Main Investigation Report

at
Land at Glenham, Anyards Road, Cobham, Surrey KT11 2LH

for
Shanly Homes Ltd

Reference: 20737/MIR
June 2023

Control Document

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This is not a valid document for use in the design of the project unless it is titled Final in the document status box.

Current regulations and good practice were used in the preparation of this report. The recommendations given in this report must be reviewed by an appropriately qualified person at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

Commission

This document comprises the Main Investigation Report (MIR) and incorporates the results, discussion, and conclusions to this intrusive works. General site data is recorded below:

Commission Record	
Client	Shanly Homes Ltd
Site Name	Land at Glenham, Anyards Road, Cobham, Surrey KT11 2LH
Grid Reference	TQ 10799 60645
Soils Limited Quotation Ref	Q27527 Rev102 Dated 09/02/2023
Clients Purchase Order	Q27527 Rev102 Dated 09/02/2023

Note(s):

The record of revision to this document is presented below:

Record Of Revisions		
Revision	**Date**	**Reason**

Note(s): The latest revised document supersedes all previous revisions of the MIR produced by Soils Limited.

Documents associated with this development that must be referred to are given below.

Record Of Associated Documents			
Reference	**Type**	**Date**	**Creator**
20737/PIR	Preliminary Investigation Report	March 2023	Soils Limited

Note(s):

Limitations and Disclaimers

The report was prepared solely for the brief described in Section 1.1 of this report.

The contents, recommendations and advice given in the report are subject to the Terms and Conditions given in Soils Limited's Quotation

Soils Limited disclaims any responsibility to the Client and others in respect of any matters outside the scope of the above.

This report has been prepared by Soils Limited, with all reasonable skill, care and diligence within the terms of the Contract with the Client, incorporation of our General Conditions of Contract of Business and taking into account the resources devoted to us by agreement with the Client.

The report is personal and confidential to the Client and Soils Limited accept no responsibility of whatever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report wholly at its own risk.

The Client may not assign the benefit of the report or any part to any third party without the written consent of Soils Limited.

The ground is a product of continuing natural and artificial processes. As a result, the ground will exhibit a variety of characteristics that vary from place to place across a site, and also with time. Whilst a ground investigation will mitigate to a greater or lesser degree against the resulting risk from variation, the risks cannot be eliminated.

The investigation, interpretations, and recommendations given in this report were prepared for the sole benefit of the Client in accordance with their brief. As such these do not necessarily address all aspects of ground behaviour at the site.

Current regulations and good practice were used in the preparation of this report. An appropriately qualified person must review the recommendations given in this report at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

If the term "competent person" is used in this report or any Soils Limited document, it means an engineering geologist or civil engineer with a minimum of three years post graduate experience in the understanding and application of the appropriate codes of practice.

Unless the site investigation works have been designed and specified in accordance with EC7, this report is a Geotechnical Investigation Report and is not necessarily a Ground Investigation Report as defined by EC7 (Eurocode 7 Part 1, §3.4, Part 2, §6.1) or a Geotechnical Design Report (Eurocode 7 Part 1, §2.8) as defined by Eurocode 7 and as such may not characterise the ground conditions and additional works may be required to comply with the requirements of EC7.

Within the report reference to ground level relates to the site level at the time of the investigation, unless otherwise stated.

Exploratory hole is a generic term used to describe a method of direct investigation. The term trial pit, borehole or window sample borehole implies the specific technique used to produce an exploratory hole.

The depth to roots and/or of desiccation may vary from that found during the investigation. The Client is responsible for establishing the depth to roots and/or of desiccation on a plot by plot basis prior to the construction of foundations. Supplied site surveys may not include substantial shrubs or bushes and is also unlikely to have data or any trees, bushes or shrubs removed prior to or following the site survey.

Where trees are mentioned in the text this means existing trees, substantial bushes or shrubs, recently removed trees (approximately 20 years to full recovery on cohesive soils) and those planned as part of the site landscaping).

The geotechnical laboratory testing was performed by GEO Site & Testing Services Ltd (GSTL) in accordance with the methods given in BS 1377:1990 Parts 1 to 8 and their UKAS accredited test methods.

For the preparation of this report, the relevant BS code of practice were adopted for the geotechnical laboratory testing technical specifications, in the absence of the relevant Eurocode specifications (ref: ISO TS 17892).

The chemical analyses were undertaken by Derwentside Environmental Testing Services (DETS) in accordance with their UKAS and MCERTS accredited test methods or their documented in-house testing procedures. This investigation did not comprise an environmental audit of the site or its environs.

Ownership of land brings with it onerous legal liabilities in respect of harm to the environment. “Contaminated Land” is defined in Section 57 of the Environment Act 1995 (as updated 2021) as:

“Land which is in such a condition by reason of substances in, on or under the land that significant harm is being caused or that there is a significant possibility of such harm being caused or that pollution of controlled waters is being, or is likely to be caused”.

It must be noted that a detailed survey of the possible presence or absence of invasive species, such as Japanese Knotweed, is outside of the scope of investigation.

Deleterious materials may be present in any Made Ground that pose a potential risk to site workers, end users and adjacent vulnerable receptors. These could include a range of contaminants, including asbestos, especially if the material includes large fractions of demolition derived materials.

The investigation, analysis or recommendations in respect of contamination are made solely in respect of the prevention of harm to vulnerable receptors, using where possible

best practice at the date of preparation of the report. The investigation and report do not address, define or make recommendations in respect of environmental liabilities. A separate environmental audit and liaison with statutory authorities is required to address these issues.

All environmental works are undertaken in the context of, and in compliance with, BS10175+A2 2017 and LCRM (EA 2021) and all other pertinent planning, standards, documentation and guidance appropriate to the site at the time of production which may include, but are not necessarily limited to, documents provided by BS/CEN/ISO, NHBC, AGS, CIEH, CIRIA, SoBRA and CLAIRE.

Contents

List of Figures

List of Tables

List of Appendices

Section 1 Introduction

1.1 Objective of Investigation

The Client commissioned Soils Limited to undertake an intrusive ground investigation and to prepare a Main Investigation Report to supply the Client and their designers with information regarding ground conditions, to assist in preparing a foundation scheme for development that was appropriate to the settings present on the site.

The investigation was to be undertaken to provide comment on appropriate foundation options for the proposed development. The investigation was to be made by means of in-situ testing and geotechnical laboratory testing undertaken on soil samples taken from the exploratory holes.

Soil and groundwater samples were to be taken for chemical laboratory testing to enable recommendations for the safe redevelopment of the site and the protection of site workers, end-users and the public from any contamination identified as dictated by the Conceptual Site Model (CSM) in the Preliminary Investigation Report undertaken for the site by Soils Limited (20737/PIR, March 2023) and/or the Revised Conceptual Site Model presented in Appendix D.1.

1.2 Site Description

At the time Soils Limited visited the site (February 2023), the site comprised private garages and a single storey detached dwelling. The undeveloped areas of the site covering was variable and mainly comprised concrete, tarmac, turf and gravel. Vegetation was limited to grass, former garden areas and remains of former mature trees. The onsite topography was flat, with a <1° dip observed to the west. The wider area gently sloped downwards to the west with a slope angle of <3°. The property was bounded to the west by the terraced houses at 132 – 158 Anyards Road, to the south by the terraced houses at 35 – 51 Copse Road, to the east by the terraced and semi-detached houses at 3 – 23 Copse Road and to the north by the semi-detached houses at 100 – 134 Portsmouth Road.

The site location plan is given in Figure 1. An aerial photograph of the site and its close environs has been included in Figure 2.

1.3 Proposed Development

The feasibility proposal indicated the demolition of the existing structures and the erection or redevelopment of the commercial property to the northwest as commercial ground floor and flats (Plots 21-28), a block of flats (Plots 17-20), terraced housing or flats (Plots 1-8) and 4 semi-detached houses (Plots 9-16). Most plots appear to have either private gardens or open spaces, hardstanding access and parking spaces.

In compiling this report reliance was placed on drawing number AR/Feas/111, dated 1st February 2023 and prepared by Shanly Homes. The recommendations provided within this report are made exclusively in relation to the scheme outlined above, and must not

be applied to any other scheme without further consultation with Soils Limited. Soils Limited must be notified about any change or deviation from the scheme outlined.

Development plans provided by the Client are presented in Appendix G.

1.4 Anticipated Geology

The 1:50,000 BGS map showed the site to be located directly upon the bedrock Bagshot Formation which overlies the London Clay Formation, with overlying superficial deposits of Taplow Gravel Member.

1.4.1 Taplow Gravel Member

The rivers of the south-east of England, including the River Thames and its tributaries, have been subject to at least three changes of level since Pleistocene times. One result has been the formation of a complex series of River Terrace Gravels. These terraces represent ancient floodplain deposits that became isolated as the river cut downwards to lower levels. The Taplow Gravel Formation is found at an elevation that approximates to the present floodplain gravel.

1.4.2 Bagshot Formation

Bagshot Formation comprises mainly fine grained yellow, pink and brown sand with ferruginous concretions. Beds of grey clay "pipe clay" occur frequently as do beds of black flint gravel.

1.4.3 London Clay Formation

The London Clay Formation comprises stiff grey fissured clay, weathering to brown near surface. Concretions of argillaceous limestone in nodular form (Claystones) occur throughout the formation. Crystals of gypsum (Selenite) are often found within the weathered part of the London Clay, and precautions against sulphate attack to concrete are sometimes required.

The upper boundary member of the London Clay Formation is known as the Claygate Member and marks the transition between the deep water, predominantly clay environment and succeeding shallow-water, sand environment of the Bagshot Formation.

The lower boundary is generally marked by a thin bed of well-rounded flint gravel and/or a glauconitic horizon. The formation overlies the Harwich Formation or where the Harwich Formation is absent the Lambeth Group.

Section 2 Site Works

2.1 Proposed Project Works

The proposed intrusive investigation was designed to provide information on the ground conditions and to aid the design of foundations for the proposed residential development. The intended investigation, as outlined within the Soils Limited quotation (Q27527 Rev102, dated 9th February 2023), was to comprise the following items:

- Service clearance of the proposed locations via CAT scanning
- 8No. windowless sampler boreholes and dynamic probes, maximum 5.00m deep
- 3No. gas and groundwater monitoring wells
- 3No. gas and groundwater monitoring visits
- CBR testing using the TRL DCP
- 2No. infiltration tests compliant to BRE365:2016
- Geotechnical laboratory testing
- Contamination laboratory testing including 2No. WAC tests.

2.1.1 Actual Project Works

The actual project works were undertaken between 27th February and 3rd March 2023, with subsequent sample logging, laboratory testing, monitoring, and reporting. The actual works comprised:

- Service clearance of the proposed locations via CAT scanning
- 8No. windowless sampler boreholes, 3.70m to 5.40m deep
- 8No. dynamic probes, 6.00m deep
- 3No. gas and groundwater monitoring wells, 2.70m o 5.00m deep
- 9No. CBR tests using the TRL DCP, 0.42m to 0.93m deep
- 2No. infiltration tests compliant to BRE365:2016
- 1No. percolation test
- Geotechnical laboratory testing
- Contamination laboratory testing including 2No. WAC tests.

Three windowless sampler boreholes (WS1, WS4 and WS6) were backfilled with gravel and bentonite following the installation of monitoring wells. The remaining five boreholes (WS2, WS3, WS5, WS7 and WS8) were backfilled with gravel.

Two machine excavated trial pits for the undertaking of infiltration tests (TPSK1 and TPSK2) and one hand excavated trial pit (Perc1) for the development of a percolation test were backfilled with arisings

All exploratory hole locations have been presented in Figure 3.

Following completion of site works, soil cores were logged and sub sampled so that samples could be sent to the laboratory for both contamination and geotechnical testing.

2.2 Ground Conditions

On 27th February 2023 eight windowless sampler boreholes (WS1 – WS8) were drilled, using a Premier 110 Compact drilling rig, to depths ranging between 3.70m (WS3) and 5.40m (WS6) below ground level (bgl) at locations selected by Soils Limited using a development plan provided by the Client.

One standpipe per hole was installed within window sample borehole locations (WS1, WS4 and WS6) to allow for continued monitoring of both groundwater and ground gas, where present.

Eight super heavy dynamic probes, (DP1 – DP8) were driven prior and adjacent to their corresponding windowless sampler borehole to a depth of 6.00m bgl.

Two trial pits (TPSK1 and TPSK2) were machine excavated between 2nd and 3rd March 2023 to depths of 1.50m (TPSK2) and 1.80m bgl (TPSK1). One trial pit (Perc1) was hand excavated to a depth of 0.80m bgl on 2nd March 2023.

Nine DCP tests (DCP1-DCP5 and DCP7-DCP10) were also conducted across the site to depths of up to 1.00m bgl.

The maximum depths of exploratory holes have been included in Table 2.1.

Table 2.1 Final Depth of Exploratory Holes

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
WS1[w]	3.80	DP5	6.00
WS2	5.00	DP6	6.00
WS3	3.70	DP7	6.00
WS4[w]	5.00	DP8	6.00
WS5	5.00	DCP1	0.928
WS6[w]	5.40	DCP2	0.875
WS7	4.80	DCP3	0.425
WS8	4.50	DCP4	0.875
TPSK1	1.80	DCP5	0.875
TPSK2	1.50	DCP7	0.875
Perc1	0.80	DCP8	0.875
DP1	6.00	DCP9	0.928
DP2	6.00	DCP10	0.928
DP3	6.00	DCP9	0.928
DP4	6.00		
Notes:			

The approximate exploratory hole locations are shown on Figure 3.

All exploratory holes were scanned with a Cable Avoidance Tool (C.A.T.) and GENNY prior to excavation to ensure the health and safety of the operatives.

The soil conditions encountered were recorded and soil sampling commensurate with the purposes of the investigation was carried out. The depths given on the exploratory hole logs and quoted in this report were measured from ground level.

The soils encountered from immediately below ground surface have been described in the following manner. Where the soil incorporated an organic content such as either decomposing leaf litter or roots or has been identified as part of the in-situ weathering profile, it has been described as Topsoil both on the logs and within this report. Where man has clearly either placed the soil, or the composition altered, with say greater than an estimated 5% of a non-natural constituent, it has been referred to as Made Ground both on the log and within this report.

For more complete information about the soils encountered within the general area of the site reference must be made to the detailed records given within Appendix B, but for the purposes of discussion, the succession of conditions encountered in the exploratory holes in descending order can be summarised as:

Made Ground (MG)
Taplow Gravel Member (TPGR) – Not encountered
Bagshot Formation (BGS)
London Clay Formation (LCF)

The ground conditions encountered in the exploratory holes are summarised in Table 2.2.

Table 2.2 Ground Conditions

Strata	Depth Encountered (m bgl)		Typical Thickness (m)	Typical Description
	Top	Bottom		
MG	GL	0.30 – 0.80	0.50	Soft, dark brown mottled black, slightly gravelly, slightly sandy CLAY overlain by tarmac/construction gravel and multicoloured sandy GRAVEL to the west of the site. Gravel was flint, brick, concrete, clinker, tarmac, glass, ash and charcoal.
BGS	0.30 – 0.80	3.70[1] – 5.00	4.20	Soft, yellowish brown, orangish brown, greenish grey and light grey mottled, sandy CLAY over clayey SAND, gravelly SAND and sandy GRAVEL horizons.
LCF	4.20 – 5.00	5.00[1] – 6.00[13]	Not proven[2]	Soft to firm, grey sandy CLAY.

Note(s): [1] Final depth of exploratory hole. [2] Base of strata not encountered. [3] Inferred from dynamic probing. The depths given in this table are taken from the ground level on-site at the time of investigation.

2.3 Ground Conditions Encountered in Exploratory Holes

The ground conditions encountered in exploratory holes have been described below in descending order. The engineering logs are presented in Appendix B.1.

2.3.1 Made Ground

Soils described as Made Ground were encountered in ten out of the eleven exploratory holes (WS1 – WS6, WS8, TPSK1, TPSK2 and Perc1) from ground level to depths ranging between 0.30m (WS1, WS6 and TPSK2) and 0.80m bgl (WS3). Suspect Made Ground, probably representing reworked soil due to the similarities with the materials observed in the adjacent trial holes, was encountered in one out of the ten exploratory holes (WS7).

The Made Ground comprised soft, dark brown mottled black, slightly gravelly, slightly sandy CLAY overlain by tarmac/construction gravel and multicoloured sandy GRAVEL to the west of the site. Sand was fine to coarse and included rare brick fragments. Gravel was fine to coarse, sub-angular to angular, locally sub-rounded, flint, brick, concrete, clinker, tarmac, glass, ash and charcoal. Occasional brick cobbles.

The established depth of Made Ground found at each exploratory hole location have been included in Table 2.3.

Table 2.3 Established Depth of Made Ground

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
WS1	0.30	TPSK1	0.50
WS2	0.70	TPSK2	0.30
WS3	0.80	Perc1	0.40
WS4	0.60	-	-
WS5	0.40	-	-
WS6	0.30	-	-
WS7	0.50[2]	-	-
WS8	0.50	-	-

Note(s): [1] Final depth of exploratory hole. [2] Suspected Made Ground.

2.3.2 Bagshot Formation

Soils described as Bagshot Formation were encountered each of the eleven exploratory holes (WS1 – WS8, TPSK1, TPSK2 and Perc1) from directly below the Made Ground to depths ranging between 1.50m (the final depth of TPSK2) and 5.00m bgl (WS6 and the final depth of WS2 and WS4). The presence of the soils of the Bagshot Formation was also inferred from the results of dynamic probing to depths ranging between 4.20m (WS8) and 5.00m bgl (WS2, WS4 and WS6).

The Bagshot Formation typically comprised soft, yellowish brown, orangish brown, greenish grey and light grey mottled, sandy CLAY over clayey SAND, gravelly SAND and sandy GRAVEL horizons. Sand was fine to coarse. Gravel was fine to coarse, sub-rounded to sub-angular, medium flint.

The established depth of Bagshot Formation found at each exploratory hole location have been included in Table 2.4.

Table 2.4 Established Depth of Bagshot Formation

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
WS1/DP1	3.80[1]/4.90	TPSK1	1.80[1]
WS2/DP2	5.00[1]/5.00	TPSK2	1.50[1]
WS3/DP3	3.70[1]/4.50	Perc1	0.80[1]
WS4/DP4	5.00[1]/5.00	-	-
WS5/DP5	4.60/4.60	-	-
WS6/DP6	5.00/5.00	-	-
WS7/DP7	4.50/4.50	-	-
WS8/DP8	4.20/4.20	-	-

Note(s): [1] Final depth of exploratory hole. [2] Inferred from the results of dynamic probing.

2.3.3 London Clay Formation

Soils described as London Clay Formation were encountered in four out of the ten exploratory holes (WS5 – WS8) from directly below the Bagshot Formation to the final investigated depths ranging between 4.50m (WS8) and 5.40m bgl (WS6). The presence of the soils of the London Clay Formation was also inferred from the results of dynamic probing to the final investigated depth of 6.00m bgl.

The London Clay Formation typically comprised soft to firm, grey sandy CLAY. Sand was fine to medium.

The established depth of London Clay Formation found at each exploratory hole location have been included in Table 2.5.

Table 2.5 Established Depth of London Clay Formation

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
WS1/DP1	-/6.00[1]	TPSK1	Not encountered
WS2/DP2	-/6.00[1]	TPSK2	Not encountered
WS3/DP3	-/6.00[1]	Perc1	Not encountered
WS4/DP4	-/6.00[1]	-	-
WS5/DP5	5.00[1]/6.00[1]	-	-
WS6/DP6	5.40[1]/6.00[1]	-	-
WS7/DP7	4.80[1]/6.00[1]	-	-
WS8/DP8	4.50[1]/6.00[1]	-	-

Note(s): [1] Final depth of exploratory hole. [2] Inferred from the results of dynamic probing.

2.4 Roots

Roots were encountered in nine out of the eleven exploratory holes at depths ranging between 0.80m (WS3 and Perc1) and 1.50m bgl (TPSK2). The established depth of root penetration found at the exploratory hole locations has been included in Table 2.6.

Table 2.6 Established Depth of Root Penetration

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
W S1	Not encountered	TPSK1	Not encountered
WS2	1.20	TPSK2	1.50
WS3	0.80	Perc1	0.80[1]
WS4	1.00	-	-
WS5	1.20	-	-
WS6	1.00	-	-
WS7	1.00	-	-
WS8	1.00	-	-

Note: [1] Final depth of exploratory hole

Roots may be found to greater depth at other locations on the site particularly close to trees and/or trees that have been removed both within the site and its close environs.

It must be emphasised that the probability of determining the maximum depth of roots from a narrow diameter borehole is low. A direct observation such as from within a trial pit is necessary to gain a better indication of the maximum root depth.

2.5 Groundwater

Groundwater was encountered within nine of the ten exploratory holes (WS1 – WS8, TPSK1 and TPSK2) at depths ranging between 1.40m and 2.00m bgl during the drilling works and at depths between 0.32m and 1.42m bgl during the groundwater monitoring.

Changes in groundwater level occur for a number of reasons including seasonal effects and variations in drainage, tidal effects. The investigation was conducted in February and April (2023), when groundwater levels should be approaching their annual maximum (highest) elevation, which typically occurs around March.

Further groundwater monitoring was conducted within the standpipes installed on site following completion of site works. Groundwater monitoring was complete, and the results have been presented in Table 2.7.

The groundwater details as encountered during the site works and monitoring to date are presented in Table 2.7.

Table 2.7 Groundwater Record

Trial Hole	Well Depth (m bgl)	Depth to Water (m bgl)			
		8/03/2023	13.03.23	14.03.23	04.04.23
W S1	2.80	1.80[12]	1.42	0.57	0.51
WS 4	5.00	2.00[1]/1.40[2]	1.25	0.95	0.60
WS 6	5.00	2.00[1]/1.40[2]	0.99	0.70	0.32
WS2	None	2.00[1]/1.40[2]		No installation	
WS3	None	1.90[1]/1.50[2]		No installation	

Trial Hole	Well Depth (m bgl)	Depth to Water (m bgl)			
		8/03/2023	13.03.23	14.03.23	04.04.23
WS5	None	1.80[1]/1.40[2]		No installation	
WS6	None	2.00[1]/1.40[2]		No installation	
WS7	None	2.00[1]/1.40[2]		No installation	
WS8	None	2.00[1]/1.80[2]		No installation	
TPSK1	None	1.80[3]		No installation	
TPSK2	None	Dry at 1.50		No installation	
Perc1	None	Dry at 0.80		No installation	

Note: [1] Groundwater strike. [2] Groundwater level after 20/30mins of ceased drilling. Groundwater level observed.

Groundwater equilibrium conditions may only be conclusively established, if a series of observations are made via groundwater monitoring wells.

Section 3 Geotechnical In-Situ and Laboratory Testing

3.1 Dynamic Probe Tests

The results were converted to equivalent SPT "N60" values based on dynamic energy using commercial computer software (Geostru). The results were then interpreted based on the classifications outlined in Appendix C.1,Table C.1.1 to **Error! Reference source not found.**.

Table 3.1 SPT Hammer Efficiency

Rig Reference	Energy Ratio Er (%)
Premier 1 (110-60)	90.25
Premier 3 (110-105)	87.45

Table 3.2 Inferred SPT Interpretation

Strata	Inferred N60 Range	Cohesive Soils Classification	Inferred Cohesion
Bagshot Formation	0 – 17	Extremely low to medium	<10 – 85
London Clay Formation	8 – 29	Medium to high	40 – 145
Strata	**Inferred N60 Range**	**Granular Soils Classification**	**Relative Density**
Bagshot Formation	0 - >50		Very loose to very dense

Note(s): SPT "N60" values presented have been corrected in accordance with BS EN 22476 Part 3

A full interpretation of the DPSH tests, are outlined in Appendix C.2, Table C.2.1.

3.2 Dynamic Cone Penetrometer Tests

The Transport Research Laboratory (TRL), Dynamic Cone Penetrometer (DCP) was undertaken at nine locations (DCP1 – DCP5, DCP7 – DCP10). The results were interpreted based on the classification outlined in Appendix C.1.

The results from DCP testing indicated CBR values of between 3% and 104% for the soils encountered in the top 0.425m – 0.928m bgl. The high CBR values encountered were anticipated to be large gravel clasts or Made Ground inclusions struck during the test.

The DCP results are presented in Appendix C.3.

3.3 Infiltration Tests

Infiltration testing was undertaken in TPSK1 and TPSK2 within the Bagshot Formation following the principles of BRE Digest 365 Soakaway design: 1991

A single test was carried in TPSK1 and TPSK2 due to insufficient infiltration within the test time to permit three test cycles as required by the Code.

3.4 Percolation Tests

One percolation test was undertaken within Perc1. No results can be provided due to insufficient infiltration.

3.5 Atterberg Limit Tests

Atterberg Limit tests were performed on nine samples, eight obtained from the Bagshot Formation and the remaining one from the London Clay Formation. The results were classified in accordance with BRE Digest 240 and NHBC Standards Chapter 4.2.

Table 3.2 Atterberg Limit Results Classification

Strata	Depth (m bgl)	Classification	
		NHBC	BRE 240
BGS	0.50	Medium	Medium
	1.60	Medium	Medium
	1.50	Medium	Medium
	0.60	Medium	Medium
	0.50	Medium	Medium
	0.80	Medium	Medium
	0.90	Medium	Medium
	0.50	Medium	Medium
LCF	4.60	Medium	Medium

A full interpretation of the Atterberg Limit tests, are outlined in Table C.2.2, Appendix C.2 and the laboratory report in Appendix C.3.

3.6 Particle Size Distribution Tests

Particle Size Distribution (PSD) tests were performed on four samples from the Bagshot Formation.

Table 3.2 Particle Size Distribution Classification

Strata	Depth (m bgl)	Classification	
		NHBC	BRE 240
BGS	1.20-1.40	Yes	No
	2.40-3.40	No	No
	1.70-2.00	No	No
	3.20-3.70	No	No

Note that a cohesive soil is only classified as having a volume change potential if it is also plastic and an Atterberg Limit test can be conducted on the strata.

A full interpretation of the PSD tests, are outlined in Table C.2.3, Appendix C.2 and the laboratory report in Appendix C.3.

3.7 Sulphate and pH Tests

Water soluble sulphate (2:1) and pH testing in accordance with Building Research Establishment Special Digest 1, 2005, 'Concrete in Aggressive Ground'.

Table 3.2 Sulphate and pH Test Results

Strata	Depth (m bgl)	Sulphate Concentration (mg/l)	pH
MG	0.20 -0.40	307	8.5
	0.20	12	6.0
BGS	0.90	<10	7.1
	1.90	<10	7.2
	1.40	15	7.0
	3.50	<10	6.9
	2.20	10	6.5
	1.20	58	5.2
	2.00	14	8.2
LCF	4.30	94	7.4

The significance of the sulphate and pH Test results are discussed in Section 5.2 and the laboratory report in Appendix C.3.

Section 4 Engineering Appraisal

4.1 Established Ground Conditions

An engineering appraisal of the soil types encountered during the site investigation and likely to be encountered during the redevelopment of this site is presented. Soil descriptions are based on analysis of disturbed samples taken from the exploratory holes.

4.1.1 Made Ground and Topsoil

Foundations must not be placed on non-engineered fill unless such use can be justified on the basis of a thorough ground investigation and detailed design. Foundations must be taken through any Topsoil and/or Made Ground and either into, or onto a suitable underlying natural stratum of adequate bearing characteristics.

Soils described as Made Ground were encountered in ten out of the eleven exploratory holes (WS1 – WS6, WS8, TPSK1, TPSK2 and Perc1) from ground level to depths ranging between 0.30m (WS1, WS6 and TPSK2) and 0.80m bgl (WS3). Suspect Made Ground, probably representing reworked soil due to the similarities with the materials observed in the adjacent trial holes, was encountered in one out of the ten exploratory holes (WS7).

4.1.2 Bagshot Formation

Soils described as Bagshot Formation were encountered each of the eleven exploratory holes (WS1 – WS8, TPSK1, TPSK2 and Perc1) from directly below the Made Ground to depths ranging between 1.50m (the final depth of TPSK2) and 5.00m bgl (WS6 and the final depth of WS2 and WS4). The presence of the soils of the Bagshot Formation was also inferred from the results of dynamic probing to depths ranging between 4.20m (WS8) and 5.00m bgl (WS2, WS4 and WS6).

Soils of the Bagshot Formation are predominantly granular soils and as such are expected to display moderate bearing capacities with moderate settlement characteristics. It is recommended to avoid setting the foundations within the cohesive lenses of the Bagshot Formation encountered below the Made Ground. The granular soils of the Bagshot Formation were considered as a suitable foundation layer for the proposed development.

4.1.3 London Clay Formation

Soils described as London Clay Formation were encountered in four out of the ten exploratory holes (WS5 – WS8) from directly below the Bagshot Formation to the final investigated depths ranging between 4.50m (WS8) and 5.40m bgl (WS6). The presence of the soils of the London Clay Formation was also inferred from the results of dynamic probing to the final investigated depth of 6.00m bgl.

Soils of the London Clay Formation are overconsolidated, predominantly cohesive soils and as such are expected to display moderate bearing capacities with moderate settlement characteristics at this specific site. The soils of the London Clay Formation were considered as a suitable foundation layer for the proposed development in the case

of the adoption of piled foundations.

4.1.4 Guidance on Shrinkable Soils

The ground conditions were established as Bagshot Formation, with a typical thickness of 4.20m, overlying the London Clay Formation.

The volume change potential for each strata was established and presented in Table 4.1.

Table 4.1 Established Volume Change Potential by Strata

Strata	Volume Change Potential		Established Lower Boundary (m bgl)
	BRE	NHBC	
BGS	Medium	Medium	4.20
LCF	Medium	Medium	Not determined

The overall volume change potential of the soils of the Bagshot Formation was recorded as medium with reference to the tests undertaken on samples from the cohesive beds. Although no volume change potential can be considered for the granular soils of the Bagshot Formation, the presence of cohesive layers or lenses within the predominantly granular matrix cannot be excluded.

4.1.5 Groundwater

Groundwater was encountered within nine of the ten exploratory holes (WS1 – WS8, TPSK1 and TPSK2) at depths ranging between 1.40m and 2.00m bgl during the drilling works and at depths between 0.32m and 1.42m bgl during the groundwater monitoring.

The high groundwater table encountered on this site could impact on the foundation options.

Section 5 Foundation Scheme

5.1 Foundation Recommendations

Foundations **must not** be constructed within any Made Ground/Topsoil and cohesive beds of the Bagshot Formation due to the likely variability and potential for large load induced settlements both total and differential.

Roots were encountered in eight out of the ten exploratory holes at depths ranging between 0.80m (WS3) and 1.50m bgl (TPSK2). If roots are encountered during the construction phase foundations **must not be placed within any live root penetrated** or desiccated **cohesive soils or those with a volume change potential**. Should the foundation excavations reveal such materials, the excavations **must** be extended to greater depth in order to bypass these unsuitable soils. Excavations must be checked by a suitable person prior to concrete being poured.

Considering the type of development, a shallow foundation solution set within the granular soils of the Bagshot Formation was considered the suitable.

Although shallow foundation can be considered suitable for the proposed development albeit without potentially constructional challenges given the given the high groundwater table and the likely rapid nature of flows within the granular horizons.

The proposed development was likely to be both light and brittle. It is therefore considered that foundation design is undertaken using NHBC Standards Chapter 4.2.

5.1.1 Shallow Foundations into the Bagshot Formation

Based on a 5.00 by 0.75m strip foundation and a 1.00 by 1.00m pad footing, using commercial software Table 5.1 and Table 5.2 show the calculated bearing values and anticipated settlement characteristics respectively within the western and eastern portions of the site. The maximum encountered depth of Made Ground and of the underlying unsuitable cohesive soils of the Bagshot Formation was 1.70m bgl to the west and 1.00m bgl to the east of the site. Bearing capacities were calculated below these depths.

Given the groundwater levels on the site the shallowest being 0.32m bgl and likely to have rapid inflow be within the granular horizons, consideration must be given to piled foundation solution.

If foundations are to be constructed in the summer months then the groundwater level may be sufficiently lower to permit the construction of shallow (strip, deep strip) foundations.

