IAN FARMER ASSOCIATES

MR & MRS BROOM

MAWLES FARM
SIBFORD GOWER OX15 5RW

GROUND INVESTIGATION REPORT

Contract: 2220483

Date: February 2021

Ian Farmer Associates (1998) Limited
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GROUND INVESTIGATION REPORT

Carried out at

MAWLES FARM

SIBFORD GOWER OX15 5RW

Prepared for

MR & MRS BROOM
Mawles Farm
Main Street
Sibford Gower
Banbury
OX15 5RW

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Document Control

Project reference: **2220483**

Project name: **MAWLES FARM**

Report title: **GROUND INVESTIGATION REPORT**

Version	Date	Comment
01	25/02/2021	First Issue

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EXECUTIVE SUMMARY

On the instructions of Mr and Mrs Broom, an investigation was undertaken to determine ground conditions and provide a geoenvironmental risk assessment.

The site is situated to the northeast of the cross-roads of Main Street and Pound Lane, Sibford Gower, approximately 11km to the west of the town centre of Banbury, and may be located by Grid Reference SP 352 378.

Published geological records indicate that the site is directly underlain by the bedrock of the Northampton Sand Formation.

The site work was carried out on the 29th January 2021 and comprised the sinking of five window sample boreholes to depths of between 2.35m and 3.45m below ground level (bgl).

The boreholes encountered the anticipated geology, being deposits consistent with the Northampton Sand Formation extending to the full depths of the boreholes, generally described as loose, becoming medium dense, orangish-brown clayey gravelly fine sand. The natural strata were overlain by a thin layer of Topsoil or Made Ground extending to depths between 0.15m and 1.00mbgl. Groundwater was not encountered during the investigation.

The contamination assessment has identified potential risks to human receptors from arsenic and asbestos identified within the shallow soils. Possible risks to plastic water supply pipes were also identified with regard to marginally elevated TPH concentrations in BH103.

In areas that are to be covered by buildings or hardstanding, no pathway is likely to exist between any source of contamination and the human receptors by ingestion or dermal contact, therefore no further remedial action is likely to be required. In gardens or areas of landscaping, a capping layer of 'inert' material could be provided to break the pathway between the identified contamination and end users of the site. Further details of this are provided in section 7.1.8.

The proposed development requires the installation of basic radon protective measures.

The local water supply company should be contacted for confirmation of any specific requirements with regard to the selection of materials for any new potable water supply pipes proposed on the site.

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1.0 INTRODUCTION

1.1 On the instructions of Mr and Mrs Broom, an investigation was undertaken to determine ground conditions and provide a geoenvironmental risk assessment.

1.2 It is understood that the proposed development comprises conversion of existing barns to create one new dwelling, demolition of the existing steel barn, erection of a replacement ancillary outbuilding and associated works under planning application reference 20/02545/F.

1.3 This report should be read in conjunction with the Preliminary Investigation Report (PIR) which was reported under reference 22145 in September 2020.

1.4 It is recommended that a copy of this report be submitted to the relevant authorities to enable them to carry out their own site assessments and provide any comments.

1.5 This report has been prepared for the sole use of the Client for the purpose described and no extended duty of care to any third party is implied or offered. Third parties using any information contained within this report do so at their own risk.

1.6 The comments given in this report and the opinions expressed herein are based on the information received, the conditions encountered during site works, and on the results of tests made in the field and laboratory. However, there may be conditions prevailing at the site which have not been disclosed by the investigation and which have not been taken into account in the report.

1.7 The comments on groundwater conditions are based on observations made at the time the site work was carried out. It should be noted that groundwater levels vary owing to seasonal or other effects.

2.0 SITE SETTING

2.1 Site Location

2.1.1 The site is situated to the northeast of the cross-roads of Main Street and Pound Lane, Sibford Gower, approximately 11km to the west of the town centre of Banbury, and may be located by Grid Reference SP 352 378. A site location plan is included in Appendix 1, Figure A1.1.

2.2 Site Description

2.2.1 The site is irregular in shape and occupies an area of approximately 0.16 hectares.

2.2.2 At the time of the investigation, the site was situated at a general elevation of approximately 192mAOD, though was distributed over three different ground levels. The highest area was in the north/northeast of the site, approximately 195mAOD, the main area of the site lay at approximately 192mAOD, and a street level access pit was present on the corner of Main Street and Pound Lane, which was approximately 3m below the main elevation of the site.

2.2.3 The site was no longer in use at the time of the investigation and comprised a yard surrounded by former agricultural buildings. An L-shaped, single-storey, stone agricultural building was located along the southern boundary of the site, which was previously used as a dairy with stalls and a grain store with grain silo present. A piggery, which was a small, single-storey, brick building, was present within the centre of the site with a more modern storage barn located behind, with higher level ground beyond this.

2.2.4 The ground surface of the site varied and comprised concrete hardstanding, with rough ground/hard standing forming the main yard area. The northern area of the site was surfaced with rough vegetation.

2.2.5 A tank was located in the south eastern corner of the site, which was used to store kerosene.

2.2.6 An exploratory hole location plan is given in Appendix 1, Figure A1.2.

2.3 Site History

2.3.1 The site has remained relatively unchanged since the first available historical maps, dated 1882-1887, with the exception of the replacement of the original central barn with a newer barn. The surrounding area has also undergone minimal changes with some residential development noted to the north of the site and an adjacent swimming pool noted on the 1919 historical aerial photograph.

2.4 Geological Setting

2.4.1 Details of the geology underlying the site have been obtained from BGS Sheet 218, ref. 8.2, and from information provided by the British Geological Survey (contains British Geological Survey materials © UKRI 2020).

2.4.2 The geological map does not indicate the site to be underlain by superficial deposits, however, Head deposits are noted within 1km of the site of clay, described as 'silt, sand and gravel'.

2.4.3 The bedrock underlying the site is indicated to be the Northampton Sand Formation, described as 'ooidal and sideritic ironstone and limonitic sandstone with lenses of mudstone and limestone'.

2.4.4 Although not indicated as present on the site from the geological maps, there is the possibility that Made Ground may exist on the site given that the site is developed and has been used as a working farm.

2.4.5 The PIR identified possible geological hazards associated with any Made Ground encountered on the site, including potential instability in excavations for foundations or services trenches.

3.0 SITE WORK

3.1 The site work was carried out on the 29th January 2021. The locations of the exploratory holes have been planned to provide general coverage of the site.

3.2 The site work has been carried out on the basis of the practices set out in BS 10175:2011, ref. 8.4, BS 5930:2015, ref. 8.5, and BS EN 1997-2:2007, ref 8.6. Additional references are noted within the table.

Exploratory Hole Type	Quantity	Hole Reference	Depths	Notes
Window sample boreholes	5	BH101 to BH105	2.35m to 3.45m	Locations to provide general site coverage

3.3 The positions of the above are shown on the exploratory hole location plan, Appendix 1, Figure A1.2.

3.4 The depths of the exploratory holes, descriptions of strata encountered and comments on groundwater conditions are given in the site work records in Appendix 2.

3.5 Representative disturbed samples were taken, ref. 8.8, at the depths shown on the exploratory hole records. Samples for environmental purposes were collected in appropriate containers.

3.6 Standard penetration tests (SPT), ref. 8.7, were carried out in the boreholes in the various strata to assess the relative density or consistency. The values of penetration resistance are given in the borehole records.

3.7 The ground levels at the exploratory hole locations were not determined.

4.0 LABORATORY TESTS

4.1 Chemical Testing

4.1.1 The suite of chemical analyses has been scheduled by IFA based upon the findings of the desk study, to investigate the potential sources of contamination identified in the conceptual model. The chemical analyses were carried out on six samples of soil, four of which were representative of the natural soil in boreholes BH101 to BH102, and two of which were representative of the Made Ground encountered in BH105. The nature of the analyses is detailed below:

- 6 No. Metals suites:
  - Arsenic, Cadmium, Chromium (total & hexavalent), Copper, Lead, Mercury, Nickel, Selenium, Zinc
- 5 No. Total petroleum hydrocarbons (TPH) – CWG bandings
- 6 No. Polycyclic aromatic hydrocarbons (PAH) – USEPA 16 suite
- 3 No. Cyanide contents – total
- 4 No. Sulphate contents – water soluble
- 6 No. pH values
- 3 No. Organic matter contents
- 4 No. Asbestos screens
- 1 No. Asbestos quantifications
- 1 No. E-Coli – Faecal Coliforms
- 1 No. Coliforms – total

4.1.2 The soil testing was carried out in accordance with the MCERTS performance standard, ref. 8.10, and the results are shown in Appendix 4, Test Report 21/01098.

5.0 GROUND CONDITIONS ENCOUNTERED

5.1 Sequence

5.1.1 The sequence of the strata encountered during the investigation generally confirms the anticipated geology as interpreted from the geological map.

5.1.2 Interpolation of strata depths between locations should be undertaken with caution, particularly for depths of Made Ground where structures are still present at the time of the investigation.

5.1.3 The sequence and indicative thicknesses of strata are provided below:

Strata Encountered	Depth Encountered (mbgl)		Strata Thickness (m)
	From	To	
Topsoil (BH101, BH102, BH104)	0.00	0.10 to 0.15	0.10 to 0.15
Made Ground (BH103, BH105)	0.00	0.30 to 1.00	0.30 to 1.00
Northampton Sand Formation	0.10 to 1.00	>3.45	>3.35

5.2 Topsoil

5.2.1 A thin layer of topsoil was encountered in boreholes BH101, BH102 and BH104, extending to depths of between 0.10m and 0.15m below ground level (bgl). This was generally described as brown sandy, gravelly in BH102, clay/silt.

5.3 Made Ground

5.3.1 Made Ground was encountered in boreholes BH103 and BH105, extending to depths of 0.30m and 1.00mbgl respectively. In BH103 this comprised light orangish-brown slightly clayey sand with a low cobble content, whilst in BH105, the Made Ground was described as soft dark brown gravelly clay with occasional brick, concrete and clinker.

5.4 Northampton Sand Formation

5.4.1 Deposits consistent with the Northampton Sand Formation were encountered beneath the Topsoil or Made Ground to the full depths of all the boreholes, generally described as loose, becoming medium dense, orangish-brown clayey gravelly fine sand.

5.5 Groundwater

5.5.1 Groundwater was not encountered in any of the exploratory holes.

6.0 GEOENVIRONMENTAL RISK ASSESSMENT

6.1 Contaminated Land

6.1.1 The definition of 'contaminated land', along with the relevant details on legislation and guidance is set out in Appendix 4.

6.2 Site History

6.2.1 The site has remained relatively unchanged since the first available historical maps, dated 1882-1887, with the exception of the replacement of the original central barn with a newer barn. The site has previously been in use as a farm, including a dairy, piggery and grain storage. A kerosene storage tank was observed in the south eastern corner of the site during the recent walkover survey.

6.3 Sampling and Testing Strategy

6.3.1 Exploratory hole locations were set out to provide an overview of ground conditions across the site in relation to the proposed construction, together with enabling the collection of samples to enable chemical characterisation of the underlying strata.

6.3.2 Representative samples for potential environmental testing were obtained from the exploratory holes at 0.15m-0.40m intervals, to depths of up to 0.70mbgl, within the various strata to allow a representation of the materials encountered, with additional samples to be obtained if necessary where there was visual or olfactory evidence of contamination.

6.3.3 The analytical testing was based on a suite of commonly occurring inorganic and organic contaminants, taking into account the Conceptual Site Mode and the ground conditions encountered.

