|    | 024-007-00-3   | 236-878-9 | 13530-65-9 |          |                   |              |                |                      |            |                |
| 12 | TPH (C6 to C40) petroleum group  |           |            |          | <10 mg/kg         |              | <10 mg/kg      | <0.001 %             |            | <LOD           |
|    |  |           | TPH        |          |                   |              |                |                      |            |                |
| 13 | tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane   |           |            |          | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <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   |          |                   |              |                |                      |            |                |
| 14     | benzene  |  |  |          | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
|        | 601-020-00-8   | 200-753-7  | 71-43-2  |          |                   |              |                |                      |            |                |
| 15     | toluene  |  |  |          | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
|        | 601-021-00-3   | 203-625-9  | 108-88-3   |          |                   |              |                |                      |            |                |
| 16     | ethylbenzene   |  |  |          | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
|        | 601-023-00-4   | 202-849-4  | 100-41-4   |          |                   |              |                |                      |            |                |
| 17     | xylene   |  |  |          | <0.002 mg/kg      |              | <0.002 mg/kg   | <0.0000002 %         |            | <LOD           |
|        | 601-022-00-9   | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4] | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] |          |                   |              |                |                      |            |                |
| 18     | 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 } |  |  |          | <0.5 mg/kg        | 1.884        | <0.942 mg/kg   | <0.0000942 %         |            | <LOD           |
|        | 006-007-00-5   |  |  |          |                   |              |                |                      |            |                |
| 19     | pH   |  |  |          | 7.6 pH            |              | 7.6 pH         | 7.6 pH               |            |                |
|        |  |  | PH   |          |                   |              |                |                      |            |                |
| 20     | naphthalene  |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        | 601-052-00-2   | 202-049-5  | 91-20-3  |          |                   |              |                |                      |            |                |
| 21     | acenaphthylene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 205-917-1  | 208-96-8   |          |                   |              |                |                      |            |                |
| 22     | acenaphthene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 201-469-6  | 83-32-9  |          |                   |              |                |                      |            |                |
| 23     | fluorene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 201-695-5  | 86-73-7  |          |                   |              |                |                      |            |                |
| 24     | phenanthrene   |  |  |          | 2.7 mg/kg         |              | 2.295 mg/kg    | 0.00023 %            | ✓          |                |
|        |  | 201-581-5  | 85-01-8  |          |                   |              |                |                      |            |                |
| 25     | anthracene   |  |  |          | 0.63 mg/kg        |              | 0.536 mg/kg    | 0.0000536 %          | ✓          |                |
|        |  | 204-371-1  | 120-12-7   |          |                   |              |                |                      |            |                |
| 26     | fluoranthene   |  |  |          | 3.2 mg/kg         |              | 2.72 mg/kg     | 0.000272 %           | ✓          |                |
|        |  | 205-912-4  | 206-44-0   |          |                   |              |                |                      |            |                |
| 27     | pyrene   |  |  |          | 3.3 mg/kg         |              | 2.805 mg/kg    | 0.000281 %           | ✓          |                |
|        |  | 204-927-3  | 129-00-0   |          |                   |              |                |                      |            |                |
| 28     | benzo[a]anthracene   |  |  |          | 1 mg/kg           |              | 0.85 mg/kg     | 0.000085 %           | ✓          |                |
|        | 601-033-00-9   | 200-280-6  | 56-55-3  |          |                   |              |                |                      |            |                |
| 29     | chrysene   |  |  |          | 1.6 mg/kg         |              | 1.36 mg/kg     | 0.000136 %           | ✓          |                |
|        | 601-048-00-0   | 205-923-4  | 218-01-9   |          |                   |              |                |                      |            |                |
| 30     | benzo[b]fluoranthene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        | 601-034-00-4   | 205-911-9  | 205-99-2   |          |                   |              |                |                      |            |                |
| 31     | benzo[k]fluoranthene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        | 601-036-00-5   | 205-916-6  | 207-08-9   |          |                   |              |                |                      |            |                |
| 32     | benzo[a]pyrene; benzo[def]chrysene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        | 601-032-00-3   | 200-028-5  | 50-32-8  |          |                   |              |                |                      |            |                |
| 33     | indeno[123-cd]pyrene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 205-893-2  | 193-39-5   |          |                   |              |                |                      |            |                |
| 34     | 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  |          |                   |              |                |                      |            |                |
| 35     | benzo[ghi]perylene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 205-883-8  | 191-24-2   |          |                   |              |                |                      |            |                |
| 36     | sulfur { sulfur }  |  |  |          | 8.1 mg/kg         |              | 6.885 mg/kg    | 0.000689 %           | ✓          |                |
|        | 016-094-00-1   | 231-722-6  | 7704-34-9  |          |                   |              |                |                      |            |                |
| Total: |  |  |  |          |                   |              |                | 0.0452 %             |            |                |