Table 5.1 Allowable Bearing Capacities in the Bagshot Formation (West of the Site)

Depth (m bgl)	Size (m)	Bearing Capacity (kPa)	Anticipated Settlement (mm)
1.70	5.00 x 0.75	130	20
2.00		160	20
2.50		180	25
1.70	1.00 x 1.00	140	20
2.00		170	20
2.50		190	20

Note(s): The above values are applicable to the area of WS1, WS2 and WS3. Further investigation must be undertaken along the proposed footprint to ensure no unsuitable soil was underlying the foundation.

Given the groundwater levels on the site the shallowest being 0.32m bgl and likely to have rapid inflow be within the granular horizons, consideration must be given to piled foundation solution.

If foundations are to be constructed in the summer months then the groundwater level may be sufficiently lower to permit the construction of shallow (strip, deep strip) foundations.

Table 5.2 Allowable Bearing Capacities in the Bagshot Formation (East of the Site)

Depth (m bgl)	Size (m)	Bearing Capacity (kPa)	Anticipated Settlement (mm)
1.00	5.00 x 0.75	90	20
1.50		110	20
2.00		150	20
2.50		170	20
1.00	1.00 x 1.00	100	20
1.50		120	20
2.00		150	20
2.50		170	20

Note(s): The above values are applicable to the area of WS4, WS5, WS6, WS7 and WS8. Further investigation must be undertaken along the proposed footprint to ensure no unsuitable soil was underlying the foundation.

All foundation formations must be examined, recorded, and signed off by a competent person.

The use of reinforced trench fill foundations reduces the potential for differential settlement affecting the foundations.

For the allowable bearing value given above, settlements should not exceed the presented values, provided that excavation bases are carefully bottomed out and blinded or concreted as soon after excavation as possible and kept dry.

Foundations must not be constructed over former structures and other hard spots. The foundations design must be suitable for the conditions present at the site.

Isolated pad foundations must be kept at least 1.5 times the width of the largest adjacent

pad apart (face to adjacent face) to ensure that their vertical stress “bowls” do not interact. Failure to do so may result in additional settlements.

The anticipated settlement includes both elastic settlement and long-term drained settlement (in the case of cohesive soils).

Anticipated settlements may be taken as proportional to the bearing capacity adopted (for the same configuration of foundation), therefore if the bearing value is halved the anticipated settlement will halve.

All loose material, soft spots and Made Ground must be removed from the base of the excavations. Failure to do so could results in increased settlements.

It has been assumed that the foundations to any existing structures have been grubbed out. Where foundations have been grubbed out the new foundation must be taken through any backfill material into suitable natural ground as outlined in this report.

Piled foundation solution can be considered given the potentially constructional challenges associated with strips foundations and the like.

5.1.2 Pile Foundations

If adopted, the piled foundations should be taken through any Topsoil, Topsoil/Made Ground or Made Ground, Taplow Gravel Formation, and disturbed and/or desiccated ground, below any roots and into the soils of the Bagshot Formation and/or the London Clay Formation.

The construction of a piled foundation is a specialist job, and the advice of a reputable contractor, familiar with the type of ground and groundwater conditions encountered on this site, should be sought prior to finalising the foundation design, as the actual pile working load will depend on the particular type of pile and method of installation.

Should piled foundation solution be adopted then cable percussive boreholes would be required to be drilled to enable testing and sampling at greater depth to obtain parameters aid the design.

5.1.3 Ground Floor Slab

NHBC Standards 2023 states ground floors should be constructed as suspended floors where:

> *“the foundation depth dictated by the NHBC Standards 2023, Chapter 4.2.10 would exceed 1.5m bgl;”*
>
> *“ground floor construction is undertaken when the surface soils are seasonally desiccated;”*
>
> *“the depth of fill exceeds 600mm;”*
>
> *“there is shrinkable soil that could be subject to movement, expansive material or other unstable soils;”*
>
> *“the ground has been subject to vibratory improvement;” or*

"ground or fill is not suitable to support ground-bearing slabs."

The use of suspended floor slabs is recommended within the western portion of the site, where the minimum recommended foundation depth exceeded 1.50m bgl.

In the eastern portion of the site the observed thickness of the Made Ground did not exceed 0.60m bgl. However, there was clay horizon underlying the Made Ground with roots and the former trees, which would dictate the adoption of suspended floor slabs.

Based on the above, suspended floor slabs must be adopted for the entire site.

5.2 Subsurface Concrete

The sulphate and pH tests carried out in accordance with BRE Special Digest 1, 2005, 'Concrete in Aggressive Ground', established the site concrete classifications for each stratum as presented in Table 5.3.

Table 5.3 Concrete Classification

Stratum	Design Sulphate Class	ACEC Class
MG	DS-1	AC-1
BGS	DS-1	AC-3z
LC	DS-1	AC-1

Concrete to be placed in contact with soil or groundwater must be designed in accordance with the recommendations of Building Research Establishment Special Digest 1 2005, *'Concrete in Aggressive Ground'* taking into account any possible exposure of potentially pyrite bearing natural ground and the pH of the soils.

5.3 Excavations

Shallow excavations in the Made Ground/Topsoil and Bagshot Formation are likely to be marginally stable in the short term at best especially with shallow groundwater being found within the site .

Deeper excavations taken into the Bagshot Formation and London Clay Formation are likely to be unstable and require support. Unsupported earth faces formed during excavation may be liable to collapse without warning and suitable safety precautions must therefore be taken to ensure that such earth faces are adequately supported or battered back to a safe angle of repose.

Excavations beneath the groundwater table would be unstable and dewatering of foundation trenches would be necessary. The groundwater table has been found to be high on this site and the flow will be rapid within the granular horizons.

Section 6 Pavements

6.1 Pavements

The Transport Research Laboratory (TRL) Dynamic Cone Penetrometer (DCP) was undertaken at nine locations onsite (DCP1 – DCP5. DCP7 – DCP10). The results from dynamic cone penetrometer tests indicated **CBR values of between 3% and 104%** for the soils encountered in the top 0.425m – 0.928m bgl. The high CBR values encountered were anticipated to be large gravel clasts struck during the test.

When removing 700mm of either Made Ground or Bagshot Formation the worst case CBR value was 7% which was considered suitable for design purposes for the majority of the road layout. During the interpretation the areas of DCP4, DCP5 and DCP7 were highlighted as potentially problematic with CBR values of 4% persisting to 0.875mm.

As CBR values were highly variable due to changes in moisture content and ground conditions, **in-situ testing must be undertaken** immediately prior to the installation of pavements/roads. Any soft spots at formation level, as identified in the areas around DCP4, DCP5 and DCP7, must be dug out and replaced with a suitably compacted granular fill. Prior to construction the formation level must be proof rolled.

The shallow cohesive soils of the Bagshot Formation were regarded as non-frost-susceptible as their plasticity index was >20%.

The overall thickness of the pavement will be dictated by the frost susceptibly of the sub-grade.

Section 7 Site Drainage

7.1 Soakaways

The results of in-situ infiltration and percolation tests showed poor infiltration rates within the soils of the Bagshot Formation in the top 0.80m – 1.80m bgl. These indicate the Bagshot Formation to be of poor drainage characteristics.

It is recommended that the results of the in-situ permeability testing are passed to a drainage engineer for commentary and design.

Section 8 Determination of Chemical Analysis

8.1 Site Characterisation and Revised Conceptual Site Model

The Preliminary Investigation Report undertaken by Soils Limited (report ref: 20737/PIR, March 2023) identified a low to very low risk of ground contamination in general except from the Asbestos noted in the garage areas (and possibly in other structures) to which a high risk had been assigned and regarding which specialist advice should be retained to comply with current guidance and legislation.

The Contamination Investigation identified Made Ground to depths between 0.30m and 0.80m bgl. Potential hydrocarbon type odours were identified in WS1, WS3 and TP1.

Superficial deposits of Bagshot Formation were encountered underlying the Made Ground. Shallow groundwater was encountered within the Made Ground and Bagshot Formation. The conceptual site model was updated to take account of the shallow groundwater encountered at the site and is presented in Appendix D.1.

The groundwater flow direction was shown, by groundwater levelling and plotting, to be in a northerly direction, based on monitoring undertaken. A groundwater flow direction map is presented in Figure 4.

8.2 Soil Sampling

Exploratory hole locations were established 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. Representative samples for potential environmental testing were obtained from the exploratory holes to allow appropriate representation of the materials encountered, with additional samples to be obtained, if necessary, where there was visual or olfactory evidence of contamination (WS1 0.90, WS3 0.60m and TP1 0.40m).

Unless otherwise stated, analytical testing was based initially on a screening suite of commonly identified inorganic and organic contaminants, taking into account the prevailing site conditions and the findings of the initial conceptual site model.

8.3 Determination of Chemical Analysis

The driver for determination of the analysis suite was the information obtained from the Preliminary Investigation and Contamination intrusive investigation.

The driver for determination of the analysis suite was the information obtained from the Preliminary Investigation Report and Contamination Investigation Report intrusive investigation.

The chemical analyses were carried out on 9 samples of Made Ground (MG) and 1 sample of the underlying Bagshot Formation (BGS), with the latter evidencing olfactory

indications of hydrocarbons as noted on the logs. The nature of the analyses is detailed in Table 8.1.

Table 8.1 Chemical Analyses Suites - Soil

No. of Tests	Determinants	Soil Tested	
		MG	BGS
6	Metal suites: Arsenic, Boron (Water Soluble), Cadmium, Chromium (total & hexavalent), Copper, Lead, Mercury, Nickel, Selenium, Vanadium, Zinc		
6	Organic Matter		
8	pH		
7	Polycyclic aromatic hydrocarbons (PAH) – (EPA 16)		
6	Phenols – total monohydric		
8	Extractable petroleum hydrocarbons (EPH) – Texas banding		
1	Extractable petroleum hydrocarbons (EPH) – Texas banding		
6	Cyanide total & free		
2	Waste acceptance criteria (WAC)		
6	Asbestos screening		

The soil testing was carried out in compliance with the MCERTS performance standard, and the results are shown in Appendix D.2, test reports 23-03360.

The groundwater chemical analysis was carried on 3No, samples, with the nature of the analyses detailed in Table 8.2.

Table 8.2 Chemical Analyses Suites - W ater

No. of Tests	Determinants
3	Metal suites: Arsenic, Boron, Cadmium, Chromium (total & hexavalent), Copper, Lead, Mercury, Nickel, Selenium, Vanadium, Zinc
3	Total organic carbon (TOC)
3	pH
3	Polycyclic aromatic hydrocarbons (PAH) – (EPA 16)
3	Phenols – total monohydric
3	Cyanide total & free
3	Total petroleum hydrocarbons (TPH) – CWG banding
3	BTEX and MTBE
3	Hardness – total (as $CaCO_3$)
3	Dissolved oxygen
3	Semi-volatile organic compounds (SVOC)
3	Volatile organic compounds (VOC)

The groundwater test report 23-04796 is presented in Appendix D.2.

Section 9 Qualitative Risk Assessment

9.1 Assessment Criteria

The assessment criteria used to determine risks to human health are derived and explained within Appendix D.3.

9.2 Representative Contamination Criteria - Soil

In compiling this report reliance was placed on drawing AR/Feas/111 for Shanly Homes dated 01.02.2023. The recommendations provided within this report are made exclusively in relation to the scheme outlined above and must not be applied to any other scheme without further consultation with Soils Limited. Soils Limited must be notified about any change or deviation from the scheme outlined and for planning approval purposes will have to be considered and revised in light of the final plans presented in support of the application.

Based on the proposed development, the results of the chemical analysis have been compared against generic assessment criteria (GAC) for a '***Residential with home grown produce'*** end use, as presented in SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination December 2014 (C4SL), derived for the protection of human health. Where this document has not published screening values for determinants, GACs derived for the same end use have been adopted from the following published guidance; DEFRA Soil Guideline Values (SGV) and LQM/CIEH/Suitable 4 Use Level (S4UL).

To assess the potential toxicity of organic determinants (Petroleum Hydrocarbons and Polyaromatic Hydrocarbons) to the human health, soils samples were analysed for Soil Organic Matter (SOM). The selected samples analysed recorded, SOM values of between 2.2% and 5.6%. For each soil sample tested, the resultant SOM allowed for the correct comparison to be made with the appropriate guideline value for each organic determinants analysed.

9.3 Risk Assessment – Made Ground

Table 9.1 outlines the sample that have exceeded their relevant assessment criteria. The full laboratory report is presented in Appendix D.2.

Table 9.1 Summary of GAC Exceedances – Made Ground

Location	Depth (m bgl)	Contaminant	Concentration	Guidance Level
WS2	0.20-0.40	Lead	365	210
WS5	0.20	Lead	213	210
WS8	0.20-0.40	Lead	247	210

Location	Depth (m bgl)	Contaminant	Concentration	Guidance Level
WS8	0.20-0.40	Benzo(a)pyrene	13.8	5
WS8	0.20-0.40	Benzo(b)fluoranthene	17.5	3.3
WS8	0.20-0.40	Di-benzo(a,h)anthracene	1.67	0.28

Note(s): Units mg/kg

The risk assessment has established potential pollutant linkages in relation to human health from an elevated Lead concentrations at several locations in the Made Ground (WS2, WS5 and WS8) and a probable PAH outlier in Made Ground at WS8. None of the underlying superficial materials indicated any exceedance for the reported analytes.

The elevated Lead is probably in an insoluble form most likely associated with the Glass and Clinker noted in the logs and does not appear to be systematic across the site or Made Ground. Most relict Lead (as opposed to depositional Lead from vehicle emissions etc.) would be expected to be sporadic in nature as relict outliers and fragments which indeed appears to be the case at this site.

As such the Lead levels may not actually be significant in context as they are unlikely to be significantly bioavailable. This appears to be confirmed in the WAC/Leachate analysis undertaken on two samples (WS02 and WS05) both with elevated levels which record no leachable Lead in excess of the method limit <0.05mg/kg. This generally also equates to a very low bioavailability and generation of no risk allowable or remediation values of around 450mg/kg, which is in excess of all noted values to date and co-incidentally approximated to the previous EA guideline value for residential site use.

Recommendations in relation to this material are made in Section 9.9.

9.4 Risk Assessment – Bagshot Formation

Table 9.2 outlines the samples that have exceeded their relevant assessment criteria. The full laboratory report is presented in Appendix D.2.

Table 9.2 Summary of GAC Exceedances – Bagshot Formation

Location	Depth (m bgl)	Contaminant	Concentration	Guidance Level
None				

Note(s): Units mg/kg

The risk assessment has established no potential pollutant linkage in relation to human health from the samples analysed within the Bagshot Formation.

9.5 Asbestos

The test certificate for each sample submitted for contamination analysis during this investigation includes the results of an Asbestos Screen.

In each case ‘Not detected’ was reported.

This finding does not obviate the risk of asbestos being present on the site and the Client must seek advice from qualified and competent asbestos specialist during and prior to undertaking works to ensure compliance with appropriate legislation and guidance.

9.6 Risk to Groundwater

The site is located on a Principal Aquifer (Taplow Gravel) overlying Secondary A Aquifer (Bagshot Formation) and is not within a groundwater source protection zone and there are no potable groundwater abstractions within 1km of the site, the closest is located 927m NW of the site and is for agricultural purposes.

The groundwater flow was established to be in a northerly direction based on groundwater levelling and plotting.

The nearest surface watercourse feature was an un-named Inland River (Thames Catchment), located approximately 26m to the northwest of the site.

An initial assessment of the risk to controlled waters has been conducted on the basis of the groundwater testing undertaken.

The chemical laboratory results were compared against the Surface Fresh Water (SFW). If no SFW was available, standards from the UK Drinking Water Standard (DWS) were used, and if no DWS was available, standards from the World Health Organisation (WHO) were used.

Groundwater samples were recovered from the standpipes installed within WS01, WS04 and WS06 to establish whether groundwater on site had been impacted.

Based on the depths of groundwater, the hydraulic gradient of the site has been calculated as flowing in a northerly direction.

Error! Reference source not found.3 outlines the samples that have exceeded their relevant assessment criteria. The full laboratory report is presented in Appendix D.2

Table 9.3 Summary of Chemical Analysis for Groundwater Samples Exceedances

Location	Contaminant	Concentration	Guidance Value
WS01	Chromium	10	4.7
WS01	Lead	56	7.2
WS04	Lead	153	7.2
WS06	Nickel	24	20
WS01	Vanadium	22	20
WS01	Zinc	95	75
WS01	Fluoranthene	1.47	1
WS01	Benzo(b)fluoranthene	1.51	0.03
WS01	Benzo(k)fluoranthene	1.01	0.03
WS01	Benzo(a)pyrene	1.57	0.05

Note(s): Units µg/l

The groundwater chemical testing has identified a range of determinands in WS01, WS04 and WS06, which were over their guideline values.

PAHs (fluoranthene, benzo(b)fluoranthene, benzo(k)fluoranthene and benzo(a)pyrene) were found in WS01 and none within WS04, and given that WS01 was located within the southwest portion of the site up hydraulic gradient, this was likely to be due to an offsite source. Although PAHs were found on the site at the location of WS08 which was northeastern portion of the site, none at the location where the groundwater was impacted with PAHs.

Chromium, vanadium and zinc were found in WS01 and none within WS04, which implied that the source of these contaminants is likely to be from an offsite source.

Nickel was found to be over the screening value in WS06 which was located within the southeast portion of the site up the hydraulic gradient, and none within WS04 down the hydraulic gradient. This implied that the presence of nickel within the groundwater was likely due to an offsite source.

Lead was found within WS01 (up hydraulic gradient with concentration of 56µg/l) and WS04 (down hydraulic gradient with concentration of 153µg/l), which implied that the site was likely contributing to the groundwater contamination. Although, lead was found within the Made Ground on the site in WS02, WS05 and WS08, the leachate analysis as part of WAC testing showed the lead was not leachable, and therefore, it was considered unlikely to have been impacted by the Made Ground. Given the former and historical use of the site being domestic garages, it is possible that lead from localised sources, such as broken up car batteries, could be the source, however, this was considered to be low likelihood. Based on the above, the source of the lead was inconclusive, and therefore, further groundwater assessment was considered necessary.

9.7 Risk from Ground Gas Ingression

Potential sources of ground gas within influencing distance of the site identified within the CSM comprise:

On Site Made Ground

Local Garages

Risk from on-site sources is confirmed as low to very low as no significant sources have been identified or confirmed during this investigation. However, the client requested 3no monitoring to be undertaken as a precautionary measure.

The summary of the gas monitoring is presented in Table 9.4. and the field data provided in Appendix E.

Table 9.4 Ground Gas Monitoring Results

Date	Pressure Trend	WS (BOH mbgl)	CH_4 (%)	CO_2 (%)	O_2 (%)	H_2S (ppm)	CO (ppm)	LEL (%)	aP (mb)	Flow (l/h)	H_2O (m bgl)
03/03/23	Rising	ATM	0.0	0.0	21.5	0.0	0.0	0.0	1026	N/A	N/A
		WS1 (2.21)	0.0	0.1	21.4	0.0	10	0.0	1026	0.0	1.42
		WS4 (3.60)	0.0	3.1	13.9	0.0	0.0	0.0	1026	0.0	1.25
		WS6 (2.85)	0.0	0.0	21.7	0.0	3.0	0.0	1025	0.0	0.99
14/03/13	Rising	ATM	0.0	0.0	21.1	0.0	0.0	0.0	999	N/A	N/A
		WS1 (2.10)	0.0	0.0	19.3	0.0	0.0	0.0	998	0.0	0.57
		WS4 (3.60)	0.0	1.9	18.3	0.0	0.0	0.0	997	0.0	0.95
		WS6 (2.90)	0.0	0.0	21.0	0.0	0.0	0.0	1000	0.0	0.70
04/04/23	Falling	ATM	0.0	0.0	20.4	0.0	0.0	0.0	1027	N/A	N/A
		WS1 (2.01)	0.0	0.0	20.8	0.0	0.0	0.0	1026	0.0	0.51
		WS4 (3.39)	0.0	0.4	19.1	0.0	0.0	0.0	1027	0.4	0.60
		WS6 (2.86)	0.0	0.0	20.7	0.0	2.0	0.0	1025	0.0	0.32
Minimum			*0.0*	*0.0*	*13.9*	*0.0*	*0.0*	*0.0*	*997*	*0.0*	*0.32*
Maximum			*0.0*	*3.1*	*21.7*	*0.0*	*0.0*	*0.0*	*1027*	*0.4*	*1.42*

Note: reading of 0.0 = not detected (below detection level). VOC=Volatile Organic Compounds. Dp=Pressure Difference. BOH = Base of Hole. BOH=Base of Hole. DAB=Damp at Base. The pressure trend was obtained from a weather station at Cobham.

A maximum carbon dioxide concentration of 3.1% has been recorded. No methane concentrations have been recorded above the Level of Detection (LoD) and negligible flow rates have been observed, with a peak of 0.4 litres/hour recorded.

Using the worst-case values, a carbon dioxide Gas Screening Value (GSV) of 0.0124 l/h has been calculated.

Based on the GSVs derived and the method for determining the CS presented within Table 2 of BS8485:2015, the site has been characterised as CS1, where the installation of gas protection measures will not be required.

Given that there was no significant source and that the risk from ground gas has been considered as low to very low, and the fact that no significant ground gas has been found with the initial monitoring, it was therefore considered no further monitoring was considered necessary and no remediation was deemed necessary. However, the regulators must be consulted before finalising foundation design.

9.7.1 Radon

As noted in the Soils Limited PIR, the BGS Radon interactive Atlas accessed in March 2023 indicated that the site is not located in a radon affected area. Risk is between 0 and <1% that a property will be in excess of the guideline value. No Radon protection measures would be anticipated in new developments or extensions.

9.8 Generic Quantitative Risk Assessment

Quantitative risk assessments are undertaken for soil, groundwater and ground gas. The CSM has been updated to take account of the assessments below and presented in Appendix D.1. The full laboratory chemical report is presented in Appendix D.2.

9.8.1 Soils

The Tier 1 Quantitative risk assessment has established that there was a **potential risk to human health receptors** from Lead and PAH's.

This risk is considered low overall and may be related in the case of PAHs to a single hotspot, possibly as relict Tarmac or clinker as the PAH ratio analysis indicates Coal Tar materials as the source. This will require further investigation and/or mitigation agreement with the regulator to resolve.

It is also probable that the elevated Lead may not actually be significant in context but again this would require the agreement of the regulator and may require additional investigation and analysis to confirm as it remains unknown and unquantified.

9.8.2 Asbestos

Asbestos was not detected in any of the soil samples analysed. However, asbestos could be encountered in other parts of the site.

There was asbestos associated with the structures onsite (domestic garages). Asbestos risk assessment / removal must be undertaken by professional competent person in agreement with regulators.

9.8.3 Groundwater

The Groundwater Risk Assessment has established the groundwater underlying the site has been impacted by lead from likely onsite source and further groundwater assessment was required to establish whether remediation is necessary.

9.8.4 Ground Gas

The ground gas risk assessment established that ground gas was unlikely to be an issue to the site and the no ground gas protection was considered necessary. However, agreement with the regulator would be required.

As noted in the Soils Limited PIR, the BGS Radon interactive Atlas accessed in March 2023 indicated that the site is not located in a radon affected area. No Radon protection measures would be anticipated in new developments or extensions.

9.9 Recommendations

Soil chemical analysis recorded three samples with substance levels over their representative guideline values. Therefore, there was a risk to the Human Health receptors, which could require agreement of a remediation strategy or additional investigation and analysis.

The remedial objective for any site is to ensure site clean-up removes any unacceptable risk to the identified receptors. In essence the remedial objective must sever any source-pathway-receptor pollutant linkages that have been established. Once this has been achieved, by whatever means, there can theoretically be no risk.

There was asbestos associated with the structures onsite (domestic garages). Asbestos

risk assessment / removal must be undertaken by professional competent person in agreement with regulators.

The groundwater underlying the site was impacted by lead from likely onsite source and further groundwater assessment was required to establish whether remediation is necessary.

9.10 Protection of Services

Contamination of the ground may pose a risk to human health by permeating potable water supply pipes. To fulfil their statutory obligations, UK water supply companies require robust evidence from developers to demonstrate either that the ground in which new plastic supply pipes will be laid is free from contaminants specified in UKWIR Report 10/WM/03/21 Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites (UKWIR, 2010), or that the proposed remedial strategy will mitigate any existing risk.

9.11 Duty of Care

Groundworkers must maintain a good standard of personal hygiene including the wearing of overalls, boots, gloves and eye protectors and the use of dust masks during periods of dry weather.

9.12 Excavated Material

Excavated material as waste must be defined or classified prior to any disposal, transport, recycling or re-use at or by an appropriately licensed or exempt carrier and/or off-site disposal facility. The requirements inherent in both Duty of Care and Health and Safety must also be complied with. In order to determine what is to happen, what is suitable, appropriate and most effective in the disposal of wastes, especially those subject to CDM waste management plan requirements, several factors must be considered, and competent advice must always be sought.

9.13 HazWasteOnline

The waste classification tool HazWasteOnlineTM was used on the entire data set to provide a general indication for future waste removal. The samples were all classified as Non-Hazardous, with the HazWasteOnlineTM report being presented in Appendix G. The WAC certificate is presented in Appendix E.2, within Test Report 23-0660.1, and also indicated that the materials analysed could be suitable for disposal at a landfill capable of receiving inert wastes.

9.14 Re-use of Excavated Material On-site

The re-use of on-site soils may be undertaken either under the Environmental Permitting Regulations 2007 (EPR), in which case soils other than uncontaminated soils are classed as waste, or under the CL:AIRE Voluntary Code of Practice (CoP) which was published in September 2008 and is accepted as an alternative regime to the EPR.

9.15 Imported Material

Any soil, which is to be imported onto the site, must undergo chemical analysis to permit classification prior to its importation and placement in order to ascertain its status with specific regard to contamination, i.e. to prove that it is suitable for the purpose for which it is intended.

9.16 Discovery Strategy

There may be areas of contamination not identified during the course of the investigation. Such occurrences may also be discovered during the demolition and construction phases for the redevelopment of the site.

List of Figures

List of Appendices

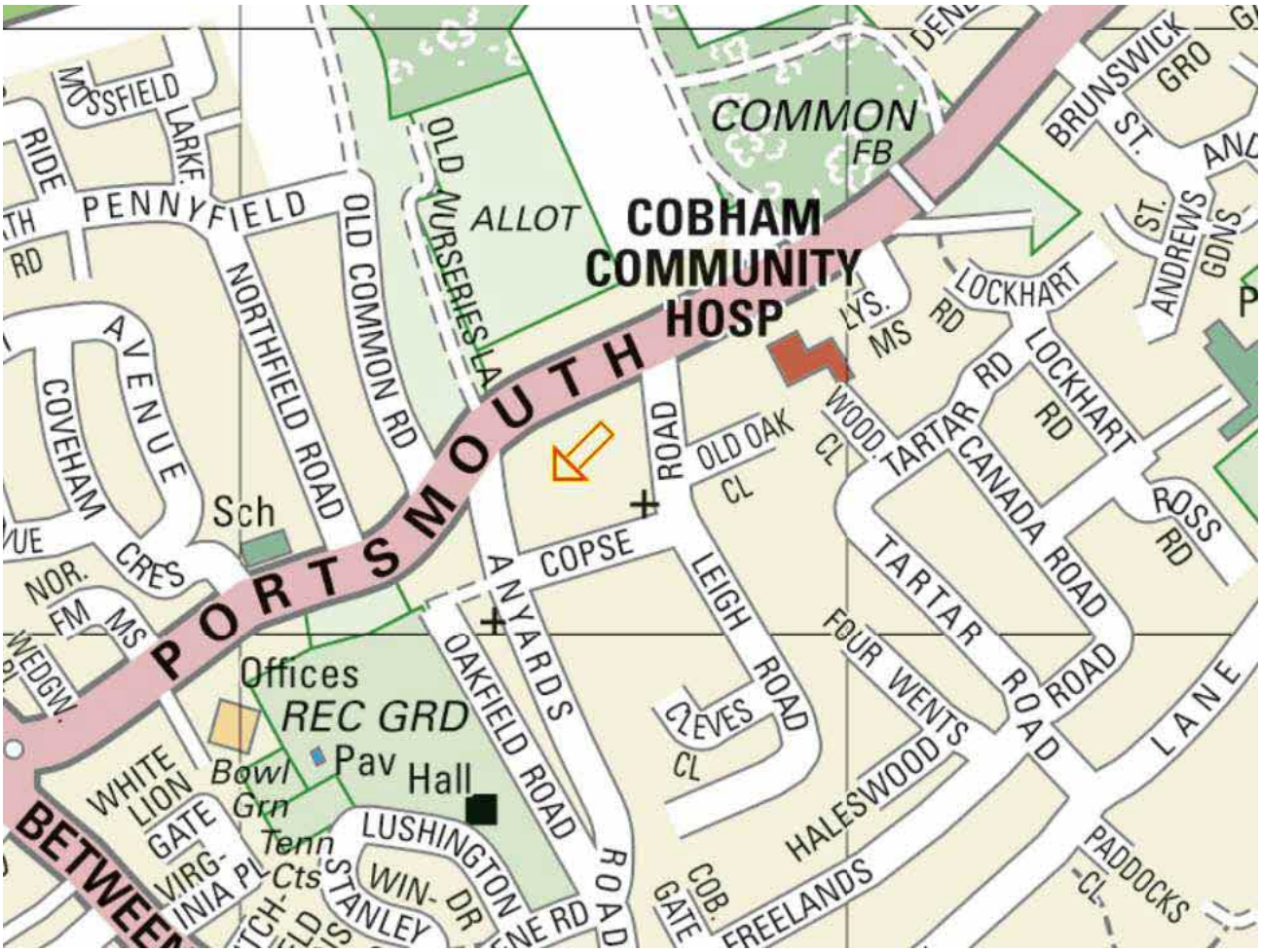


Figure 1 – Site Location Map

N

Job Number 20737	**Project** Land at Glenham, Anyards Road, Cobham, Surrey KT11 2LH
Client Shanly Homes Ltd	**Date** June 2023

Figure 2 – Aerial Photograph

Project
Land at Glenham, Anyards Road, Cobham, Surrey KT11 2LH

Client
Shanly Homes Ltd

Date
June 2023

Job Number
20737

Figure 3 – Exploratory Hole Plan

Project
Land at Glenham, Anyards Road, Cobham, Surrey KT11 2LH

Client
Shanly Homes Ltd

Date
June 2023

Job Number
20737

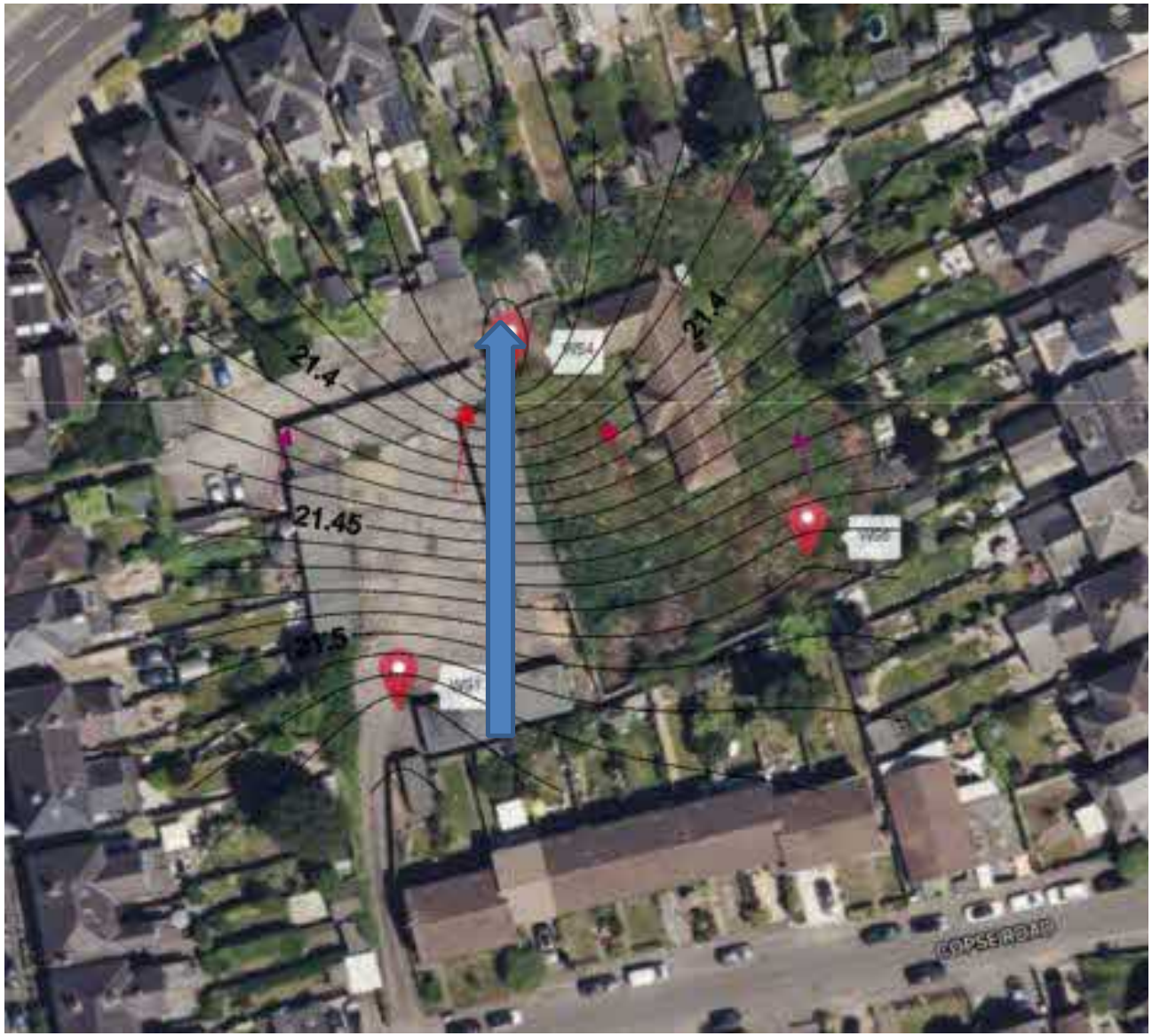


Figure 4 – Groundwater Flow Direction

Project
Land at Glenham, Anyards Road, Cobham, Surrey KT11 2LH

Client
Shanly Homes Ltd

Date
June 2023

Job Number
20737

N

Appendix A Standards and Resources

The site works, soil descriptions and geotechnical testing was undertaken in accordance with the following standards were applicable:

BS 5930:2015 and BS EN ISO 22476-2 2005+A1:2011

BS 5930:2015 and BS EN ISO 22476-2&3:2005+A1:2011

BS 5930:2015 and BS EN ISO 22476-3:2005+A1:2011

BS EN 1997-1:2004+A1:2013 Eurocode 7. Geotechnical design

BS EN ISO 14688-1:2018 - Geotechnical investigation and testing - Identification and description

BS EN ISO 14688-2:2018 - Geotechnical investigation and testing - Principles for a classification

BS 10175:2011+A2:2017 - Investigation of potentially contaminated sites

LCRM 2021 Environment Agency

BS 8004:2015 – Code of practice for foundations

BS 1377:1990 Parts 1 to 8

BRE Digest 241 “Low-rise buildings on shrinkable clay soils: Part 2

BRE Special Digest 1, 2005, ‘Concrete in Aggressive Ground’

Stroud, M. A. 1974, “The Standard Penetration Test – its application and interpretation”, Proc. ICE Conf. on Penetration Testing in the UK, Birmingham. Thomas Telford, London.