6.4 Risk Assessment – Human Health

6.4.1 The proposed development consists of conversion of existing barns to create one new dwelling, demolition of the existing steel barn, erection of a replacement ancillary outbuilding and associated works. The risk assessment has therefore been based on guidelines for a residential end use with homegrown produce. Should the proposed development be changed in the future then further risk assessment may be required.

6.4.2 There was no visual or olfactory evidence for any significant source of contamination identified from within the exploratory holes undertaken.

6.4.3 The results of all chemical analyses have been processed in accordance with the recommendations set out in the CIEH and CL:AIRE document 'Guidance on Comparing Soil Contamination Data with a Critical Concentration', ref. 8.18. The results have been compared to screening levels, ref. 8.16 and 8.19, derived in accordance with current legislation and guidance and those primarily used have been tabulated and detailed within Appendix 4.

6.4.4 Taking into account the most likely sensitive receptor, the human health risk assessment has been based on guidelines for a residential end use with homegrown produce. Screening levels derived using a Soil Organic Matter content of 2.5% for the Made Ground and 1% for the natural soil, where relevant, have been used in the first instance.

6.4.5 Where the concentrations determined on site are at or below the respective Screening Level, they are considered not to pose a risk and are removed from further consideration, unless otherwise stated.

6.4.6 Those contaminants with observed concentrations above the Screening Level are detailed below:

Location	Depth (mbgl)	Contaminant	Concentration (mg/kg)	Guidance Level (mg/kg)
BH102	0.25	Arsenic	62	37
BH103	0.30	Arsenic	39	37
BH104	0.30	Arsenic	52	37
BH105	0.30	Arsenic	41	37
BH105	0.70	Arsenic	45	37

6.4.7 Further statistical analysis of the results is not deemed appropriate, due to the quantity and distribution of the samples taken. The results are therefore considered in further detail within the following paragraphs.

6.4.8 Elevated concentrations of arsenic were identified in four of the five sampling locations, both in the natural soil sampled in locations BH102 to BH104, and in both samples of Made Ground tested in BH105. Consequently, the elevated concentrations are considered likely to be widespread within the shallow soils across the site.

6.4.9 The risk assessment has established potential pollutant linkage in relation to human health from the elevated concentrations of arsenic within the Made Ground and natural strata. Some minor remediation will be required to protect end users of the proposed residential development, most likely limited to hard standing and a capping layer in any landscaped areas.

6.5 Risk Assessment - Asbestos

6.5.1 Asbestos including Asbestos Containing Soils (ACS) only presents a risk to health if fibres are released into the air. It is generally assumed that only near surface ACS would contribute airborne fibres. However, in instances where gardens are proposed, then there is a risk that ACS could be exposed to the atmosphere through the action of digging.

6.5.2 Although no assessment criteria (AC) has been proposed in the new CIRIA C733, ref. 8.21, Ian Farmer Associates has adopted the view that if asbestos is identified within soil then further assessment should be undertaken to quantify the amount and type of asbestos present.

6.5.3 Asbestos was identified within the soil samples as follows:

Location	Depth (mbgl)	Quantification Result (%)	Comments
BH105	0.30	0.028	Chrysotile – loose fibres and cement
(No asbestos identified in the deeper sample of Made Ground in BH105 at 0.70mbgl)			

6.6 Risk Assessment - Controlled Waters

6.6.1 The site is situated above a Secondary aquifer, relating to the variably permeable sandstone and ironstone. It is not within a groundwater Source Protection Zone (SPZ) and no licensed groundwater abstractions have been identified within 1km.

6.6.2 The nearest surface watercourse is a spring feeding an inland river, located approximately 141m to the southeast of the site at its closest point.

6.6.3 Taking into consideration the ground conditions encountered and the contaminant concentrations observed in the soils, there is not considered to be any significant risk to controlled waters and no further assessment deemed necessary at this time.

6.7 Gas Generation

6.7.1 The site is identified as falling within a radon affected area, with the probability of 3% to 10% of present or future homes being above the action level of 200Bq/m3. Therefore, the guidance recommends that basic radon protective measures should be installed in the proposed development in accordance with the Building Research Establishment, Report BR211.

6.7.2 The PIR did not identify any other potential sources of ground gas on or close to the site and no significant Made Ground or organic constituents were encountered during the intrusive investigation. Consequently, no further monitoring or assessment of ground gas has been undertaken as the risk to the proposed development is considered to be low.

6.8 Protection of Services

6.8.1 Guidance from the UKWIR, ref 8.22, sets out the material requirements for newly laid water supply pipes within Brownfield sites. However, the exact requirements should be clarified with the relevant local water utility supplier for the site.

6.8.2 An assessment of the contamination testing has been undertaken, which indicates marginally elevated levels of hydrocarbons (TPH C_{10}-C_{16}) present within the near surface soils, which exceed the guidelines for standard plastic pipes, specifically within the natural soil in BH103. However, the majority of the concentrations of organic contaminants recorded in the shallow soils were below UKWIR guidelines. The local water supply company should be contacted for confirmation of whether barrier pipe or selection of an alternative material to plastic will be required for any new potable water supply services proposed on the site.

6.9 Conceptual Site Model – Revised

6.9.1 The conceptual model formed within the PIR has been updated to reflect the findings of the contamination risk assessment and the revised conceptual model, detailing the relevant pollutant linkages, is tabulated below:

Source	Contaminants of Concern	Potential Pathways	Receptor Group
Made Ground and natural strata	Inorganic Compounds • Arsenic	• Ingestion of contaminated soil by direct contact • Ingestion of contaminants through vegetables • Entry of contaminants by skin or eye contact with contaminated soils or dust • Inhalation of contaminated dust	Humans • Site occupants[1] • Site users[1] • Construction workers[2] • Maintenance workers[1] • Neighbouring site users[2]
Made Ground (BH105)	• Asbestos	• Inhalation of fibres	Humans • Site occupants[1] • Site users[1] • Construction workers[2] • Maintenance workers[1] • Neighbouring site users[2]
Natural geology	• Radon	• Inhalation	Humans • Site occupants
Shallow soils (BH103)	Organic Compounds • TPH	• Direct contact of contaminants with building materials	Building Materials and Services • Plastic pipes and services
[1] – Assumes no remediation is undertaken [2] – Pathway exists only during the construction period			

6.10 Summary of Risk Evaluation

6.10.1 The above assessment identifies that 'source – pathway – receptor' linkages potentially occur with arsenic and asbestos impacting upon the identified receptors. Possible risks to plastic water supply pipes were also identified with regard to marginally elevated TPH concentrations within the shallow soils in BH103.

6.10.2 Elevated concentrations of arsenic were identified in four of the five sampling locations, within the Made Ground and natural strata, and is therefore considered likely to be widespread within the shallow soils across the site. Asbestos was identified within the shallow sample of Made Ground encountered in BH105, though not in the deeper sample tested.

6.10.3 The proposed development requires the installation of basic radon protective measures.

6.11 Waste

6.11.1 An initial assessment of the likely waste classification for any material to be disposed of has been conducted on the basis of the chemical test results obtained as part of the contamination risk assessment.

6.11.2 This assessment has been conducted using the HazWasteOnline^{tm} tool, ref. 8.23, the output sheets from which are included within Appendix 3.

6.11.3 Very little Made Ground was encountered across the site. This assessment indicates the material represented by the samples tested, whether Made Ground or natural material, would be classified as non-hazardous waste under code 17 05 04, should disposal to landfill be required.

6.11.4 A number of the samples were initially classified as potentially hazardous due to Hazard Property HP3(i): Flammable. However, maximum TPH concentrations were measured at less than 0.1% and it is unlikely that at these levels materials would be flammable. Therefore, the criteria has been altered to indicate total TPH concentrations less than 500mg/kg (inert soil threshold) in solid samples as non-hazardous.

6.11.5 Any material found to contain asbestos may also be classified as hazardous waste. However, quantification analysis undertaken on the sample from BH105 in which asbestos was identified indicated the mass of asbestos in the soil to be 0.028%, and therefore less than the 0.1% screening criteria for hazardous waste. Consequently, this material would not be classified as hazardous waste on the basis of the asbestos identified.

6.11.6 It should be noted that individual tips might require further analysis prior to the disposal of any material from the site. Any such requirements should be clarified with the tip prior to any further analysis being undertaken.

6.11.7 Any unexpected visually contaminated material should be segregated for further classification testing prior to disposal.

7.0 MANAGEMENT OF CONTAMINATION

7.1 Remediation and Verification

7.1.1 The risk management framework set out in the Model Procedures for the Management of Land Contamination, CLR 11, ref.8.24, is applicable to the redevelopment of sites that may be affected by contamination.

7.1.2 The risk management process set out in the Model Procedures has three main components:

- Risk assessment
- Options appraisal
- Implementation

7.1.3 An important part of the risk management process is identifying and informing all stakeholders with an interest in the outcome of the risk management project. To this end, if the regulators have not yet been contacted with regard to the redevelopment of this site, it is recommended that they be supplied with a copy of all relevant reports in order to enable liaison to be undertaken with them.

7.1.4 Following liaison with the relevant regulatory bodies, a remediation strategy could be formulated, which should incorporate an options appraisal and summarise in detail the chosen remedial approach, along with the verification proposals. The remediation strategy should then be approved by the relevant regulatory authorities prior to implementation.

7.1.5 The remediation strategy will need to review methods of reducing or controlling the identified unacceptable risks. This could be done by removing or treating the sources of contamination, removing or modifying the pathways or removing or modifying the behaviour of the receptors, to ensure there is no significant risk of significant harm to either human health or controlled waters from the identified contamination, in relation to the proposed end use.

7.1.6 Where remediation is required, a verification report will need to be formulated following implementation of the remediation strategy, which should provide a complete record of all remedial activities conducted on site and include all the data obtained to support the remedial objectives and demonstrate that the remediation has been effective. Any unexpected conditions encountered during the remedial works should also be detailed within the verification report.

7.1.7 In areas that are to be covered by buildings or hard standing, no pathway is likely to exist between any source of contamination and the human receptors by ingestion or dermal contact, therefore no further remedial action is likely to be required.

7.1.8 In gardens or areas of landscaping, a capping layer of 'inert' material could be provided to break the pathway between the identified contamination and end users of the site. The required capping thickness will need to be agreed with the Local Authority, though for the majority of the site, a minimum capping thickness of 600mm is likely to be required for private gardens, and 450mm for communal landscaped areas, including provision of a capillary break layer, such as a geotextile membrane or 100mm crushed concrete layer at the base. However, in the area of deeper Made Ground encountered in BH105, a capping thickness of up to a metre may be required to address the potential risks associated with the asbestos identified. Further sampling may help to reduce the area where this would be required.

7.1.9 Basic radon protective measures are required in accordance with the Building Research Establishment, Report BR211.

7.1.10 The local water supply company should be contacted for confirmation of any specific requirements with regard to the selection of materials for any new potable water supply pipes proposed on the site.

7.2 Management of Unidentified Sources of Contamination

7.2.1 There is the possibility that sources of contamination may be present on site that were not detected during the investigation. Should such contamination be identified or suspected during the site clearance or ground works, these should be dealt with accordingly. A number of options are available for handling this material, which include:

- The removal from site and disposal to a suitably licensed tip of all material suspected of being contaminated. The material would need to be classified prior to disposal.

- Short-term storage of the suspected material while undertaking verification testing for potential contamination. The storage area should be a contained area to ensure that contamination does not migrate and affect other areas of the site. Depending upon the amounts of material under consideration, this could be either a skip or a lined area.