Key

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

**Classification of sample: WS02 0.80m**

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

**Sample details**

|                         |           |   |
|-------------------------|-----------|---|
| Sample Name:            | LoW Code: |   |
| <b>WS02 0.80m</b>       | Chapter:  | 17: Construction and Demolition Wastes (including excavated soil from contaminated sites) |
| Sample Depth:           | Entry:    | 17 05 04 (Soil and stones other than those mentioned in 17 05 03)                         |
| <b>0.80 m</b>           |           |   |
| Moisture content:       |           |   |
| <b>12%</b>              |           |   |
| (wet weight correction) |           |   |

**Hazard properties**

None identified

**Determinands**

Moisture content: 12% Wet 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      | ●                | pH        |            |          | 9 pH              |              | 9 pH           | 9pH                  |            |                |
|        |                  |           | PH         |          |                   |              |                |                      |            |                |
| Total: |                  |           |            |          |                   |              |                | 0%                   |            |                |

**Key**

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS03 0.25m

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

Sample details

|                         |           |   |
|-------------------------|-----------|---|
| Sample Name:            | LoW Code: |   |
| <b>WS03 0.25m</b>       | Chapter:  | 17: Construction and Demolition Wastes (including excavated soil from contaminated sites) |
| Sample Depth:           | Entry:    | 17 05 04 (Soil and stones other than those mentioned in 17 05 03)                         |
| <b>0.25 m</b>           |           |   |
| Moisture content:       |           |   |
| <b>8.2%</b>             |           |   |
| (wet weight correction) |           |   |