Robertson, P.K., 1990. Soil classification using the cone penetration test. Canadian Geotechnical Journal, 27, pp. 151 – 158.

Robertson, P.K., 2010, “Soil Behaviour type from the CPT: an update”, 2nd International Symposium on Cone Penetration Testing, Huntington Beach, CA, Vol.2. pp575-583.

N.E. Simons, B.K. Menzies, “A Short Course in Foundation Engineering”

NHBC Standards Chapter 4.2, January 2023.

SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination December 2014

CIRIA C733, Asbestos in soil and made ground: a guide to understanding and managing risks and CAR2012 regulations.

CIRIA C574, Engineering in Chalk; 2002

Google Earth

British Geological Survey Website & iGeology App

Appendix B Field Work

Appendix B.1 Engineers Logs

Samples & In Situ Testing			Strata Details		
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend
				0.10	
				0.30	
				(0.35)	
				0.65	
				(0.35)	
				1.00	
				(0.50)	
				1.50	
				(0.30)	
				1.80	
				(0.30)	
				2.10	
				(0.50)	
				2.60	
				(0.90)	
				3.50	
				(0.30)	
				3.80	

Samples & In Situ Testing			Strata Details		
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend
				0.05	
				0.30	
				(0.40)	
				0.70	
				(0.50)	
				1.20	
				(1.00)	
				2.20	
				(1.60)	
				3.80	
				(1.00)	
				4.80	
				5.00	

Samples & In Situ Testing			Strata Details		
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend
				0.10	
				(0.30)	
				0.40	
				(0.40)	
				0.80	
				(0.90)	
				1.70	
				(0.30)	
				2.00	
				(0.30)	
				2.30	
				(0.50)	
				2.80	
				(0.40)	
				3.20	
				(0.50)	
				3.70	

Samples & In Situ Testing			Strata Details		
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend
				0.10	
				0.35	
				0.60	
				(1.30)	
				1.90	
				(0.40)	
				2.30	
				(0.70)	
				3.00	
				(2.00)	
				5.00	

Samples & In Situ Testing			Strata Details		
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend
				(0.40)	
				0.40	
				0.65	
				(0.95)	
				1.60	
				(1.20)	
				2.80	
				3.00	
				(0.50)	
				3.50	
				(1.10)	
				4.60	
				(0.40)	
				5.00	

Samples & In Situ Testing			Strata Details		
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend
				(0.30)	
				0.30	
				(0.70)	
				1.00	
				(1.00)	
				2.00	
				(0.40)	
				2.40	
				(1.60)	
				4.00	
				(1.00)	
				5.00	
				(0.40)	
				5.40	

Samples & In Situ Testing			Strata Details		
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend
				(0.50)	
				0.50	
				(0.40)	
				0.90	
				(0.90)	
				1.80	
				(0.80)	
				2.60	
				2.70	
				(0.55)	
				3.25	
				(1.25)	
				4.50	
				(0.30)	
				4.80	

Samples & In Situ Testing			Strata Details		
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend
				(0.30)	
				0.30	
				0.50	
				(0.50)	
				1.00	
				(0.70)	
				1.70	
				(0.80)	
				2.50	
				(1.00)	
				3.50	
				(0.50)	
				4.00	
				4.20	
				(0.30)	
				4.50	

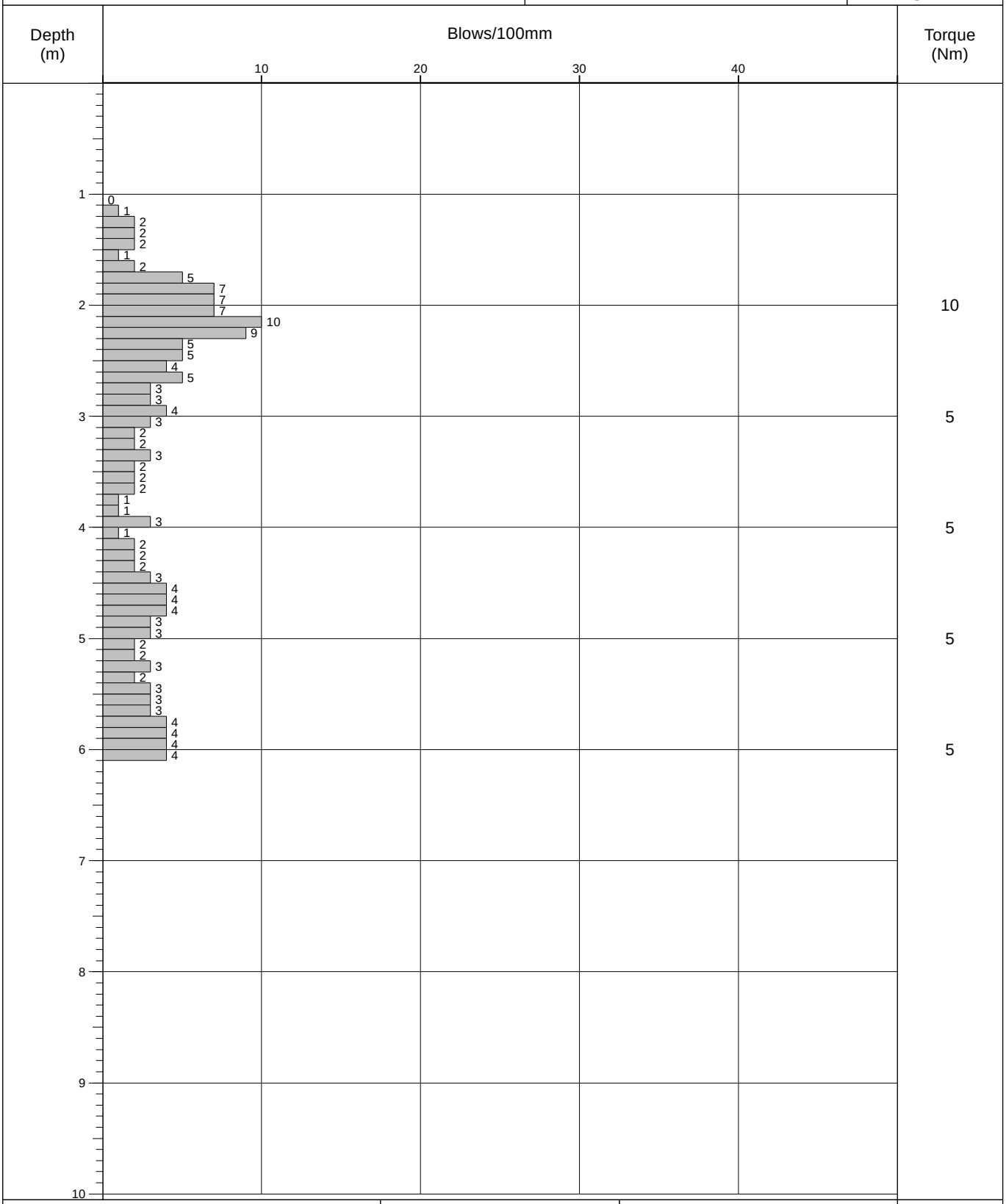
Water Strike	Samples & In Situ Testing			Depth (m)	Level (mAOD)	Legend
	Depth	Type	Results			
				0.08		
				0.28		
				0.50		
				1.60		
▼				1.80		

Water Strike	Samples & In Situ Testing			Depth (m)	Level (mAOD)	Legend
	Depth	Type	Results			
				0.30		
				1.30		
				1.50		

Water Strike	Samples & In Situ Testing			Depth (m)	Level (mAOD)	Legend
	Depth	Type	Results			
				0.40		
				0.80		

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk	**Probe Log**	Probe No. **DP1** Sheet 1 of 1

Project Name:	Land at Glenham, Anyards Road, Cobham	Project No. 20737	Co-ords:	Hole Type DP
Location:	Land at Glenham, Anyards Road, Cobham		Level: m AOD	Scale 1:50
Client:	Shanly Homes Limited		Dates: 27/02/2023	Logged By SW

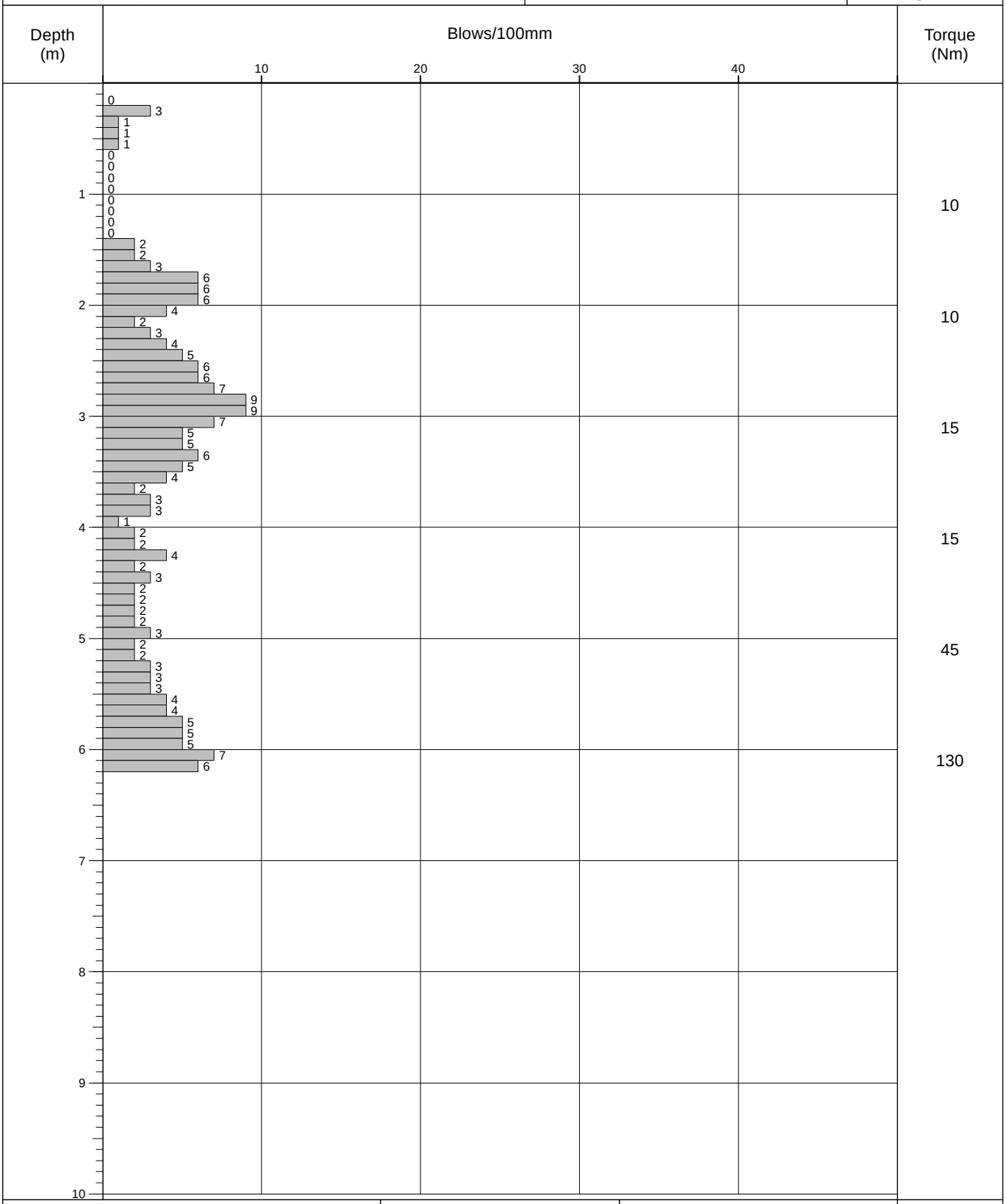


Remarks				
	Fall Height	760mm	Cone Base Diameter	50.5mm
	Hammer Weight	64kg	Final Depth	6m
	Probe Type	DPSH-B	Energy Ratio (Er)	90.25%

AGS REGISTERED USER 2020

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk	**Probe Log**	Probe No. **DP2** Sheet 1 of 1

Project Name:	Land at Glenham, Anyards Road, Cobham	Project No. 20737	Co-ords:	Hole Type DP
Location:	Land at Glenham, Anyards Road, Cobham		Level: m AOD	Scale 1:50
Client:	Shanly Homes Limited		Dates: 27/02/2023	Logged By GB

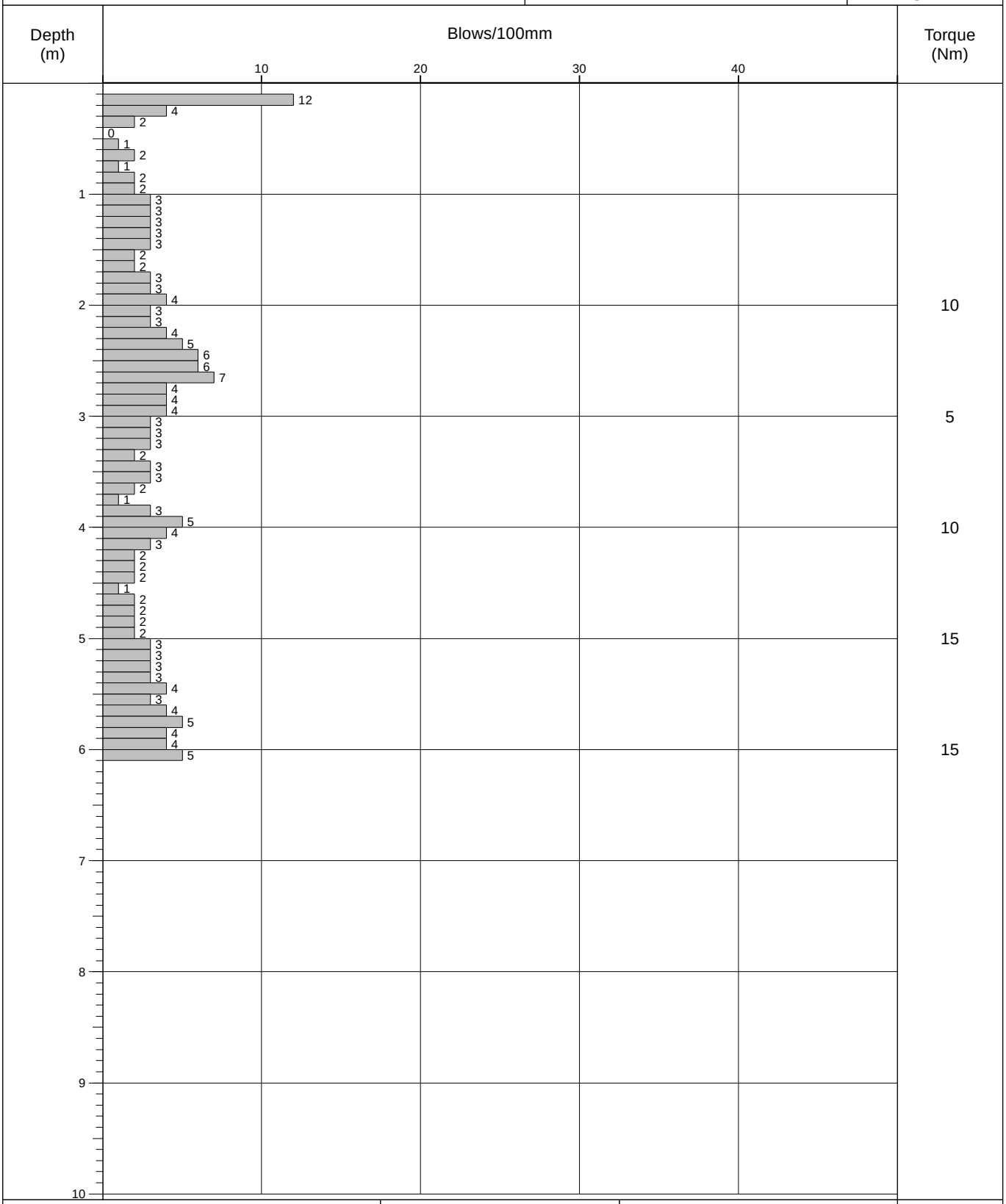


Remarks		Fall Height	760mm	Cone Base Diameter	50.5mm
		Hammer Weight	63.5kg	Final Depth	6m
		Probe Type	DPSH-B	Energy Ratio (Er)	87.45%

AGS REGISTERED USER 2020

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk	**Probe Log**	Probe No. **DP3** Sheet 1 of 1

Project Name:	Land at Glenham, Anyards Road, Cobham	Project No. 20737	Co-ords:	Hole Type DP
Location:	Land at Glenham, Anyards Road, Cobham		Level: m AOD	Scale 1:50
Client:	Shanly Homes Limited		Dates: 27/02/2023	Logged By SW

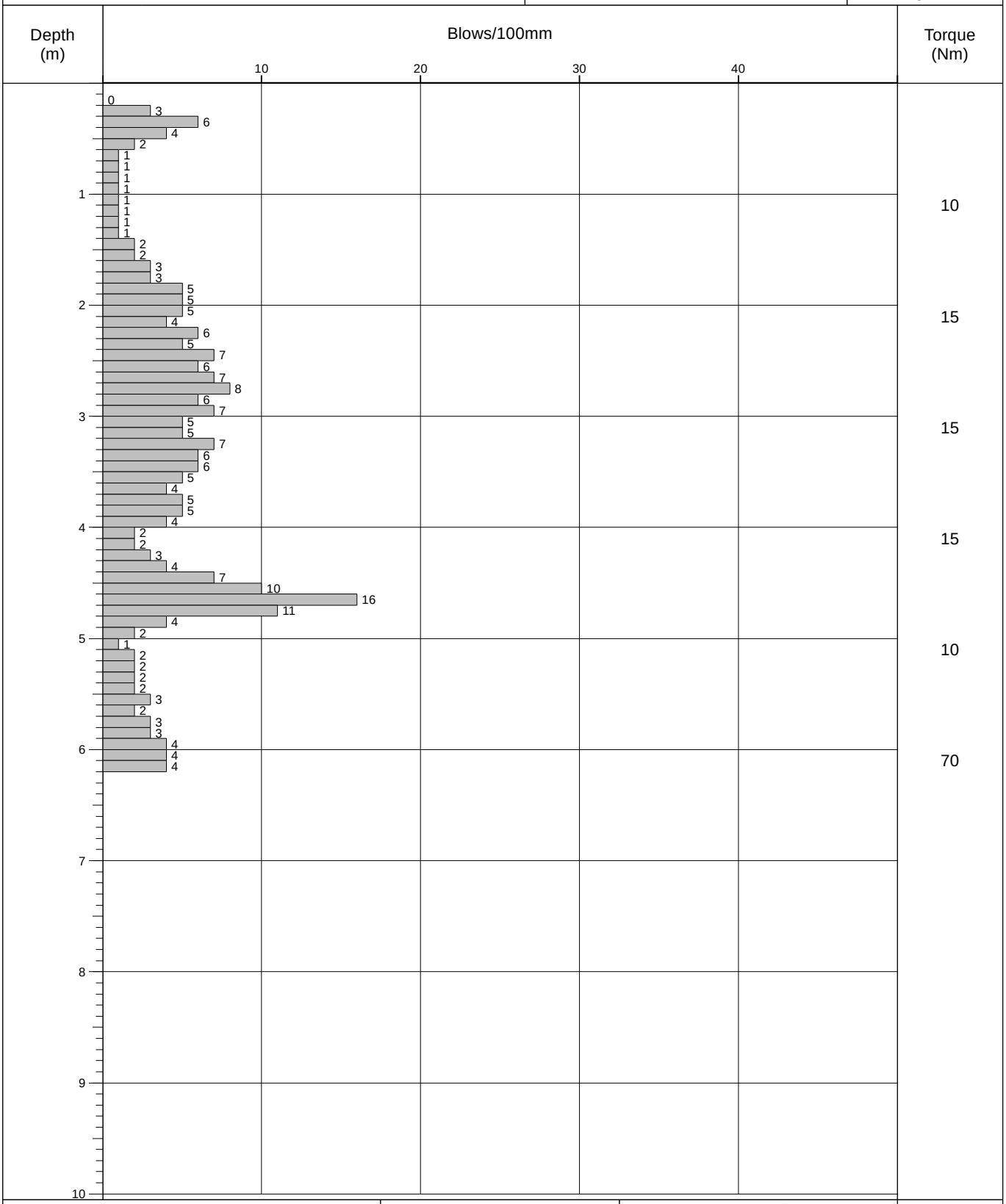


Remarks	Fall Height	760mm	Cone Base Diameter	50.5mm
	Hammer Weight	64kg	Final Depth	6m
	Probe Type	DPSH-B	Energy Ratio (Er)	90.25%

AGS REGISTERED USER 2020

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk	**Probe Log**	Probe No. **DP4** Sheet 1 of 1

Project Name:	Land at Glenham, Anyards Road, Cobham	Project No. 20737	Co-ords:	Hole Type DP
Location:	Land at Glenham, Anyards Road, Cobham		Level: m AOD	Scale 1:50
Client:	Shanly Homes Limited		Dates: 27/02/2023	Logged By GB

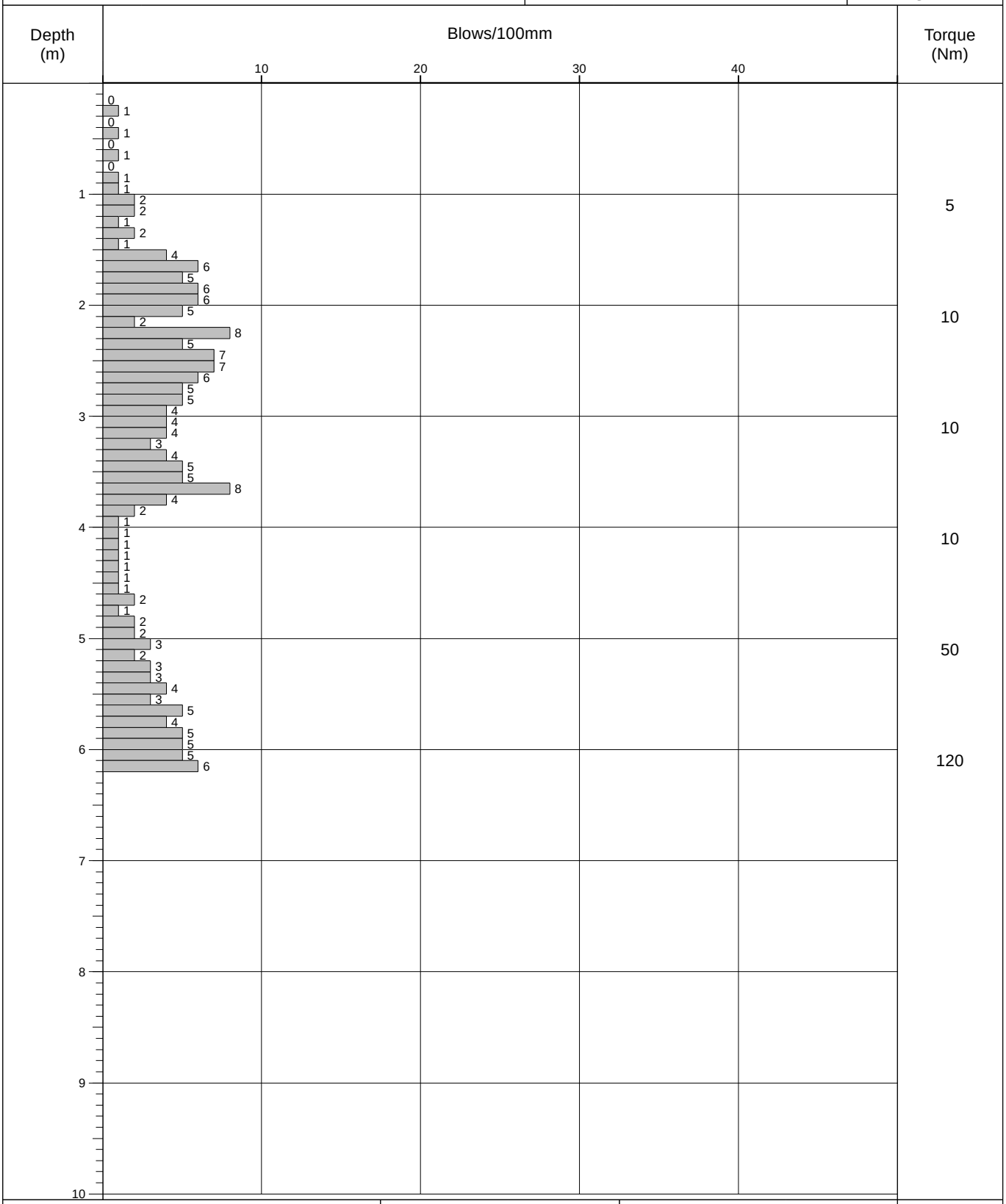


Remarks				
	Fall Height	760mm	Cone Base Diameter	50.5mm
	Hammer Weight	63.5kg	Final Depth	6m
	Probe Type	DPSH-B	Energy Ratio (Er)	87.45%

AGS REGISTERED USER 2020

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk	**Probe Log**	Probe No. **DP5** Sheet 1 of 1

Project Name:	Land at Glenham, Anyards Road, Cobham	Project No. 20737	Co-ords:	Hole Type DP
Location:	Land at Glenham, Anyards Road, Cobham		Level: m AOD	Scale 1:50
Client:	Shanly Homes Limited		Dates: 27/02/2023	Logged By GB

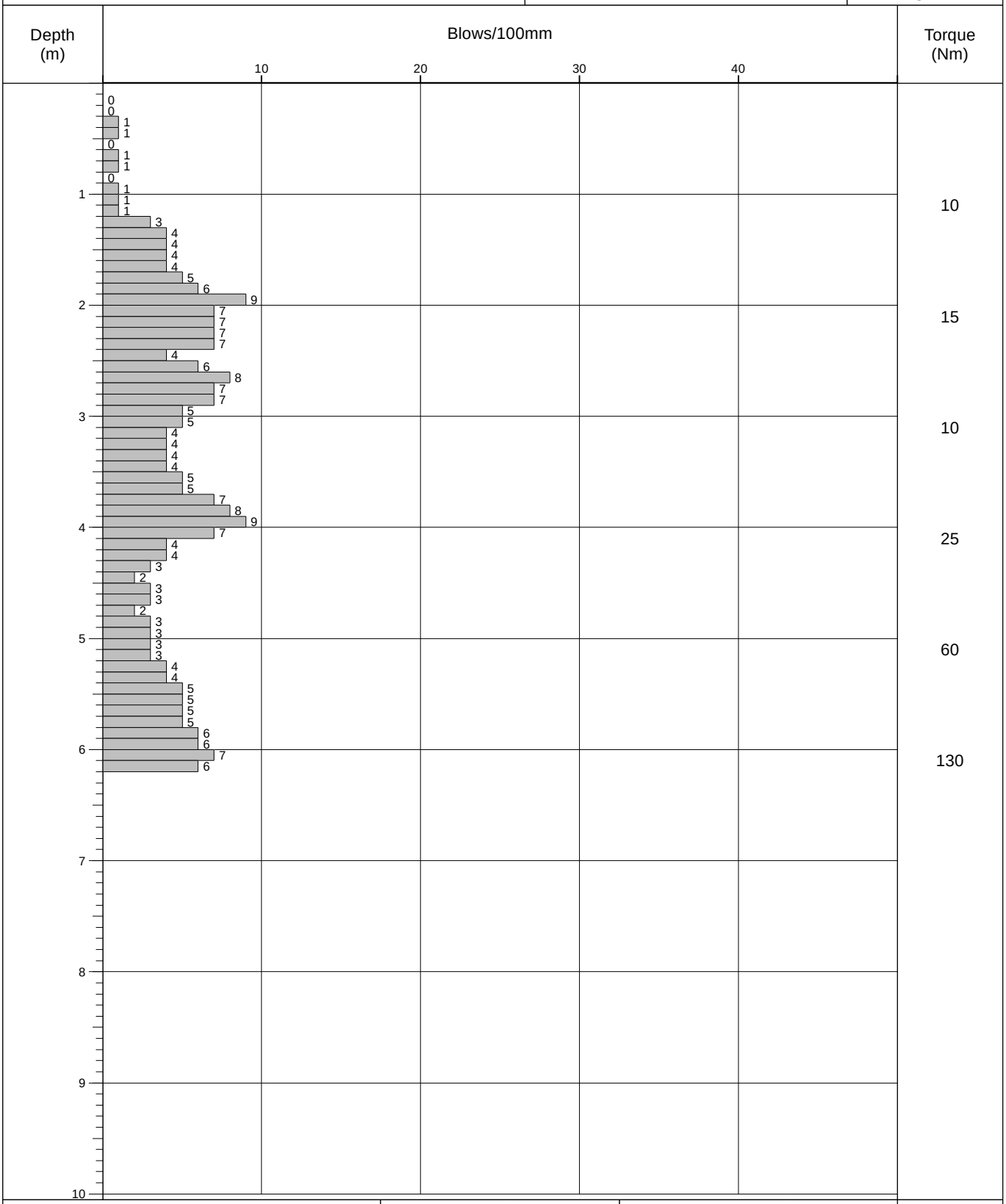


Remarks				
	Fall Height	760mm	Cone Base Diameter	50.5mm
	Hammer Weight	63.5kg	Final Depth	6m
	Probe Type	DPSH-B	Energy Ratio (Er)	87.45%

