



Compiled Ground Investigation Report

at

**Land North of Mayflower Way, Angmering, Littlehampton,
West Sussex BN16 4AY**

for

Peter Taylor & Crayfern Homes

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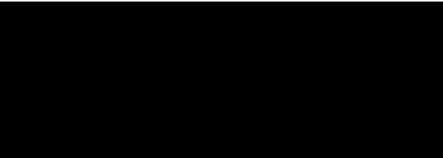
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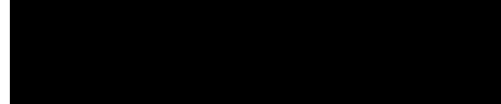
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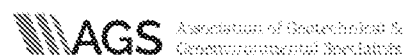
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This is not a valid document for use in the design of the project unless it is titled Final in the document status box.

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

Soils Limited was commissioned by Crayfern Homes to compile a report based on the various phases of intrusive site investigation undertaken at the site referred to as Land to the North of Mayflower Way, Angmering, Littlehampton, West Sussex BN16 4AY. Works were originally undertaken for the joint benefit of Peter Taylor and Crayfern Homes. The scope of the phases of investigation undertaken to date were outlined within the following correspondence:

- Soils Limited quotation reference Q17034, dated 10th October 2015;
- Soils Limited quotation reference Q17034/Rev2.01, dated 9th November 2016.

This document comprises the Compiled Ground Investigation Report and incorporates the results, discussion and conclusions to all intrusive works undertaken on the site between 19th November 2015 and 24th November 2016, initially reported within the following documents:

- Groundwater Letter Report (Soils Limited report ref: 17028/GWLR, dated May 2016);
- Infiltration Letter Report (Soils Limited report ref: 17028 LR/Rev1.1, dated December 2016).

This Ground Investigation Report must also be read in conjunction with the Phase I Desk Study report undertaken on the site by Soils Limited, Report ref: 17028/DS, dated November 2016.

Standards

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

- BS 5930:2015 and BS EN ISO 22476-2 2005+A1:2011
- BS EN 1997-1:2004+A1:2013
- BS EN ISO 14688-1:2002+A1:2013
- BS EN ISO 14688-2:2004+A1:2013
- BS 10175:2011+A1:2013

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 was 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 QTS Environmental Limited 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.

Trial 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 a trial hole.

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Section I Introduction

I.1 Objective of Investigation

Soils Limited was commissioned by Peter Taylor & Crayfern Homes to undertake an intrusive site investigation and produce a Compiled Ground Investigation Report to supply the client and their designers with information regarding ground conditions to assist in developing an environmental audit of the site.

The investigation was to be undertaken to provide comment on underlying ground conditions, predominantly in respect to potential ground contamination and groundwater through in-situ testing / monitoring and laboratory analysis. Preliminary comment on anticipated foundations was to be made by means of in-situ geotechnical testing. No allowance was made for geotechnical laboratory analysis.

Soil samples were 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 (Report ref: 17028/DS, dated November 2016).

I.2 Location

The site was located on land to the north of Mayflower Way, Angmering, Littlehampton, West Sussex BN16 4AY and had an approximate O.S Land Ranger Grid Reference of TQ 072 033.

The site location plan is given in Figure 1.

I.3 Site Description

At the time of the site investigation, the site comprised open land used for the storage of building materials and equipment and stockpiles of aggregate and crushed building material.

The site was level and slightly undulating. Mature vegetation was noted at the site boundaries, with mature trees lining the southern boundary. The site was bound by a nursery to the north, commercial and industrial land to the east, agricultural and residential to the south and recreational land to the west.

An aerial photograph has been included in Figure 2.

I.4 Proposed Development

The proposed development comprised erection of 24No. residential units including two, three and four-bedroom detached, semi-detached and terraced houses. The

development was to include areas of hard landscaping such as access roads, pavements and driveways, and areas of soft landscaping including communal open space and private gardens.

In compiling this report reliance was placed on drawing number 1701/2.10/P8, dated March 2017, prepared by Crossley Design Architecture. Any change or deviation from the scheme outlined in the drawing could invalidate the recommendations presented within this report. Soils Limited must be notified about any such changes.

Development plans provided by the client are presented in Appendix D.

1.5 Anticipated Geology

The 1:50,000 BGS map showed the site to be located upon the bedrock Lewes Nodular Chalk Formation with overlying superficial deposits of River Terrace Deposits.

1.5.1 River Terrace Deposits

River Terrace Deposits are superficial deposits of Quaternary age that lie along the margins of rivers and are predominantly found in the southern part of West Sussex, along the coastal plain and are typically less than 10m thick. The composition of the River Terrace Gravel varies greatly, depending on the source material available in the river's catchment. Deposits generally consist of sands and gravels of roughly bedded flint or chert commonly in a matrix of silts and clays. In West Sussex the rivers flow mainly south over the Weald Clay, which contains some sandstones and limestone that could be incorporated into the river gravel.