Hazard properties

None identified

Determinands





Moisture content: 8.2% Wet 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 }   |           |            |          | 8.1 mg/kg         | 1.32         | 9.818 mg/kg    | 0.000982 %           | ✓          |                |
|    | 033-003-00-0   | 215-481-4 | 1327-53-3  |          |                   |              |                |                      |            |                |
| 2  | boron { diboron trioxide; boric oxide }  |           |            |          | <0.4 mg/kg        | 3.22         | <1.288 mg/kg   | <0.000129 %          |            | <LOD           |
|    | 005-008-00-8   | 215-125-8 | 1303-86-2  |          |                   |              |                |                      |            |                |
| 3  | cadmium { cadmium oxide }  |           |            |          | 0.14 mg/kg        | 1.142        | 0.147 mg/kg    | 0.0000147 %          | ✓          |                |
|    | 048-002-00-0   | 215-146-2 | 1306-19-0  |          |                   |              |                |                      |            |                |
| 4  | chromium in chromium(III) compounds { chromium(III) oxide (worst case) }   |           |            |          | 31 mg/kg          | 1.462        | 41.593 mg/kg   | 0.00416 %            | ✓          |                |
|    |  | 215-160-9 | 1308-38-9  |          |                   |              |                |                      |            |                |
| 5  | chromium in chromium(VI) compounds { chromium(VI) oxide }  |           |            |          | <0.5 mg/kg        | 1.923        | <0.962 mg/kg   | <0.0000962 %         |            | <LOD           |
|    | 024-001-00-0   | 215-607-8 | 1333-82-0  |          |                   |              |                |                      |            |                |
| 6  | copper { dicopper oxide; copper (I) oxide }  |           |            |          | 28 mg/kg          | 1.126        | 28.94 mg/kg    | 0.00289 %            | ✓          |                |
|    | 029-002-00-X   | 215-270-7 | 1317-39-1  |          |                   |              |                |                      |            |                |
| 7  | lead { lead chromate }   |           |            | 1        | 16 mg/kg          | 1.56         | 22.911 mg/kg   | 0.00147 %            | ✓          |                |
|    | 082-004-00-2   | 231-846-0 | 7758-97-6  |          |                   |              |                |                      |            |                |
| 8  | mercury { mercury dichloride }   |           |            |          | <0.1 mg/kg        | 1.353        | <0.135 mg/kg   | <0.0000135 %         |            | <LOD           |
|    | 080-010-00-X   | 231-299-8 | 7487-94-7  |          |                   |              |                |                      |            |                |
| 9  | nickel { nickel chromate }   |           |            |          | 44 mg/kg          | 2.976        | 120.217 mg/kg  | 0.012 %              | ✓          |                |
|    | 028-035-00-7   | 238-766-5 | 14721-18-7 |          |                   |              |                |                      |            |                |
| 10 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } |           |            |          | <0.2 mg/kg        | 1.405        | <0.281 mg/kg   | <0.0000281 %         |            | <LOD           |
|    | 034-002-00-8   |           |            |          |                   |              |                |                      |            |                |
| 11 | zinc { zinc chromate }   |           |            |          | 77 mg/kg          | 2.774        | 196.093 mg/kg  | 0.0196 %             | ✓          |                |
|    | 024-007-00-3   | 236-878-9 | 13530-65-9 |          |                   |              |                |                      |            |                |
| 12 | TPH (C6 to C40) petroleum group  |           |            |          | <10 mg/kg         |              | <10 mg/kg      | <0.001 %             |            | <LOD           |
|    |  |           | TPH        |          |                   |              |                |                      |            |                |
| 13 | tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane   |           |            |          | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <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   |          |                   |              |                |                      |            |                |
| 14     | benzene  |  |  |          | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
|        | 601-020-00-8   | 200-753-7  | 71-43-2  |          |                   |              |                |                      |            |                |
| 15     | toluene  |  |  |          | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
|        | 601-021-00-3   | 203-625-9  | 108-88-3   |          |                   |              |                |                      |            |                |
| 16     | ethylbenzene   |  |  |          | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
|        | 601-023-00-4   | 202-849-4  | 100-41-4   |          |                   |              |                |                      |            |                |
| 17     | xylene   |  |  |          | <0.002 mg/kg      |              | <0.002 mg/kg   | <0.0000002 %         |            | <LOD           |
|        | 601-022-00-9   | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4] | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] |          |                   |              |                |                      |            |                |
| 18     | 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 } |  |  |          | <0.5 mg/kg        | 1.884        | <0.942 mg/kg   | <0.0000942 %         |            | <LOD           |
|        | 006-007-00-5   |  |  |          |                   |              |                |                      |            |                |
| 19     | pH   |  |  |          | 8.8 pH            |              | 8.8 pH         | 8.8 pH               |            |                |
|        |  |  | PH   |          |                   |              |                |                      |            |                |
| 20     | naphthalene  |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        | 601-052-00-2   | 202-049-5  | 91-20-3  |          |                   |              |                |                      |            |                |
| 21     | acenaphthylene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 205-917-1  | 208-96-8   |          |                   |              |                |                      |            |                |
| 22     | acenaphthene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 201-469-6  | 83-32-9  |          |                   |              |                |                      |            |                |
| 23     | fluorene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 201-695-5  | 86-73-7  |          |                   |              |                |                      |            |                |
| 24     | phenanthrene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 201-581-5  | 85-01-8  |          |                   |              |                |                      |            |                |
| 25     | anthracene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 204-371-1  | 120-12-7   |          |                   |              |                |                      |            |                |
| 26     | fluoranthene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 205-912-4  | 206-44-0   |          |                   |              |                |                      |            |                |
| 27     | pyrene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 204-927-3  | 129-00-0   |          |                   |              |                |                      |            |                |
| 28     | benzo[a]anthracene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        | 601-033-00-9   | 200-280-6  | 56-55-3  |          |                   |              |                |                      |            |                |
| 29     | chrysene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        | 601-048-00-0   | 205-923-4  | 218-01-9   |          |                   |              |                |                      |            |                |
| 30     | benzo[b]fluoranthene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        | 601-034-00-4   | 205-911-9  | 205-99-2   |          |                   |              |                |                      |            |                |
| 31     | benzo[k]fluoranthene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        | 601-036-00-5   | 205-916-6  | 207-08-9   |          |                   |              |                |                      |            |                |
| 32     | benzo[a]pyrene; benzo[def]chrysene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        | 601-032-00-3   | 200-028-5  | 50-32-8  |          |                   |              |                |                      |            |                |
| 33     | indeno[123-cd]pyrene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 205-893-2  | 193-39-5   |          |                   |              |                |                      |            |                |
| 34     | 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  |          |                   |              |                |                      |            |                |
| 35     | benzo[ghi]perylene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 205-883-8  | 191-24-2   |          |                   |              |                |                      |            |                |
| 36     | sulfur { sulfur }  |  |  |          | <1 mg/kg          |              | <1 mg/kg       | <0.0001 %            |            | <LOD           |
|        | 016-094-00-1   | 231-722-6  | 7704-34-9  |          |                   |              |                |                      |            |                |
| Total: |  |  |  |          |                   |              |                | 0.0428 %             |            |                |