AGS REGISTERED USER 2020

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk	**Probe Log**	Probe No. **DP6** Sheet 1 of 1

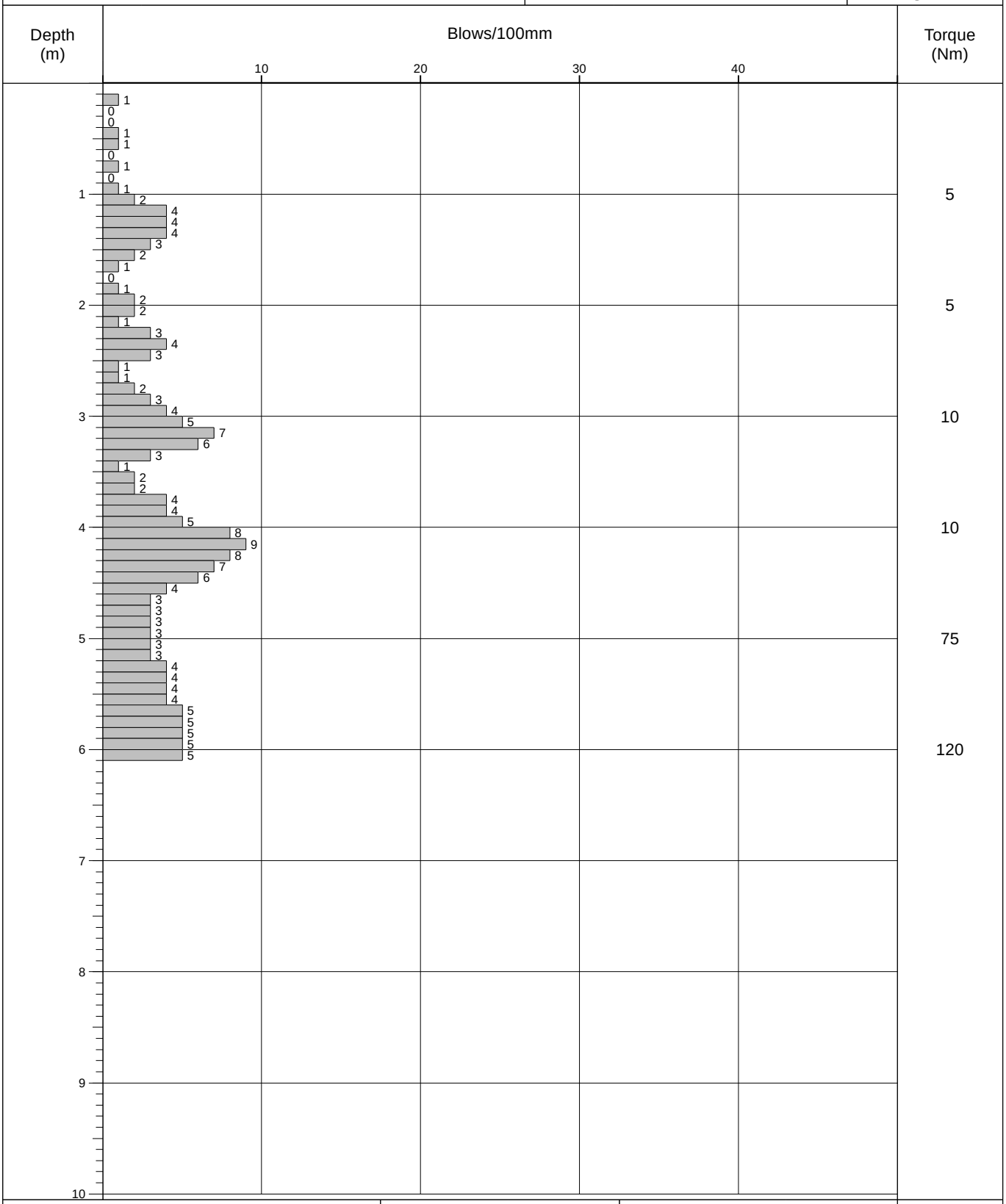
Project Name:	Land at Glenham, Anyards Road, Cobham	Project No. 20737	Co-ords:	Hole Type DP
Location:	Land at Glenham, Anyards Road, Cobham		Level: m AOD	Scale 1:50
Client:	Shanly Homes Limited		Dates: 27/02/2023	Logged By GB



Remarks	Fall Height	760mm	Cone Base Diameter	50.5mm	AGS REGISTERED USER 2020
	Hammer Weight	63.5kg	Final Depth	6m	
	Probe Type	DPSH-B	Energy Ratio (Er)	87.45%	

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk	**Probe Log**	Probe No. **DP7** Sheet 1 of 1

Project Name:	Land at Glenham, Anyards Road, Cobham	Project No. 20737	Co-ords:	Hole Type DP
Location:	Land at Glenham, Anyards Road, Cobham		Level: m AOD	Scale 1:50
Client:	Shanly Homes Limited		Dates: 27/02/2023	Logged By SW

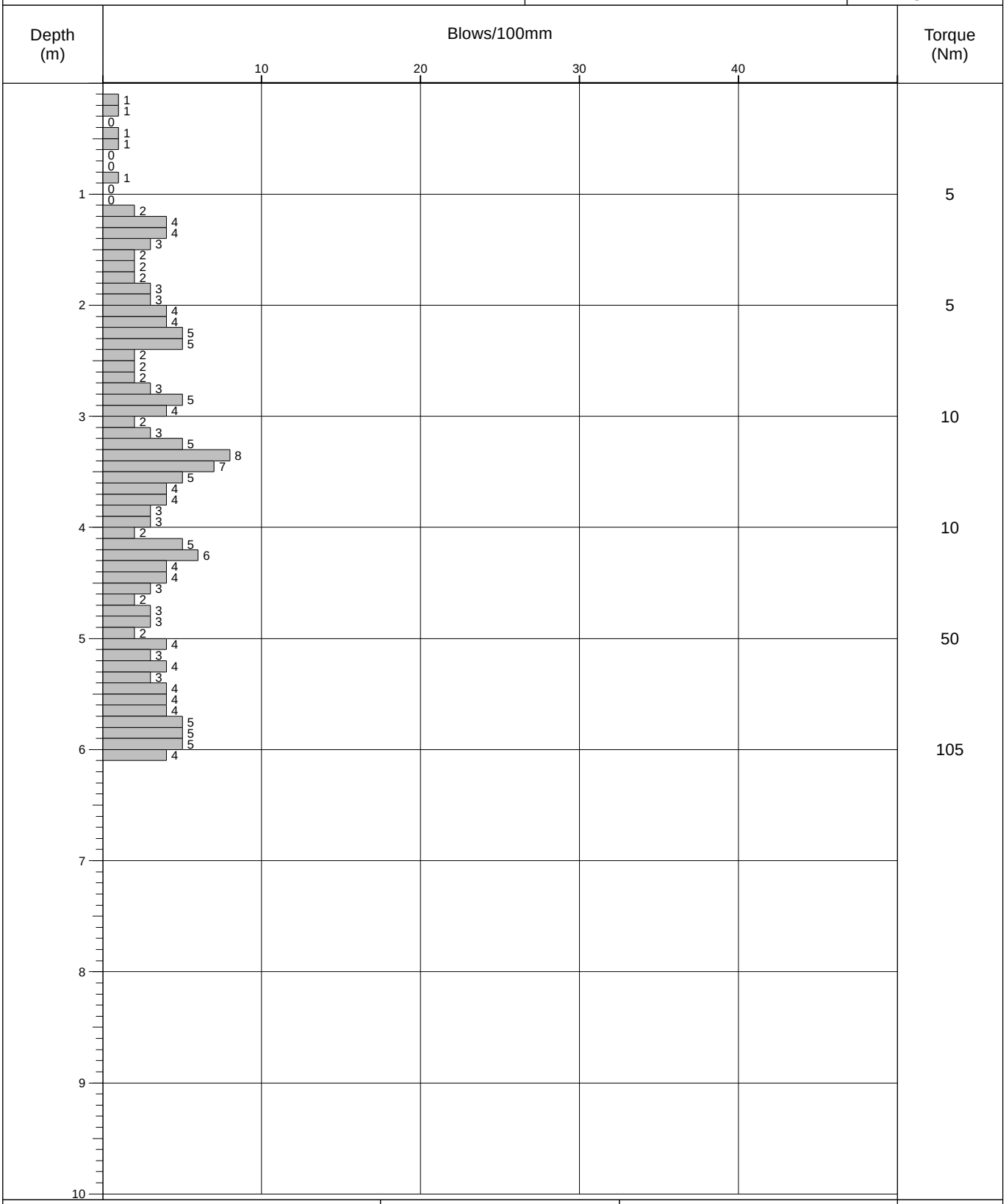


Remarks				
	Fall Height	760mm	Cone Base Diameter	50.5mm
	Hammer Weight	64kg	Final Depth	6m
	Probe Type	DPSH-B	Energy Ratio (Er)	90.25%

AGS REGISTERED USER 2020

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk	**Probe Log**	Probe No. **DP8** Sheet 1 of 1

Project Name:	Land at Glenham, Anyards Road, Cobham	Project No. 20737	Co-ords:	Hole Type DP
Location:	Land at Glenham, Anyards Road, Cobham		Level: m AOD	Scale 1:50
Client:	Shanly Homes Limited		Dates: 27/02/2023	Logged By SW



Remarks	Fall Height	760mm	Cone Base Diameter	50.5mm	AGS REGISTERED USER 2020
	Hammer Weight	64kg	Final Depth	6m	
	Probe Type	DPSH-B	Energy Ratio (Er)	90.25%	

Appendix C Geotechnical In-Situ and Laboratory Testing

Appendix C.1 Classification

Classification based on SPT "N" values:

The inferred undrained strength of the cohesive soils was based on the SPT "N" blow counts, derived from the relationship suggested by Stroud (1974) and classified using Table C.1.1. (Ref: Stroud, M. A. 1974, "The Standard Penetration Test – its application and interpretation", Proc. ICE Conf. on Penetration Testing in the UK, Birmingham. Thomas Telford, London.).

Table C.1.1 SPT "N" Blow Count Cohesive Classification

Classification	Undrained Cohesive Strength C_u (kPa)
Extremely low	<10
Very low	10 – 20
Low	20 – 40
Medium	40 – 75
High	75 – 150
Very high	150 – 300
Extremely high	> 300

Note(s): (Ref: BS EN ISO 14688-2:2004+A1:2013 Clause 5.3.)

The relative density of granular soils was classified based of the relationship given in Table C.1.2.

The *UK National Annex to Eurocode 7: Geotechnical design – Part 2: Ground investigation and testing, NA 3.7 SPT test, BS EN 1997-2:2007, Annex F* states "Relative density descriptions on borehole records should also be based on uncorrected SPT N values, unless significantly disturbed, using the density classification in BS 5930:2015, Table 7.

Table C.1.2 SPT "N" Blow Count Granular Classification

Classification	SPT "N" blow count (blows/300mm)
Very loose	0 to 4
Loose	4 to 10
Medium dense	10 to 30
Dense	30 to 50
Very dense	Greater than 50

Note(s): (Ref: The Standard Penetration Test (SPT): Methods and Use, CIRIA Report 143, 1995)

Chalk samples recovered are disturbed by the sampling process. Therefore, it is difficult to assess an accurate chalk grade for in accordance with CIRIA C574 'Engineering in

Classification of DCP results to CBR:

The DCP consists of a cone fixed to the bottom of a 575mm vertical rod. An 8kg weight is repeatedly lifted and dropped onto an anvil at the mid-height of the rod to deliver a 'blow'. A vertical scale alongside the rod is used to measure the depth of penetration of the cone. These measurements are then converted to CBR values using the following equation derived from the DTP Interim Advice Note 73/06 – Design Guidance for Road Pavement Foundations:

$$Log_{10}(CBR) = 2.48 - 1.057 \times Log_{10}(mm\ per\ blow)$$

Appendix C.2 Interpretation

Table C.2.1 Interpretation of DPSH Blow Counts

DP	Strata	Equivalent SPT N60 Blow Counts	Inferred Cohesive Strength/Granular Density
DP1	BGS[1] 1.00 – 4.90 SAND/GRAVEL	4 - 43	Loose to dense
	LCF[1] 4.90 – 6.00 CLAY	9 - 17	Medium to high (C_u = 45 – 85kPa)
DP2	BGS 1.20 – 4.80 SAND/GRAVEL	4 – 38	Loose to dense
	BGS 4.80 – 5.00 Sandy CLAY	8	Medium (C_u = 40kPa)
	LCF[1] 5.00 – 6.00 CLAY	13 - 29	Medium to high (C_u = 65 – 145kPa)
DP3	BGS 0.80 – 1.70 Sandy CLAY	9 - 17	Medium to high (C_u = 45 – 85kPa)
	BGS[1] 1.20 – 4.80 SAND/GRAVEL	4 – 30	Loose to dense
	LCF[1] 5.00 – 6.00 CLAY	9 - 22	Medium to high (C_u = 45 – 110kPa)
DP4	BGS 0.60 – 5.00 Gravelly SAND	4 – >50	Loose to very dense
	LCF[1] 5.00 – 6.00 CLAY	8 - 17	Medium to high (C_u = 40 – 85kPa)
DP5	BGS 0.40 – 0.65 Sandy CLAY	<4	Extremely low to low (C_u = <20kPa)
	BGS 0.65 – 4.60 SAND/GRAVEL	4 – 33	Loose to dense
	LCF[1] 4.60 – 6.00 Sandy CLAY	8 - 21	Medium to high (C_u = 40 – 105kPa)
DP6	BGS 0.30 – 1.00 Sandy CLAY	<4	Extremely low to low (C_u = <20kPa)
	BGS 1.00 – 5.00 SAND/GRAVEL	8 – 38	Loose to dense

DP	Strata	Equivalent SPT N60 Blow Counts	Inferred Cohesive Strength/Granular Density
	LCF[1] 5.00 – 6.00 Sandy CLAY	17 - 29	High (C_u = 85 – 145kPa)
DP7	BGS 0.50 – 0.90 Sandy CLAY	<4	Extremely low to low (C_u = <20kPa)
	BGS 0.90 – 4.50 SAND/GRAVEL	<39	Very loose to dense
	LCF[1] 4.50 – 6.00 Sandy CLAY	13 - 22	Medium to high (C_u = 65 – 110 kPa)
DP8	BGS 0.50 – 1.00 Sandy CLAY	<4	Extremely low to low (C_u = <20kPa)
	BGS 1.00 – 4.20 Gravelly SAND	9 – 34	Loose to dense
	LCF[1] 4.20 – 6.00 Sandy CLAY	9 - 22	Medium to high (C_u = 45 – 110kPa)

Note(s): [1] Ground conditions inferred past the base of windowless sampler boreholes.

Table C.2.2 Interpretation of Atterberg Limit Tests

Stratum	Moisture Content (%)	Plasticity Index (%)	Passing 425µm Sieve (%)	Modified Plasticity Index (%)	Soil Classification	Volume Change Potential	
						BRE	NHBC
BGS	17 - 25	22 - 30	80 - 100	22 - 28	CI	Medium	Medium
LCF	23	27	100	27	CI	Medium	Medium

Note(s): BRE Volume Change Potential refers to BRE Digest 240 (based on Atterberg results)
NHBC Volume Change Potential refers to NHBC Standards Chapter 4.2
Soils Classification based on British Soil Classification System
The most common use of the term clay is to describe a soil that contains enough clay-sized material or clay minerals to exhibit cohesive properties. The fraction of clay-sized material required varies, but can be as low as 15%. Unless stated otherwise, this is the sense used in Digest 240. The term can be used to denote the clay minerals. These are specific, naturally occurring chemical compounds, predominately silicates. The term is often used as a particle size descriptor. Soil particles that have a nominal diameter of less than 2 µm are normally considered to be of clay size, but they are not necessarily clay minerals. Some clay minerals are larger than 2 µm and some particles, 'rock flour' for example, can be finer than 2 µm but are not clay minerals.
(The Atterberg Limit Tests were undertaken in accordance with BS 1377:Part 2:1990 Clauses 3.2, 4.3 and 5)

Table C.2.3 Interpretation of PSD Tests

Location	Depth (m bgl)	Soil Description	Volume Change Potential		Passing 63µm Sieve (%)
			BRE	NHBC	
WS1	1.20-1.40	Brown slightly gravelly silty/ clayey fine to coarse SAND	Yes	No	33

Location	Depth (m bgl)	Soil Description	Volume Change Potential		Passing 63µm Sieve (%)
			BRE	NHBC	
WS2	2.40-3.40	Brown slightly silty/ clayey fine to coarse sandy fine to coarse GRAVEL	No	No	2
WS5	1.70-2.00	Brown slightly silty/ clayey fine to coarse sandy fine to coarse GRAVEL	No	No	7
WS6	3.20-3.70	Brown slightly gravelly silty/ clayey fine to coarse SAND	No	No	10

Note(s): BRE 240 states that a soil has a volume change potential when the clay fraction **exceeds 15%** Only the silt and clay combined fraction are determined by sieving therefore the volume change potential is estimated from the percentage passing the 63µm sieve. NHBC Standards Chapter 4.2 states that a soil is shrinkable if the percentage of silt and clay passing the 63µm sieve is greater than 35% and the Plasticity Index is greater than 10%.
(The Particle Size Distribution Tests were undertaken in accordance with BS 1377: Part 2: 1990 Clause 9)

Appendix C.3 Geotechnical In-Situ and Laboratory Results

Laboratory Report

UKAS TESTING 2788

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES
A PHENNA GROUP COMPANY

Contract Number: 65188

Client Ref: **20737**
Client PO: **20737/RB**

Date Received: **15-03-2023**
Date Completed: **03-04-2023**
Report Date: **03-04-2023**

Client: **Soils Limited**
Newton House
Cross Road
Tadworth
Surrey
KT20 5SR

This report has been checked and approved by:

[redacted]
Brendan Evans
Office Administrator

Contract Title: **Land at Glenham, Anyards Road, Cobham, KT11 2LH**
For the attention of: **Richard Biney**

Test Description	Qty
Moisture Content of Soil BS1377 : Part 2 : Clause 3.2 : 1990 - * UKAS	9
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	9
PSD Wet & Dry Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	4
Disposal of samples for job	1

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
 # - denotes test carried out by approved contractor
@ - denotes non accredited tests

Approved Signatories:
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (Human Resources/ Health and Safety Manager)

GEO Site & Testing Services Ltd
Units 3-4, Heol Aur, Dafen, Llanelli, Carmarthenshire, Wales SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)

Contract Number	65188
Project Name	Land at Glenham, Anyards Road, Cobham, KT11 2LH
Date Tested	27/03/2023

DESCRIPTIONS

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
WS02		D	0.90	-		Brown silty CLAY
WS03		D	1.60	-		Brown fine to medium gravelly sandy silty CLAY
WS04		D	1.50	-		Brown silty CLAY
WS05		D	0.60	-		Brown fine to medium gravelly sandy silty CLAY
WS06		D	0.50	-		Brown silty CLAY
WS07		D	4.60	-		Brown sandy silty CLAY
WS08		D	0.80	-		Brown silty CLAY
TP01		D	0.90	-		Brown silty CLAY
TP02		D	0.50	-		Brown silty CLAY
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		

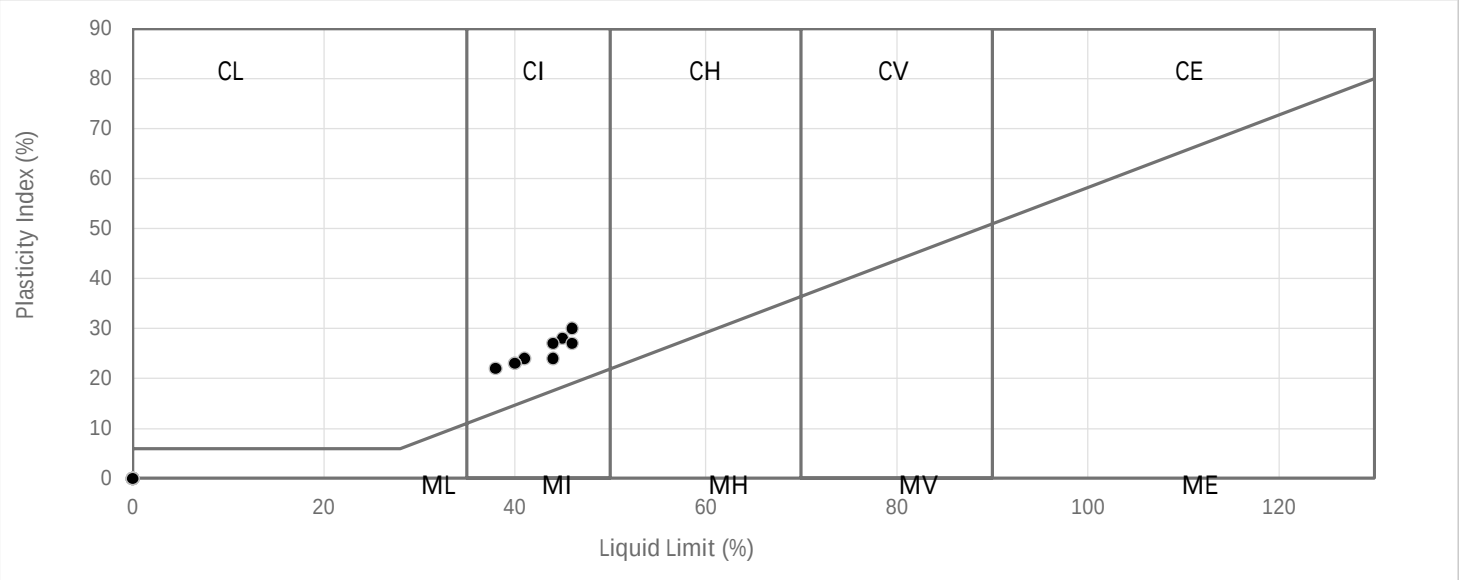
Operator
Clayton Jenkins

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377:1990 - Part 2 : 4.3 & 5.3)	
Contract Number	65188	
Project Name	Land at Glenham, Anyards Road, Cobham, KT11 2LH	
Date Tested	27/03/2023	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
WS02		D	0.90	-		18	45	17	28	100	CI Intermediate Plasticity
WS03		D	1.60	-		17	46	16	30	80	CI Intermediate Plasticity
WS04		D	1.50	-		19	41	17	24	100	CI Intermediate Plasticity
WS05		D	0.60	-		21	46	19	27	89	CI Intermediate Plasticity
WS06		D	0.50	-		18	38	16	22	100	CI Intermediate Plasticity
WS07		D	4.60	-		23	44	17	27	100	CI Intermediate Plasticity
WS08		D	0.80	-		23	40	17	23	100	CI Intermediate Plasticity
TP01		D	0.90	-		20	40	17	23	100	CI Intermediate Plasticity
TP02		D	0.50	-		25	44	20	24	100	CI Intermediate Plasticity
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

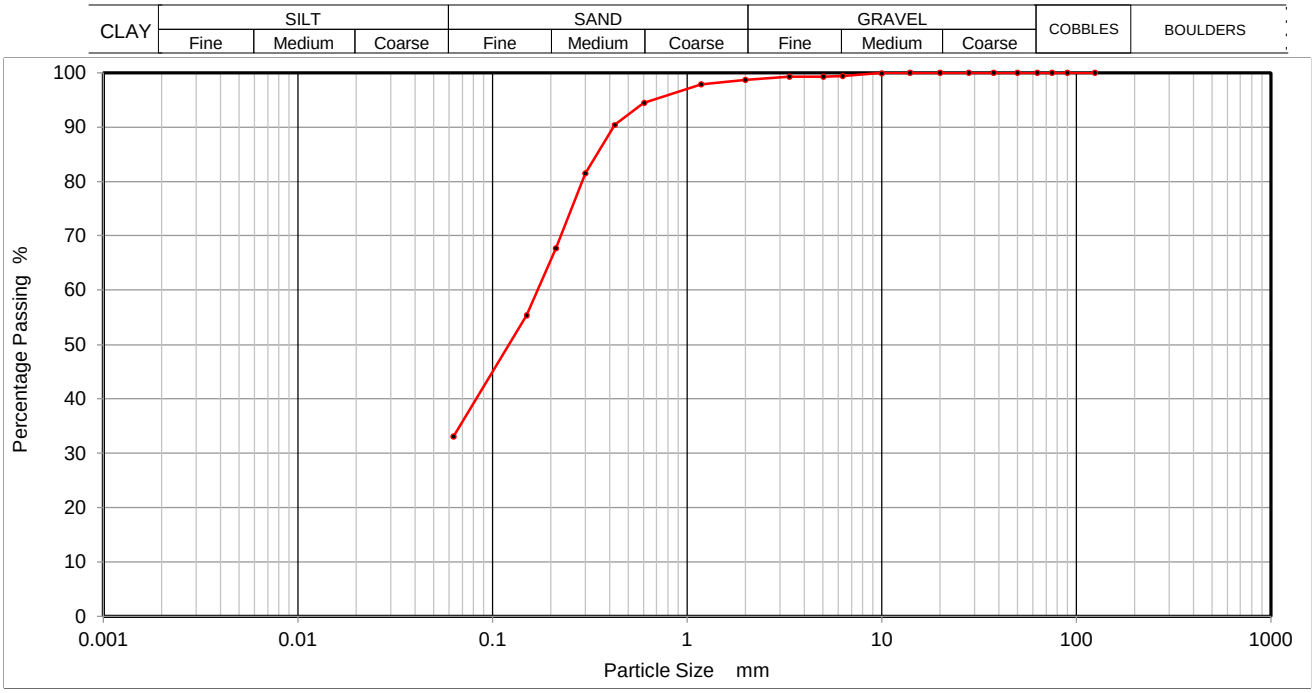
PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:2015+A1:2020



Operator
Clayton Jenkins

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65188
		Borehole/Pit No.	WS01
Project Name	Land at Glenham, Anyards Road, Cobham, KT11 2LH	Sample No.	
Soil Description	Brown slightly gravelly silty/ clayey fine to coarse SAND	Depth Top	1.20
		Depth Base	1.40
Date Tested	01/04/2023	Sample Type	D+D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	99		
2	99		
1.18	98		
0.6	94		
0.425	90		
0.3	82		
0.212	68		
0.15	55		
0.063	33		

Sample Proportions	% dry mass
Cobbles	0
Gravel	1
Sand	66
Silt and Clay	33

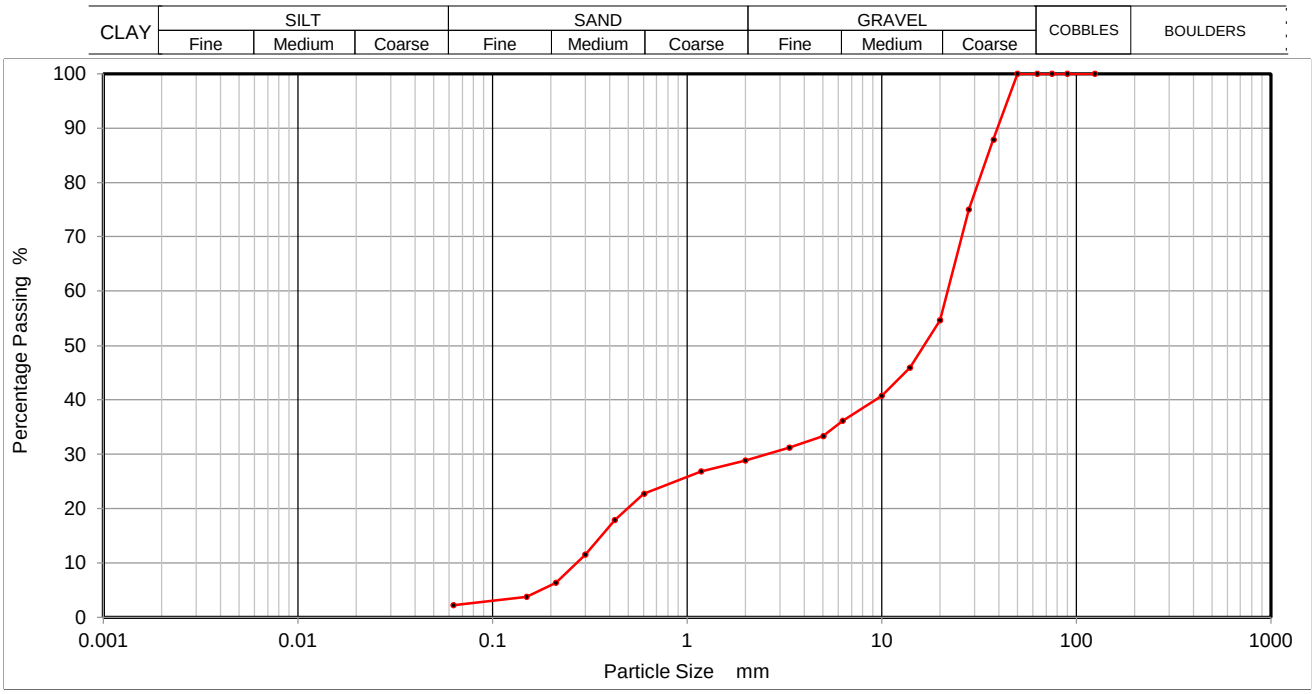
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65188
		Borehole/Pit No.	WS02
Project Name	Land at Glenham, Anyards Road, Cobham, KT11 2LH	Sample No.	
Soil Description	Brown slightly silty/ clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	2.40
		Depth Base	3.40
Date Tested	01/04/2023	Sample Type	D+D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	88		
28	75		
20	55		
14	46		
10	41		
6.3	36		
5	33		
3.35	31		
2	29		
1.18	27		
0.6	23		
0.425	18		
0.3	12		
0.212	6		
0.15	4		
0.063	2		

Sample Proportions	% dry mass
Cobbles	0
Gravel	71
Sand	27
Silt and Clay	2

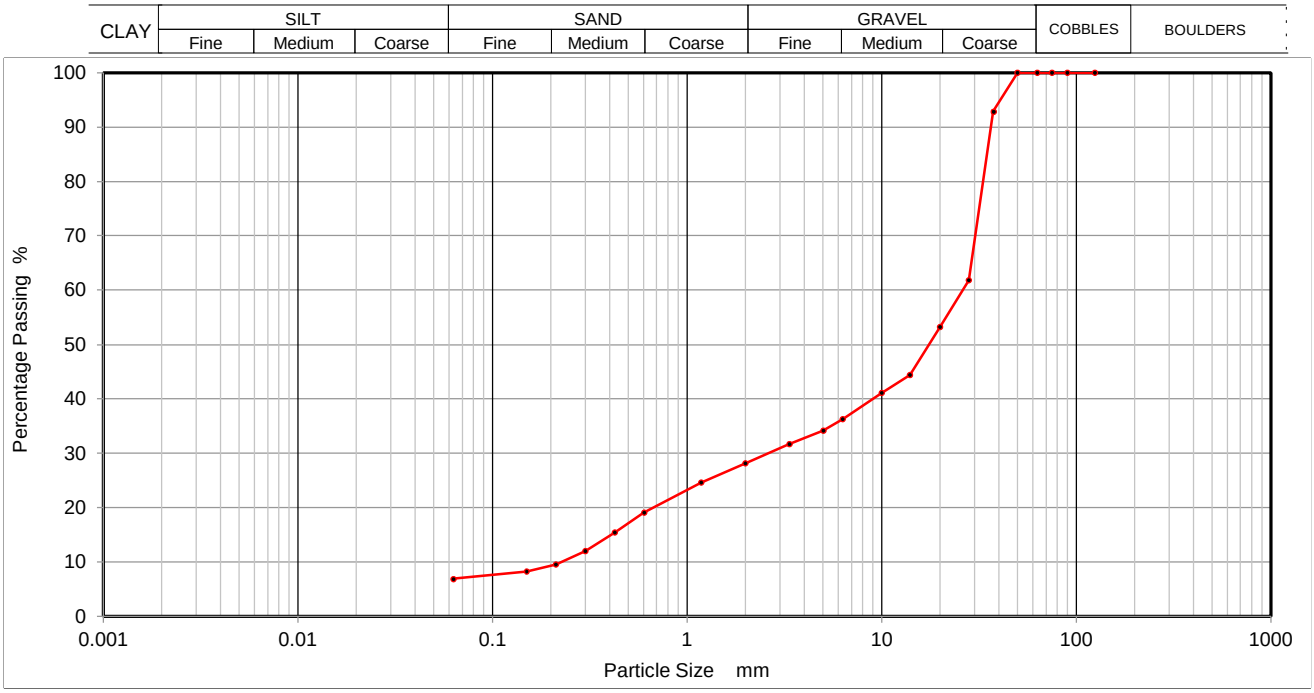
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65188
		Borehole/Pit No.	WS05
Project Name	Land at Glenham, Anyards Road, Cobham, KT11 2LH	Sample No.	
Soil Description	Brown slightly silty/ clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.70
		Depth Base	2.00
Date Tested	01/04/2023	Sample Type	D+D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	93		
28	62		
20	53		
14	44		
10	41		
6.3	36		
5	34		
3.35	32		
2	28		
1.18	25		
0.6	19		
0.425	15		
0.3	12		
0.212	10		
0.15	8		
0.063	7		