1.5.2 Lewes Nodular Chalk Formation

The Lewes Nodular Chalk Formation is composed of hard to very hard nodular chalks and hardgrounds with interbedded soft to medium hard chalks (some grainy) and marls; some griotte chalks. The softer chalks become more abundant towards the top. Nodular chalks are typically lumpy and iron-stained. Brash is rough and flaggy or rubbly and tends to be dirty. First regular seams of nodular flint, some large, commence near the base and continue throughout.

This formation can exhibit occasional erosional features such as pipes, swallow holes and solution cavities, usually in-filled with drift deposits. The features sometimes manifest themselves at the surface as shallow circular depressions and solution features may be reactivated by the concentrated ingress of water from leaking drains or soakaways. This reactivation may lead to surface collapse.

1.6 Limitations and Disclaimers

This Compiled Ground Investigation Report relates to the site located on land to the north of Mayflower Way, Angmering, Littlehampton, West Sussex BN16 4AY and was prepared for the benefit of Peter Taylor & Crayfern Homes (The "Client"). The report was prepared solely for the brief described in Section 1.1 of this report.

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.

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 on 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).

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:

"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”.

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.

Ownership of copyright of all printed material including reports, laboratory test results, trial pit and borehole log sheets, including drillers log sheets remains with Soils Limited. License is for the sole use of the client and may not be assigned, transferred or given to a third party.

Section 2 Site Works

2.1 Proposed Project Works

The proposed intrusive investigation was designed to provide information on the ground conditions, predominantly relating to potential contamination, groundwater and infiltration characteristics but also aid the preliminary design of foundations for the proposed residential development from the information available. The intended investigation was outlined within the following correspondence:

- Soils Limited quotation reference Q17034, dated 10th October 2015;
- Soils Limited quotation reference Q17034/Rev2.01, dated 9th November 2016.

The investigation was to comprise:

- Machine excavated trial holes;
- Infiltration testing in accordance with BRE DG 365;
- Windowless sampling (and dynamic probes);
- Installation and monitoring of groundwater wells;
- Chemical laboratory analysis.

2.1.1 Actual Project Works

The actual project works were undertaken in multiple phases between 19th November 2015 and 24th November 2016 and comprised:

- 3No. windowless sampler boreholes;
- 6No. super heavy dynamic probes;
- Installation of 3No. groundwater monitoring wells;
- 9No. machine excavated trial pits;
- Infiltration testing in accordance with BRE DG 365:2016

All three windowless sampler boreholes (WS1 – WS3) were backfilled with gravel and bentonite following the installation of monitoring wells.

All machine excavated trial pits were backfilled with arisings on completion.

All trial hole locations have been presented in Figure 3.

No geotechnical laboratory testing was commissioned as part of the works.

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

2.2 Ground Conditions

As part of the initial phase of works, on 19th November 2015, three windowless sampler boreholes (WS1 – WS3) were drilled to depths ranging between 4.00m and 5.00m below ground level (bgl) at locations selected by Soils Limited using a development plan provided by the client.

At the same time, six super heavy dynamic probes were driven prior and adjacent to their corresponding windowless sampler boreholes, and at three additional locations selected by Soils Limited, to depths ranging between 4.60m and 5.00m bgl.

As part of the second phase of works, on 24th November 2016, nine trial pits were machine excavated to depths ranging between 1.40m and 2.90m bgl at locations selected by Soils Limited using a development plan provided by the client. Following construction of the trial holes, infiltration tests broadly in accordance with the principles of BRE 365 were carried out in three trial pits (TP1 – TP3). Due to slow infiltration, infiltration testing could only be carried out once within these trial pits, with the exception of TP1 where infiltration testing was carried out twice.

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

All trial 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.

Table 2.1 Final Depth of Trial Holes

Trial Hole	Depth (m bgl)	Probe Hole	Depth (m bgl)
WS1 ^w	4.00	DPI	4.70
WS2 ^w	5.00	DP2	5.00
WS3 ^w	5.00	DP3	4.60
TP1	2.90	DP4	5.00
TP2	2.20	DP5	5.00
TP3	2.60	DP6	5.00
TP4	1.40		
TP5	1.90		
TP6	1.70		
TP8	2.00		
TP9	1.70		
TP10	1.80		

Note: w – well installation

The approximate trial hole locations are shown on Figure 3.

The soil conditions encountered were recorded and soil sampling commensurate with the purposes of the investigation was carried out. The depths given on the trial 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 should be made to the detailed records given within Appendix A, but for the purposes of discussion, the succession of conditions encountered in the trial holes in descending order can be summarised as:

Made Ground (MG)
River Terrace Deposits (RTD)
Lewes Nodular Chalk Formation (Not encountered)

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

Table 2.2 Ground Conditions

Strata	Epoch	Depth Encountered (m bgl)		Typical Thickness (m)	Typical Description
		Top	Bottom		
MG	Anthropocene	0.00	0.30 – 1.50 ¹	0.70	Black, brown and grey slightly sandy gravelly SILT/CLAY. Gravel was fragments of flint brick, concrete, glass and ash.
RTD	Quaternary	0.30 – 1.50 ¹	1.40 ² /5.00 ²	Not proven ³	Cohesive: Orangish brown slightly fine sandy silty CLAY. over Granular: Light brown gravelly clayey SAND and sandy clayey GRAVEL. Gravel was fine to medium angular clasts of flint.