Key

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

Classification of sample: WS04 0.10m

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

Sample details

|                         |            |           |   |
|-------------------------|------------|-----------|---|
| Sample Name:            | WS04 0.10m | LoW Code: |   |
| Sample Depth:           | 0.10 m     | Chapter:  | 17: Construction and Demolition Wastes (including excavated soil from contaminated sites) |
| Moisture content:       | 20%        | Entry:    | 17 05 04 (Soil and stones other than those mentioned in 17 05 03)                         |
| (wet weight correction) |            |           |   |

Hazard properties

None identified

Determinands

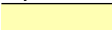



Moisture content: 20% Wet Weight Moisture Correction applied (MC)

| #  | 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 }  |           |            |          | 19                | mg/kg | 1.32         | 20.069         | mg/kg | 0.00201 %            | ✓          |                |
|    | 033-003-00-0  | 215-481-4 | 1327-53-3  |          |                   |       |              |                |       |                      |            |                |
| 2  | boron { diboron trioxide; boric oxide }   |           |            |          | 1.1               | mg/kg | 3.22         | 2.833          | mg/kg | 0.000283 %           | ✓          |                |
|    | 005-008-00-8  | 215-125-8 | 1303-86-2  |          |                   |       |              |                |       |                      |            |                |
| 3  | cadmium { cadmium oxide }   |           |            |          | 0.28              | mg/kg | 1.142        | 0.256          | mg/kg | 0.0000256 %          | ✓          |                |
|    | 048-002-00-0  | 215-146-2 | 1306-19-0  |          |                   |       |              |                |       |                      |            |                |
| 4  | chromium in chromium(III) compounds { chromium(III) oxide (worst case) }  |           |            |          | 36                | mg/kg | 1.462        | 42.093         | mg/kg | 0.00421 %            | ✓          |                |
|    |   | 215-160-9 | 1308-38-9  |          |                   |       |              |                |       |                      |            |                |
| 5  | chromium in chromium(VI) compounds { chromium(VI) oxide }   |           |            |          | <0.5              | mg/kg | 1.923        | <0.962         | mg/kg | <0.0000962 %         |            | <LOD           |
|    | 024-001-00-0  | 215-607-8 | 1333-82-0  |          |                   |       |              |                |       |                      |            |                |
| 6  | copper { dicopper oxide; copper (I) oxide }   |           |            |          | 28                | mg/kg | 1.126        | 25.22          | mg/kg | 0.00252 %            | ✓          |                |
|    | 029-002-00-X  | 215-270-7 | 1317-39-1  |          |                   |       |              |                |       |                      |            |                |
| 7  | lead { lead chromate }  |           |            | 1        | 47                | mg/kg | 1.56         | 58.649         | mg/kg | 0.00376 %            | ✓          |                |
|    | 082-004-00-2  | 231-846-0 | 7758-97-6  |          |                   |       |              |                |       |                      |            |                |
| 8  | mercury { mercury dichloride }  |           |            |          | 0.19              | mg/kg | 1.353        | 0.206          | mg/kg | 0.0000206 %          | ✓          |                |
|    | 080-010-00-X  | 231-299-8 | 7487-94-7  |          |                   |       |              |                |       |                      |            |                |
| 9  | nickel { nickel chromate }  |           |            |          | 23                | mg/kg | 2.976        | 54.763         | mg/kg | 0.00548 %            | ✓          |                |
|    | 028-035-00-7  | 238-766-5 | 14721-18-7 |          |                   |       |              |                |       |                      |            |                |
| 10 | selenium { selenium compounds with the exception of cadmium selenosulfide and those specified elsewhere in this Annex } |           |            |          | 0.5               | mg/kg | 1.405        | 0.562          | mg/kg | 0.0000562 %          | ✓          |                |
|    | 034-002-00-8  |           |            |          |                   |       |              |                |       |                      |            |                |
| 11 | zinc { zinc chromate }  |           |            |          | 78                | mg/kg | 2.774        | 173.107        | mg/kg | 0.0173 %             | ✓          |                |
|    | 024-007-00-3  | 236-878-9 | 13530-65-9 |          |                   |       |              |                |       |                      |            |                |
| 12 | TPH (C6 to C40) petroleum group   |           |            |          | <10               | mg/kg |              | <10            | mg/kg | <0.001 %             |            | <LOD           |
|    |   |           | TPH        |          |                   |       |              |                |       |                      |            |                |
| 13 | tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane  |           |            |          | <0.001            | mg/kg |              | <0.001         | mg/kg | <0.0000001 %         |            | <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   |          |                   |              |                |                      |            |                |
| 14     | benzene  |  |  |          | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
|        | 601-020-00-8   | 200-753-7  | 71-43-2  |          |                   |              |                |                      |            |                |
| 15     | toluene  |  |  |          | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
|        | 601-021-00-3   | 203-625-9  | 108-88-3   |          |                   |              |                |                      |            |                |