- Having a suitably experienced environmental engineer either on-call or with a watching brief for the visual and olfactory assessment of the material, and sampling for verification purposes.

7.3 Risk Management During Site Works

7.3.1 During ground works, some simple measures may have to be put in place to mitigate the risk of any contamination affecting the site workers and the environs. The majority of the proposed measures represent good practice for the construction industry and include:

- Informing the site workers of any contamination on site and the potential health effects from exposure.

- Where appropriate, the provision of suitable Personal Protective Equipment (PPE) for workers who may be potentially impacted by working in areas of the contamination.

- Ensuring good hygiene is enforced on site and washing facilities are maintained on the site. Workers are discouraged from smoking, eating or drinking without washing their hands first.

- Dust monitoring, and if necessary, suppression measures should be put into practice where contamination is becoming airborne.

- Site drainage should be prevented from entering any nearby watercourse.

7.3.2 Where contaminated materials are being removed from the site they should be disposed of at a suitably licensed landfill, with a 'duty of care' system in place and maintained throughout the disposal operations.

7.4 Consultation

7.4.1 During the development of a site, consultation may be required for a number of reasons with a number of regulatory Authorities. The following provides an indication as to the most likely Authorities with which consultation may be required.

- **Local Authority.** There may be a planning condition regarding contamination and consultation will be required with a designated Contaminated Land Officer within the Environmental Health Department. The Local Authority is generally concerned with human health risks. Some Authorities now require 'Completion Certificates' to be signed off following remediation works.

- **Environment Agency.** Where a site is situated above an aquifer, within a groundwater protection zone, in close proximity to a surface watercourse, or has been designated as a special site, the Environment Agency is likely to be involved to ensure that controlled waters are protected.

- **National House Building Council, NHBC.** Section 4.1 of the NHBC Standards requires land management to be addressed. For a new housing development to be approved by the NHBC, any remediation will require a validation report.

7.4.2 Based on the results of any consultation, there may be specific remediation requirements imposed by one or more of the Authorities.

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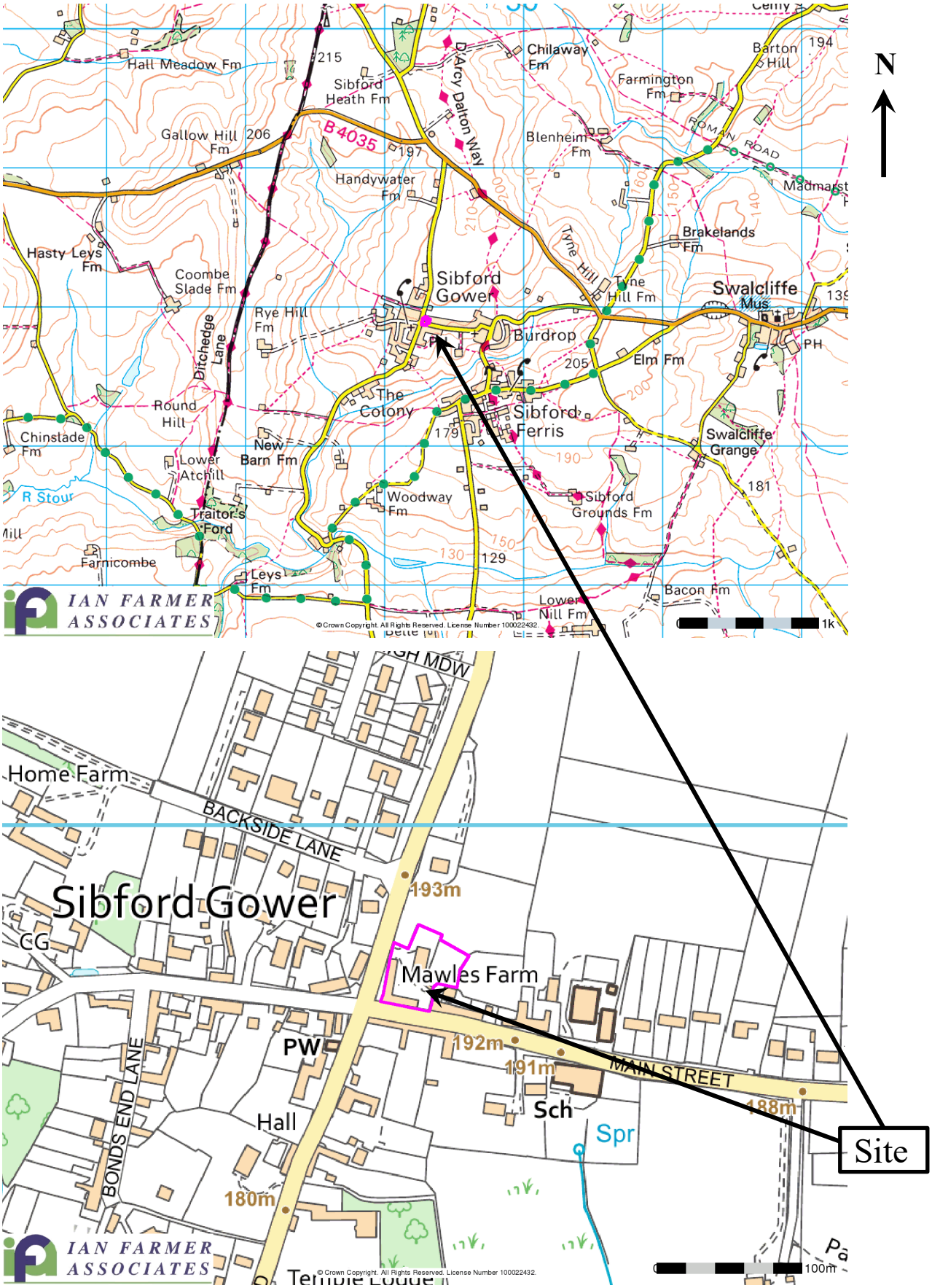
APPENDIX 1

DRAWINGS

2220483: Mawles Farm, Sibford Gower

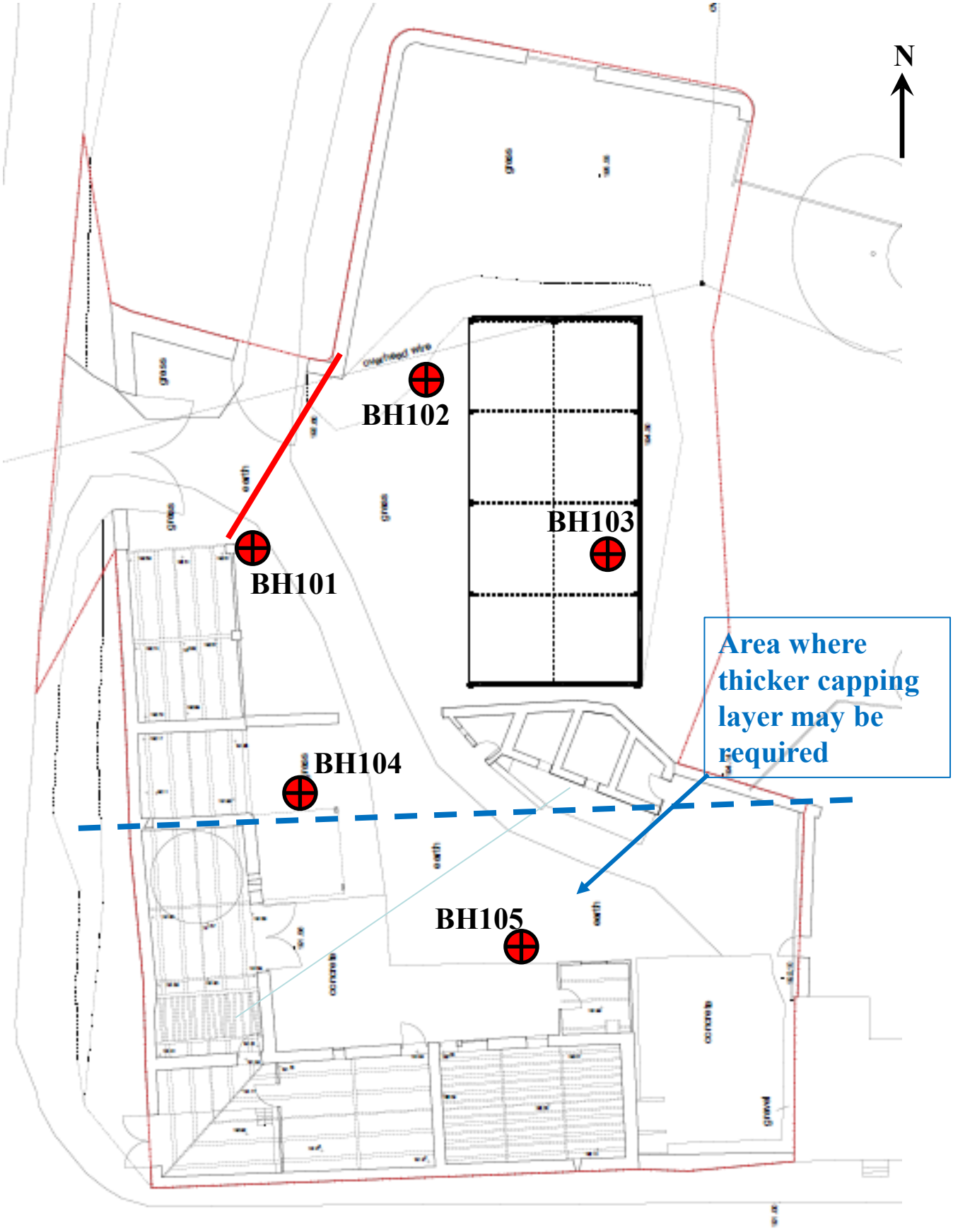


Site Location Plan

Scale: NTS

Figure A1.1

2220483: Mawles Farm, Sibford Gower



Exploratory Hole Location Plan

Scale: NTS

Figure A1.2

APPENDIX 2

SITE WORK

APPENDIX 2

GENERAL NOTES ON SITE WORKS

A2.1 SITE WORK

A2.1.1 General

Site work is carried out in general accordance with the guidelines given in BS EN 1997, 8.6 and BS 5930, ref 8.5, and BS 10175, ref.8.4.

A2.1.2 Drive-in Window Sampler

The dynamic sampler, ref. 8.8, consists generally of a track mounted window sampler and a series of cylindrical sample tubes, generally varying in diameter from 98mm to 35mm. A cutting shoe is fitted to the bottom of each tube, while samples are collected in plastic liners fitted inside the sample tube.

The borehole is extended by using progressively smaller diameter tubes.

A2.2 IN-SITU TESTS

A2.2.1 Standard Penetration Test

The Standard Penetration Test is carried out in accordance with the proposals recommended by BS EN ISO 22476-3 ref 8.7.

The standard penetration test, **SPT**, covers the determination of the resistance of soils to the penetration of a split barrel sampler. A 50mm diameter split barrel sampler is driven 450mm into the soil using a 63.5kg hammer with a 760mm drop. The penetration resistance is expressed as the number of blows required to obtain 300mm penetration below an initial seating drive of 150mm through any disturbed ground at the bottom of the borehole. The number of blows to achieve the standard penetration of 300mm is reported as the 'N' value.

The test is generally carried out in fine soils, however, it may also be carried out in coarse granular soils, weak rocks and glacial tills using the same procedure as for the SPT but with a 50mm diameter, 60° apex solid cone replacing the split spoon sampler, **CPT.**

When attempting the standard penetration test in very dense material or weathered rocks it may be necessary to terminate the test before completion to prevent damage to the equipment. In these circumstances it is important to distinguish how the blow count relates to the penetration of the sampler. This may be achieved in the following manner:

- Where the seating drive has been completed, the test drive is terminated if 50 blows are reached before the full penetration of 300mm is achieved. The penetration for 50 blows is recorded and an approximate N value obtained by linear extrapolation of the number of blows for the partial test drive.