Sample Proportions	% dry mass
Cobbles	0
Gravel	72
Sand	21
Silt and Clay	7

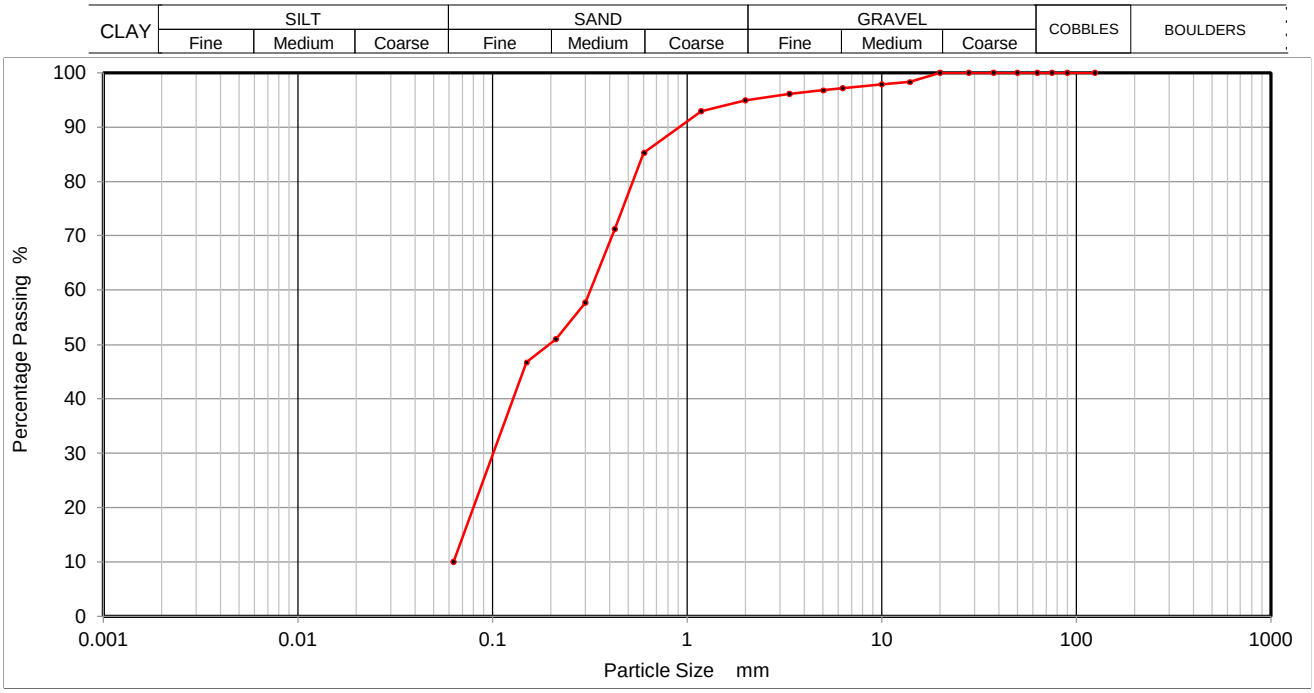
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	65188
		Borehole/Pit No.	WS06
Project Name	Land at Glenham, Anyards Road, Cobham, KT11 2LH	Sample No.	
Soil Description	Brown slightly gravelly silty/ clayey fine to coarse SAND	Depth Top	3.20
		Depth Base	3.70
Date Tested	01/04/2023	Sample Type	D+D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	98		
6.3	97		
5	97		
3.35	96		
2	95		
1.18	93		
0.6	85		
0.425	71		
0.3	58		
0.212	51		
0.15	47		
0.063	10		

Sample Proportions	% dry mass
Cobbles	0
Gravel	5
Sand	85
Silt and Clay	10

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

Richard Biney
Soils Ltd
Newton House
Cross Road
Tadworth
Surrey
KT20 5SR

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 23-03366

Site Reference:	Land at Glenham, Anyards Road, Cobham, KT11 2LH
Project / Job Ref:	20737
Order No:	20737/BRE/RB
Sample Receipt Date:	10/03/2023
Sample Scheduled Date:	10/03/2023
Report Issue Number:	1
Reporting Date:	17/03/2023

Authorised by:

[redacted]

Kevin Old
Operations Director

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

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

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

Soil Analysis Certificate						
DETS Report No: 23-03366	Date Sampled	07/03/23	07/03/23	07/03/23	07/03/23	07/03/23
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH	TP / BH No	WS01	WS02	WS03	WS04	WS05
Project / Job Ref: 20737	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 20737/BRE/RB	Depth (m)	0.90	1.90	1.40	3.50	2.20
Reporting Date: 17/03/2023	DETS Sample No	640023	640024	640025	640026	640027

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	7.1	7.2	7.0	6.9	6.5
Total Sulphate as SO_4	mg/kg	< 200	MCERTS	< 200	< 200			
Total Sulphate as SO_4	%	< 0.02	MCERTS	< 0.02	< 0.02			
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	< 10	< 10	15	< 10	10
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	< 0.01	< 0.01	0.02	< 0.01	0.01
Total Sulphur	%	< 0.02	NONE	< 0.02	< 0.02			
Ammonium as NH_4	mg/kg	< 0.5	ISO17025	25.1	0.8			
Ammonium as NH_4	mg/l	< 0.05	ISO17025	2.51	0.08			
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	8	7			
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS	4.1	3.5			
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	MCERTS	< 3	< 3			
Water Soluble Nitrate (2:1) as NO_3	mg/l	< 1.5	MCERTS	< 1.5	< 1.5			
W/S Magnesium	mg/l	< 0.1	NONE	1.6	0.8			

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

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

Soil Analysis Certificate						
DETS Report No: 23-03366	Date Sampled	07/03/23	07/03/23	07/03/23		
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH	TP / BH No	WS06	WS07	WS08		
Project / Job Ref: 20737	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: 20737/BRE/RB	Depth (m)	1.20	2.00	4.30		
Reporting Date: 17/03/2023	DETS Sample No	640028	640029	640030		

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	5.2	8.2	7.4		
Total Sulphate as SO_4	mg/kg	< 200	MCERTS	388		322		
Total Sulphate as SO_4	%	< 0.02	MCERTS	0.04		0.03		
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	58	14	94		
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	0.06	0.01	0.09		
Total Sulphur	%	< 0.02	NONE	< 0.02		0.33		
Ammonium as NH_4	mg/kg	< 0.5	ISO17025	0.6		3.2		
Ammonium as NH_4	mg/l	< 0.05	ISO17025	0.06		0.32		
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	19		18		
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS	9.6		8.8		
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	MCERTS	< 3		< 3		
Water Soluble Nitrate (2:1) as NO_3	mg/l	< 1.5	MCERTS	< 1.5		< 1.5		
W/S Magnesium	mg/l	< 0.1	NONE	1.6		4.8		

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

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

Soil Analysis Certificate - Sample Descriptions
DETS Report No: 23-03366
Soils Ltd
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH
Project / Job Ref: 20737
Order No: 20737/BRE/RB
Reporting Date: 17/03/2023

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
640023	WS01	None Supplied	0.90	12.2	Grey sandy clay
640024	WS02	None Supplied	1.90	13.7	Grey sand
640025	WS03	None Supplied	1.40	13.1	Brown sandy clay with stones
640026	WS04	None Supplied	3.50	10.8	Brown sandy clay with stones
640027	WS05	None Supplied	2.20	6.9	Brown gravelly sand with stones
640028	WS06	None Supplied	1.20	13.7	Light brown sandy clay
640029	WS07	None Supplied	2.00	4.7	Grey sandy clay with stones
640030	WS08	None Supplied	4.30	18.8	Grey sandy clay

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample I/S

Unsuitable Sample U/S

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

Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 23-03366
Soils Ltd
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH
Project / Job Ref: 20737
Order No: 20737/BRE/RB
Reporting Date: 17/03/2023

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

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List of HWOL Acronyms and Operators
DETS Report No: 23-03366
Soils Ltd
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH
Project / Job Ref: 20737
Order No: 20737/BRE/RB
Reporting Date: 17/03/2023

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym

Appendix A Chemical Laboratory Analyses

Appendix D.1 Conceptual Site Model

Table D.1.1 CSM Revised Pre-Chemical Analyses

Source	Potential Contaminant	Exposure Pathway	Receptor	Initial Assessment from Preliminary Investigation Report Information			Comments	Proposed Investigation
				Severity	Probability	Risk		
Domestic Garages On-site historic and current site usage.	Metals, Semi-metals and non-metals, PAHs, Asbestos	Inhalation of dust	Site Workers/Site Maintenance	Severe	High	Very High	Underlying granular aquifers with northern down gradient.	Phase II ground investigation to confirm the ground conditions present and chemical testing prior to undertaking a generic quantitative risk assessment including assessment / confirmation of potential gas and water risks through monitoring.
			End Users	Medium	Low	Moderate/Low		
			Off-site Users	Severe	High	Very High	Asbestos risk liable to be removed during development leading to lower risk on completion.	
	PAHs, TPHs, Gasses and Vapours	Inhalation of vapour/gases (including Radon)	Site Workers/Site Maintenance	Mild	Low	Low		
			End Users					
			Off-site Users	Minor	Unlikely	Very low		
	Metals, Semi-metals and non-metals, PAHs, TPHs, pH	Ingestion and absorption via direct contact	Site Workers/Site Maintenance	Medium	Unlikely	Low		Asbestos risk assessment / removal must be undertaken by professional competent person in agreement with regulator.
			End Users	Medium	Unlikely	Low		
	Metals, Semi-metals and non-metals, PAHs, TPHs, pH	Migration via surface runoff	Surface Water	Mild	Low	Low		
		Migration in solution via groundwater	Surface Water	Mild	Low	Low		
			Shallow Aquifer	Mild	Low	Low		
			Deep Aquifer	Mild	Low	Low		
		Direct contact with construction material	Buried Structures	Mild	Low	Low		
			Buried Services					
	PAHs, TPHs	Migration of gases via permeable soils	Site Workers/Site Maintenance	Medium	Unlikely	Low		
			End Users					
			Off-site Users	Minor	Unlikely	Very low		
			Building and Confined Spaces					
Laundry/Works/Car Dealer south of site Off-site sources from which potential contamination could have migrated onto the site.	Metals, Semi-metals and non-metals, PAHs	Inhalation of dust	Site Workers/Site Maintenance	Mild	Low	Low	Underlying granular aquifers with northern down gradient	Phase II ground investigation to confirm the ground conditions present and chemical testing prior to undertaking a generic quantitative risk assessment including assessment / confirmation of potential gas and water risks through monitoring.
			End Users	Mild	Low	Low		
			Off-site Users	Minor	Unlikely	Very low		
	PAHs, TPHs, Gasses and Vapours	Inhalation of Vapour/gases (including Radon)	Site Workers/Site Maintenance	Mild	Low	Low		
			End Users	Mild	Low	Low		
			Off-site Users	Medium	Unlikely	Low		
	Metals, Semi-metals and non-metals, PAHs, TPHs, pH	Ingestion and absorption via direct contact	Site Workers/Site Maintenance	Mild	Low	Low		
			End Users	Mild	Low	Low		
	Metals, Semi-metals and non-metals, PAHs, TPHs, pH	Migration via surface runoff	Surface Water	Medium	Unlikely	Low		
		Migration in solution via groundwater	Surface Water	Medium	Unlikely	Low		
			Shallow Aquifer	Medium	Unlikely	Low		
			Deep Aquifer	Medium	Unlikely	Low		
		Direct contact with construction material	Buried structures	Mild	Low	Low		
			Buried Services	Mild	Low	Low		
	PAHs, TPHs, Gases and Vapours	Migration of gases via permeable soils	Site Workers/Site Maintenance	Mild	Low	Low		
			End Users	Mild	Low	Low		
			Off-site Users including buildings and confined spaces	Medium	Unlikely	Low		

Table D.1.2 CSM Revised Post-Chemical Analyses

Source	Potential Contaminant	Exposure Pathway	Receptor	Initial Assessment from Preliminary Investigation Report Information			Comments	Further Assessment
				Severity	Probability	Risk		
Domestic Garages On-site historic and current site usage.	Lead Benzo(a)pyrene Benzo(b)fluoranthene Di-benzo(a,h)anthracene Asbestos associated with the structures onsite (domestic garages).	Inhalation of dust	Site Workers/Site Maintenance	Severe	High	Very High	Underlying granular aquifers with northern down gradient. Asbestos risk liable to be removed during development leading to lower risk on completion.	Lead, benzo(a)pyrene, benzo(b)fluoranthene and di-benzo(a,h)anthracene were found, and as such, further investigation and remediation would be required. Asbestos associated with the structures onsite (domestic garages). Asbestos risk assessment / removal must be undertaken by professional competent person in agreement with regulator. Ground workers should follow regulations on health and safety during development (HSE, 1991). Ground Gas Risk Assessment showed there was unlikely risk from ground gas. Groundwater has been impacted by lead from likely onsite source and further and further groundwater assessment was required to establish whether remediation is necessary.
			End Users	Medium	Low	Moderate/Low		
			Off-site Users	Severe	High	Very High		
		Inhalation of vapour/gases (including Radon)	Site Workers/Site Maintenance	Mild	Low	Low		
			End Users					
			Off-site Users	Minor	Unlikely	Very low		
		Ingestion and absorption via direct contact	Site Workers/Site Maintenance	Medium	Unlikely	Low		
			End Users	Medium	Unlikely	Low		
		Migration via surface runoff	Surface Water	Mild	Low	Low		
		Migration in solution via groundwater	Surface Water	Mild	Low	Low		
			Shallow Aquifer	Mild	Low	Low		
			Deep Aquifer	Mild	Low	Low		
		Direct contact with construction material	Buried Structures	Mild	Low	Low		
			Buried Services					
	None	Migration of gases via permeable soils	Site Workers/Site Maintenance	Medium	Unlikely	Low		
			End Users					
			Off-site Users	Minor	Unlikely	Very low		
			Building and Confined Spaces					
Laundry/Works/Car Dealer south of site Off-site sources from which potential contamination could have migrated onto the site.	Nickel Selenium Zinc PAHs	Inhalation of dust	Site Workers/Site Maintenance	Mild	Low	Low	Underlying granular aquifers with northern down gradient The identified sources have the potential to migrate to the site via the shallow groundwater aquifer.	The groundwater has been impacted by offsite source and no remediation was required to that regard. Ground Gas Risk Assessment showed there was unlikely risk from ground gas.
			End Users	Mild	Low	Low		
			Off-site Users	Minor	Unlikely	Very low		
		Inhalation of Vapour/gases (including Radon)	Site Workers/Site Maintenance	Mild	Low	Low		
			End Users	Mild	Low	Low		
			Off-site Users	Medium	Unlikely	Low		
		Ingestion and absorption via direct contact	Site Workers/Site Maintenance	Mild	Low	Low		
			End Users	Mild	Low	Low		
		Migration via surface runoff	Surface Water	Medium	Unlikely	Low		
		Migration in solution via groundwater	Surface Water	Medium	Unlikely	Low		
			Shallow Aquifer	Medium	Unlikely	Low		
			Deep Aquifer	Medium	Unlikely	Low		
		Direct contact with construction material	Buried structures	Mild	Low	Low		
			Buried Services	Mild	Low	Low		
	None	Migration of gases via permeable soils	Site Workers/Site Maintenance	Mild	Low	Low		
			End Users	Mild	Low	Low		
			Off-site Users including buildings and confined spaces	Medium	Unlikely	Low		

Appendix D.2 Chemical Laboratory Results

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Surrey
KT20 5SR

Derwentside Environmental Testing Services Ltd
Unit 1
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Kent
ME17 2JN
t: 01622 850410

DETS Report No: 23-03360

Site Reference:	Land at Glenham, Anyards Road, Cobham, KT11 2LH
Project / Job Ref:	20737
Order No:	20737/Soil/RB
Sample Receipt Date:	10/03/2023
Sample Scheduled Date:	10/03/2023
Report Issue Number:	1
Reporting Date:	27/03/2023

Authorised by:

[redacted]

Kevin Old
Operations Director

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

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

For Topsoil and WAC analysis the expanded uncertainty measurement should be considered while evaluating results against compliance values.

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Soil Analysis Certificate						
DETS Report No: 23-03360	Date Sampled	07/03/23	07/03/23	07/03/23	07/03/23	07/03/23
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH	TP / BH No	WS01	WS01	WS02	WS03	WS03
Project / Job Ref: 20737	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 20737/Soil/RB	Depth (m)	0.20	0.90	0.20 - 0.40	0.20	0.60
Reporting Date: 27/03/2023	DETS Sample No	639999	640000	640001	640002	640003

Determinand	Unit	RL	Accreditation				(n)	
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected		Not Detected	Not Detected	
pH	pH Units	N/a	MCERTS	9.8		8.5	10.2	
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS			307		
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS			0.31		
Organic Matter (SOM)	%	< 0.1	MCERTS	5.6		2.5	2.5	
Arsenic (As)	mg/kg	< 2	MCERTS	27		15	19	
W/S Boron	mg/kg	< 1	NONE	< 1		< 1	< 1	
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2		0.4	< 0.2	
Chromium (Cr)	mg/kg	< 2	MCERTS	21		20	25	
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2		< 2	< 2	
Copper (Cu)	mg/kg	< 4	MCERTS	40		37	10	
Lead (Pb)	mg/kg	< 3	MCERTS	25		356	39	
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1		< 1	< 1	
Nickel (Ni)	mg/kg	< 3	MCERTS	35		14	20	
Selenium (Se)	mg/kg	< 2	MCERTS	< 2		< 2	< 2	
Vanadium (V)	mg/kg	< 1	MCERTS	48		35	51	
Zinc (Zn)	mg/kg	< 3	MCERTS	68		200	53	
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2		< 2	< 2	

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)
(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

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Soil Analysis Certificate						
DETS Report No: 23-03360	Date Sampled	07/03/23	07/03/23	07/03/23	07/03/23	02/03/23
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH	TP / BH No	WS04	WS05	WS06	WS08	TP01
Project / Job Ref: 20737	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 20737/Soil/RB	Depth (m)	0.20	0.20	0.20	0.20 - 0.40	0.40
Reporting Date: 27/03/2023	DETS Sample No	640004	640005	640006	640007	640008

Determinand	Unit	RL	Accreditation	(n)				
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected	Not Detected		Not Detected	
pH	pH Units	N/a	MCERTS	8.2	6.0		6.3	
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS		12			
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS		0.01			
Organic Matter (SOM)	%	< 0.1	MCERTS	2.2	3.1		5.4	
Arsenic (As)	mg/kg	< 2	MCERTS	19	13		14	
W/S Boron	mg/kg	< 1	NONE	< 1	< 1		< 1	
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.3	< 0.2		0.3	
Chromium (Cr)	mg/kg	< 2	MCERTS	19	15		15	
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2		< 2	
Copper (Cu)	mg/kg	< 4	MCERTS	24	24		44	
Lead (Pb)	mg/kg	< 3	MCERTS	164	213		247	
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1		< 1	
Nickel (Ni)	mg/kg	< 3	MCERTS	14	9		12	
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2		< 2	
Vanadium (V)	mg/kg	< 1	MCERTS	42	25		26	
Zinc (Zn)	mg/kg	< 3	MCERTS	125	120		220	
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2		< 2	

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

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Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 23-03360	Date Sampled	07/03/23	07/03/23	07/03/23	07/03/23	07/03/23
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH	TP / BH No	WS01	WS02	WS03	WS04	WS05
Project / Job Ref: 20737	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 20737/Soil/RB	Depth (m)	0.20	0.20 - 0.40	0.20	0.20	0.20
Reporting Date: 27/03/2023	DETS Sample No	639999	640001	640002	640004	640005

Determinand	Unit	RL	Accreditation			(n)	(n)	
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	0.14	< 0.1	< 0.1	0.25
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	0.40	0.65	0.39	0.38	0.93
Pyrene	mg/kg	< 0.1	MCERTS	0.41	0.60	0.33	0.39	0.85
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.19	0.38	0.15	0.28	0.42
Chrysene	mg/kg	< 0.1	MCERTS	0.22	0.49	0.17	0.34	0.52
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.24	0.67	0.18	0.55	0.67
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.25	< 0.1	0.20	0.23
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.22	0.54	0.13	0.49	0.53
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.15	0.40	< 0.1	0.36	0.36
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.16	0.36	< 0.1	0.35	0.33
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	2	4.5	< 1.6	3.3	5.1

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 23-03360	Date Sampled	07/03/23	07/03/23			
Soils Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH	TP / BH No	WS06	WS08			
Project / Job Ref: 20737	Additional Refs	None Supplied	None Supplied			
Order No: 20737/Soil/RB	Depth (m)	0.20	0.20 - 0.40			
Reporting Date: 27/03/2023	DETS Sample No	640006	640007			

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	0.23			
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	0.51			
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Phenanthrene	mg/kg	< 0.1	MCERTS	0.28	2.73			
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.85			
Fluoranthene	mg/kg	< 0.1	MCERTS	1.23	18.70			
Pyrene	mg/kg	< 0.1	MCERTS	1.19	17			
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.82	9.56			
Chrysene	mg/kg	< 0.1	MCERTS	0.81	8.71			
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	1.19	17.50			
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.45	4.68			
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	1.04	13.80			
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.71	8.08			
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	0.16	1.67			
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.65	7.47			
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	8.5	111			

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Soil Analysis Certificate - EPH Texas Banded						
DETS Report No: 23-03360	Date Sampled	07/03/23	07/03/23	07/03/23	07/03/23	07/03/23
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH	TP / BH No	WS01	WS01	WS02	WS03	WS03
Project / Job Ref: 20737	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 20737/Soil/RB	Depth (m)	0.20	0.90	0.20 - 0.40	0.20	0.60
Reporting Date: 27/03/2023	DETS Sample No	639999	640000	640001	640002	640003

Determinand	Unit	RL	Accreditation				(n)	
EPH Texas (C6 - C8) : HS_1D_MS_Total	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
EPH Texas (>C8 - C10) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
EPH Texas (>C10 - C12) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
EPH Texas (>C12 - C16) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
EPH Texas (>C16 - C21) : EH_1D_Total	mg/kg	< 1	MCERTS	4	< 1	1	3	5
EPH Texas (>C21 - C40) : EH_1D_Total	mg/kg	< 6	MCERTS	83	< 6	10	67	11
EPH Texas (C6 - C40) : HS_1D_MS+EH_1D_Total	mg/kg	< 6	NONE	86	< 6	12	70	15

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

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Soil Analysis Certificate - EPH Texas Banded						
DETS Report No: 23-03360	Date Sampled	07/03/23	07/03/23	07/03/23	02/03/23	
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH	TP / BH No	WS04	WS05	WS08	TP01	
Project / Job Ref: 20737	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: 20737/Soil/RB	Depth (m)	0.20	0.20	0.20 - 0.40	0.40	
Reporting Date: 27/03/2023	DETS Sample No	640004	640005	640007	640008	

Determinand	Unit	RL	Accreditation	(n)				
EPH Texas (C6 - C8) : HS_1D_MS_Total	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
EPH Texas (>C8 - C10) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	< 1	< 1	5	
EPH Texas (>C10 - C12) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	< 1	< 1	18	
EPH Texas (>C12 - C16) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	2	2	83	
EPH Texas (>C16 - C21) : EH_1D_Total	mg/kg	< 1	MCERTS	2	6	52	86	
EPH Texas (>C21 - C40) : EH_1D_Total	mg/kg	< 6	MCERTS	12	18	165	455	
EPH Texas (C6 - C40) : HS_1D_MS+EH_1D_Total	mg/kg	< 6	NONE	14	25	219	648	

DETS Ltd
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Waste Acceptance Criteria Analytical Certificate - BS EN 12457/2

DETS Report No: 23-03360		Date Sampled	07/03/23				Landfill Waste Acceptance Criteria Limits		
Soils Ltd		Time Sampled	None Supplied				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH		TP / BH No	WS02						
Project / Job Ref: 20737		Additional Refs	None Supplied						
Order No: 20737/Soil/RB		Depth (m)	0.20 - 0.40						
Reporting Date: 27/03/2023		DETS Sample No	640001						
Determinand	Unit	MDL							
TOC[MU]	%	< 0.1	1.5				3%	5%	6%
Loss on Ignition[MU]	%	< 0.01	3.40				--	--	10%
BTEX[MU]	mg/kg	< 0.05	< 0.05				6	--	--
Sum of PCBs	mg/kg	< 0.1	< 0.1				1	--	--
Mineral Oil[MU]	mg/kg	< 10	< 10				500	--	--
Total PAH[MU]	mg/kg	< 1.7	4.6				100	--	--
pH[MU]	pH Units	N/a	8.5				--	>6	--
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	< 1				--	To be evaluated	To be evaluated
Eluate Analysis			10:1 mg/l			Cumulative 10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
Arsenic[U]			< 0.01			< 0.1	0.5	2	25
Barium[U]			< 0.02			< 0.2	20	100	300
Cadmium[U]			< 0.0005			< 0.005	0.04	1	5
Chromium[U]			< 0.005			< 0.05	0.5	10	70
Copper[U]			< 0.01			< 0.1	2	50	100
Mercury[U]			< 0.0005			< 0.005	0.01	0.2	2
Molybdenum[U]			< 0.001			< 0.01	0.5	10	30
Nickel[U]			< 0.007			< 0.07	0.4	10	40
Lead[U]			< 0.005			< 0.05	0.5	10	50
Antimony[U]			< 0.005			< 0.05	0.06	0.7	5
Selenium[U]			< 0.005			< 0.05	0.1	0.5	7
Zinc[U]			< 0.005			< 0.05	4	50	200
Chloride[U]			1.4			14	800	15000	25000
Fluoride[U]			< 0.5			< 5	10	150	500
Sulphate[U]			3.0			30	1000	20000	50000
TDS			42			420	4000	60000	100000
Phenol Index			0.02			0.2	1	-	-
DOC			7.6			76.3	500	800	1000
Leach Test Information									
Sample Mass (kg)			0.10						
Dry Matter (%)			86.5						
Moisture (%)			15.6						
Stage 1									
Volume Eluate L10 (litres)			0.89						

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

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Waste Acceptance Criteria Analytical Certificate - BS EN 12457/2

DETS Report No: 23-03360		Date Sampled	07/03/23				Landfill Waste Acceptance Criteria Limits		
Soils Ltd		Time Sampled	None Supplied				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH		TP / BH No	WS05						
Project / Job Ref: 20737		Additional Refs	None Supplied						
Order No: 20737/Soil/RB		Depth (m)	0.20						
Reporting Date: 27/03/2023		DETS Sample No	640005						
Determinand	Unit	MDL							
TOC[MU]	%	< 0.1	1.8				3%	5%	6%
Loss on Ignition[MU]	%	< 0.01	4.70				--	--	10%
BTEX[MU]	mg/kg	< 0.05	< 0.05				6	--	--
Sum of PCBs	mg/kg	< 0.1	< 0.1				1	--	--
Mineral Oil[MU]	mg/kg	< 10	< 10				500	--	--
Total PAH[MU]	mg/kg	< 1.7	5.1				100	--	--
pH[MU]	pH Units	N/a	6.0				--	>6	--
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	< 1				--	To be evaluated	To be evaluated
Eluate Analysis			10:1 mg/l			Cumulative 10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
Arsenic[U]			< 0.01			< 0.1	0.5	2	25
Barium[U]			< 0.02			< 0.2	20	100	300
Cadmium[U]			< 0.0005			< 0.005	0.04	1	5
Chromium[U]			< 0.005			< 0.05	0.5	10	70
Copper[U]			< 0.01			< 0.1	2	50	100
Mercury[U]			< 0.0005			< 0.005	0.01	0.2	2
Molybdenum[U]			< 0.001			< 0.01	0.5	10	30
Nickel[U]			< 0.007			< 0.07	0.4	10	40
Lead[U]			< 0.005			< 0.05	0.5	10	50
Antimony[U]			< 0.005			< 0.05	0.06	0.7	5
Selenium[U]			< 0.005			< 0.05	0.1	0.5	7
Zinc[U]			0.006			0.06	4	50	200
Chloride[U]			1.5			15	800	15000	25000
Fluoride[U]			< 0.5			< 5	10	150	500
Sulphate[U]			2.4			24	1000	20000	50000
TDS			23			230	4000	60000	100000
Phenol Index			< 0.01			< 0.1	1	-	-
DOC			8.4			84.4	500	800	1000
Leach Test Information									
Sample Mass (kg)			0.11						
Dry Matter (%)			82.6						
Moisture (%)			21.2						
Stage 1									
Volume Eluate L10 (litres)			0.88						

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
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M Denotes MCERTS accredited test
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Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 23-03360	
Soils Ltd	
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH	
Project / Job Ref: 20737	
Order No: 20737/Soil/RB	
Reporting Date: 27/03/2023	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
639999	WS01	None Supplied	0.20	12.8	Black sandy clay with stones and concrete
640000	WS01	None Supplied	0.90	12.3	Brown sandy clay
640001	WS02	None Supplied	0.20 - 0.40	13.5	Brown sandy clay with stones and concrete
640002	WS03	None Supplied	0.20	6.7	Brown sandy gravel with stones and concrete
640003	WS03	None Supplied	0.60	14.2	Brown sandy clay with stones
640004	WS04	None Supplied	0.20	10.7	Brown sandy gravel with stones and concrete
640005	WS05	None Supplied	0.20	17.4	Brown sandy clay with stones
640006	WS06	None Supplied	0.20	18.6	Brown sandy clay with stones and vegetation
640007	WS08	None Supplied	0.20 - 0.40	19.1	Black loamy sand with vegetation
640008	TP01	None Supplied	0.40	13.6	Brown sandy clay with stones and concrete

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample I/S

Unsuitable Sample U/S

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Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 23-03360
Soils Ltd
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH
Project / Job Ref: 20737
Order No: 20737/Soil/RB
Reporting Date: 27/03/2023

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

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UKAS TESTING 4480

Water Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 23-03360
Soils Ltd
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH
Project / Job Ref: 20737
Order No: 20737/Soil/RB
Reporting Date: 27/03/2023

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	F	Ammoniacal Nitrogen	Determination of ammoniacal nitrogen by discrete analyser.	E126
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR dete	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 – C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GI-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichlorometha	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered

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List of HWOL Acronyms and Operators
DETS Report No: 23-03360
Soils Ltd
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH
Project / Job Ref: 20737
Order No: 20737/Soil/RB
Reporting Date: 27/03/2023

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym
EPH Texas (C10 - C12) - EH_1D_Total
EPH Texas (C12 - C16) - EH_1D_Total
EPH Texas (C16 - C21) - EH_1D_Total
EPH Texas (C21 - C40) - EH_1D_Total
EPH Texas (C6 - C40) - HS_1D_MS+EH_1D_Total
EPH Texas (C6 - C8) - HS_1D_MS_Total
EPH Texas (C8 - C10) - EH_1D_Total
Mineral Oil (C10 - C40) (BS EN 12457-2) - EH_CU_1D_AL
Total BTEX (BS EN 12457-2) - HS_1D_MS_Total

Parameter	Matrix Type	Suite Reference	Expanded Uncertainity Measurement	Unit
TOC	Soil	BS EN 12457	10.4	%
Loss on Ignition	Soil	BS EN 12457	16.9	%
BTEX	Soil	BS EN 12457	14.0	%
Sum of PCBs	Soil	BS EN 12457	21.1	%
Mineral Oil	Soil	BS EN 12457	9.0	%
Total PAH	Soil	BS EN 12457	17.9	%
pH	Soil	BS EN 12457	0.282	Units
Acid Neutralisation Capacity	Soil	BS EN 12457	18.0	%
Arsenic	Leachate	BS EN 12457	19.5	%
Barium	Leachate	BS EN 12457	12.2	%
Cadmium	Leachate	BS EN 12457	17.2	%
Chromium	Leachate	BS EN 12457	20.7	%
Copper	Leachate	BS EN 12457	14.1	%
Mercury	Leachate	BS EN 12457	16.7	%
Molybdenum	Leachate	BS EN 12457	13.3	%
Nickel	Leachate	BS EN 12457	14.0	%
Lead	Leachate	BS EN 12457	12.1	%
Antimony	Leachate	BS EN 12457	16.1	%
Selenium	Leachate	BS EN 12457	15.5	%
Zinc	Leachate	BS EN 12457	14.0	%
Chloride	Leachate	BS EN 12457	15.7	%
Fluoride	Leachate	BS EN 12457	19.1	%
Sulphate	Leachate	BS EN 12457	27.6	%
TDS	Leachate	BS EN 12457	10.0	%
Phenol Index	Leachate	BS EN 12457	12.9	%
DOC	Leachate	BS EN 12457	20.4	%
Clay Content	Soil	BS 3882: 2015	15.0	%
Silt Content	Soil	BS 3882: 2015	14.0	%
Sand Content	Soil	BS 3882: 2015	13.0	%
Loss on Ignition	Soil	BS 3882: 2015	16.9	%
pH	Soil	BS 3882: 2015	0.282	Units
Carbonate	Soil	BS 3882: 2015	12.0	%
Total Nitrogen	Soil	BS 3882: 2015	12.0	%
Phosphorus (Extractable)	Soil	BS 3882: 2015	24.0	%
Potassium (Extractable)	Soil	BS 3882: 2015	20.0	%
Magnesium (Extractable)	Soil	BS 3882: 2015	26.0	%
Zinc	Soil	BS 3882: 2015	19.8	%
Copper	Soil	BS 3882: 2015	23.2	%
Nickel	Soil	BS 3882: 2015	32.6	%
Available Sodium	Soil	BS 3882: 2015	23.0	%
Available Calcium	Soil	BS 3882: 2015	23.0	%
Electrical Conductivity	Soil	BS 3882: 2015	10.0	%

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DETS Report No: 23-04796

Site Reference:	Land at Glenham, Anyards Road, Cobham, KT11 2LH
Project / Job Ref:	20737
Order No:	20737/GW/RB
Sample Receipt Date:	06/04/2023
Sample Scheduled Date:	06/04/2023
Report Issue Number:	2
Reporting Date:	14/04/2023

Authorised by:
[redacted]
Kevin Old
Operations Director

Dates of laboratory activities for each tested analyte are available upon request.
This report supersedes 23-04796, issue no.1.
Reason for re-issue:
Total Cyanide result amended.