| 16     | ethylbenzene   |  |  |          | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
|        | 601-023-00-4   | 202-849-4  | 100-41-4   |          |                   |              |                |                      |            |                |
| 17     | xylene   |  |  |          | <0.002 mg/kg      |              | <0.002 mg/kg   | <0.0000002 %         |            | <LOD           |
|        | 601-022-00-9   | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4] | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] |          |                   |              |                |                      |            |                |
| 18     | 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 } |  |  |          | 0.6 mg/kg         | 1.884        | 0.904 mg/kg    | 0.0000904 %          | ✓          |                |
|        | 006-007-00-5   |  |  |          |                   |              |                |                      |            |                |
| 19     | pH   |  | PH   |          | 7 pH              |              | 7 pH           | 7pH                  |            |                |
| 20     | naphthalene  |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        | 601-052-00-2   | 202-049-5  | 91-20-3  |          |                   |              |                |                      |            |                |
| 21     | acenaphthylene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 205-917-1  | 208-96-8   |          |                   |              |                |                      |            |                |
| 22     | acenaphthene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 201-469-6  | 83-32-9  |          |                   |              |                |                      |            |                |
| 23     | fluorene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 201-695-5  | 86-73-7  |          |                   |              |                |                      |            |                |
| 24     | phenanthrene   |  |  |          | 5.3 mg/kg         |              | 4.24 mg/kg     | 0.000424 %           | ✓          |                |
|        |  | 201-581-5  | 85-01-8  |          |                   |              |                |                      |            |                |
| 25     | anthracene   |  |  |          | 1.2 mg/kg         |              | 0.96 mg/kg     | 0.000096 %           | ✓          |                |
|        |  | 204-371-1  | 120-12-7   |          |                   |              |                |                      |            |                |
| 26     | fluoranthene   |  |  |          | 6 mg/kg           |              | 4.8 mg/kg      | 0.00048 %            | ✓          |                |
|        |  | 205-912-4  | 206-44-0   |          |                   |              |                |                      |            |                |
| 27     | pyrene   |  |  |          | 5.8 mg/kg         |              | 4.64 mg/kg     | 0.000464 %           | ✓          |                |
|        |  | 204-927-3  | 129-00-0   |          |                   |              |                |                      |            |                |
| 28     | benzo[a]anthracene   |  |  |          | 2.2 mg/kg         |              | 1.76 mg/kg     | 0.000176 %           | ✓          |                |
|        | 601-033-00-9   | 200-280-6  | 56-55-3  |          |                   |              |                |                      |            |                |
| 29     | chrysene   |  |  |          | 2.5 mg/kg         |              | 2 mg/kg        | 0.0002 %             | ✓          |                |
|        | 601-048-00-0   | 205-923-4  | 218-01-9   |          |                   |              |                |                      |            |                |
| 30     | benzo[b]fluoranthene   |  |  |          | 2.7 mg/kg         |              | 2.16 mg/kg     | 0.000216 %           | ✓          |                |
|        | 601-034-00-4   | 205-911-9  | 205-99-2   |          |                   |              |                |                      |            |                |
| 31     | benzo[k]fluoranthene   |  |  |          | 1.4 mg/kg         |              | 1.12 mg/kg     | 0.000112 %           | ✓          |                |
|        | 601-036-00-5   | 205-916-6  | 207-08-9   |          |                   |              |                |                      |            |                |
| 32     | benzo[a]pyrene; benzo[def]chrysene   |  |  |          | 2.1 mg/kg         |              | 1.68 mg/kg     | 0.000168 %           | ✓          |                |
|        | 601-032-00-3   | 200-028-5  | 50-32-8  |          |                   |              |                |                      |            |                |
| 33     | indeno[123-cd]pyrene   |  |  |          | 1.2 mg/kg         |              | 0.96 mg/kg     | 0.000096 %           | ✓          |                |
|        |  | 205-893-2  | 193-39-5   |          |                   |              |                |                      |            |                |
| 34     | dibenz[a,h]anthracene  |  |  |          | 0.3 mg/kg         |              | 0.24 mg/kg     | 0.000024 %           | ✓          |                |
|        | 601-041-00-2   | 200-181-8  | 53-70-3  |          |                   |              |                |                      |            |                |
| 35     | benzo[ghi]perylene   |  |  |          | 1.9 mg/kg         |              | 1.52 mg/kg     | 0.000152 %           | ✓          |                |
|        |  | 205-883-8  | 191-24-2   |          |                   |              |                |                      |            |                |
| 36     | sulfur { sulfur }  |  |  |          | 10 mg/kg          |              | 8 mg/kg        | 0.0008 %             | ✓          |                |
|        | 016-094-00-1   | 231-722-6  | 7704-34-9  |          |                   |              |                |                      |            |                |
| Total: |  |  |  |          |                   |              |                | 0.0403 %             |            |                |