- If the seating drive of 150mm is not achieved within the first 25 blows, the penetration after 25 blows is recorded and the test drive then commenced.

- For tests in soft rocks, the test drive should be terminated after 100 blows where the penetration of 300mm has not been achieved.

The N-value obtained from the Standard Penetration Test may be used to assess the relative density of sands and gravels with the general descriptions as follows:

Term	SPT N-Value : Blows/300mm Penetration
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	Over 50

A2.3 SAMPLES / TESTS

D represents small disturbed sample

ES represents environmental soil sample, consisting of amber jar, vial and plastic tub

A2.4 DESCRIPTION OF SOILS

A2.4.1 General

The procedures and principles given in BS EN ISO 14688 Parts 1 and 2, ref 8.9, supplemented by section 6 of BS 5930, ref. 8.5 have been used in the soil descriptions contained within this report.

Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Dynamic sampling uk ltd
5-8 victory parkway
victory road
Derby
DE24 8ZF

Hammer Ref:	110..70
Test Date:	30/06/2020
Report Date:	30/06/2020
File Name:	110..70.spt
Test Operator:	AP

Instrumented Rod Data

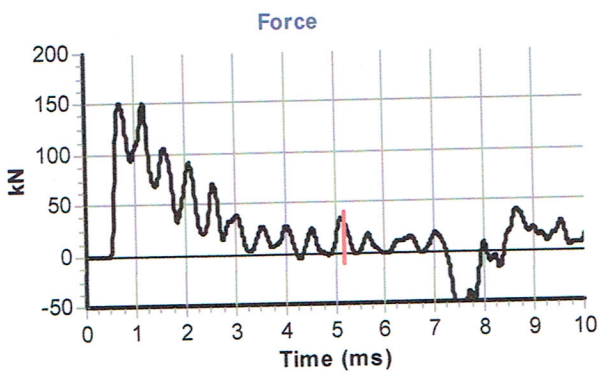
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.9
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	62901
Accelerometer No.2:	62902

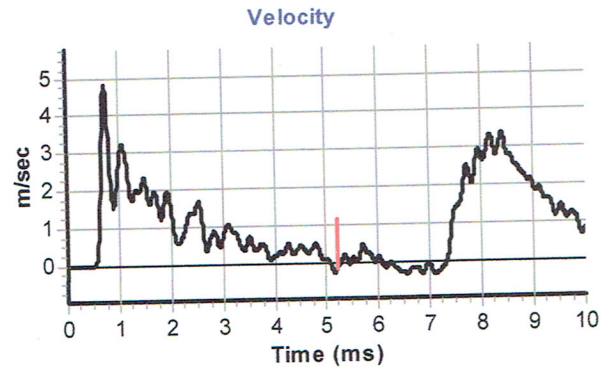
Hammer Information

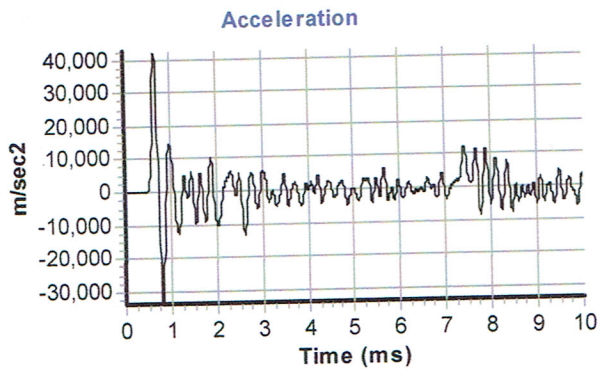
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
String Length L (m):	15.0

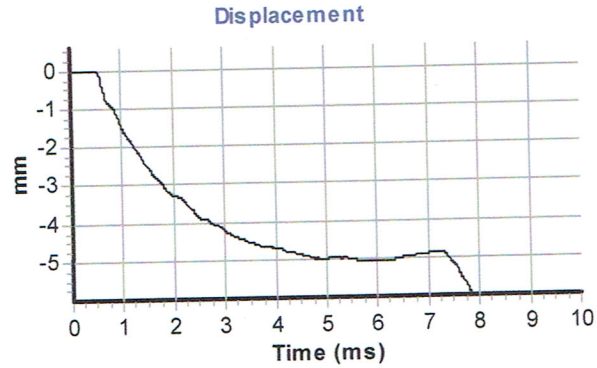
Comments / Location

Hammer tested at Dynmaic samplings yard.









Calculations

Area of Rod A (mm2):	1021
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	402

Energy Ratio E_r (%): **85**

[redacted]

Signed: A.parker.

Title: Associate Director.

The recommended calibration interval is 12 months

IAN FARMER ASSOCIATES

Plant used: Premier 110	Project: Mawles Farm, Sibford Gower		Location ID: **BH101**
Dates: 29/01/2021	Client: Mr & Mrs Broom		Sheet 1 of 1
Dynamic Sample Borehole Log	Location:	Ground level:	Logged by: LB / Vertical scale: 1:50 / Project ID: 2220483

Samples & In Situ Testing			Strata Details					Groundwater	
Depth	Sample ID	Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend		Water Strike	Backfill/ Installation
0.10	ES1			0.12	Light brown/beige, sandy, gravelly clay/silt. Gravel is fine to medium, sub angular to sub rounded sandstone. (Topsoil)				
0.10 - 1.20	B1				Loose orangish-brown, slightly clayey, slightly gravelly, fine SAND. Gravel is fine to medium, subangular to subrounded sandstone (possible lithorelicts). With frequent rootlets to begin with. (Northampton Sand Formation)				
0.30	ES2								
0.70	ES3						1		
1.20		SPT(C) N=4 (1,2/1,1,1,1)							
1.40	D1				*Between 1.5m-1.55m: Becoming light grey*				
				(3.33)					
2.00		SPT(C) N=4 (1,2/1,1,1,1)			*Below 1.9m: Reddish and silty with occasional coarse gravel sized sandstone gravel.*		2		
2.30	D2								
3.00		SPT(C) N=25 (5,6/7,7,5,6)			*Below 3.00m: Medium dense.*		3		
				3.45	End of Borehole at 3.45m				
							4		
							5		
							6		
							7		
							8		
							9		
							10		

Dynamic Sample Recovery

Top (m)	Base (m)	Dia (mm)	Recovery %	Remarks

Remarks:
Inspection pit hand excavated to 1.2m.
No groundwater ingress observed during excavation.

SPT Hammer: 110..70 Energy Ratio: 85%

Water Strikes

Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Monitoring Installations

Top (m)	Base (m)	Pipe Type	Dia (mm)

Checked by:	DWB	IFA DS v01.01
Log status:	FINAL	

IAN FARMER ASSOCIATES

Plant used: Premier 110	Project: Mawles Farm, Sibford Gower		Location ID: **BH102**
Dates: 29/01/2021	Client: Mr & Mrs Broom		Sheet 1 of 1
Dynamic Sample Borehole Log	Location:	Ground level:	Logged by: LB / Vertical scale: 1:50 / Project ID: 2220483

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend	Water Strike	Backfill/ Installation
0.10	ES1			0.15	Light brown, sandy clay/silt, with frequent rootlets. (TOPSOIL)			
0.25	ES2				Loose orangish-brown, slightly clayey, slightly gravelly, fine SAND. Gravel is fine to medium, subangular to subrounded sandstone. (Possible lithorelicts) With frequent rootlets to begin with. (Northampton Sand Formation)			
0.50 - 1.00	B1							
1.20		SPT(C) N=8 (2,2/2,2,2,2)			*At 1.3m: Band of soft clay.*			
1.50	D1			(3.30)				
2.00		SPT(C) N=4 (1,1/1,1,1,1)						
2.50	D2							
3.00		SPT(C) N=13 (1,2/2,4,3,4)			*Below 3.00m: Medium dense.*			
				3.45	End of Borehole at 3.45m			

1 2 3 4 5 6 7 8 9 10

Dynamic Sample Recovery

Top (m)	Base (m)	Dia (mm)	Recovery %	Remarks

Remarks:
Inspection pit hand excavated to 1.2m.
No groundwater ingress observed during excavation.

SPT Hammer: 110..70 Energy Ratio: 85%

Water Strikes

Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Monitoring Installations

Top (m)	Base (m)	Pipe Type	Dia (mm)

Checked by:	DWB	IFA DS v01.01
Log status:	FINAL	

IAN FARMER ASSOCIATES

Plant used: Premier 110	Project: Mawles Farm, Sibford Gower		Location ID: **BH103**
Dates: 29/01/2021	Client: Mr & Mrs Broom		Sheet 1 of 1
Dynamic Sample Borehole Log	Location:	Ground level:	Logged by: LB / Vertical scale: 1:50 / Project ID: 2220483

Samples & In Situ Testing			Strata Details					Groundwater	
Depth	Sample ID	Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend		Water Strike	Backfill/ Installation
0.10 - 1.00	B1			(0.30)	MADE GROUND: Light orangish-brown, slightly clayey, sand with a low cobble content.				
0.30	ES1			0.30	Loose light orangish-brown, very clayey, slightly gravelly, fine, SAND. Gravel is fine to medium, subangular to subrounded sandstone (Possible lithorelicts). (Northampton Sand Formation)				
0.70	ES2								
1.20		SPT(C) N=7 (1,1/1,2,2,2)					1		
1.50	D1								
2.00		SPT(C) N=23 (2,3/5,6,6,6)		(3.15)	*Below 2.00m: Medium dense.*		2		
2.50	D2								
3.00		SPT(C) N=30 (4,6/7,7,8,8)			*Below 3.0m: Dense*		3		
				3.45	End of Borehole at 3.45m		4		
							5		
							6		
							7		
							8		
							9		
							10		

Dynamic Sample Recovery

Top (m)	Base (m)	Dia (mm)	Recovery %	Remarks

Remarks:
Inspection pit hand excavated to 1.2m.
No groundwater ingress observed during excavation.

SPT Hammer: 110..70 Energy Ratio: 85%

Water Strikes

Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Monitoring Installations

Top (m)	Base (m)	Pipe Type	Dia (mm)

Checked by:	DWB	IFA DS v01.01
Log status:	FINAL	

IAN FARMER ASSOCIATES

Plant used: Premier 110	Project: Mawles Farm, Sibford Gower		Location ID: **BH104**
Dates: 29/01/2021	Client: Mr & Mrs Broom		Sheet 1 of 1
Dynamic Sample Borehole Log	Location:	Ground level:	Logged by: LB / Vertical scale: 1:50 / Project ID: 2220483

Samples & In Situ Testing			Strata Details					Groundwater	
Depth	Sample ID	Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend		Water Strike	Backfill/ Installation
0.05	ES1			0.10	Dark brown, sandy, clayey silt. (TOPSOIL)				
0.10 - 1.20	B1				Loose and medium dense orangish-brown, gravelly, clayey SAND. Gravel is fine to coarse, subangular to subrounded sandstone (Possible lithorelicts). (Northampton Sand Formation)				
0.30	ES2								
0.70	ES3								
1.18		SPT(C) N=17 (1,2/3,2,4,8)					1		
1.70	D1			(3.35)					
2.00		SPT(C) N=7 (1,2/1,2,2,2)					2		
					Between 2.3m-2.4m: Becoming light grey				
2.70	D2				*From 2.6m: Becoming reddish brown and silty*				
3.00		SPT(C) N=10 (2,2/2,2,3,3)					3		
				3.45	End of Borehole at 3.45m				
							4		
							5		
							6		
							7		
							8		
							9		
							10		

Dynamic Sample Recovery

Top (m)	Base (m)	Dia (mm)	Recovery %	Remarks

Remarks:
Inspection pit hand excavated to 1.2m.
No groundwater ingress observed during excavation.