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UKAS TESTING
4480

Water Analysis Certificate						
DETS Report No: 23-04796	Date Sampled	04/04/23	04/04/23	04/04/23		
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH	TP / BH No	WS01	WS04	WS06		
Project / Job Ref: 20737	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: 20737/GW/RB	Depth (m)	0.51	0.60	0.32		
Reporting Date: 14/04/2023	DETS Sample No	645852	645853	645854		

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	ISO17025	8.3	7.0	6.9		
Total Cyanide	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Free Cyanide	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Total Organic Carbon (TOC)	mg/l	< 0.1	NONE	87.4	8.1	17.2		
Hardness - Total	mgCaCO3/l	< 1	NONE	190	499	303		
Dissolved Oxygen	mg/l	<1	NONE	5.9	3.4	4.4		
Arsenic (dissolved)	ug/l	< 5	ISO17025	7	< 5	< 5		
Boron (dissolved)	ug/l	< 5	ISO17025	107	931	501		
Cadmium (dissolved)	ug/l	< 0.4	ISO17025	0.5	< 0.4	< 0.4		
Chromium (dissolved)	ug/l	< 5	ISO17025	10	< 5	< 5		
Chromium (hexavalent)	ug/l	< 20	NONE	< 20	< 20	< 20		
Copper (dissolved)	ug/l	< 5	ISO17025	40	17	7		
Lead (dissolved)	ug/l	< 5	ISO17025	56	153	< 5		
Mercury (dissolved)	ug/l	< 0.05	ISO17025	< 0.05	< 0.05	< 0.05		
Nickel (dissolved)	ug/l	< 5	ISO17025	17	11	24		
Selenium (dissolved)	ug/l	< 5	ISO17025	6	< 5	< 5		
Vanadium (dissolved)	ug/l	< 5	ISO17025	22	6	< 5		
Zinc (dissolved)	ug/l	< 2	ISO17025	95	123	28		
Total Phenols (monohydric)	ug/l	< 10	ISO17025	< 10	< 10	< 10		

Subcontracted analysis (S)
Insufficient sample I/S
Unsuitable Sample U/S

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Water Analysis Certificate - Speciated PAH							
DETS Report No: 23-04796	Date Sampled	04/04/23	04/04/23	04/04/23		
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH	TP / BH No	WS01	WS04	WS06		
Project / Job Ref: 20737	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: 20737/GW/RB	Depth (m)	0.51	0.60	0.32		
Reporting Date: 14/04/2023	DETS Sample No	645852	645853	645854		

Determinand	Unit	RL	Accreditation					
Naphthalene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Acenaphthylene	ug/l	< 0.01	NONE	0.06	< 0.01	< 0.01		
Acenaphthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Fluorene	ug/l	< 0.01	NONE	0.06	< 0.01	< 0.01		
Phenanthrene	ug/l	< 0.01	NONE	0.27	< 0.01	< 0.01		
Anthracene	ug/l	< 0.01	NONE	0.13	< 0.01	< 0.01		
Fluoranthene	ug/l	< 0.01	NONE	1.47	< 0.01	< 0.01		
Pyrene	ug/l	< 0.01	NONE	1.29	< 0.01	< 0.01		
Benzo(a)anthracene	ug/l	< 0.01	NONE	1.05	< 0.01	< 0.01		
Chrysene	ug/l	< 0.01	NONE	1.07	< 0.01	< 0.01		
Benzo(b)fluoranthene	ug/l	< 0.01	NONE	1.51	< 0.01	< 0.01		
Benzo(k)fluoranthene	ug/l	< 0.01	NONE	1.01	< 0.01	< 0.01		
Benzo(a)pyrene	ug/l	< 0.01	NONE	1.57	< 0.01	< 0.01		
Indeno(1,2,3-cd)pyrene	ug/l	< 0.01	NONE	1.35	< 0.01	< 0.01		
Dibenz(a,h)anthracene	ug/l	< 0.01	NONE	0.32	< 0.01	< 0.01		
Benzo(ghi)perylene	ug/l	< 0.008	NONE	1.310	< 0.008	< 0.008		
Total EPA-16 PAHs	ug/l	< 0.16	NONE	12.47	< 0.16	< 0.16		

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Water Analysis Certificate - TPH CWG Banded							
DETS Report No: 23-04796	Date Sampled	04/04/23	04/04/23	04/04/23		
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH	TP / BH No	WS01	WS04	WS06		
Project / Job Ref: 20737	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: 20737/GW/RB	Depth (m)	0.51	0.60	0.32		
Reporting Date: 14/04/2023	DETS Sample No	645852	645853	645854		

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6 : HS_1D_MS_AL	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C6 - C8 : HS_1D_MS_AL	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C8 - C10 : EH_CU_1D_AL	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C10 - C12 : EH_CU_1D_AL	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C12 - C16 : EH_CU_1D_AL	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C16 - C21 : EH_CU_1D_AL	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C21 - C34 : EH_CU_1D_AL	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic (C5 - C34) : HS_1D_MS+EH_CU_1D_AL	ug/l	< 70	NONE	< 70	< 70	< 70		
Aromatic >C5 - C7 : HS_1D_MS_AR	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C7 - C8 : HS_1D_MS_AR	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C8 - C10 : EH_CU_1D_AR	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C10 - C12 : EH_CU_1D_AR	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C12 - C16 : EH_CU_1D_AR	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C16 - C21 : EH_CU_1D_AR	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C21 - C35 : EH_CU_1D_AR	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic (C5 - C35) : HS_1D_MS+EH_CU_1D_AR	ug/l	< 70	NONE	< 70	< 70	< 70		
Total >C5 - C35 : HS_1D_MS+EH_CU_1D_Total	ug/l	< 140	NONE	< 140	< 140	< 140		

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Water Analysis Certificate - BTEX / MTBE							
DETS Report No: 23-04796	Date Sampled	04/04/23	04/04/23	04/04/23		
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH	TP / BH No	WS01	WS04	WS06		
Project / Job Ref: 20737	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: 20737/GW/RB	Depth (m)	0.51	0.60	0.32		
Reporting Date: 14/04/2023	DETS Sample No	645852	645853	645854		

Determinand	Unit	RL	Accreditation					
Benzene : HS_1D_MS	ug/l	< 1	ISO17025	< 1	< 1	< 1		
Toluene : HS_1D_MS	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Ethylbenzene : HS_1D_MS	ug/l	< 5	ISO17025	< 5	< 5	< 5		
p & m-xylene : HS_1D_MS	ug/l	< 10	ISO17025	< 10	< 10	< 10		
o-xylene : HS_1D_MS	ug/l	< 5	ISO17025	< 5	< 5	< 5		
MTBE : HS_1D_MS	ug/l	< 10	ISO17025	< 10	< 10	< 10		

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Water Analysis Certificate - Volatile Organic Compounds (VOC)						
DETS Report No: 23-04796	Date Sampled	04/04/23	04/04/23	04/04/23		
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH	TP / BH No	WS01	WS04	WS06		
Project / Job Ref: 20737	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: 20737/GW/RB	Depth (m)	0.51	0.60	0.32		
Reporting Date: 14/04/2023	DETS Sample No	645852	645853	645854		

Determinand	Unit	RL	Accreditation					
Dichlorodifluoromethane	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Vinyl Chloride	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Chloromethane	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Chloroethane	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Bromomethane	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Trichlorofluoromethane	ug/l	< 5	ISO17025	< 5	< 5	< 5		
1,1-Dichloroethene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
MTBE	ug/l	< 10	ISO17025	< 10	< 10	< 10		
trans-1,2-Dichloroethene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
1,1-Dichloroethane	ug/l	< 5	ISO17025	< 5	< 5	< 5		
cis-1,2-Dichloroethene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
2,2-Dichloropropane	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Chloroform	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Bromochloromethane	ug/l	< 10	ISO17025	< 10	< 10	< 10		
1,1,1-Trichloroethane	ug/l	< 5	ISO17025	< 5	< 5	< 5		
1,1-Dichloropropene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Carbon Tetrachloride	ug/l	< 5	ISO17025	< 5	< 5	< 5		
1,2-Dichloroethane	ug/l	< 10	ISO17025	< 10	< 10	< 10		
Benzene	ug/l	< 1	ISO17025	< 1	< 1	< 1		
1,2-Dichloropropane	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Trichloroethene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Bromodichloromethane	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Dibromomethane	ug/l	< 5	ISO17025	< 5	< 5	< 5		
TAME	ug/l	< 5	ISO17025	< 5	< 5	< 5		
cis-1,3-Dichloropropene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Toluene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
trans-1,3-Dichloropropene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
1,1,2-Trichloroethane	ug/l	< 10	ISO17025	< 10	< 10	< 10		
1,3-Dichloropropane	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Tetrachloroethene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Dibromochloromethane	ug/l	< 5	ISO17025	< 5	< 5	< 5		
1,2-Dibromoethane	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Chlorobenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
1,1,1,2-Tetrachloroethane	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Ethyl Benzene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
m,p-Xylene	ug/l	< 10	ISO17025	< 10	< 10	< 10		
o-Xylene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Styrene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Bromoform	ug/l	< 10	ISO17025	< 10	< 10	< 10		
Isopropylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
1,1,2,2-Tetrachloroethane	ug/l	< 10	ISO17025	< 10	< 10	< 10		
1,2,3-Trichloropropane	ug/l	< 5	ISO17025	< 5	< 5	< 5		
n-Propylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Bromobenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
2-Chlorotoluene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
1,3,5-Trimethylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
4-Chlorotoluene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
tert-Butylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
1,2,4-Trimethylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
sec-Butylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
p-Isopropyltoluene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
1,3-Dichlorobenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
1,4-Dichlorobenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
n-Butylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
1,2-Dichlorobenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
,2-Dibromo-3-chloropropane	ug/l	< 10	ISO17025	< 10	< 10	< 10		
Hexachlorobutadiene	ug/l	< 5	ISO17025	< 5	< 5	< 5		

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Water Analysis Certificate - Semi Volatile Organic Compounds (SVOC)							
DETS Report No: 23-04796	Date Sampled	04/04/23	04/04/23	04/04/23		
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH	TP / BH No	WS01	WS04	WS06		
Project / Job Ref: 20737	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: 20737/GW/RB	Depth (m)	0.51	0.60	0.32		
Reporting Date: 14/04/2023	DETS Sample No	645852	645853	645854		

Determinand	Unit	RL	Accreditation					
Phenol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
1,2,4-Trichlorobenzene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
2-Nitrophenol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
Nitrobenzene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
0-Cresol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
bis(2-chloroethoxy)methane	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
bis(2-chloroethyl)ether	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
2,4-Dichlorophenol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
2-Chlorophenol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
1,3-Dichlorobenzene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
1,4-Dichlorobenzene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
1,2-Dichlorobenzene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
2,4-Dimethylphenol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
Isophorone	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
Hexachloroethane	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
p-Cresol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
2,4,6-Trichlorophenol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
2,4,5-Trichlorophenol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
2-Nitroaniline	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
4-Chloro-3-methylphenol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
2-Methylnaphthalene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
Hexachlorocyclopentadiene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
Hexachlorobutadiene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
2,6-Dinitrotoluene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
Dimethyl phthalate	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
2-Chloronaphthalene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
4-Chloroanaline	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
4-Nitrophenol	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
4-Chlorophenyl phenyl ether	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
3-Nitroaniline	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
4-Nitroaniline	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
4-Bromophenyl phenyl ether	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
Hexachlorobenzene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
2,4-Dinitrotoluene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
Diethyl phthalate	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
Dibenzofuran	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
Azobenzene	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
Dibutyl phthalate	ug/l	< 0.1	NONE	1.1	< 0.1	< 0.1		
Carbazole	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
bis(2-ethylhexyl)phthalate	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
Benzyl butyl phthalate	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
Di-n-octyl phthalate	ug/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1		

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Water Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 23-04796
Soils Ltd
Site Reference: Land at Glenham, Anyards Road, Cobham, KT11 2LH
Project / Job Ref: 20737
Order No: 20737/GW/RB
Reporting Date: 14/04/2023

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	F	Ammoniacal Nitrogen	Determination of ammoniacal nitrogen by discrete analyser.	E126
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR dete	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 – C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GI-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichlorometha	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered

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UKAS TESTING
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List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym
Benzene - HS_1D_MS
Ethylbenzene - HS_1D_MS
MTBE - HS_1D_MS
TPH CWG - Aliphatic >C10 - C12 - EH_CU_1D_AL
TPH CWG - Aliphatic >C12 - C16 - EH_CU_1D_AL
TPH CWG - Aliphatic >C16 - C21 - EH_CU_1D_AL
TPH CWG - Aliphatic >C21 - C34 - EH_CU_1D_AL
TPH CWG - Aliphatic >C5 - C34 - HS_1D_MS+EH_CU_1D_AL
TPH CWG - Aliphatic >C5 - C6 - HS_1D_MS_AL
TPH CWG - Aliphatic >C6 - C8 - HS_1D_MS_AL
TPH CWG - Aliphatic >C8 - C10 - EH_CU_1D_AL
TPH CWG - Aromatic >C10 - C12 - EH_CU_1D_AR
TPH CWG - Aromatic >C12 - C16 - EH_CU_1D_AR
TPH CWG - Aromatic >C16 - C21 - EH_CU_1D_AR
TPH CWG - Aromatic >C21 - C35 - EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C7 - HS_1D_MS_AR
TPH CWG - Aromatic >C7 - C8 - HS_1D_MS_AR
TPH CWG - Aromatic >C8 - C10 - EH_CU_1D_AR
TPH CWG - Aromatic C5 - C35 - HS_1D_MS+EH_CU_1D_AR
TPH CWG - Total >C5 - C35 - HS_1D_MS+EH_CU_1D_Total
Toluene - HS_1D_MS
m & p-xylene - HS_1D_MS
o-Xylene - HS_1D_MS

Appendix D.3 General Assessment Criteria

HUMAN HEALTH RISK ASSESSMENT

Introduction

The statutory definition of contaminated land was initially defined in the Environmental Protection Act 1990, ref. 1.1, which was introduced by the Environment Act 1995, ref. 1.2, and retained in the Environment Act 2021, ref 1.3, as;

‘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.’

The UK guidance on the assessment of contaminated land has developed as a direct result of the introduction of these Acts. The technical guidance supporting the original legislation was summarised in a number of key documents collectively known as the Contaminated Land Reports (CLRs). These have since been replaced or superseded by Land Contamination Risk Management (LCRM) 2021, ref 1.4 produced and administrated by the Environment Agency online through the .GOV.uk website https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm .

However, the basic definitions, methodology and guidance remain essentially the same utilizing the UK Contaminated Land Exposure Assessment Models (CLEA) as within the original CLR and planning guidance it replaces or supersedes.

In establishing whether a site fulfils the statutory definition of ‘contaminated land’ it remains 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 identified 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.

A ‘pollutant linkage’ may therefore be defined as the confirmation of a link between a contaminant ‘source’ and a vulnerable at risk ‘receptor’ by means of a ‘pathway’ and that the risk is potentially significant. If there is no complete linkage, risk defaults to low to negligible and can never be potentially significant.

Assessment Methodology

A four-stage assessment process is followed for identifying potential pollutant linkages on a site. These stages are summarised 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 in the context of existing and future proposals.

Stages 1 and 2 develop an initial *'conceptual model'* based upon information collated from desk-based available and existing site information and a walkover of the site as recommended in BS10175 and LCRM. The formation of any conceptual model is an iterative process and as such it should be updated and refined throughout each phase of the project to reflect any additional information obtained and unknowns being resolved and identify the potential contaminants of concern at the site, i.e. those with the potential to cause significant harm to identified receptors.

The extent of the desk studies and enquiries to be conducted should be in general accordance with BS10175 and other UK guidance to produce an initial conceptual model highlighting the known potential risks, remaining unknowns and contaminants of concern. The information from these enquiries is presented in a desk study or preliminary report with recommendations, if necessary, for further work based upon the conceptual model findings and any identified or unresolved unknowns.

If potential pollutant linkages or potentially significant unknowns are identified within the initial conceptual model, further site investigation and report will be recommended and usually required under planning. Such investigation should be based on and driven by the findings of the initial conceptual model and planned in general accordance with BS10175, LCRM and other current UK guidance where relevant. The number of exploratory holes and samples collected for analysis should be consistent with the size, extent and nature of the site, the identified contaminants of concern and the level of initial risk identified in the initial conceptual model. This will enable a contamination risk assessment to be conducted in accordance with current UK requirements, at which point the conceptual model can be updated and any relevant pollutant linkages can be further quantified and any remaining unknowns resolved. As previously this is an iterative process that may highlight or require additional investigation to resolve to the satisfaction of the regulator.

A two-stage investigation process may therefore be more appropriate where time constraints are less of an issue with the first intrusive investigation being conducted as an initial or screening assessment to confirm or validate the presence of potential sources on site identified in the initial conceptual model and to investigate if additional unknown sources not previously identified are present. This helps to define the scope, extent and requirements of a second more refined and targeted investigation to delineate wherever possible the extent of the identified contamination, contaminants of concern and/or remaining unknowns.

All site works should be undertaken in general accordance with the British Standards BS 10175, ref. 5, for environmental only investigations and BS 5930:2015, ref. 1.6, in the case of combined Geoenvironmental and/or Geotechnical investigations.

The results of analysis are compared initially against generic guidance values which are dependent on the proposed end-use of the development and which must ultimately be based on traceable, scientifically valid and justified exposure and chemical data using the UKCLEA methodology.

The end-use and therefore potential exposure pathways may be defined as one of the following under current UK guidance;

- Residential with homegrown produce i.e. typical low rise and low-density housing with gardens where vegetables and fruits may be grown for home consumption.
- Residential without homegrown produce i.e. low-density housing where no gardens are present where vegetables and fruits could be grown for home consumption.
- Allotments –i.e. areas where vegetables and fruits are grown for home consumption but are not specifically associated with a residential property.
- Public open space residential –i.e. grassed areas adjacent and/or directly related to high density housing and other common or communal open areas on which underlying soils could be exposed but on which vegetables and fruits are not grown for consumption.
- Public open space –i.e. areas such as parks, playing fields and other recreational areas to which public access is possible but otherwise to which there is no direct residential linkage.
- Commercial –i.e. industrial premises where there is limited exposure to soil and residents are not present on site.

Standard Land-use Scenarios

The standard land-use scenarios used to develop exposure models are further detailed in the following sections:

Residential with homegrown produce

Generic scenario assumes a house built on a ground bearing slab with a private garden having a lawn, flowerbeds and a small fruit and vegetable patch.

- Critical receptor is assumed to be a young female child (zero to six years old)
- Exposure pathways include direct soil and indoor dust ingestion, consumption of home-grown produce and any adhering soil, skin contact with soils and indoor dust and inhalation of indoor and outdoor dust and vapours.

A sub-set of the Residential land-use is **Residential without Homegrown produce**. The generic scenario assumes low density housing with communal landscaped gardens where the consumption of homegrown vegetables will not occur and the pathways of direct ingestion and produce inputs are suitably moderated.

Allotments

Areas of open space commonly made available to local users but remote from residential properties, but on which tenants may grow fruit and vegetables for their own consumption. Typically, there are a number of plots to a site which may have a total area of up to 1 hectare. The tenants are assumed to be adults and that young children make only occasional accompanied visits.

Although some allotment holders may choose to keep animals on allotments, potential exposure to animal products is not currently considered within the CLEA model.

- Critical receptor is a young female child (zero to six years old)
- Exposure pathways include direct soil ingestion, consumption of homegrown produce and any adhering soil, skin contact with soils and inhalation of outdoor dust and vapours but at reduced exposure levels reflecting non-residential status.

Commercial

This generic scenario assumes a typical commercial or light industrial property at which employees spend most time indoors and are involved in office-based or relatively light physical work.

- Critical receptor is a working female adult (aged 16 to 65 years old).
- Exposure duration is over working lifetime
- Exposure pathways include direct soil and indoor dust ingestion, skin contact with soils and dusts and inhalation of dust and vapours but exposure reduced to reflect non-residential nature and general lack of open spaces.

Public Open Space within Residential Area

This generic scenario refers to any grassed area up to 0.05 ha that is associated with residential properties but is not for their exclusive use and on which no fruit or vegetables are grown for home consumption.

- Grassed area of up to 0.05 ha and a considerable proportion of this (up to 50%) may be bare soil which can be interacted with directly
- Predominantly used by children for play and/or access
- Sufficiently close proximity to home for tracking back of soil to occur, thus indoor exposure pathways apply

- older children chosen as the critical receptor on basis that they will use site most frequently (age class 4-9 years)
- ingestion rate assumed to be 75 mg.day^{-1}

Public Open Space Park

This generic scenario refers to any public park or grassed space that is more than 0.5ha in area:

- Public park (>0.5 ha), predominantly grassed and may also contain children's play equipment and border areas of soil containing flowers or shrubs (75% assumed cover)
- Female child age classes 1-6
- Soil ingestion rate of 50 mg.day^{-1}
- Occupancy period outdoors = 2 hours.day^{-1}
- Exposure frequency of 170 days.year-1 for age classes 2-18 and 85
- days.year^{-1} for age class 1
- Outdoor exposure pathways only (no tracking back of soils).

Human Health Generic Quantitative Risk Assessment (GQRA) involves the comparison of contaminant concentrations measured in soil at the site with Generic Assessment Criteria (GAC) generated using the CLEA model based on the exposure and land use scenario assumptions noted above.

GAC's are deliberately conservative values adopted to ensure that they are applicable to the majority of possible contaminated sites and below which there is considered a low to negligible risk to identified human health receptors, i.e. there can be no harm. These values may be published Contaminated Land Exposure Assessment Model (CLEA) derived GAC's derived by a competent third party or the Environment Agency / DEFRA. It is imperative to the risk assessor to understand the uncertainties and limitations associated with these GAC's to ensure that they are used appropriately.

Where the adoption of a GAC is not appropriate, for instance when the intended land-use is at variance the CLEA standard land-uses or the contaminant is susceptible to wide variation depending on factors such as form and bioavailability, then a Detailed Quantitative Risk Assessment (DQRA) may be undertaken to develop site specific or remediation values for relevant soil contaminants based on site and contaminant specific conditions.

In 2014, the publication of Category 4 Screening Levels (C4SL), refs 1.8 and 1.9, as part of the Defra-funded research project SP1010, included modifications to certain exposure assumptions documented within EA Science Report SC050221/SR3 (herein after referred to as SR3) ref 1.7 used in the generation of SGVs. C4SL were published for six substances (cadmium, arsenic, benzene, benzo(a)pyrene, chromium VI and lead) for a sandy loam soil type with 6% soil organic matter, based on a low level of toxicological concern. Where a C4SL has been published, Soils Limited has adopted them as GAC for these six substances.

For all other substances the soils will be compared to Suitable For Use Levels (S4ULs) published by LQM, ref. 1.10, which were developed for around 85 substances and are

intended to enable a screening assessment of the risks posed by soil quality on development sites. The updated LQM/CIEH GAC publication was developed to accommodate recent developments in the understanding of chemical, toxicological and routine exposure to soil-based contaminants.

Where no S4UL or C4SL is available, assessment criteria may be generated using the Contaminated Land Exposure Assessment (CLEA) Software Version 1.07, ref. 1.11, Toxicological and physico-chemical/fate and transport data used to generate the criteria 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.

In the case of the majority of contaminants considered, the toxicological data has been drawn originally from the relevant CLR 9 TOX report, or updated toxicological data published by the Environment Agency (2009), where available. Where no TOX report is available reference has been made to appropriately determined health criteria values, derived from the above-noted hierarchy, as this is considered to represent appropriate peer reviewed data sources. Similarly, fate and transport data should also be determined by reference to appropriate sources and the CLEA model assumptions.

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. 1.12. Individual concentrations are then compared to the selected guideline values to identify and isolate concentrations of contaminants that are in excess of the selected screening low or no risk criteria.

Where the risk estimation identifies significant concentrations of one or more contaminants, further risk evaluation needs to be undertaken often as a site specific DQRA in line with current guidance to determine and confirm if the identified exceedances are significant in the context of the proposed development or activity.

References

1.1 The Environmental Protection Act, Part IIA, Section 78, DoE 1990.

1.2 Environment Act 1995, Section 57, DoE 1995.

1.3 Environment Act 2021 OEP 2021.

1.4 Land Contamination Risk Management Gov.UK (EA) 2021

1.5 BS 10175: 2011+A2:2017 '*Investigation of potentially contaminated sites. Code of practice*', British Standards Institute, 2017

1.6 BS 5930: 2015+A1:2020 '*Code of practice for ground investigations*', British Standards Institute, 2015

1.7 Science Report SC050021/SR3 '*Updated technical background to the CLEA model*', Environment Agency, 2008

1.8 DEFRA SP1010: Development of Category 4 Screening Levels for the Assessment of Land Affected by Contamination, published March 2014.

1.9 Contaminated Land: Applications in Real Environment (CL:AIRE) (2014). 'Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination', Revision 2, DEFRA research project SP1010.

1.10 The LQM/S4ULs for Human Health Risk Assessment, Nathanail P, McCaffery C, Gillett A, Ogden R, and Nathanail J, Land Quality Press, Nottingham, published 2015.

1.11 CLEA '*Software Version 1.071*' (downloaded from the CL:AIRE website , https://www.claire.co.uk/home/news/44-risk-assessment/178-soil-guideline-values)

1.12 CIEH '*Guidance on Comparing Soil Contamination Data with a Critical Concentration*', Chartered Institute of Environmental Health (CIEH) and Contaminated Land: Applications in Real Environments (CL:AIRE), May 2008.