Key

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

**Classification of sample: WS04 0.45m**

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

**Sample details**

|                         |           |   |
|-------------------------|-----------|---|
| Sample Name:            | LoW Code: |   |
| <b>WS04 0.45m</b>       | Chapter:  | 17: Construction and Demolition Wastes (including excavated soil from contaminated sites) |
| Sample Depth:           | Entry:    | 17 05 04 (Soil and stones other than those mentioned in 17 05 03)                         |
| <b>0.45 m</b>           |           |   |
| Moisture content:       |           |   |
| <b>17%</b>              |           |   |
| (wet weight correction) |           |   |

**Hazard properties**

None identified

**Determinands**

Moisture content: 17% Wet 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      | ●                | pH        |            |          | 7.5 pH            |              | 7.5 pH         | 7.5 pH               |            |                |
| Total: |                  |           |            |          |                   |              |                |                      | 0%         |                |

**Key**

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

**Classification of sample: WS06 0.50m**

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

**Sample details**

|                         |           |   |
|-------------------------|-----------|---|
| Sample Name:            | LoW Code: |   |
| <b>WS06 0.50m</b>       | Chapter:  | 17: Construction and Demolition Wastes (including excavated soil from contaminated sites) |
| Sample Depth:           | Entry:    | 17 05 04 (Soil and stones other than those mentioned in 17 05 03)                         |
| <b>0.50 m</b>           |           |   |
| Moisture content:       |           |   |
| <b>18%</b>              |           |   |
| (wet weight correction) |           |   |

**Hazard properties**

None identified

**Determinands**

Moisture content: 18% Wet 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      | ●                | pH        |            |          | 7.8 pH            |              | 7.8            | pH | 7.8 pH               |            |                |
|        |                  |           | PH         |          |                   |              |                |    |                      |            |                |
| Total: |                  |           |            |          |                   |              |                |    | 0%                   |            |                |

**Key**

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS07 0.40m

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

Sample details

|                         |           |   |
|-------------------------|-----------|---|
| Sample Name:            | LoW Code: |   |
| <b>WS07 0.40m</b>       | Chapter:  | 17: Construction and Demolition Wastes (including excavated soil from contaminated sites) |
| Sample Depth:           | Entry:    | 17 05 04 (Soil and stones other than those mentioned in 17 05 03)                         |
| <b>0.40 m</b>           |           |   |
| Moisture content:       |           |   |
| <b>17%</b>              |           |   |
| (wet weight correction) |           |   |