SPT Hammer: 110..70 Energy Ratio: 85%

Water Strikes

Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Monitoring Installations

Top (m)	Base (m)	Pipe Type	Dia (mm)

Checked by:	DWB	IFA DS v01.01
Log status:	FINAL	

IAN FARMER ASSOCIATES

Plant used: Premier 110	Project: Mawles Farm, Sibford Gower		Location ID: **BH105**
Dates: 29/01/2021	Client: Mr & Mrs Broom		Sheet 1 of 1
Dynamic Sample Borehole Log	Location:	Ground level:	Logged by: LB / Vertical scale: 1:50 / Project ID: 2220483

Samples & In Situ Testing			Strata Details					Groundwater	
Depth	Sample ID	Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend		Water Strike	Backfill/ Installation
0.30	ES1			(1.00)	MADE GROUND: Soft, dark brown, gravelly clay. Gravel is fine to coarse, rounded to angular sandstone with occasional brick, concrete, clinker and flint.				
0.50	D1								
0.70	ES2								
1.20		SPT(C) N=9 (2,2/2,2,2,3)		1.00	Loose orangish-brown, slightly clayey, SAND with occasional rootlets. (Northampton Sand Formation)		1		
1.60	D2			(1.35)					
2.00		SPT(C) 60 (2,15/60 for 200mm)			*Below 2.00m: Very dense.*		2		
				2.35	End of Borehole at 2.35m				
							3		
							4		
							5		
							6		
							7		
							8		
							9		
							10		

Dynamic Sample Recovery

Top (m)	Base (m)	Dia (mm)	Recovery %	Remarks

Remarks:
Inspection pit hand excavated to 1.2m.
No groundwater ingress observed during excavation.

SPT Hammer: 110..70 Energy Ratio: 85%

Water Strikes

Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Monitoring Installations

Top (m)	Base (m)	Pipe Type	Dia (mm)

Checked by:	DWB	IFA DS v01.01
Log status:	FINAL	

APPENDIX 3

GEOENVIRONMENTAL TESTS

APPENDIX 3

GENERAL NOTES ON GEOENVIRONMENTAL TESTS

A3.1 ACCREDITATION

A3.1.1 Testing has been carried out to either UKAS or MCERTS accreditation, as specified in the results tables.

A3.1.2 The unique reference for each sample is as stated on the relevant engineering log. Each sample is logged on a chain of custody and can be traced from exploratory hole to laboratory. The date of soil samples taken is as per the date shown on the engineering log.

A3.1.3 Subcontracted results are presented directly on headed paper from the subcontracting laboratory.

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 21/01098
Issue Number: 1 **Date:** 16 February, 2021

Client:
Ian Farmer Associates (Coventry)
1 Fairfield Court
Seven Stars Industrial Estate
Wheler Road
Coventry
CV3 4LJ

Project Manager: David Bland/Paul Bailey
Project Name: Mawles Farm
Project Ref: 2220483
Order No: P7525604
Date Samples Received: 04/02/21
Date Instructions Received: 04/02/21
Date Analysis Completed: 16/02/21

Prepared by:

[redacted]

Holly Neary-King
Client Services Supervisor

Approved by:

[redacted]

Sophie France
Client Service Manager

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING 1247

Envirolab Job Number: 21/01098

Client Project Name: Mawles Farm

Client Project Ref: 2220483

Lab Sample ID	21/01098/1	21/01098/2	21/01098/3	21/01098/4	21/01098/5	21/01098/6		Units	Limit of Detection	Method ref
Client Sample No	2	2	1	2	1	2				
Client Sample ID	BH101	BH102	BH103	BH104	BH105	BH105				
Depth to Top	0.30	0.25	0.30	0.30	0.30	0.70				
Depth To Bottom										
Date Sampled	29-Jan-21	29-Jan-21	29-Jan-21	29-Jan-21	29-Jan-21	29-Jan-21				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES				
Sample Matrix Code	4AE	4A	4A	4A	6AE	4A				
% Stones >10mm$_A$	<0.1	<0.1	0.9	<0.1	<0.1	<0.1		% w/w	0.1	A-T-044
pH$_D$$^{M\#}$	7.93	7.76	7.61	7.49	7.90	7.79		pH	0.01	A-T-031s
Sulphate (water sol 2:1)$_D$$^{M\#}$	-	<0.01	<0.01	-	<0.01	<0.01		g/l	0.01	A-T-026s
Cyanide (total)$_A$$^{M\#}$	-	-	<1	-	<1	<1		mg/kg	1	A-T-042sTCN
Organic matter$_D$$^{M\#}$	0.6	-	0.4	-	2.3	-		% w/w	0.1	A-T-032 OM
Arsenic$_D$$^{M\#}$	36	62	39	52	41	45		mg/kg	1	A-T-024s
Cadmium$_D$$^{M\#}$	2.6	2.3	1.8	2.6	2.1	3.1		mg/kg	0.5	A-T-024s
Copper$_D$$^{M\#}$	3	5	2	4	18	11		mg/kg	1	A-T-024s
Chromium$_D$$^{M\#}$	49	78	61	47	57	79		mg/kg	1	A-T-024s
Chromium (hexavalent)$_D$	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-040s
Lead$_D$$^{M\#}$	10	8	8	11	104	41		mg/kg	1	A-T-024s
Mercury$_D$	<0.17	<0.17	<0.17	<0.34	<0.17	<0.17		mg/kg	0.17	A-T-024s
Nickel$_D$$^{M\#}$	20	19	19	17	21	20		mg/kg	1	A-T-024s
Selenium$_D$$^{M\#}$	<1	<1	<1	<2	<1	<1		mg/kg	1	A-T-024s
Zinc$_D$$^{M\#}$	28	33	37	33	163	108		mg/kg	5	A-T-024s
E-Coli (Faecal Coliforms)$_A$	-	<10	-	-	-	-		MPN/g	1	Subcon Mercian
Coliforms (total)$_A$	-	30	-	-	-	-		MPN/g	1	Subcon Mercian

Envirolab Job Number: 21/01098

Client Project Name: Mawles Farm

Client Project Ref: 2220483

Lab Sample ID	21/01098/1	21/01098/2	21/01098/3	21/01098/4	21/01098/5	21/01098/6		Units	Limit of Detection	Method ref
Client Sample No	2	2	1	2	1	2				
Client Sample ID	BH101	BH102	BH103	BH104	BH105	BH105				
Depth to Top	0.30	0.25	0.30	0.30	0.30	0.70				
Depth To Bottom										
Date Sampled	29-Jan-21	29-Jan-21	29-Jan-21	29-Jan-21	29-Jan-21	29-Jan-21				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES				
Sample Matrix Code	4AE	4A	4A	4A	6AE	4A				
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_{D}^{\#}$	-	NAD	NAD	-	Chrysotile	NAD				A-T-045
Asbestos Matrix (microscope)$_{D}$	-	-	-	-	Loose Fibres & Cement	-				A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_{D}$	-	N/A	N/A	-	No	N/A				A-T-045
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing)$_{D}$	-	-	-	-	0.028	-		% w/w	0.001	A-T-054

Envirolab Job Number: 21/01098

Client Project Name: Mawles Farm

Client Project Ref: 2220483

Lab Sample ID	21/01098/1	21/01098/2	21/01098/3	21/01098/4	21/01098/5	21/01098/6		Units	Limit of Detection	Method ref
Client Sample No	2	2	1	2	1	2				
Client Sample ID	BH101	BH102	BH103	BH104	BH105	BH105				
Depth to Top	0.30	0.25	0.30	0.30	0.30	0.70				
Depth To Bottom										
Date Sampled	29-Jan-21	29-Jan-21	29-Jan-21	29-Jan-21	29-Jan-21	29-Jan-21				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES				
Sample Matrix Code	4AE	4A	4A	4A	6AE	4A				
PAH-16MS										
Acenaphthene$_A^{M\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-019s
Anthracene$_A^{M\#}$	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	<0.04	<0.04	<0.04	<0.04	0.06	0.11		mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	<0.04	<0.04	<0.04	<0.04	0.06	0.15		mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	<0.05	<0.05	<0.05	<0.05	0.09	0.17		mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	<0.05	<0.05	<0.05	<0.05	<0.05	0.07		mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07		mg/kg	0.07	A-T-019s
Chrysene$_A^{M\#}$	<0.06	<0.06	<0.06	<0.06	0.07	0.15		mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04		mg/kg	0.04	A-T-019s
Fluoranthene$_A^{M\#}$	<0.08	<0.08	<0.08	<0.08	0.15	0.27		mg/kg	0.08	A-T-019s
Fluorene$_A^{M\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	<0.03	<0.03	<0.03	<0.03	<0.03	0.09		mg/kg	0.03	A-T-019s
Naphthalene $_A^{M\#}$	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03		mg/kg	0.03	A-T-019s
Phenanthrene$_A^{M\#}$	<0.03	<0.03	<0.03	<0.03	0.05	0.09		mg/kg	0.03	A-T-019s
Pyrene$_A^{M\#}$	<0.07	<0.07	0.29	<0.07	0.13	0.26		mg/kg	0.07	A-T-019s
Total PAH-16MS$_A^{M\#}$	<0.08	<0.08	0.29	<0.08	0.61	1.36		mg/kg	0.01	A-T-019s

Envirolab Job Number: 21/01098

Client Project Name: Mawles Farm

Client Project Ref: 2220483

Lab Sample ID	21/01098/1	21/01098/2	21/01098/3	21/01098/4	21/01098/5	21/01098/6		Units	Limit of Detection	Method ref
Client Sample No	2	2	1	2	1	2				
Client Sample ID	BH101	BH102	BH103	BH104	BH105	BH105				
Depth to Top	0.30	0.25	0.30	0.30	0.30	0.70				
Depth To Bottom										
Date Sampled	29-Jan-21	29-Jan-21	29-Jan-21	29-Jan-21	29-Jan-21	29-Jan-21				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES				
Sample Matrix Code	4AE	4A	4A	4A	6AE	4A				
TPH CWG										
Ali >C5-C6$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01		mg/kg	0.01	A-T-022s
Ali >C6-C8$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01		mg/kg	0.01	A-T-022s
Ali >C8-C10$_A$	<1	<1	<1	-	<1	<1		mg/kg	1	A-T-055s
Ali >C10-C12$_A^{M\#}$	<1	<1	<1	-	<1	<1		mg/kg	1	A-T-055s
Ali >C12-C16$_A^{M\#}$	<1	<1	7	-	<1	<1		mg/kg	1	A-T-055s
Ali >C16-C21$_A^{M\#}$	<1	<1	15	-	<1	<1		mg/kg	1	A-T-055s
Ali >C21-C35$_A^{M\#}$	<1	6	18	-	4	7		mg/kg	1	A-T-055s
Total Aliphatics$_A$	<1	6	40	-	4	7		mg/kg	1	A-T-055s
Aro >C5-C7$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01		mg/kg	0.01	A-T-022s
Aro >C7-C8$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01		mg/kg	0.01	A-T-022s
Aro >C8-C10$_A$	<1	<1	<1	-	<1	<1		mg/kg	1	A-T-055s
Aro >C10-C12$_A$	<1	<1	<1	-	<1	<1		mg/kg	1	A-T-055s
Aro >C12-C16$_A$	<1	<1	13	-	<1	<1		mg/kg	1	A-T-055s
Aro >C16-C21$_A^{M\#}$	<1	<1	28	-	1	4		mg/kg	1	A-T-055s
Aro >C21-C35$_A^{M\#}$	<1	<1	19	-	7	16		mg/kg	1	A-T-055s
Total Aromatics$_A$	<1	<1	60	-	9	20		mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35)$_A$	<1	6	100	-	12	27		mg/kg	1	A-T-055s
BTEX - Benzene$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01		mg/kg	0.01	A-T-022s
BTEX - Toluene$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01		mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01		mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01		mg/kg	0.01	A-T-022s
BTEX - o Xylene$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01		mg/kg	0.01	A-T-022s
MTBE$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01		mg/kg	0.01	A-T-022s