Land Use				Residential With or Without Plant Uptake							Allotments			Commercial			Public Open Space (POS)								
				With home-grown produce				Without home-grown produce									Residential			Park					
				SOM	1.0	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6			
Type	Contaminants	Species	Year																						
Metals	Antimony		2010					550					7500										EIC/AGS/ CL:AIRE	EIC/AGS/ CL:AIRE	2010
	Arsenic		2014			37		40		49			640			79			168				C4SL	DEFRA	2014
			2015			37		40		40			640			79			170				S4UL	LQM/CIEH	2015
	Barium		2010					1300					22000										EIC/AGS/ CL:AIRE	EIC/AGS/ CL:AIRE	2010
	Beryllium		2015			1.7		1.7		35			12			2.2			63				S4UL	LQM/CIEH	2015
	Boron		2015			290		11000		45			240000			21000			46000				S4UL	LQM/CIEH	2015
	Cadmium		2015			11		85		1.9			190			120			532				S4UL	LQM/CIEH	2015
			2014			26		149		4.9			410			220			880				C4SL	DEFRA	2014
	Chromium	III	2015			910		910		18000			8600			1500			33000				S4UL	LQM/CIEH	2015
		VI	2014			21		21		170			49			23			250				C4SL	DEFRA	2014
		VI	2015			6		6		1.8			33			7.7			220				S4UL	LQM/CIEH	2015
	Copper		2015			2400		7100		520			68000			12000			44000				S4UL	LQM/CIEH	2015
	Lead					210		310		84			6000			760			1400				C4SL	DEFRA	2014
	Mercury	Elemental	2012			1.0		1.0		26			26										SGV	DEFRA	2012
			2015			1.2		1.2		21			58			16			30				S4UL	LQM/CIEH	2015
		Inorganic	2012			170		170		80			36000										SGV	DEFRA	2012
			2015			40		56		19			1100			120			240				S4UL	LQM/CIEH	2015
		Methyl	2012			11		11		8			410										SGV	DEFRA	2012
			2015			11		15		6			320			40			68				S4UL	LQM/CIEH	2015
	Molybdenum		2010					670					17000										EIC/AGS/ CL:AIRE	EIC/AGS/ CL:AIRE	2010
	Nickel		2012			130		130		230			1800										SGV	DEFRA	2012
			2015			130		180		53			980			230			800				S4UL	LQM/CIEH	2015
	Selenium		2012			350		350		120			13000										SGV	DEFRA	2012
	Vanadium		2015			250		430		88			12000			1100			1800				S4UL	LQM/CIEH	2015
			2015			410		1200		91			9000			2000			5000				S4UL	LQM/CIEH	2015
	Zinc		2015			3700		40000		620			730000			81000			170000				S4UL	LQM/CIEH	2015
BTEX & MTBE	Benzene		2012			0.33		0.33		0.07			95										SGV	DEFRA	2012
			2014			0.87		3.3		0.18			98			140			230				C4SL	DEFRA	2014
			2015	0.087	0.17	0.37	0.38	0.7	1.4	0.017	0.034	0.075	27	47	90	72	72	73	90	100	110		S4UL	LQM/CIEH	2015
	Toluene		2012			610		610		120			4400										SGV	DEFRA	2012
			2015	130	290	660	880	1900	3900	22	51	120	65000	110000	180000	56000	56000	56000	87000	95000	100000		S4UL	LQM/CIEH	2015
	Ethylbenzene		2012			350		350		90			2800										SGV	DEFRA	2012
			2015	47	110	260	83	190	440	16	39	91	4700	13000	27000	24000	24000	25000	17000	22000	27000		S4UL	LQM/CIEH	2015
	Xylenes	o-xylene	2012			250		250		160			2600										SGV	DEFRA	2012
			2015	60	140	330	88	210	480	28	67	160	6600	15000	33000	41000	42000	43000	17000	24000	33000		S4UL	LQM/CIEH	2015
		m-xylene	2012			240		240		180			3500										SGV	DEFRA	2012
			2015	59	140	320	82	190	450	31	74	170	6200	14000	31000	41000	42000	43000	17000	24000	32000		S4UL	LQM/CIEH	2015
		p-xylene	2012			230		230		160			3200										SGV	DEFRA	2012
			2015	56	130	310	79	180	310	29	69	160	5900	14000	30000	41000	42000	43000	17000	23000	31000		S4UL	LQM/CIEH	2015
Petroleum Hydrocarbons Fractions	Aliphatic >C5 - C6		2015	42	78	160	42	78	160	730	1700	3900	3200	5900	12000	570000	590000	600000	95000	130000	180000		S4UL	LQM/CIEH	2015
	Aliphatic >C6 - C8		2015	100	230	530	100	230	530	2300	5600	13000	7800	17000	40000	600000	610000	620000	150000	220000	320000		S4UL	LQM/CIEH	2015
	Aliphatic >C8 - C10		2015	27	65	150	27	65	150	320	770	1700	2000	4800	11000	13000	13000	13000	14000	18000	21000		S4UL	LQM/CIEH	2015
	Aliphatic >C10 - C12		2015	130	330	760	130	330	770	2200	4400	7300	9700	23000	47000	13000	13000	13000	21000	23000	24000		S4UL	LQM/CIEH	2015
	Aliphatic >C12 - C16		2015	1100	2400	4300	1100	2400	4400	11000	13000	13000	59000	82000	90000	13000	13000	13000	25000	25000	26000		S4UL	LQM/CIEH	2015
	Aliphatic >C16 - C35		2015	65000	92000	110000	65000	92000	110000	260000	270000	270000	1600000	1700000	1800000	250000	250000	250000	450000	480000	490000		S4UL	LQM/CIEH	2015
	Aliphatic >C35 - C44		2015	65000	92000	140000	65000	92000	110000	260000	270000	270000	1600000	1700000	1800000	250000	250000	250000	450000	480000	490000		S4UL	LQM/CIEH	2015
	Aromatic >C5 - C7		2015	70	140	300	370	690	1400	13	27	57	26000	46000	86000	56000	56000	56000	76000	84000	92000		S4UL	LQM/CIEH	2015
	Aromatic >C7 - C8		2015	130	290	660	860	1800	3900	22	51	120	56000	110000	180000	56000	56000	56000	87000	95000	100000		S4UL	LQM/CIEH	2015
	Aromatic >C8 - C10		2015	34	83	190	47	110	270	8.6	21	51	3500	8100	17000	5000	5000	5000	7200	8500	9300		S4UL	LQM/CIEH	2015

Land Use			Residential With or Without Plant Uptake							Allotments			Commercial			Public Open Space (POS)								
			With home-grown produce			Without home-grown produce										Residential			Park					
		SOM	1.0	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6			
Type	Contaminants Species	Year																						
	Aromatic >C10 - C12	2015	74	180	380	250	590	1200	13	31	74	*16000*	*28000*	*34000*	5000	5000	5000	*9200*	*9700*	*10000*	S4UL	LQM/CIEH	2015
	Aromatic >C12 - C16	2015	140	330	660	1800	2300	2500	23	57	130	*36000*	*37000*	*38000*	5100	5100	5000	10000	10000	10000	S4UL	LQM/CIEH	2015
	Aromatic >C16 - C21	2015	260	540	930	1900	1900	1900	46	110	260	28000	28000	28000	3800	3800	3800	7600	7700	7800	S4UL	LQM/CIEH	2015
	Aromatic >C21 - C35	2015	1100	1500	1700	1900	1900	1900	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900	S4UL	LQM/CIEH	2015
	Aromatic >C34 - C44	2015	1100	1500	1700	1900	1900	1900	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900	S4UL	LQM/CIEH	2015
	Aliphatic + Aromatic >C44 - C70		1600	1800	1900	1900	1900	1900	1200	2100	3000	28000	28000	28000	3800	3800	3800	7800	7800	7900	S4UL	LQM/CIEH	2015
Polycyclic Aromatic Hydrocarbons (PAH's) (mg/kg)	Acenaphthene	2015	210	510	1100	*3000*	*4700*	*6000*	34	85	200	*84000*	*97000*	100000	15000	15000	15000	29000	30000	30000	S4UL	LQM/CIEH	2015
	Acenaphthylene	2015	170	420	920	*2900*	*4600*	*6000*	28	69	160	*83000*	*97000*	100000	15000	15000	15000	29000	30000	30000	S4UL	LQM/CIEH	2015
	Anthracene	2015	2400	5400	11000	*31000*	*35000*	*37000*	380	950	2200	520000	54000	540000	74000	74000	74000	150000	150000	150000	S4UL	LQM/CIEH	2015
	Benzo(a)anthracene	2015	7.2	11	13	11	14	15	2.9	6.5	13	170	170	180	29	29	29	49	56	62	S4UL	LQM/CIEH	2015
	Benzo(a)pyrene	2014			5			5.3			5.7			76			10			21	C4SL	DEFRA	2014
		2015	2.2	2.7	3	3.2	3.2	3.2	0.97	2	3.5	35	35	36	5.7	5.7	5.7	11	12	13	S4UL	LQM/CIEH	2015
	Benzo(b)fluoranthene	2015	2.6	3.3	3.7	3.9	4.0	4.0	0.99	2.1	3.9	44	44	45	7.1	7.2	7.2	13	15	16	S4UL	LQM/CIEH	2015
	Benzo(ghi)perylene	2015	320	340	350	360	360	360	290	470	640	3900	4000	4000	640	640	640	1400	1500	1600	S4UL	LQM/CIEH	2015
	Benzo(k)fluoranthene	2015	77	93	100	110	110	110	37	75	130	1200	1200	1200	190	190	190	370	410	440	S4UL	LQM/CIEH	2015
	Chrysene	2015	15	22	27	30	31	32	4.1	9.4	19	350	350	350	57	57	57	93	110	120	S4UL	LQM/CIEH	2015
	Dibenz(a,h)anthracene	2015	0.24	0.28	0.3	0.31	0.32	0.32	0.14	0.27	0.43	3.5	3.6	3.6	0.57	0.57	0.58	1.1	1.3	1.4	S4UL	LQM/CIEH	2015
	Fluoranthene	2015	280	560	890	1500	1600	1600	52	130	290	23000	23000	23000	3100	3100	3100	6300	6300	6400	S4UL	LQM/CIEH	2015
	Fluorene	2015	170	400	860	*2800*	*3800*	*4500*	27	67	160	63000	68000	71000	9900	9900	9900	20000	20000	20000	S4UL	LQM/CIEH	2015
	Indeno(1,2,3-cd)pyrene	2015	27	36	41	45	46	46	9.5	21	39	500	510	510	82	82	82	150	170	180	S4UL	LQM/CIEH	2015
	Naphthalene	2015	2.3	5.6	13	2.3	5.6	13	4.1	10	24	*190*	*460*	*1100*	4900	4900	4900	*1200*	*1900*	*3000*	S4UL	LQM/CIEH	2015
	Phenanthrene	2015	95	220	440	*1300*	*1500*	*1500*	15	38	90	22000	22000	23000	3100	3100	3100	6200	6200	6300	S4UL	LQM/CIEH	2015
	Pyrene	2015	620	1200	2000	3700	3800	3800	110	270	620	54000	54000	54000	7400	7400	7400	15000	15000	15000	S4UL	LQM/CIEH	2015
	Coal Tar(Bap as surrogate matter	2015	0.79	0.98	1.1	1.2	1.2	1.2	0.32	0.67	1.2	15	15	15	2.2	2.2	2.2	4.4	4.7	4.8	S4UL	LQM/CIEH	2015
Chloroalkanes & alkenes	1,2 Dichloroethane	2015	0.0071	0.011	0.019	0.0092	0.013	0.023	0.0046	0.0083	0.016	0.67	0.97	1.7	29	29	29	21	24	28	S4UL	LQM/CIEH	2015
	1,1,1 Trichloroethane	2015	8.8	18	39	9	18	40	48	110	240	660	1300	3000	140000	140000	*140000*	*57000*	*76000*	*100000*	S4UL	LQM/CIEH	2015
	1,1,2,2 Tetrachloroethane	2015	1.6	3.4	7.5	3.9	8	17	0.41	0.89	2	270	550	1100	1400	1400	1400	1800	2100	2300	S4UL	LQM/CIEH	2015
	1,1,1,2 Tetrachloroethane	2015	1.2	2.8	6.4	1.5	3.5	8.2	0.79	1.9	4.4	110	250	560	1400	1400	1400	1500	1800	2100	S4UL	LQM/CIEH	2015
	Tetrachloroethene	2015	0.18	0.39	0.9	0.18	0.4	0.92	0.65	1.5	3.6	19	42	95	1400	1400	1400	*810*	*1100*	1500	S4UL	LQM/CIEH	2015
		2021	0.31	0.7	1.6	0.32	0.71	1.6	2	4.8	11	24	55	130	3200	3300	3400	1400	1900	2500	C4SL	CLAIRE	2021
	Tetrachloromethane (Carbon Tetrachloride)	2015	0.026	0.056	0.13	0.026	0.056	0.13	0.45	1	2.4	2.9	6.3	14	890	920	950	190	270	400	S4UL	LQM/CIEH	2015
	Trichloroethene (TCE)	2015	0.016	0.034	0.075	0.017	0.036	0.08	0.041	0.091	0.21	1.2	2.6	5.7	120	120	120	70	91	120	S4UL	LQM/CIEH	2015
		2021	0.0093	0.02	0.043	0.0097	0.02	0.045	0.032	0.072	0.16	0.73	1.5	3.4	76	78	79	41	54	69	C4SL	CLAIRE	2021
	Trichloromethan	2015	0.91	1.7	3.4	1.2	2.1	4.2	0.42	0.83	1.7	99	170	350	2500	2500	2500	2600	2800	3100	S4UL	LQM/CIEH	2015
	Vinyl Chloride (Cloroethene)	2015	0.00064	0.00087	0.0014	0.00077	0.001	0.0015	0.00055	0.001	0.0018	0.059	0.077	0.12	3.5	3.5	3.5	4.8	5	5.4	S4UL	LQM/CIEH	2015
		2021	0.0064	0.01	0.017	0.015	0.019	0.029	0.0017	0.0031	0.0058	1.1	1.4	2.2	7.8	7.8	7.8	18	19	19	C4SL	CLAIRE	2021
Explosives	2,4,6 Trinitrotoluen	2015	1.6	3.7	8.1	65	66	66	0.24	0.58	1.4	1000	1000	1000	130	130	130	260	270	270	S4UL	LQM/CIEH	2015
	RDX (Hexogen/Cyclonite/1,3,5-trinitro-1,3,5-triazacyclohexane)	2015	120	250	540	13000	13000	13000	17	38	85	210000	210000	210000	26000	26000	27000	49000	51000	53000	S4UL	LQM/CIEH	2015
	HMX (Octogen/1,3,5,7-tetrenitro-1,3,5,7-tetrazacyclo-octane)	2015	5.7	13	26	6700	6700	6700	0.86	1.9	3.9	110000	110000	110000	13000	13000	13000	*23000*	*23000*	*24000*	S4UL	LQM/CIEH	2015
Pesticides	Aldrin	2015	5.7	6.6	7.1	7.3	7.4	7.5	3.2	6.1	9.6	170	170	170	18	18	18	30	31	31	S4UL	LQM/CIEH	2015
	Dieldrin	2015	0.97	2	3.5	7	7.3	7.4	0.17	0.41	0.96	170	170	170	18	18	18	30	30	31	S4UL	LQM/CIEH	2015
	Atrazine	2015	3.3	7.6	17.4	610	620	620	0.5	1.2	2.7	9300	9400	9400	1200	1200	1200	2300	2400	2400	S4UL	LQM/CIEH	2015
	Dichlorvos	2015	0.032	0.066	0.14	6.4	6.5	6.6	0.0049	0.01	0.022	140	140	140	16	16	16	26	26	27	S4UL	LQM/CIEH	2015
	Alpha - Endosulfan	2015	7.4	18	41	*160*	*280*	*410*	1.2	2.9	6.8	*5600*	*7400*	*8400*	1200	1200	1200	2400	2400	2500	S4UL	LQM/CIEH	2015
	Beta - Endosulfan	2015	7	17	39	*190*	*320*	*440*	1.1	2.7	6.4	*6300*	*7800*	*8700*	1200	1200	1200	2400	2400	2500	S4UL	LQM/CIEH	2015
	Alpha -Hexachlorocyclohexanes	2015	0.23	0.55	1.2	6.9	9.2	11	0.035	0.087	0.21	170	180	180	24	24	24	47	48	48	S4UL	LQM/CIEH	2015
	Beta -Hexachlorocyclohexanes	2015	0.085	0.2	0.46	3.7	3.8	3.8	0.013	0.032	0.077	65	65	65	8.1	8.1	8.1	15	15	16	S4UL	LQM/CIEH	2015
	Gamma -Hexachlorocyclohexanes	2015	0.06	0.14	0.33	2.9	3.3	3.5	0.0092	0.023	0.054	67	69	70	8.2	8.2	8.2	14	15	15	S4UL	LQM/CIEH	2015
Chlorobenzenes	Chlorobenzene	2015	0.46	1	2.4	0.46	1	2.4	5.9	14	32	56	130	290	11000	13000	14000	*1300*	*2000*	*2900*	S4UL	LQM/CIEH	2015
	1,2-Dichlorobenzene	2015	23	55	130	24	57	130	94	230	540	*2000*	*4800*	*11000*	90000	95000	98000	*24000*	*36000*	*51000*	S4UL	LQM/CIEH	2015

Land Use				Residential With or Without Plant Uptake							Allotments			Commercial			Public Open Space (POS)								
				With home-grown produce				Without home-grown produce									Residential			Park					
			SOM	1.0	2.5	6	1	2.5	6															
Type	Contaminants	Species	Year																					
	1,3-Dichlorobenzene		2015	0.4	1	2.3	0.44	1.1	2.5	0.25	0.6	1.5	30	73	170	300	300	300	390	440	470	S4UL	LQM/CIEH	2015
	1,4-Dichlorobenzene		2015	61	150	350	61	150	350	15	37	88	*4400*	*10000*	*25000*	17000	17000	1700	*36000*	*36000*	*36000*	S4UL	LQM/CIEH	2015
	1,2,3,-Trichlorobenzene		2015	1.5	3.6	8.6	1.5	3.7	8.8	4.7	12	28	102	250	590	1800	1800	1800	*770*	*1100*	*1600*	S4UL	LQM/CIEH	2015
	1,2,4,-Trichlorobenzene		2015	2.6	6.4	15	2.6	6.4	15	55	140	320	220	530	1300	15000	17000	19000	*1700*	*2600*	*4000*	S4UL	LQM/CIEH	2015
	1,3,5,-Trichlorobenzene		2015	0.33	0.81	1.9	0.33	0.81	1.9	4.7	12	28	23	55	130	1700	1700	1800	*380*	*580*	*860*	S4UL	LQM/CIEH	2015
	1,2,3,4,-Tetrachlorobenzene		2015	15	36	78	24	56	120	4.4	11	26	1700	3080	4400	830	830	830	*1500*	*1600*	*1600*	S4UL	LQM/CIEH	2015
	1,2,3,5,- Tetrachlobenzene		2015	0.66	1.6	3.7	0.75	1.9	4.3	0.38	0.9	2.2	*49*	*120*	*240*	78	79	79	*110*	*120*	*130*	S4UL	LQM/CIEH	2015
	1,2,4, 5,- Tetrachlobenzene		2015	0.33	0.77	1.6	0.73	1.7	3.5	0.06	0.16	0.37	*42*	*72*	*96*	13	13	13	25	26	26	S4UL	LQM/CIEH	2015
	Pentachlrobenzene		2015	5.8	12	22	19	30	38	1.2	3.1	7	*640*	*770*	*830*	100	100	100	190	190	190	S4UL	LQM/CIEH	2015
	Hexachlorobenzene		2015	*1.8*	*3.3*	4.9	*4.1*	*5.7*	*6.7*	0.47	1.1	2.5	*110*	120	120	16	16	16	30	30	30	S4UL	LQM/CIEH	2015
Phenols & Chlorophenols																								
	Phenols		2012			420			420			280			*3200*							SGV	DEFRA	2012
			2015	120	200	380	440	690	1200	23	42	83	*440*	*690*	*1300*	*440*	*690*	*1300*	*440*	*690*	*1300*	S4U L	LQM/CIE H	2015
	Chlorophenols (4 Congeners)		2015	0.87	2	4.5	94	150	210	0.13	0.3	0.7	3500	4000	4300	620	620	620	1100	1100	1100	S4UL	LQM/CIEH	2015
	Pentachlorophenols		2015	0.22	0.52	1.2	*27*	29	31	0.03	0.08	0.19	400	400	400	60	60	60	110	120	120	S4UL	LQM/CIEH	2015
Others																								
	Carbon Disulphide		2015	0.14	0.29	0.62	0.14	0.29	0.62	4.8	10	23	11	22	47	11000	11000	12000	1300	1900	2700	S4UL	LQM/CIEH	2015
	Hexachloro-1,3-Butadiene		2015	0.29	0.7	1.6	0.32	0.78	1.8	0.25	0.61	1.4	31	66	120	25	25	25	48	50	51	S4UL	LQM/CIEH	2015
	Sum of PCDDs, PCDFs and dioxin-like PCB's.		2012			8			8			8			240							SGV	DEFRA	2012

NOTE

Priority	Guideline (mg kg^{-1})
1	Site Specific Assessment Criteria (SSAC) (Soils Limited
2	2014: Category 4 Screening Level (C4SL) (Contaminated Land: Application in Real Environment (CL:ARE), 2(4 and 2021)
3	2012: Soil Guideline Value (SGV) (Environment Agency, 2009
4	2015: Suitable 4 Use Level (S4UL) (Nathanail *et al*, 2015)

For Generic Risk Assessment, the values in Bol should have priority unless site specific, Client or regulator requirements dictate otherwi e – which must be justifie

Table reviewed January 202 2

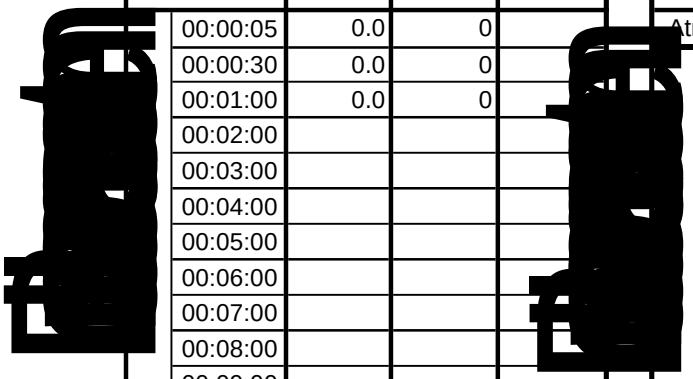
Appendix E Gas Monitoring

Job Number:	20737
Site Name:	Land at Glenham, Anyards Road, Cobham, KT11 2LH
BH/WS ID:	WS1
Date:	03-03-23
Start Time:	3:40:15 PM

Weather	* Delete as appropriate			
Wind		*Light*		
Cloud Cover				*Overcast*
Precipitation	*Dry*			
Ground Conditions		*Moist*		

Gas Monitor:*	*Gas Data GFM 435 11555*	*or*	
PID:*		*or*	*Watchgas*
Dip meter:*		*or*	*Single Phase*

Step 3	
Depth to Water (m bgl)	Base of Hole (m bgl)
1.42	2.21



Step 1

Monitoring interval	Flow L/hr	Dp Pa	SP mB
00:00:05	0.0	0	
00:00:30	0.0	0	
00:01:00	0.0	0	
00:02:00			
00:03:00			
00:04:00			
00:05:00			
00:06:00			
00:07:00			
00:08:00			
00:09:00			
00:10:00			
00:11:00			

Step 2

Monitoring interval	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	LEL CH_4 %	H2S ppm	Co ppm	Ap mB	VOC (PPM)	Temp (^oC)
Atmosphere	0.0	0	21.4	0.0	0	3	1026	0	7
00:00:05	0.0	0.0	21.4	0.0	0	6		0	
00:00:30	0.0	0.1	21.1	0.0	0	10		0	
00:01:00	0.0	0.1	21.4	0.0	0	10		0	
00:02:00	0.0	0.1	21.4	0.0	0	10		0	
00:03:00									
00:04:00									
00:05:00									
00:06:00									
00:07:00									
00:08:00									
00:09:00									
00:10:00									

Samples	

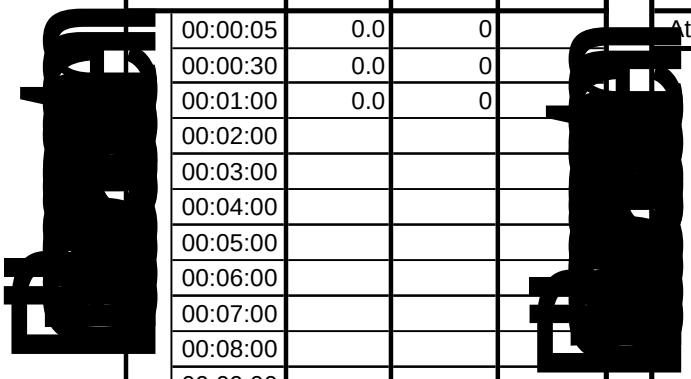
Notes;

Job Number:	20737
Site Name:	Land at Glenham, Anyards Road, Cobham, KT11 2LH
BH/WS ID:	WS2
Date:	03-03-23
Start Time:	4:04:34 PM

Weather	* Delete as appropriate			
Wind		*Light*		
Cloud Cover				*Overcast*
Precipitation	*Dry*			
Ground Conditions		*Moist*		

Gas Monitor:*	*Gas Data GFM 435 11555*	*or*	
PID:*	*Watchgas*	*or*	
Dip meter:*		*or*	*Single Phase*

Step 3	
Depth to Water (m bgl)	Base of Hole (m bgl)
1.25	3.60



Step 1			
Monitoring interval	Flow L/hr	Dp Pa	SP mB
00:00:05	0.0	0	
00:00:30	0.0	0	
00:01:00	0.0	0	
00:02:00			
00:03:00			
00:04:00			
00:05:00			
00:06:00			
00:07:00			
00:08:00			
00:09:00			
00:10:00			
00:11:00			

Step 2									
Monitoring interval	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	LEL CH_4 %	H2S ppm	Co ppm	Ap mB	VOC (PPM)	Temp (^oC)
Atmosphere	0.0	0	22.0	0.0	0	0	1027	0	
00:00:05	0.0	3.7	15.0	0.0	0	3		0	
00:00:30	0.0	3.1	14.3	0.0	0	3		0	
00:01:00	0.0	3.1	13.9	0.0	0	3		0	
00:02:00	0.0	3.1	13.9	0.0	0	3		0	
00:03:00									
00:04:00									
00:05:00									
00:06:00									
00:07:00									
00:08:00									
00:09:00									
00:10:00									

Samples	

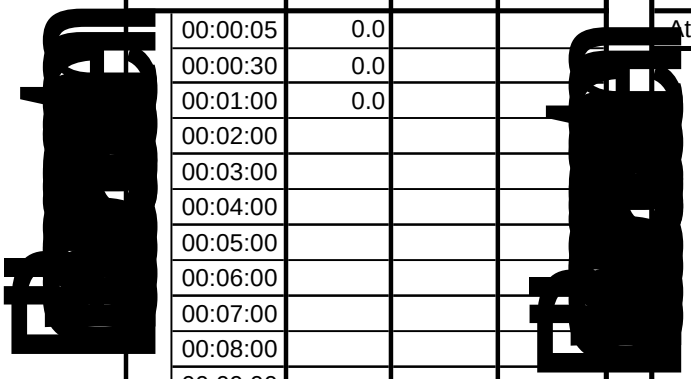
Notes;

Job Number:	20737
Site Name:	Land at Glenham, Anyards Road, Cobham, KT11 2LH
BH/WS ID:	WS6
Date:	03-03-23
Start Time:	4:14:43 PM

Weather	* Delete as appropriate			
Wind		*Light*		
Cloud Cover				*Overcast*
Precipitation	*Dry*			
Ground Conditions		*Moist*		

Gas Monitor:*	*Gas Data GFM 435 11555*	*or*	
PID:*	*Watchgas*	*or*	
Dip meter:*		*or*	*Single Phase*

Step 3	
Depth to Water (m bgl)	Base of Hole (m bgl)
0.99	2.85



Step 1			
Monitoring interval	Flow L/hr	Dp Pa	SP mB
00:00:05	0.0		
00:00:30	0.0		
00:01:00	0.0		
00:02:00			
00:03:00			
00:04:00			
00:05:00			
00:06:00			
00:07:00			
00:08:00			
00:09:00			
00:10:00			
00:11:00			

Step 2									
Monitoring interval	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	LEL CH_4 %	H2S ppm	Co ppm	Ap mB	VOC (PPM)	Temp (^oC)
Atmosphere	0.0	0	21.5	0.0	0	0	1025	0	7
00:00:05	0.0	0.3	20.8	0.0	0	17		0	
00:00:30	0.0	0.0	21.6	0.0	0	3		0	
00:01:00	0.0	0.0	21.7	0.0	0	3		0	
00:02:00	0.0	0.0	21.7	0.0	0	3		0	
00:03:00									
00:04:00									
00:05:00									
00:06:00									
00:07:00									
00:08:00									
00:09:00									
00:10:00									

Samples	
1 Litre Plastic	
1 Litre Glass	
40ml Vial	
Gas sample (Tedlar bag	

Notes;

Job Number:	20737
Site Name:	Land at Glenham, Anyards Road, Cobham, KT11 2LH
BH/WS ID:	WS1
Date:	14.3.23
Start Time:	9:45am.

Weather	* Delete as appropriate			
Wind		*Light*		
Cloud Cover				*Overcast*
Precipitation			*Moderate*	
Ground Conditions			*Wet*	

Gas Monitor:*		*or*	*Gas Data GFM 406 13302*
PID:*		*or*	*Multirae Lite*
Dip meter:*	*Dual phase*	*or*	

Step 3	
Depth to Water (m bgl)	Base of Hole (m bgl)
0.57M.	2.1M.

Step 1				
Monitoring interval		Flow	Dp	SP
		L/hr	Pa	mB
	00:00:05	0.0	0	
	00:00:30	0.0	0	
	00:01:00	0.0	0	
	00:02:00	0.0	0	
	00:03:00	0.0	0	
	00:04:00	0.0	0	
mea	00:05:00	0.0	0	
	00:06:00			
	00:07:00			
	00:08:00			
	00:09:00			
	00:10:00			
	00:11:00			

Step 2										
Monitoring interval		CH_4	CO_2	O_2	LEL CH_4	H2S	Co	Ap	VOC	Temp
		% v/v	% v/v	% v/v	%	ppm	ppm	mB	(PPM)	(^oC)
Atmosphere										
	00:00:05	0.0	1.2	19.6	0.0	0	0	998	0	4
	00:00:30	0.0	0.0	19.3	0.0	0	0	998	0	4
	00:01:00									
	00:02:00									
	00:03:00									
	00:04:00									
mea	00:05:00									
	00:06:00									
	00:07:00									
	00:08:00									
	00:09:00									
	00:10:00									

Samples	
1 Litre Plastic	
1 Litre Glass	
40ml Vial	
Gas sample (Tedlar bag	

Notes;

WATER SUCKED UP THROUGH TUBING AFTER 2 MINUTES. STOPPED.

Job Number:	20737
Site Name:	Land at Glenham, Anyards Road, Cobham, KT11 2LH
BH/WS ID:	WS4
Date:	14.3.23
Start Time:	9:26am.

Weather	* Delete as appropriate			
Wind		*Light*		
Cloud Cover				*Overcast*
Precipitation		*Slight*		
Ground Conditions	*Dry*			

Gas Monitor:*		*or*	*Gas Data GFM 406 13302*
PID:*		*or*	*Multirae Lite*
Dip meter:*	*Dual phase*	*or*	

Step 3	
Depth to Water (m bgl)	Base of Hole (m bgl)
0.95M.	3.6M.

Step 1				
Monitoring interval		Flow	Dp	SP
		L/hr	Pa	mB
	00:00:05	0.0	0	
	00:00:30	0.0	0	
	00:01:00	0.0	0	
	00:02:00	0.0	0	
	00:03:00	0.0	0	
	00:04:00	0.0	0	
mea	00:05:00			
	00:06:00			
	00:07:00			
	00:08:00			
	00:09:00			
	00:10:00			
	00:11:00			

Step 2										
Monitoring interval		CH_4	CO_2	O_2	LEL CH_4	H2S	Co	Ap	VOC	Temp
		% v/v	% v/v	% v/v	%	ppm	ppm	mB	(PPM)	(^oC)
Atmosphere										
	00:00:05	0.0	0.4	19.7	0.0	0	0	997	0	4
	00:00:30	0.0	0.9	19.2	0.0	0	0	997	0	4
	00:01:00	0.0	2.1	18.0	0.0	0	0	997	0	4
	00:02:00	0.0	2.1	18.0	0.0	0	0	997	0	4
	00:03:00	0.0	2.0	18.0	0.0	0	0	997	0	4
	00:04:00	0.0	2.0	18.1	0.0	0	0	997	0	4
mea	00:05:00	0.0	1.9	18.3	0.0	0	0	997	0	4
	00:06:00									
	00:07:00									
	00:08:00									
	00:09:00									
	00:10:00									

Samples	
1 Litre Plastic	
1 Litre Glass	
40ml Vial	
Gas sample (Tedlar bag	

Notes;

Job Number:	20737
Site Name:	Land at Glenham, Anyards Road, Cobham, KT11 2LH
BH/WS ID:	WS6
Date:	14.3.23
Start Time:	9:14am.

Weather	* Delete as appropriate			
Wind		*Light*		
Cloud Cover				*Overcast*
Precipitation			*Moderate*	
Ground Conditions			*Wet*	

Gas Monitor:*		*or*	*Gas Data GFM 406 13302*
PID:*		*or*	*Multirae Lite*
Dip meter:*	*Dual phase*	*or*	

Step 3	
Depth to Water (m bgl)	Base of Hole (m bgl)
0.7m.	2.9M.