Hazard properties

None identified

Determinands

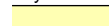



Moisture content: 17% Wet Weight Moisture Correction applied (MC)

| #  | 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 }   |           |            |          | 14 mg/kg          | 1.32         | 15.342 mg/kg   | 0.00153 %            | ✓          |                |
|    | 033-003-00-0   | 215-481-4 | 1327-53-3  |          |                   |              |                |                      |            |                |
| 2  | boron { diboron trioxide; boric oxide }  |           |            |          | 0.42 mg/kg        | 3.22         | 1.122 mg/kg    | 0.000112 %           | ✓          |                |
|    | 005-008-00-8   | 215-125-8 | 1303-86-2  |          |                   |              |                |                      |            |                |
| 3  | cadmium { cadmium oxide }  |           |            |          | 0.17 mg/kg        | 1.142        | 0.161 mg/kg    | 0.0000161 %          | ✓          |                |
|    | 048-002-00-0   | 215-146-2 | 1306-19-0  |          |                   |              |                |                      |            |                |
| 4  | chromium in chromium(III) compounds { chromium(III) oxide (worst case) }   |           |            |          | 26 mg/kg          | 1.462        | 31.54 mg/kg    | 0.00315 %            | ✓          |                |
|    |  | 215-160-9 | 1308-38-9  |          |                   |              |                |                      |            |                |
| 5  | chromium in chromium(VI) compounds { chromium(VI) oxide }  |           |            |          | <0.5 mg/kg        | 1.923        | <0.962 mg/kg   | <0.0000962 %         |            | <LOD           |
|    | 024-001-00-0   | 215-607-8 | 1333-82-0  |          |                   |              |                |                      |            |                |
| 6  | copper { dicopper oxide; copper (I) oxide }  |           |            |          | 22 mg/kg          | 1.126        | 20.559 mg/kg   | 0.00206 %            | ✓          |                |
|    | 029-002-00-X   | 215-270-7 | 1317-39-1  |          |                   |              |                |                      |            |                |
| 7  | lead { lead chromate }   |           |            | 1        | 25 mg/kg          | 1.56         | 32.366 mg/kg   | 0.00208 %            | ✓          |                |
|    | 082-004-00-2   | 231-846-0 | 7758-97-6  |          |                   |              |                |                      |            |                |
| 8  | mercury { mercury dichloride }   |           |            |          | <0.1 mg/kg        | 1.353        | <0.135 mg/kg   | <0.0000135 %         |            | <LOD           |
|    | 080-010-00-X   | 231-299-8 | 7487-94-7  |          |                   |              |                |                      |            |                |
| 9  | nickel { nickel chromate }   |           |            |          | 23 mg/kg          | 2.976        | 56.817 mg/kg   | 0.00568 %            | ✓          |                |
|    | 028-035-00-7   | 238-766-5 | 14721-18-7 |          |                   |              |                |                      |            |                |
| 10 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } |           |            |          | 0.29 mg/kg        | 1.405        | 0.338 mg/kg    | 0.0000338 %          | ✓          |                |
|    | 034-002-00-8   |           |            |          |                   |              |                |                      |            |                |
| 11 | zinc { zinc chromate }   |           |            |          | 60 mg/kg          | 2.774        | 138.152 mg/kg  | 0.0138 %             | ✓          |                |
|    | 024-007-00-3   | 236-878-9 | 13530-65-9 |          |                   |              |                |                      |            |                |
| 12 | TPH (C6 to C40) petroleum group  |           |            |          | <10 mg/kg         |              | <10 mg/kg      | <0.001 %             |            | <LOD           |
|    |  |           | TPH        |          |                   |              |                |                      |            |                |
| 13 | tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane   |           |            |          | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <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   |          |                   |              |                |                      |            |                |
| 14     | benzene  |  |  |          | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
|        | 601-020-00-8   | 200-753-7  | 71-43-2  |          |                   |              |                |                      |            |                |
| 15     | toluene  |  |  |          | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
|        | 601-021-00-3   | 203-625-9  | 108-88-3   |          |                   |              |                |                      |            |                |
| 16     | ethylbenzene   |  |  |          | <0.001 mg/kg      |              | <0.001 mg/kg   | <0.0000001 %         |            | <LOD           |
|        | 601-023-00-4   | 202-849-4  | 100-41-4   |          |                   |              |                |                      |            |                |
| 17     | xylene   |  |  |          | <0.002 mg/kg      |              | <0.002 mg/kg   | <0.0000002 %         |            | <LOD           |
|        | 601-022-00-9   | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4] | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] |          |                   |              |                |                      |            |                |
| 18     | 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 } |  |  |          | <0.5 mg/kg        | 1.884        | <0.942 mg/kg   | <0.0000942 %         |            | <LOD           |
|        | 006-007-00-5   |  |  |          |                   |              |                |                      |            |                |
| 19     | pH   |  |  |          | 6.5 pH            |              | 6.5 pH         | 6.5 pH               |            |                |
|        |  |  | PH   |          |                   |              |                |                      |            |                |
| 20     | naphthalene  |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        | 601-052-00-2   | 202-049-5  | 91-20-3  |          |                   |              |                |                      |            |                |
| 21     | acenaphthylene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 205-917-1  | 208-96-8   |          |                   |              |                |                      |            |                |
| 22     | acenaphthene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 201-469-6  | 83-32-9  |          |                   |              |                |                      |            |                |
| 23     | fluorene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 201-695-5  | 86-73-7  |          |                   |              |                |                      |            |                |
| 24     | phenanthrene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 201-581-5  | 85-01-8  |          |                   |              |                |                      |            |                |
| 25     | anthracene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 204-371-1  | 120-12-7   |          |                   |              |                |                      |            |                |
| 26     | fluoranthene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 205-912-4  | 206-44-0   |          |                   |              |                |                      |            |                |
| 27     | pyrene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 204-927-3  | 129-00-0   |          |                   |              |                |                      |            |                |
| 28     | benzo[a]anthracene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        | 601-033-00-9   | 200-280-6  | 56-55-3  |          |                   |              |                |                      |            |                |
| 29     | chrysene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        | 601-048-00-0   | 205-923-4  | 218-01-9   |          |                   |              |                |                      |            |                |
| 30     | benzo[b]fluoranthene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        | 601-034-00-4   | 205-911-9  | 205-99-2   |          |                   |              |                |                      |            |                |
| 31     | benzo[k]fluoranthene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        | 601-036-00-5   | 205-916-6  | 207-08-9   |          |                   |              |                |                      |            |                |
| 32     | benzo[a]pyrene; benzo[def]chrysene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        | 601-032-00-3   | 200-028-5  | 50-32-8  |          |                   |              |                |                      |            |                |
| 33     | indeno[123-cd]pyrene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 205-893-2  | 193-39-5   |          |                   |              |                |                      |            |                |
| 34     | 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  |          |                   |              |                |                      |            |                |
| 35     | benzo[ghi]perylene   |  |  |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
|        |  | 205-883-8  | 191-24-2   |          |                   |              |                |                      |            |                |
| 36     | sulfur { sulfur }  |  |  |          | 1.5 mg/kg         |              | 1.245 mg/kg    | 0.000125 %           | ✓          |                |
|        | 016-094-00-1   | 231-722-6  | 7704-34-9  |          |                   |              |                |                      |            |                |
| Total: |  |  |  |          |                   |              |                | 0.03 %               |            |                |