REPORT NOTES

General
This report shall not be reproduced, except in full, without written approval from Envirolab.
The results reported herein relate only to the material supplied to the laboratory.
The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.
If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:
Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

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

Predominant Matrix Codes:
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.
Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.
Secondary Matrix Codes:
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

Key:
IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Superscript "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Ian Farmer Associates (Coventry), 1 Fairfield Court, Seven Stars Industrial Estate, Wheler Road, Coventry, CV3 4LJ

Project No: 21/01098

Date Received: 04/02/2021 (am)

Project: Mawles Farm

Cool Box Temperatures (°C): 7.6, 6.9, 7.3

Clients Project No: 2220483

Lab Sample ID	21/01098/2
Client Sample No	2
Client Sample ID/Depth	BH102 0.25m
Date Sampled	29/01/21
Deviation Code	
F	✓

Key

F *Maximum holding time exceeded between sampling date and analysis for analytes listed below*

HOLDING TIME EXCEEDANCES

Lab Sample ID	21/01098/2
Client Sample No	2
Client Sample ID/Depth	BH102 0.25m
Date Sampled	29/01/21
MICRO SUBCON Coliforms (Total) & E-Coli (Faecal Coliforms) MERCIAN	✓

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Waste Classification Report

EDBVA-K8GUW-UG2KZ

Job name

2220483 Mawles Farm, Sibford Gower

Description/Comments

Project

Site

Related Documents

#	Name	Description
None		

Waste Stream Template

Example waste stream template for contaminated soils

Classified by

Name:
Victoria Tickner
Date:
22 Feb 2021 08:36 GMT
Telephone:
01582 460018

Company:
Ian Farmer Associates
1A Baford Mill
Lower Luton Road
Harpenden
AL5 5BZ

HazWasteOnline™ Training Record:

Course	Date
Hazardous Waste Classification	-
Advanced Hazardous Waste Classification	-

Report

Created by: Victoria Tickner
Created date: 22 Feb 2021 08:36 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	BH101	0.30	Non Hazardous		2
2	BH102	0.25	Non Hazardous		4
3	BH103	0.30	Non Hazardous		7
4	BH104	0.30	Non Hazardous		10
5	BH105	0.30	Non Hazardous		12
6	BH105[2]	0.70	Non Hazardous		15

Classification of sample: BH101

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

Sample details

Sample Name:
BH101
Sample Depth:
0.30 m

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

Hazard properties

None identified

Determinands

Moisture content: 0% No 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 }		36 mg/kg	1.32	47.532 mg/kg	0.00475 %		
	033-003-00-0 / 215-481-4 / 1327-53-3							
2	cadmium { cadmium oxide }		2.6 mg/kg	1.142	2.97 mg/kg	0.000297 %		
	048-002-00-0 / 215-146-2 / 1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		49 mg/kg	1.462	71.616 mg/kg	0.00716 %		
	215-160-9 / 1308-38-9							
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }		<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8							
5	copper { dicopper oxide; copper (I) oxide }		3 mg/kg	1.126	3.378 mg/kg	0.000338 %		
	029-002-00-X / 215-270-7 / 1317-39-1							
6	lead { lead chromate }	1	10 mg/kg	1.56	15.598 mg/kg	0.001 %		
	082-004-00-2 / 231-846-0 / 7758-97-6							
7	mercury { mercury dichloride }		<0.17 mg/kg	1.353	<0.23 mg/kg	<0.000023 %		<LOD
	080-010-00-X / 231-299-8 / 7487-94-7							
8	nickel { nickel chromate }		20 mg/kg	2.976	59.525 mg/kg	0.00595 %		
	028-035-00-7 / 238-766-5 / 14721-18-7							
9	selenium { nickel selenate }		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	028-031-00-5 / 239-125-2 / 15060-62-5							
10	zinc { zinc chromate }		28 mg/kg	2.774	77.676 mg/kg	0.00777 %		
	024-007-00-3 / 236-878-9 / 13530-65-9							
11	TPH (C6 to C40) petroleum group		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	TPH							
12	confirm TPH has NOT arisen from diesel or petrol		☑					
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	603-181-00-X / 216-653-1 / 1634-04-4							
14	benzene		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8 / 200-753-7 / 71-43-2							
15	toluene		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3 / 203-625-9 / 108-88-3							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		ethylbenzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		pH				7.93	pH		7.93	pH	7.93 pH		
				PH									
19		naphthalene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
20		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-917-1	208-96-8									
21		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-469-6	83-32-9									
22		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-695-5	86-73-7									
23		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-581-5	85-01-8									
24		anthracene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
			204-371-1	120-12-7									
25		fluoranthene				<0.08	mg/kg		<0.08	mg/kg	<0.000008 %		<LOD
			205-912-4	206-44-0									
26		pyrene				<0.07	mg/kg		<0.07	mg/kg	<0.000007 %		<LOD
			204-927-3	129-00-0									
27		benzo[a]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
28		chrysene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
29		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
30		benzo[k]fluoranthene				<0.07	mg/kg		<0.07	mg/kg	<0.000007 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
31		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
32		indeno[123-cd]pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-893-2	193-39-5									
33		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
34		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-883-8	191-24-2									
										Total:	0.0279 %		

Key

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

Classification of sample: BH102

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

Sample details

Sample Name:
BH102
Sample Depth:
0.25 m

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

Hazard properties

None identified

Determinands

Moisture content: 0% No 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 }		62 mg/kg	1.32	81.86 mg/kg	0.00819 %		
	033-003-00-0 / 215-481-4 / 1327-53-3							
2	cadmium { cadmium oxide }		2.3 mg/kg	1.142	2.627 mg/kg	0.000263 %		
	048-002-00-0 / 215-146-2 / 1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		78 mg/kg	1.462	114.001 mg/kg	0.0114 %		
	/ 215-160-9 / 1308-38-9							
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }		<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<**LOD**
	024-017-00-8 / /							
5	copper { dicopper oxide; copper (I) oxide }		5 mg/kg	1.126	5.629 mg/kg	0.000563 %		
	029-002-00-X / 215-270-7 / 1317-39-1							
6	lead { lead chromate }	1	8 mg/kg	1.56	12.479 mg/kg	0.0008 %		
	082-004-00-2 / 231-846-0 / 7758-97-6							
7	mercury { mercury dichloride }		<0.17 mg/kg	1.353	<0.23 mg/kg	<0.000023 %		<**LOD**
	080-010-00-X / 231-299-8 / 7487-94-7							
8	nickel { nickel chromate }		19 mg/kg	2.976	56.549 mg/kg	0.00565 %		
	028-035-00-7 / 238-766-5 / 14721-18-7							
9	selenium { nickel selenate }		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<**LOD**
	028-031-00-5 / 239-125-2 / 15060-62-5							
10	zinc { zinc chromate }		33 mg/kg	2.774	91.547 mg/kg	0.00915 %		
	024-007-00-3 / 236-878-9 / 13530-65-9							
11	TPH (C6 to C40) petroleum group		6 mg/kg		6 mg/kg	0.0006 %		
	/ / TPH							
12	confirm TPH has NOT arisen from diesel or petrol		☑					
	/ /							
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<**LOD**
	603-181-00-X / 216-653-1 / 1634-04-4							
14	benzene		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<**LOD**
	601-020-00-8 / 200-753-7 / 71-43-2							
15	toluene		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<**LOD**
	601-021-00-3 / 203-625-9 / 108-88-3							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		ethylbenzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		pH				7.76	pH		7.76	pH	7.76 pH		
				PH									
19		naphthalene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
20		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-917-1	208-96-8									
21		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-469-6	83-32-9									
22		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-695-5	86-73-7									
23		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-581-5	85-01-8									
24		anthracene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
			204-371-1	120-12-7									
25		fluoranthene				<0.08	mg/kg		<0.08	mg/kg	<0.000008 %		<LOD
			205-912-4	206-44-0									
26		pyrene				<0.07	mg/kg		<0.07	mg/kg	<0.000007 %		<LOD
			204-927-3	129-00-0									
27		benzo[a]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
28		chrysene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
29		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
30		benzo[k]fluoranthene				<0.07	mg/kg		<0.07	mg/kg	<0.000007 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
31		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
32		indeno[123-cd]pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-893-2	193-39-5									
33		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
34		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-883-8	191-24-2									
										Total:	0.0372 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because Solid, not liquid. Not deemed hazardous at concentrations observed. Inert soil threshold adopted.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0006%)

Classification of sample: BH103

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

Sample details

Sample Name:
BH103
Sample Depth:
0.30 m

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

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		39 mg/kg	1.32	51.493 mg/kg	0.00515 %		
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.8 mg/kg	1.142	2.056 mg/kg	0.000206 %		
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		61 mg/kg	1.462	89.155 mg/kg	0.00892 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		2 mg/kg	1.126	2.252 mg/kg	0.000225 %		
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	8 mg/kg	1.56	12.479 mg/kg	0.0008 %		
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.17 mg/kg	1.353	<0.23 mg/kg	<0.000023 %		<LOD
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		19 mg/kg	2.976	56.549 mg/kg	0.00565 %		
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		37 mg/kg	2.774	102.643 mg/kg	0.0103 %		
11	TPH (C6 to C40) petroleum group			TPH		100 mg/kg		100 mg/kg	0.01 %		
12	confirm TPH has NOT arisen from diesel or petrol					☑					
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
14	benzene	601-020-00-8	200-753-7	71-43-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
15	toluene	601-021-00-3	203-625-9	108-88-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		ethylbenzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
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 }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
19		pH				7.61	pH		7.61	pH	7.61 pH		
				PH									
20		naphthalene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-581-5	85-01-8									
25		anthracene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				<0.08	mg/kg		<0.08	mg/kg	<0.000008 %		<LOD
			205-912-4	206-44-0									
27		pyrene				0.29	mg/kg		0.29	mg/kg	0.000029 %		
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.07	mg/kg		<0.07	mg/kg	<0.000007 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-883-8	191-24-2									
										Total:	0.042 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because Solid, not liquid. Not deemed hazardous at concentrations observed. Inert soil threshold adopted.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.01%)