Step 1				
Monitoring interval		Flow	Dp	SP
		L/hr	Pa	mB
	00:00:05	0.0	0	
	00:00:30	0.0	0	
	00:01:00	0.0	0	
	00:02:00	0.0	0	
	00:03:00	0.0	0	
	00:04:00	0.0	0	
mea	00:05:00	0.0	0	
	00:06:00			
	00:07:00			
	00:08:00			
	00:09:00			
	00:10:00			
	00:11:00			

Step 2										
Monitoring interval		CH_4	CO_2	O_2	LEL CH_4	H2S	Co	Ap	VOC	Temp
		% v/v	% v/v	% v/v	%	ppm	ppm	mB	(PPM)	(^oC)
Atmosphere										
	00:00:05	0.0	0.0	21.1	0.0	0	0	999	0	4
	00:00:30	0.0	0.0	21.1	0.0	0	0	1000	0	4
	00:01:00	0.0	0.0	21.1	0.0	0	0	1000	0	4
	00:02:00	0.0	0.0	21.0	0.0	0	0	1000	0	4
	00:03:00	0.0	0.0	21.0	0.0	0	0	1000	0	4
	00:04:00	0.0	0.0	21.0	0.0	0	0	1000	0	4
mea	00:05:00									
	00:06:00									
	00:07:00									
	00:08:00									
	00:09:00									
	00:10:00									

Samples	
1 Litre Plastic	
1 Litre Glass	
40ml Vial	
Gas sample (Tedlar bag	

Notes;

Job Number:	20737
Site Name:	Anyards Road, Cobham
BH/WS ID:	WS1
Date:	04-04-23
Start Time:	3:31:20 PM

Weather	* Delete as appropriate			
Wind		*Light*		
Cloud Cover	*None*			
Precipitation	*Dry*			
Ground Conditions		*Moist*		

Gas Monitor:*	*Gas Data GFM 435 11555*	*or*	
PID:*	*Multirae M01C011991*	*or*	
Dip meter:*		*or*	*Single Phase*

Step 3	
Depth to Water (m bgl)	Base of Hole (m bgl)
0.51	2.01

Step 1			
Monitoring interval		Flow	DP
		L/hr	Pa
Atmosphere		0.4	2
mea	0:00:05	0.0	0
	0:00:30	0.0	0
	0:01:00	0.0	0
	0:02:00		
	0:03:00		
	0:04:00		
	0:05:00		
	0:06:00		
	0:07:00		
	0:08:00		
	0:09:00		
	0:10:00		

Step 2										
Monitoring interval		CH_4	LEL CH_4	CO_2	O_2	H2S	Co	aP	VOC	Temp
		% v/v	%	% v/v	% v/v	ppm	ppm	mb	(PPM)	(^oC)
Atmosphere		0.0	0	0.0		0	0	1027	0	14
mea	0:00:05	0.0	0	0.2	20.4	0	1	1026	0	
	0:00:30	0.0	0	0.0	20.8	0	1	1026	1	
	0:01:00	0.0	0	0.0	20.8	0	0	1026	1	
	0:02:00	0.0	0	0.0	20.8	0	0	1026	0	
	0:03:00									
	0:04:00									
	0:05:00									
	0:06:00									
	0:07:00									
	0:08:00									
	0:09:00									
	0:10:00									

Samples	
1 Litre Plastic	
1 Litre Glass	
40ml Vial	
Gas sample (Tedlar bag etc	

Notes;

Job Number:	20737
Site Name:	Anyards Road, Cobham
BH/WS ID:	WS4
Date:	04-04-23
Start Time:	2:16:13 PM

Weather	* Delete as appropriate			
Wind		*Light*		
Cloud Cover	*None*			
Precipitation	*Dry*			
Ground Conditions		*Moist*		

Gas Monitor:*	*Gas Data GFM 435 11555*	*or*	
PID:*	*Multirae M01C011991*	*or*	
Dip meter:*		*or*	*Single Phase*

Step 3	
Depth to Water (m bgl)	Base of Hole (m bgl)
0.60	3.39

Step 1

Monitoring interval		Flow L/hr	DP Pa
Atmosphere		0.4	2
mea	0:00:05	2.0	6
	0:00:30	0.4	1
	0:01:00	0.4	1
	0:02:00		
	0:03:00		
	0:04:00		
	0:05:00		
	0:06:00		
	0:07:00		
	0:08:00		
	0:09:00		
	0:10:00		

Step 2

Monitoring interval		CH_4 % v/v	LEL CH_4 %	CO_2 % v/v	O_2 % v/v	H2S ppm	Co ppm	aP mb	VOC (PPM)	Temp (^oC)
Atmosphere		0.0	0	0.0	20.5	0	0	1027	0	14
mea	0:00:05	0.0	0	0.6	20.3	0	0	1027	0	
	0:00:30	0.0	0	1.5	18.2	0	0	1027	0	
	0:01:00	0.0	0	0.4	19.1	0	0	1026	0	
	0:02:00									
	0:03:00									
	0:04:00									
	0:05:00									
	0:06:00									
	0:07:00									
	0:08:00									
	0:09:00									
	0:10:00									

Samples	
1 Litre Plastic	
1 Litre Glass	
40ml Vial	
Gas sample (Tedlar bag etc	

Notes;

Water present after 1:03min

Job Number:	20737
Site Name:	Anyards Road, Cobham
BH/WS ID:	WS6
Date:	04-04-23
Start Time:	2:54:08 PM

Weather	* Delete as appropriate			
Wind		*Light*		
Cloud Cover	*None*			
Precipitation	*Dry*			
Ground Conditions		*Moist*		

Gas Monitor:*	*Gas Data GFM 435 11555*	*or*	
PID:*	*Multirae M01C011991*	*or*	
Dip meter:*		*or*	*Single Phase*

Step 3	
Depth to Water (m bgl)	Base of Hole (m bgl)
0.32	2.86

Step 1

Monitoring interval		Flow L/hr	DP Pa
Atmosphere		0.4	2
mea	0:00:05	0.0	0
	0:00:30	0.0	0
	0:01:00	0.0	0
	0:02:00		
	0:03:00		
	0:04:00		
	0:05:00		
	0:06:00		
	0:07:00		
	0:08:00		
	0:09:00		
	0:10:00		

Step 2

Monitoring interval		CH_4 % v/v	LEL CH_4 %	CO_2 % v/v	O_2 % v/v	H2S ppm	Co ppm	aP mb	VOC (PPM)	Temp (^oC)
Atmosphere		0.0	0	0.0	20.5	0	0	1027	0	14
mea	0:00:05	0.0	0	0.0	20.7	0	2	1025	0	
	0:00:30							1025		
	0:01:00							1025		
	0:02:00									
	0:03:00									
	0:04:00									
	0:05:00									
	0:06:00									
	0:07:00									
	0:08:00									
	0:09:00									
	0:10:00									

Samples	
1 Litre Plastic	
1 Litre Glass	
40ml Vial	
Gas sample (Tedlar bag etc	

Notes;

Water present after 0:19sec

Appendix F HazWasteOnline Report

Waste Classification Report

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

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

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

EKULD-N049Y-G2UKV

Job name

20737 Land at Glenham

Description/Comments

Project

20737

Site

Land at Glenham

Classified by

Name:
Chris Swainston
Date:
29 Mar 2023 11:47 GMT
Telephone:
01962 673 330

Company:
Soils Ltd
Sun Valley Business Park,
Winnal Close
WInchester
SO23 0LB

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

HazWasteOnline™ Certification: **CERTIFIED**

Course	Date
Hazardous Waste Classification	08 Dec 2016
Most recent 3 year Refresher	02 Aug 2022

Next 3 year Refresher due by Aug 2025

Purpose of classification

2 - Material Characterisation

Address of the waste

Land at Glenelm, Anyards Road, Cobham, Surrey **Post Code** KT11 2LH

SIC for the process giving rise to the waste

41202 Construction of domestic buildings

Description of industry/producer giving rise to the waste

Redevelopment of garages and residential site

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

Redevelopment of site

Description of the waste

Made Ground, demolition and other waste materials

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS01-0.20-07/03/2023	0.20	Non Hazardous		3
2	WS01-0.90-07/03/2023	0.90	Non Hazardous		6
3	WS02-0.20 - 0.40-07/03/2023	0.20 - 0.40	Non Hazardous		7
4	WS03-0.20-07/03/2023	0.20	Non Hazardous		10
5	WS03-0.60-07/03/2023	0.60	Non Hazardous		13
6	WS04-0.20-07/03/2023	0.20	Non Hazardous		14
7	WS05-0.20-07/03/2023	0.20	Non Hazardous		17
8	WS06-0.20-07/03/2023	0.20	Non Hazardous		20
9	WS08-0.20 - 0.40-07/03/2023	0.20 - 0.40	Non Hazardous		22
10	TP01-0.40-02/03/2023	0.40	Non Hazardous		25

Related documents

#	Name	Description
1	23-03360.1.hwol	DETS South .hwol file used to populate the Job
2	Soils Suite 2 2022	waste stream template used to create this Job

Report

Created by: Chris Swainston

Created date: 29 Mar 2023 11:47 GMT

Classification of sample: WS01-0.20-07/03/2023

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

Sample details

Sample name:
WS01-0.20-07/03/2023
Sample Depth:
0.20 m
Moisture content:
12.8%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 12.8% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU 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		27 mg/kg	1.32	31.086 mg/kg	0.00311 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %		<LOD
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %		<LOD
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		21 mg/kg	1.462	26.764 mg/kg	0.00268 %	✓	
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2 mg/kg	2.27	<4.54 mg/kg	<0.000454 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		40 mg/kg	1.126	39.271 mg/kg	0.00393 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	25 mg/kg	1.56	34.004 mg/kg	0.00218 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		35 mg/kg	2.976	90.836 mg/kg	0.00908 %	✓	
10	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
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		48 mg/kg	1.785	74.721 mg/kg	0.00747 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		68 mg/kg	2.774	164.496 mg/kg	0.0164 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		86 mg/kg		74.992 mg/kg	0.0075 %	✓	
14	confirm TPH has NOT arisen from diesel or petrol					☑					
15	pH			PH		9.8 pH		9.8 pH	9.8 pH		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
17		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
18		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
19		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
20		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
21		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
22		fluoranthene				0.4	mg/kg		0.349	mg/kg	0.0000349 %	✓	
			205-912-4	206-44-0									
23		pyrene				0.41	mg/kg		0.358	mg/kg	0.0000358 %	✓	
			204-927-3	129-00-0									
24		benzo[a]anthracene				0.19	mg/kg		0.166	mg/kg	0.0000166 %	✓	
		601-033-00-9	200-280-6	56-55-3									
25		chrysene				0.22	mg/kg		0.192	mg/kg	0.0000192 %	✓	
		601-048-00-0	205-923-4	218-01-9									
26		benzo[b]fluoranthene				0.24	mg/kg		0.209	mg/kg	0.0000209 %	✓	
		601-034-00-4	205-911-9	205-99-2									
27		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
28		benzo[a]pyrene; benzo[def]chrysene				0.22	mg/kg		0.192	mg/kg	0.0000192 %	✓	
		601-032-00-3	200-028-5	50-32-8									
29		indeno[123-cd]pyrene				0.15	mg/kg		0.131	mg/kg	0.0000131 %	✓	
			205-893-2	193-39-5									
30		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
31		benzo[ghi]perylene				0.16	mg/kg		0.14	mg/kg	0.000014 %	✓	
			205-883-8	191-24-2									
32		asbestos				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									
33		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
				P1186									
										Total:	0.0543 %		

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 Insufficient liquid phase to be significant (<100mg/kg in C8-C16 range)

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0075%)

Classification of sample: WS01-0.90-07/03/2023

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

Sample details

Sample name:
WS01-0.90-07/03/2023
Sample Depth:
0.90 m
Moisture content:
12.3%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 12.3% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	•	TPH (C6 to C40) petroleum group			TPH		<6 mg/kg		<6 mg/kg	<0.0006 %		<**LOD**
2	•	confirm TPH has NOT arisen from diesel or petrol					☑					
									Total:	0.0006 %		

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)
<LOD	Below limit of detection
ND	Not detected

Classification of sample: WS02-0.20 - 0.40-07/03/2023

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

Sample details

Sample name:
WS02-0.20 - 0.40-07/03/2023
Sample Depth:
0.20-0.40 m
Moisture content:
13.5%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 13.5% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU 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		15	mg/kg	1.32	17.131	mg/kg	0.00171 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<1	mg/kg	3.22	<3.22	mg/kg	<0.000322 %		<**LOD**
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.4	mg/kg	1.142	0.395	mg/kg	0.0000395 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		20	mg/kg	1.462	25.285	mg/kg	0.00253 %	✓	
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2	mg/kg	2.27	<4.54	mg/kg	<0.000454 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		37	mg/kg	1.126	36.034	mg/kg	0.0036 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	356	mg/kg	1.56	480.329	mg/kg	0.0308 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<**LOD**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		14	mg/kg	2.976	36.043	mg/kg	0.0036 %	✓	
10	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**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		35	mg/kg	1.785	54.046	mg/kg	0.0054 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		200	mg/kg	2.774	479.927	mg/kg	0.048 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		12	mg/kg		10.38	mg/kg	0.00104 %	✓	
14	confirm TPH has NOT arisen from diesel or petrol					☑							
15	pH			PH		8.5	pH		8.5	pH	8.5 pH		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
17		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
18		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
19		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
20		phenanthrene				0.14	mg/kg		0.121	mg/kg	0.0000121 %	✓	
			201-581-5	85-01-8									
21		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
22		fluoranthene				0.65	mg/kg		0.562	mg/kg	0.0000562 %	✓	
			205-912-4	206-44-0									
23		pyrene				0.6	mg/kg		0.519	mg/kg	0.0000519 %	✓	
			204-927-3	129-00-0									
24		benzo[a]anthracene				0.38	mg/kg		0.329	mg/kg	0.0000329 %	✓	
		601-033-00-9	200-280-6	56-55-3									
25		chrysene				0.49	mg/kg		0.424	mg/kg	0.0000424 %	✓	
		601-048-00-0	205-923-4	218-01-9									
26		benzo[b]fluoranthene				0.67	mg/kg		0.58	mg/kg	0.000058 %	✓	
		601-034-00-4	205-911-9	205-99-2									
27		benzo[k]fluoranthene				0.25	mg/kg		0.216	mg/kg	0.0000216 %	✓	
		601-036-00-5	205-916-6	207-08-9									
28		benzo[a]pyrene; benzo[def]chrysene				0.54	mg/kg		0.467	mg/kg	0.0000467 %	✓	
		601-032-00-3	200-028-5	50-32-8									
29		indeno[123-cd]pyrene				0.4	mg/kg		0.346	mg/kg	0.0000346 %	✓	
			205-893-2	193-39-5									
30		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
31		benzo[ghi]perylene				0.36	mg/kg		0.311	mg/kg	0.0000311 %	✓	
			205-883-8	191-24-2									
32		asbestos				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									
33		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
				P1186									
										Total:	0.0988 %		

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 Insufficient liquid phase to be significant (<100mg/kg in C8-C16 range)

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00104%)

Classification of sample: WS03-0.20-07/03/2023

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

Sample details

Sample name:
WS03-0.20-07/03/2023
Sample Depth:
0.20 m
Moisture content:
6.7%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 6.7% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU 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		19 mg/kg	1.32	23.405 mg/kg	0.00234 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %		<LOD
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %		<LOD
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		25 mg/kg	1.462	34.091 mg/kg	0.00341 %	✓	
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2 mg/kg	2.27	<4.54 mg/kg	<0.000454 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		10 mg/kg	1.126	10.505 mg/kg	0.00105 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	39 mg/kg	1.56	56.757 mg/kg	0.00364 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		20 mg/kg	2.976	55.537 mg/kg	0.00555 %	✓	
10	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
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		51 mg/kg	1.785	84.944 mg/kg	0.00849 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		53 mg/kg	2.774	137.179 mg/kg	0.0137 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		70 mg/kg		65.31 mg/kg	0.00653 %	✓	
14	confirm TPH has NOT arisen from diesel or petrol					☑					
15	pH			PH		10.2 pH		10.2 pH	10.2 pH		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
17		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-917-1	208-96-8									
18		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
19		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
20		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-581-5	85-01-8									
21		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-371-1	120-12-7									
22		fluoranthene				0.39	mg/kg		0.364	mg/kg	0.0000364 %	✓	
			205-912-4	206-44-0									
23		pyrene				0.33	mg/kg		0.308	mg/kg	0.0000308 %	✓	
			204-927-3	129-00-0									
24		benzo[a]anthracene				0.15	mg/kg		0.14	mg/kg	0.000014 %	✓	
		601-033-00-9	200-280-6	56-55-3									
25		chrysene				0.17	mg/kg		0.159	mg/kg	0.0000159 %	✓	
		601-048-00-0	205-923-4	218-01-9									
26		benzo[b]fluoranthene				0.18	mg/kg		0.168	mg/kg	0.0000168 %	✓	
		601-034-00-4	205-911-9	205-99-2									
27		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
28		benzo[a]pyrene; benzo[def]chrysene				0.13	mg/kg		0.121	mg/kg	0.0000121 %	✓	
		601-032-00-3	200-028-5	50-32-8									
29		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-893-2	193-39-5									
30		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
31		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-883-8	191-24-2									
32		asbestos				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									
33		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
				P1186									
										Total:	0.0466 %		

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 Insufficient liquid phase to be significant (<100mg/kg in C8-C16 range)

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00653%)

Classification of sample: WS03-0.60-07/03/2023

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

Sample details

Sample name:
WS03-0.60-07/03/2023
Sample Depth:
0.60 m
Moisture content:
14.2%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 14.2% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
1	•	TPH (C6 to C40) petroleum group		TPH		15 mg/kg		12.87 mg/kg	0.00129 %	✓	
2	•	confirm TPH has NOT arisen from diesel or petrol				☑					
								Total:	0.00129 %		

Key

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

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 Insufficient liquid phase to be significant (<100mg/kg in C8-C16 range)

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00129%)

Classification of sample: WS04-0.20-07/03/2023

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

Sample details

Sample name:
WS04-0.20-07/03/2023
Sample Depth:
0.20 m
Moisture content:
10.7%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 10.7% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU 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		19 mg/kg	1.32	22.402 mg/kg	0.00224 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %		<**LOD**
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.3 mg/kg	1.142	0.306 mg/kg	0.0000306 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		19 mg/kg	1.462	24.798 mg/kg	0.00248 %	✓	
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2 mg/kg	2.27	<4.54 mg/kg	<0.000454 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		24 mg/kg	1.126	24.13 mg/kg	0.00241 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	164 mg/kg	1.56	228.438 mg/kg	0.0146 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<**LOD**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		14 mg/kg	2.976	37.209 mg/kg	0.00372 %	✓	
10	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**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		42 mg/kg	1.785	66.955 mg/kg	0.0067 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		125 mg/kg	2.774	309.664 mg/kg	0.031 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		14 mg/kg		12.502 mg/kg	0.00125 %	✓	
14	confirm TPH has NOT arisen from diesel or petrol					☑					
15	pH			PH		8.2 pH		8.2 pH	8.2 pH		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
17		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
18		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
19		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
20		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
21		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
22		fluoranthene				0.38	mg/kg		0.339	mg/kg	0.0000339 %	✓	
			205-912-4	206-44-0									
23		pyrene				0.39	mg/kg		0.348	mg/kg	0.0000348 %	✓	
			204-927-3	129-00-0									
24		benzo[a]anthracene				0.28	mg/kg		0.25	mg/kg	0.000025 %	✓	
		601-033-00-9	200-280-6	56-55-3									
25		chrysene				0.34	mg/kg		0.304	mg/kg	0.0000304 %	✓	
		601-048-00-0	205-923-4	218-01-9									
26		benzo[b]fluoranthene				0.55	mg/kg		0.491	mg/kg	0.0000491 %	✓	
		601-034-00-4	205-911-9	205-99-2									
27		benzo[k]fluoranthene				0.2	mg/kg		0.179	mg/kg	0.0000179 %	✓	
		601-036-00-5	205-916-6	207-08-9									
28		benzo[a]pyrene; benzo[def]chrysene				0.49	mg/kg		0.438	mg/kg	0.0000438 %	✓	
		601-032-00-3	200-028-5	50-32-8									
29		indeno[123-cd]pyrene				0.36	mg/kg		0.321	mg/kg	0.0000321 %	✓	
			205-893-2	193-39-5									
30		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
31		benzo[ghi]perylene				0.35	mg/kg		0.313	mg/kg	0.0000313 %	✓	
			205-883-8	191-24-2									
32		asbestos				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									
33		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
				P1186									
										Total:	0.0664 %		

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 Insufficient liquid phase to be significant (<100mg/kg in C8-C16 range)

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00125%)

Classification of sample: WS05-0.20-07/03/2023

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

Sample details

Sample name:
WS05-0.20-07/03/2023
Sample Depth:
0.20 m
Moisture content:
17.4%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 17.4% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU 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		13	mg/kg	1.32	14.178	mg/kg	0.00142 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<1	mg/kg	3.22	<3.22	mg/kg	<0.000322 %		<**LOD**
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.2	mg/kg	1.142	<0.228	mg/kg	<0.0000228 %		<**LOD**
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15	mg/kg	1.462	18.109	mg/kg	0.00181 %	✓	
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2	mg/kg	2.27	<4.54	mg/kg	<0.000454 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		24	mg/kg	1.126	22.32	mg/kg	0.00223 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	213	mg/kg	1.56	274.431	mg/kg	0.0176 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<**LOD**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		9	mg/kg	2.976	22.126	mg/kg	0.00221 %	✓	
10	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**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		25	mg/kg	1.785	36.864	mg/kg	0.00369 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		120	mg/kg	2.774	274.973	mg/kg	0.0275 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		25	mg/kg		20.65	mg/kg	0.00207 %	✓	
14	confirm TPH has NOT arisen from diesel or petrol					☑							
15	pH			PH		6	pH		6	pH	6pH		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
17		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
18		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
19		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
20		phenanthrene				0.25	mg/kg		0.207	mg/kg	0.0000207 %	✓	
			201-581-5	85-01-8									
21		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
22		fluoranthene				0.93	mg/kg		0.768	mg/kg	0.0000768 %	✓	
			205-912-4	206-44-0									
23		pyrene				0.85	mg/kg		0.702	mg/kg	0.0000702 %	✓	
			204-927-3	129-00-0									
24		benzo[a]anthracene				0.42	mg/kg		0.347	mg/kg	0.0000347 %	✓	
		601-033-00-9	200-280-6	56-55-3									
25		chrysene				0.52	mg/kg		0.43	mg/kg	0.000043 %	✓	
		601-048-00-0	205-923-4	218-01-9									
26		benzo[b]fluoranthene				0.67	mg/kg		0.553	mg/kg	0.0000553 %	✓	
		601-034-00-4	205-911-9	205-99-2									
27		benzo[k]fluoranthene				0.23	mg/kg		0.19	mg/kg	0.000019 %	✓	
		601-036-00-5	205-916-6	207-08-9									
28		benzo[a]pyrene; benzo[def]chrysene				0.53	mg/kg		0.438	mg/kg	0.0000438 %	✓	
		601-032-00-3	200-028-5	50-32-8									
29		indeno[123-cd]pyrene				0.36	mg/kg		0.297	mg/kg	0.0000297 %	✓	
			205-893-2	193-39-5									
30		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
31		benzo[ghi]perylene				0.33	mg/kg		0.273	mg/kg	0.0000273 %	✓	
			205-883-8	191-24-2									
32		asbestos				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									
33		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
				P1186									
										Total:	0.0606 %		

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 Insufficient liquid phase to be significant (<100mg/kg in C8-C16 range)

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00207%)

Classification of sample: WS06-0.20-07/03/2023

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

Sample details

Sample name:
WS06-0.20-07/03/2023
Sample Depth:
0.20 m
Moisture content:
18.6%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 18.6% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
3		acenaphthene		201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
4		fluorene		201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
5		phenanthrene		201-581-5	85-01-8		0.28 mg/kg		0.228 mg/kg	0.0000228 %	✓	
6		anthracene		204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
7		fluoranthene		205-912-4	206-44-0		1.23 mg/kg		1.001 mg/kg	0.0001 %	✓	
8		pyrene		204-927-3	129-00-0		1.19 mg/kg		0.969 mg/kg	0.0000969 %	✓	
9		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.82 mg/kg		0.667 mg/kg	0.0000667 %	✓	
10		chrysene	601-048-00-0	205-923-4	218-01-9		0.81 mg/kg		0.659 mg/kg	0.0000659 %	✓	
11		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.19 mg/kg		0.969 mg/kg	0.0000969 %	✓	
12		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.45 mg/kg		0.366 mg/kg	0.0000366 %	✓	
13		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		1.04 mg/kg		0.847 mg/kg	0.0000847 %	✓	
14		indeno[123-cd]pyrene		205-893-2	193-39-5		0.71 mg/kg		0.578 mg/kg	0.0000578 %	✓	
15		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.16 mg/kg		0.13 mg/kg	0.000013 %	✓	
16		benzo[ghi]perylene		205-883-8	191-24-2		0.65 mg/kg		0.529 mg/kg	0.0000529 %	✓	
									Total:	0.00074 %		

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)
<LOD	Below limit of detection
ND	Not detected

Classification of sample: WS08-0.20 - 0.40-07/03/2023

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

Sample details

Sample name:
WS08-0.20 - 0.40-07/03/2023
Sample Depth:
0.20-0.40 m
Moisture content:
19.1%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 19.1% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU 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		14 mg/kg	1.32	14.954 mg/kg	0.0015 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %		<**LOD**
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.3 mg/kg	1.142	0.277 mg/kg	0.0000277 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15 mg/kg	1.462	17.736 mg/kg	0.00177 %	✓	
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2 mg/kg	2.27	<4.54 mg/kg	<0.000454 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		44 mg/kg	1.126	40.077 mg/kg	0.00401 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	247 mg/kg	1.56	311.687 mg/kg	0.02 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<**LOD**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		12 mg/kg	2.976	28.894 mg/kg	0.00289 %	✓	
10	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**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		26 mg/kg	1.785	37.55 mg/kg	0.00375 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		220 mg/kg	2.774	493.743 mg/kg	0.0494 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		219 mg/kg		177.171 mg/kg	0.0177 %	✓	
14	confirm TPH has NOT arisen from diesel or petrol					☑					
15	pH			PH		6.3 pH		6.3 pH	6.3 pH		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		naphthalene				0.23	mg/kg		0.186	mg/kg	0.0000186 %	✓	
		601-052-00-2	202-049-5	91-20-3									
17		acenaphthylene				0.51	mg/kg		0.413	mg/kg	0.0000413 %	✓	
			205-917-1	208-96-8									
18		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
19		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
20		phenanthrene				2.73	mg/kg		2.209	mg/kg	0.000221 %	✓	
			201-581-5	85-01-8									
21		anthracene				0.85	mg/kg		0.688	mg/kg	0.0000688 %	✓	
			204-371-1	120-12-7									
22		fluoranthene				18.7	mg/kg		15.128	mg/kg	0.00151 %	✓	
			205-912-4	206-44-0									
23		pyrene				17	mg/kg		13.753	mg/kg	0.00138 %	✓	
			204-927-3	129-00-0									
24		benzo[a]anthracene				9.56	mg/kg		7.734	mg/kg	0.000773 %	✓	
		601-033-00-9	200-280-6	56-55-3									
25		chrysene				8.71	mg/kg		7.046	mg/kg	0.000705 %	✓	
		601-048-00-0	205-923-4	218-01-9									
26		benzo[b]fluoranthene				17.5	mg/kg		14.158	mg/kg	0.00142 %	✓	
		601-034-00-4	205-911-9	205-99-2									
27		benzo[k]fluoranthene				4.68	mg/kg		3.786	mg/kg	0.000379 %	✓	
		601-036-00-5	205-916-6	207-08-9									
28		benzo[a]pyrene; benzo[def]chrysene				13.8	mg/kg		11.164	mg/kg	0.00112 %	✓	
		601-032-00-3	200-028-5	50-32-8									
29		indeno[123-cd]pyrene				8.08	mg/kg		6.537	mg/kg	0.000654 %	✓	
			205-893-2	193-39-5									
30		dibenz[a,h]anthracene				1.67	mg/kg		1.351	mg/kg	0.000135 %	✓	
		601-041-00-2	200-181-8	53-70-3									
31		benzo[ghi]perylene				7.47	mg/kg		6.043	mg/kg	0.000604 %	✓	
			205-883-8	191-24-2									
32		asbestos				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									
33		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
				P1186									
										Total:	0.112 %		

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 Insufficient liquid phase to be significant (<100mg/kg in C8-C16 range)

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0177%)

Classification of sample: TP01-0.40-02/03/2023

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

Sample details

Sample name:
TP01-0.40-02/03/2023
Sample Depth:
0.40 m
Moisture content:
13.6%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 13.6% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
1	•	TPH (C6 to C40) petroleum group		TPH		648 mg/kg		559.872 mg/kg	0.056 %	✓	
2	•	confirm TPH has NOT arisen from diesel or petrol				☑					
								Total:	0.056 %		

Key

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

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 Insufficient liquid phase to be significant (<100mg/kg in C8-C16 range)

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.056%)

Appendix A: Classifier defined and non GB MCL 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

- **divanadium pentaoxide; vanadium pentoxide** (EC Number: 215-239-8, CAS Number: 1314-62-1)

GB MCL index number: 023-001-00-8
Description/Comments:
Additional Hazard Statement(s): Carc. 1B; H350 , Acute Tox. 3; H301 , Acute Tox. 2; H330
Reason for additional Hazards Statement(s):
20 Sep 2022 - Carc. 1B; H350 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be Carc. 1B; H350. The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.
28 Sep 2022 - Acute Tox. 3; H301 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be "Acute tox 3; H301". The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.
28 Sep 2022 - Acute Tox. 2; H330 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be "Acute tox 2; H330". The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.

- **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.

- **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

monohydric phenols (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)
Data source: CLP combined data
Data source date: 26 Mar 2019
Hazard Statements: Muta. 2; H341 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301 , STOT RE 2; H373 , Skin Corr. 1B; H314 , Skin Corr. 1B; H314 >= 3 % , Skin Irrit. 2; H315 1 £ conc. < 3 % , Eye Irrit. 2; H319 1 £ conc. < 3 % , Aquatic Chronic 2; H411

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

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

boron {diboron trioxide; boric oxide}

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

cadmium {cadmium oxide}

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

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

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

chromium in chromium(VI) compounds {chromium (VI) 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)

vanadium {divanadium pentaoxide; vanadium pentoxide}

Worst case species (edit as required)

zinc {zinc chromate}

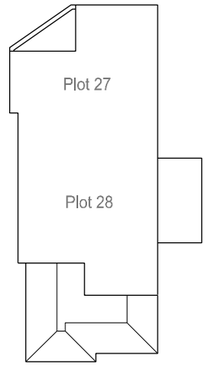
Worst case CLP species based on hazard statements/molecular weight (edit as required)

Appendix C: Version

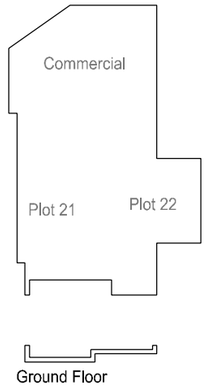
HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2023.73.5544.10256 (14 Mar 2023)
HazWasteOnline Database: 2023.73.5544.10256 (14 Mar 2023)

This classification utilises the following guidance and legislation:
WM3 v1.2.GB - Waste Classification - 1stEditionv1.2.GB-Oct2021
CLP Regulation - Regulation1272/2008/ECof16December2008
1st ATP - Regulation790/2009/ECof10August2009
2nd ATP - Regulation286/2011/ECof10March2011
3rd ATP - Regulation618/2012/EUof10July2012
4th ATP - Regulation487/2013/EUof8May2013
Correction to 1st ATP - Regulation758/2013/EUof7August2013
5th ATP - Regulation944/2013/EUof2October2013
6th ATP - Regulation605/2014/EUof5June2014
WFD Annex III replacement - Regulation1357/2014/EUof18December2014
Revised List of Waste 2014 - Decision2014/955/EUof18December2014
7th ATP - Regulation2015/1221/EUof24July2015
8th ATP - Regulation(EU)2016/918of19May2016
9th ATP - Regulation(EU)2016/1179of19July2016
10th ATP - Regulation(EU)2017/776of4May2017
HP14 amendment - Regulation(EU)2017/997of8June2017
13th ATP - Regulation(EU)2018/1480of4October2018
14th ATP - Regulation(EU)2020/217of4October2019
15th ATP - Regulation(EU)2020/1182of19May2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK:2020No.1567of16thDecember2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
GB MCL List - version1.1of09June2021

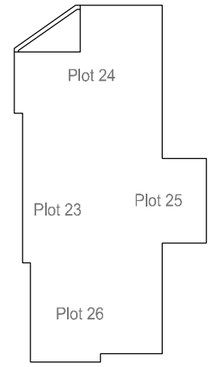
Appendix G Information Provided by the Client



Second Floor



Ground Floor



First Floor

1:500

0 10m 20m 30m 40m 50m

* ** ***

Rev	Date	Description

SHANLY HOMES

Project

Land off Anyards Road
Cobham

Feasibility

Drawing

Feasibility Study

Date	Scale @ A3	Drawn
01.02.23	1:500	CE

Drawing number	Revision
AR/Feas/111	-

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