Key

---

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

Classification of sample: WS07 0.45m

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

Sample details

|                   |                                 |           |   |
|-------------------|---------------------------------|-----------|---|
| Sample Name:      | WS07 0.45m                      | LoW Code: |   |
| Sample Depth:     | 0.45 m                          | Chapter:  | 17: Construction and Demolition Wastes (including excavated soil from contaminated sites) |
| Moisture content: | 8.3%<br>(wet weight correction) | Entry:    | 17 05 04 (Soil and stones other than those mentioned in 17 05 03)                         |

Hazard properties

None identified

Determinands

Moisture content: 8.3% Wet 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      | ●                | pH        |            |          | 7 pH              |              | 7 pH           | 7pH                  |            |                |
| Total: |                  |           |            |          |                   |              |                | 0%                   |            |                |

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

## Appendix A: Classifier defined and non CLP determinands

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

Conversion factor: 1.462

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)

### 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) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (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) Worst 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)

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**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 {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}**

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (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)

**sulfur {sulfur}**

Elemental sulfur most likely to be worst case scenario hazardous

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## Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.1, May 2018**

HazWasteOnline Classification Engine Version: 2020.310.4521.8789 (05 Nov 2020)

HazWasteOnline Database: 2020.310.4521.8789 (05 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 Wastes 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 2004** - Regulation 850/2004/EC of 29 April 2004  
**1st ATP to POPs Regulation** - Regulation 756/2010/EU of 24 August 2010  
**2nd ATP to POPs Regulation** - Regulation 757/2010/EU of 24 August 2010



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