Classification of sample: BH104

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

Sample details

Sample Name:
BH104
Sample Depth:
0.30 m

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

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		52	mg/kg	1.32	68.657	mg/kg	0.00687 %		
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2.6	mg/kg	1.142	2.97	mg/kg	0.000297 %		
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		47	mg/kg	1.462	68.693	mg/kg	0.00687 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		4	mg/kg	1.126	4.504	mg/kg	0.00045 %		
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	11	mg/kg	1.56	17.158	mg/kg	0.0011 %		
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.34	mg/kg	1.353	<0.46	mg/kg	<0.000046 %		<LOD
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		17	mg/kg	2.976	50.597	mg/kg	0.00506 %		
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<2	mg/kg	2.554	<5.108	mg/kg	<0.000511 %		<LOD
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		33	mg/kg	2.774	91.547	mg/kg	0.00915 %		
11	confirm TPH has NOT arisen from diesel or petrol					☑							
12	pH			PH		7.49	pH		7.49	pH	7.49 pH		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
14	acenaphthylene		205-917-1	208-96-8		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
15	acenaphthene		201-469-6	83-32-9		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			201-695-5	86-73-7									
17		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
18		anthracene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
			204-371-1	120-12-7									
19		fluoranthene				<0.08	mg/kg		<0.08	mg/kg	<0.000008 %		<**LOD**
			205-912-4	206-44-0									
20		pyrene				<0.07	mg/kg		<0.07	mg/kg	<0.000007 %		<**LOD**
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.07	mg/kg		<0.07	mg/kg	<0.000007 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-883-8	191-24-2									
										Total:	0.0306 %		

Key

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

Classification of sample: BH105

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

Sample details

Sample Name:
BH105
Sample Depth:
0.30 m

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

Hazard properties

None identified

Determinands

Moisture content: 0% No 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 }		41 mg/kg	1.32	54.133 mg/kg	0.00541 %		
	033-003-00-0 / 215-481-4 / 1327-53-3							
2	cadmium { cadmium oxide }		2.1 mg/kg	1.142	2.399 mg/kg	0.00024 %		
	048-002-00-0 / 215-146-2 / 1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		57 mg/kg	1.462	83.309 mg/kg	0.00833 %		
	215-160-9 / 1308-38-9							
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }		<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<**LOD**
	024-017-00-8							
5	copper { dicopper oxide; copper (I) oxide }		18 mg/kg	1.126	20.266 mg/kg	0.00203 %		
	029-002-00-X / 215-270-7 / 1317-39-1							
6	lead { lead chromate }	1	104 mg/kg	1.56	162.221 mg/kg	0.0104 %		
	082-004-00-2 / 231-846-0 / 7758-97-6							
7	mercury { mercury dichloride }		<0.17 mg/kg	1.353	<0.23 mg/kg	<0.000023 %		<**LOD**
	080-010-00-X / 231-299-8 / 7487-94-7							
8	nickel { nickel chromate }		21 mg/kg	2.976	62.502 mg/kg	0.00625 %		
	028-035-00-7 / 238-766-5 / 14721-18-7							
9	selenium { nickel selenate }		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<**LOD**
	028-031-00-5 / 239-125-2 / 15060-62-5							
10	zinc { zinc chromate }		163 mg/kg	2.774	452.186 mg/kg	0.0452 %		
	024-007-00-3 / 236-878-9 / 13530-65-9							
11	TPH (C6 to C40) petroleum group		12 mg/kg		12 mg/kg	0.0012 %		
	TPH							
12	confirm TPH has NOT arisen from diesel or petrol		☑					
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<**LOD**
	603-181-00-X / 216-653-1 / 1634-04-4							
14	benzene		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<**LOD**
	601-020-00-8 / 200-753-7 / 71-43-2							
15	toluene		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<**LOD**
	601-021-00-3 / 203-625-9 / 108-88-3							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		ethylbenzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
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 }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
19		pH				7.9	pH		7.9	pH	7.9 pH		
				PH									
20		naphthalene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				0.05	mg/kg		0.05	mg/kg	0.000005 %		
			201-581-5	85-01-8									
25		anthracene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				0.15	mg/kg		0.15	mg/kg	0.000015 %		
			205-912-4	206-44-0									
27		pyrene				0.13	mg/kg		0.13	mg/kg	0.000013 %		
			204-927-3	129-00-0									
28		benzo[a]anthracene				0.06	mg/kg		0.06	mg/kg	0.000006 %		
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				0.07	mg/kg		0.07	mg/kg	0.000007 %		
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				0.09	mg/kg		0.09	mg/kg	0.000009 %		
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.07	mg/kg		<0.07	mg/kg	<0.000007 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				0.06	mg/kg		0.06	mg/kg	0.000006 %		
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-883-8	191-24-2									
										Total:	0.0799 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because Solid, not liquid. Not deemed hazardous at concentrations observed. Inert soil threshold adopted.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0012%)

Classification of sample: BH105[2]

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

Sample details

Sample Name:	LoW Code:	
BH105[2]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
0.70 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		45 mg/kg	1.32	59.415 mg/kg	0.00594 %		
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		3.1 mg/kg	1.142	3.541 mg/kg	0.000354 %		
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		79 mg/kg	1.462	115.463 mg/kg	0.0115 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		11 mg/kg	1.126	12.385 mg/kg	0.00124 %		
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	41 mg/kg	1.56	63.952 mg/kg	0.0041 %		
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.17 mg/kg	1.353	<0.23 mg/kg	<0.000023 %		<**LOD**
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		20 mg/kg	2.976	59.525 mg/kg	0.00595 %		
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		108 mg/kg	2.774	299.608 mg/kg	0.03 %		
11	TPH (C6 to C40) petroleum group			TPH		27 mg/kg		27 mg/kg	0.0027 %		
12	confirm TPH has NOT arisen from diesel or petrol					☑					
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<**LOD**
14	benzene	601-020-00-8	200-753-7	71-43-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<**LOD**
15	toluene	601-021-00-3	203-625-9	108-88-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		ethylbenzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
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 }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
19		pH				7.79	pH		7.79	pH	7.79 pH		
				PH									
20		naphthalene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				0.09	mg/kg		0.09	mg/kg	0.000009 %		
			201-581-5	85-01-8									
25		anthracene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				0.27	mg/kg		0.27	mg/kg	0.000027 %		
			205-912-4	206-44-0									
27		pyrene				0.26	mg/kg		0.26	mg/kg	0.000026 %		
			204-927-3	129-00-0									
28		benzo[a]anthracene				0.11	mg/kg		0.11	mg/kg	0.000011 %		
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				0.15	mg/kg		0.15	mg/kg	0.000015 %		
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				0.17	mg/kg		0.17	mg/kg	0.000017 %		
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.07	mg/kg		<0.07	mg/kg	<0.000007 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				0.15	mg/kg		0.15	mg/kg	0.000015 %		
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				0.09	mg/kg		0.09	mg/kg	0.000009 %		
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				0.07	mg/kg		0.07	mg/kg	0.000007 %		
			205-883-8	191-24-2									
										Total:	0.0626 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because Solid, not liquid. Not deemed hazardous at concentrations observed. Inert soil threshold adopted.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0027%)

Appendix A: Classifier defined and non CLP determinands

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

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

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

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

- **confirm TPH has NOT arisen from diesel or petrol**

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

- **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

- **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

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

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)

cadmium {cadmium oxide}

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

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

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

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

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

copper {dicopper oxide; copper (I) oxide}

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

lead {lead chromate}

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

mercury {mercury dichloride}

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

nickel {nickel chromate}

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

selenium {nickel selenate}

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

zinc {zinc chromate}

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

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

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

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2021.50.4670.8985 (19 Feb 2021)
HazWasteOnline Database: 2021.50.4670.8985 (19 Feb 2021)

This classification utilises the following guidance and legislation:
WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2019 - UK: 2019 No. 720 of 27th March 2019
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
POPs Regulation 2019 - Regulation (EU) 2019/1021 of 20 June 2019

APPENDIX 4

GEOENVIRONMENTAL ASSESSMENT

APPENDIX 4

GENERAL NOTES ON GEOENVIRONMENTAL ASSESSMENT

A4.1 STATUTORY FRAMEWORK AND DEFINITIONS

A4.1.1 The statutory definition of contaminated land is defined in the Environmental Protection Act 1990, ref. 8.11, which was introduced by the Environment Act 1995, ref. 8.12;

'Land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that –

(a) significant harm is being caused or there is a significant possibility of such harm being caused; or

(b) pollution of controlled waters is being, or is likely to be, caused.'

A4.1.2 The UK guidance on the assessment of contaminated has developed as a direct result of the introduction of these two Acts. The technical guidance supporting the new legislation has been summarised in a number of key documents collectively known as the Contaminated Land Reports (CLRs), a proposed series of twelve documents. Seven were originally published in March 1994, four more were published in April 2002, while the last remaining guidance document, CLR 11, ref. 8.24 was published in 2004. In 2008 CLR reports 7 to 10 were withdrawn by DEFRA and the Environment Agency and updated version of CLR 9 and 10 were produced in the form of Science Reports SR2, ref. 8.13 and SR3, ref. 8.14.

A4.1.3 In establishing whether a site fulfils the statutory definition of 'contaminated land' it is necessary to identify, whether a pollutant linkage exists in respect of the land in question and whether the pollutant linkage:

- is resulting in significant harm being caused to the receptor in the pollutant linkage,
- presents a significant possibility of significant harm being caused to that receptor,
- is resulting in the pollution of the controlled waters which constitute the receptor, or
- is likely to result in such pollution.

A4.1.4 A *'pollutant linkage'* may be defined as the link between a contaminant *'source'* and a *'receptor'* by means of a *'pathway'*.

A4.2 ASSESSMENT METHODOLOGY

A4.2.1 The guidance proposes a four-stage assessment process for identifying potential pollutant linkages on a site. These stages are set out in the table below:

No.	Process	Description
1	Hazard Identification	Establishing contaminant sources, pathways and receptors (the conceptual model).
2	Hazard Assessment	Analysing the potential for unacceptable risks (what linkages could be present, what could be the effects).
3	Risk Estimation	Trying to establish the magnitude and probability of the possible consequences (what degree of harm might result and to what receptors, and how likely is it).
4	Risk Evaluation	Deciding whether the risk is unacceptable.

A4.2.2 Stages 1 and 2 develop a *'conceptual model'* based upon information collated from desk based studies, and frequently a walkover of the site. The walkover survey should be conducted in general accordance with CLR 2, ref. 8.25. The formation of a conceptual model is an iterative process and as such, it should be updated and refined throughout each stage of the project to reflect any additional information obtained.

A4.2.3 The extent of the desk studies and enquiries to be conducted should be in general accordance with CLR 3, ref. 8.26. The information from these enquiries is presented in a desk study report with recommendations, if necessary, for further work based upon the conceptual model. Specific DoE 'Industry Profiles' provide guidance on the nature of contaminants relating to specific industrial processes.

A4.2.4 If potential pollutant linkages are identified within the conceptual model, a Phase 2 site investigation and report will be recommended. The investigation should be planned in general accordance with CLR 4, ref. 8.3. The number of exploratory holes and samples collected for analysis should be consistent with the size of the site and the level of risk envisaged. This will enable a contamination risk assessment to be conducted, at which point the conceptual model can be updated and relevant pollutant linkages can be identified.

A4.2.5 A two-stage investigation may be more appropriate where time constraints are less of an issue. The first stage investigation being conducted as an initial assessment for the presence of potential sources, a second being a more refined investigation to delineate wherever possible the extent of the identified contamination.

A4.2.6 All site works should be in general accordance with the British Standards, BS 5930:2015, ref. 8.5, ISO 1997, ref. 8.6 and BS 10175:2011, ref. 8.4.

A4.2.7 The generic contamination risk assessment screens the results of the chemical analysis against generic guidance values which are dependent on the proposed end-use of the development.

A4.2.8 The end-use may be defined as one of the following ref. 8.19;

- Residential with homegrown produce – domestic low rise and low density housing with gardens where vegetable may be grown for home consumption
- Residential without homegrown produce – domestic low density and low density housing where no gardens are present.
- Allotments – specific areas where vegetables are grown for home consumption.
- Public open space in close proximity to residential housing – includes the predominantly grassed area adjacent to high density housing and the central green area around which houses are developed. This land-use includes the smaller areas commonly incorporated in newer developments as informal grassed areas or more formal landscaped areas with a mixture of open space and covered soil with planting.
- Public open space in use as general parkland – provided for recreational use and may be used for family visits and picnics, children's play area, sports grounds and dig walking.
- Commercial – industrial premises where there is limited exposure to soil.

A4.2.9 Exposure pathways for each type of end-use are given below:

Standard Land Use	Oral Routes			Dermal Routes		Inhalation Routes			
	Direct soil & dust ingestion	Consumption of homegrown produce	Soil attached to homegrown produce	Indoor	Outdoor	Indoor dust	Outdoor dust	Indoor vapour	Outdoor vapour
Residential with homegrown produce	✓	✓	✓	✓	✓	✓	✓	✓	✓
Residential without homegrown produce	✓	X	X	✓	✓	✓	✓	✓	✓
Allotments	✓	✓	✓	X	✓	X	✓	✓	✓
Public open space – adjacent to dwellings	✓	X	X	✓	✓	✓	✓	X	✓
Public open space – parkland	✓	X	X	X	✓	X	✓	X	✓
Commercial	✓	X	X	✓	X	✓	X	✓	X

A4.2.1 In the first instance, soils will be compared to Suitable 4 Use Levels (S4ULs) published by LQM ref. 8.16. Screening levels for lead are taken from guidance published by DEFRA as no S4UL has been derived, ref. 8.19.

A4.2.2 The decision to use S4ULs is based on the fact that C4SLs are primarily intended for use under Part 2A of the Environmental Protection Act 1990 in determining when land is not contaminated land as defined under the Act. By its definition, this implies a lower standard of protection than the previous SGVs due to their use of a "Low Level of Toxicological Concern", as opposed to the minimal or tolerable level of risk. As such, it was considered that, excepting lead, S4ULs are suitable in evaluating this site.

A4.2.3 Where no S4UL or C4SL is available, the assessment criteria (AC) may be generated using the Contaminated Land Exposure Assessment (CLEA) Software Version 1.07, ref. 8.17. Toxicological and physico-chemical/fate and transport data used to generate the AC has been derived from a hierarchy of data sources as follows:

1. Environment Agency or Department of Environment Food and Rural Affairs

   (DEFRA) documents;

2. Other documents produced by UK Government or state organisations;

3. European institution documents;

4. International organisation documents;

5. Foreign government institutions.

A4.2.4 In the case of the majority of contaminants considered, the toxicological data has been drawn from the relevant CLR 9 TOX report, or updated toxicological data published by the Environment Agency (2009), ref. 8.15, where available. Where no TOX report is available reference has been made to the health criteria values, derived for use in Land Quality Press (2006), ref. 8.20, as this is considered to represent a peer reviewed data source. Similarly, fate and transport data has been derived in the first instance from Environment Agency (2003), ref. 8.27 and for contaminants not considered in this document the fate and transport data used in previous versions of the CLEA model has been used.

A4.2.5 Chemical laboratory test results are processed as follows. A statistical analysis of the results is conducted, as detailed in CIEH and CL:AIRE 'Guidance on Comparing Soil Contamination Data with a Critical Concentration', ref. 8.18. Individual concentrations are compared to the selected guideline values to identify concentrations of contaminants that are above the selected screening criteria.

A4.2.6 Where the risk estimation identifies significant concentrations of one or more contaminants, a further risk evaluation needs to be undertaken.

A4.3 RISK EVALUATION

A4.3.1 The risk evaluation is a qualitative method for interpreting the data from the hazard estimation stage. It involves the classification of the:

- magnitude of the potential 'consequence' (severity) of the risk occurring and:
- magnitude of the 'probability' (likelihood) of the risk occurring.

A4.3.2 These are defined in the following sections:

A4.4 CLASSIFICATION OF CONSEQUENCE

Classification	Definition	Examples
Severe	Short-term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution (note: Water Resources Act contains no scope for considering significance of pollution) of sensitive water resource. Catastrophic damage to buildings property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem (note: the definitions of ecological systems within the Draft Circular on Contaminated Land, DETR, 2000).	High Concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled water. Explosion, causing building collapse can also equate to a short-term human health risk if buildings are occupied.
Medium	Chronic damage to Human Health ('significant harm' as defined in DETR, 2000). Pollution of sensitive water resources (note: Water Resources Act contains no scope for considering significance of pollution). A significant change in a particular ecosystem, or organism forming part of such ecosystem, (note: the definitions of ecological systems within Draft Circular on Contaminated Land, DETR, 2000).	Concentrations of a contaminant from site exceed the generic, or site-specific assessment criteria. Leaching of contaminants from a site to a major or minor aquifer. Death of a species within a designated nature reserve.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in the *Draft Circular on Contaminated Land*, DETR 2000). Damage to sensitive buildings/ structures/services or the environment.	Pollution of non-classified ground water. Damage to building rendering it unsafe to occupy (eg foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc). Easily repairable effects of damage to buildings, structures and services.	The presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in landscaping scheme. Discoloration of concrete

A4.4.1 In theory, both severe and medium classification can result in death. The differential is that severe relates to short term risk while medium relates to long-term risk. Therefore, the classification of severe requires urgent action while medium may require urgent action but usually long term action would be sufficient.

A4.5 CLASSIFICATION OF PROBABILITY

Classification	Definition
High likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low likelihood	There is a pollution linkage and circumstances are possible under which an event could occur However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term

A4.6 COMPARISON OF CONSEQUENCE AGAINST PROBABILITY

A4.6.1 These classifications are compared to indicate the risk presented by each pollutant linkage. Once the consequence and probability have been classified they can be used to produce a risk category as below:

		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Probability	High likelihood	Very high risk	High risk	Moderate risk	Moderate/low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

A4.6.2 The action required for the classified risks are as follows:

Very high risk	There is a high probability that severe harm could pose a risk to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required
High risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term
Moderate risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term
Low risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very low risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

A4.6.3 The risk evaluation will address the potential pollutant linkages between an identified source of contamination and the likely receptors both on and off site.

A4.6.4 The potential receptors include:

1) Humans – current site occupants, construction workers, future site users and neighbouring site users.

2) Controlled Waters – surface water and groundwater resources

3) Plants – current and future site vegetation

4) Building materials

A4.6.5 The potential hazards to be considered in relation to contamination are:

a) Ingestion and inhalation.

b) Uptake of contaminants via cultivated vegetables.

c) Dermal contact

d) Phytotoxicity (the prevention or inhibition of plant growth)

e) Contamination of water resources

f) Chemical attack on building materials and services

g) Fire and explosion

A4.6.6 Dependent on the outcome of the initial, generic contamination risk assessment, further detailed assessment of the identified risks may be required.

A4.7 Generic Guidance Values Used Within Contamination Risk Assessment

Residential End Use with Homegrown Produce

Residential with Homegrown Produce	Determinant	Guidance Value (mg/kg) 1% SOM	Guidance Value (mg/kg) 2.5% SOM	Guidance Value (mg/kg) 6% SOM	Primary Data Source
PAH	Acenaphthene	210	510	1100	LQM/CIEH S4UL
	Acenaphthylene	170	420	920	LQM/CIEH S4UL
	Anthracene	2400	5400	11000	LQM/CIEH S4UL
	Benzo(a)anthracene	7.2	11	13	LQM/CIEH S4UL
	Benzo(a)pyrene	2.2	2.7	3	LQM/CIEH S4UL
	Benzo(b)fluoranthene	2.6	3.3	3.7	LQM/CIEH S4UL
	Benzo(ghi)perylene	320	340	350	LQM/CIEH S4UL
	Benzo(k)fluoranthene	77	93	100	LQM/CIEH S4UL
	Chrysene	15	22	27	LQM/CIEH S4UL
	Dibenzo(ah)anthracene	0.24	0.28	0.30	LQM/CIEH S4UL
	Fluoranthene	280	560	890	LQM/CIEH S4UL
	Fluorene	170	400	860	LQM/CIEH S4UL
	Indeno(123-cd)pyrene	27	36	41	LQM/CIEH S4UL
	Naphthalene	2.3f	5.6f	13f	LQM/CIEH S4UL
	Phenanthrene	95	220	440	LQM/CIEH S4UL
	Pyrene	620	1200	2000	LQM/CIEH S4UL
Other Organics	Phenol	280	550	1100	LQM/CIEH S4UL
Metals	Arsenic	37	37	37	LQM/CIEH S4UL
	Beryllium	1.7	1.7	1.7	LQM/CIEH S4UL
	Boron	290	290	290	LQM/CIEH S4UL
	Cadmium	11	11	11	LQM/CIEH S4UL
	Chromium (III)	910	910	910	LQM/CIEH S4UL
	Chromium (VI)	6	6	6	LQM/CIEH S4UL
	Copper	2400	2400	2400	LQM/CIEH S4UL
	Lead	200	200	200	EA C4SL
	Mercury	40	40	40	LQM/CIEH S4UL
	Nickel	180f	180	180	LQM/CIEH S4UL
	Selenium	250	250	250	LQM/CIEH S4UL
	Vanadium	410e	410	410	LQM/CIEH S4UL
	Zinc	3700	3700	3700	LQM/CIEH S4UL

d = Based on inhalation exposure compared with inhalation ID
e = Based on oral and dermal exposure with oral TDI
f = Based on comparison of exposure from all pathways with TDI oral

Residential with Homegrown Produce	Guidance Value (mg/kg)	Guidance Value (mg/kg)	Guidance Value (mg/kg)	Primary Data Source
	1% SOM	2.5% SOM	6% SOM	
Aliphatic				
EC 5-6	42	78	160	LQM/CIEH S4UL
EC >6-8	100	230	530	LQM/CIEH S4UL
EC >8-10	27	65	150	LQM/CIEH S4UL
EC >10-12	130 (48)	330 (118)	770 (283)	LQM/CIEH S4UL
EC >12-16	1100 (24)	2400 (59)	4400 (142)	LQM/CIEH S4UL
EC >16-35	65000 (8.48)	92000 (21)	110000	LQM/CIEH S4UL
EC >35-44	65000 (8.48)	92000 (21)	110000	LQM/CIEH S4UL
Aromatic				
EC 5-7 (benzene)	70	140	300	LQM/CIEH S4UL
EC >7-8 (toluene)	130	290	660	LQM/CIEH S4UL
EC >8-10	34	83	190	LQM/CIEH S4UL
EC >10-12	74	180	380	LQM/CIEH S4UL
EC >12-16	140	330	660	LQM/CIEH S4UL
EC >16-21	260f	540f	930f	LQM/CIEH S4UL
EC >21-35	1100f	1500f	1700f	LQM/CIEH S4UL
EC >35-44	1100f	1500f	1700f	LQM/CIEH S4UL
Aliphatic and Aromatic				
EC >44-70	1600f	1800f	1900f	LQM/CIEH S4UL
BTEX				
Benzene	0.087	0.17	0.37	LQM/CIEH S4UL
Toluene	130	290	660	LQM/CIEH S4UL
Ethylbenzene	47	110	260	LQM/CIEH S4UL
p Xylenes	56	130	310	LQM/CIEH S4UL
m Xylenes	59	140	320	LQM/CIEH S4UL
o Xylene	60	140	330	LQM/CIEH S4UL

SOM = Soil Organic Matter

Values in brackets indicate the solubility or vapour saturation limit where this is exceeded by the GAC