Note: ¹ Depth inferred from dynamic probe. ² Final depth of trial hole. ³ Base of strata not encountered

2.3 Ground Conditions Encountered in Trial Holes

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

2.3.1 Made Ground

Soils described as Made Ground were encountered in all twelve trial holes from ground level to depths ranging between 0.30m and 1.10m bgl and inferred to 1.50m bgl within DP5.

The Made Ground typically comprised black, brown and grey slightly sandy gravelly SILT/CLAY. Gravel was fragments of flint, brick, concrete glass and ash.

The depths of Made Ground have been included in Table 2.3.

Table 2.3 Final Depth of Made Ground

Trial Hole	Depth (m bgl)
WS1	0.40
WS2	0.90
WS3	0.60
DP4	0.80 ¹
DP5	1.50 ¹
DP6	0.80 ¹
TP1	1.00
TP2	0.90
TP3	1.00
TP4	1.10
TP5	0.80
TP6	0.80
TP8	0.30
TP9	0.30
TP10	0.30

Note: ¹ Depth inferred from dynamic probe

2.3.2 River Terrace Deposits

Soils described as River Terrace Deposits were encountered in all twelve trial holes underlying the Made Ground and persisted to full investigatory depths of between 1.40m and 5.00m bgl.

The River Terrace Deposits underlying the site were observed to comprise both cohesive and granular horizons, with cohesive soils persisting to depths ranging between 3.00m and 4.00m bgl and described as orangish brown slightly fine sandy silty CLAY. A granular horizon was observed underlying the cohesive beds within the windowless sampler boreholes and described as light brown gravelly clayey SAND and sandy clayey GRAVEL. Gravel was fine to medium angular clasts of flint.

The depth of River Terrace Deposits has been included in Table 2.4.

Table 2.4 Final Depth of River Terrace Deposits

Trial Hole	Depth (m bgl)
WS1/DP1	4.00 ¹ /4.70 ¹
WS2/DP2	5.00 ¹ /5.00 ¹
WS3/DP3	5.00 ¹ /4.60 ¹
DP4	5.00 ¹
DP5	5.00 ¹
DP6	5.00 ¹
TP1	2.90 ¹
TP2	2.20 ¹

Trial Hole	Depth (m bgl)
TP3	2.60 ¹
TP4	1.40 ¹
TP5	1.90 ¹
TP6	1.70 ¹
TP8	2.00 ¹
TP9	1.70 ¹
TP10	1.80 ¹

Note: ¹ Final depth of trial hole/ dynamic probe

2.4 Roots

Roots/rootlets were observed in ten of the twelve trial holes, persisting to depths ranging between 0.70m and full investigatory depth of 2.00m bgl.

The depths of root penetration have been included in Table 2.5.

Table 2.5 Depth of Root Penetration

Trial Hole	Depth (m bgl)
WS1	1.00
WS2	2.00
WS3	1.00
TP1	None observed
TP2	1.50
TP3	0.80
TP4	0.70
TP5	0.80
TP6	None observed
TP8	2.00 ¹
TP9	1.70 ¹
TP10	1.20

Note:

Roots / rootlets 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

No groundwater was recorded within any of the exploratory trial holes at the time of investigations.

Changes in groundwater level occur for a number of reasons including seasonal effects and variations in drainage. The investigations were undertaken around November (2015 & 2016), when groundwater would be rising from its lowest level which is typically observed around September. The highest groundwater levels typically occur around March.

Groundwater monitoring was undertaken within the standpipes installed onsite in two phases across winter months at monthly intervals, between 30th November 2015 and 12th March 2016 and between 11th January 2018 and 16th April 2018. The results have been presented in Table 2.6.

Table 2.6 Groundwater Monitoring

Trial Hole	Depth to Water (m bgl)										Base of Hole (m bgl)
	30/11/2015	17/12/2015	08/01/2016	12/02/2016	14/03/2016	12/04/2016	11/01/2018	07/20/2018	06/03/2018	16/04/2018	
WS1	DRY	3.84	3.85	DRY	DRY	DRY	DRY	DRY	DRY	DRY	4.04
WS2	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	5.24
WS3	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	5.17

Note:

Groundwater was recorded within WS1 on two occasions, 17th December 2015 and 8th January 2016 at a depth of 3.84m and 3.85m respectively and were subsequently found to be dry on remaining observations.

Section 3 Discussion of Geotechnical In-Situ Testing

3.1 Dynamic Probe Tests

Dynamic probing (DPSH) was undertaken at six locations, DP1 – DP3 driven prior and adjacent to the drilling of WS1 – WS3 respectively, and DP4 – DP6 at standalone locations (DP1 to DP2), to depths ranging between 4.60m and 5.00m bgl. 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.

The SPT “N60” values presented have been corrected in accordance with BS EN 22476 Part 3, to account for the rig efficiency, borehole depth, overburden factors etc. Further correction of the ‘N’ values should therefore not be necessary. The energy ratio of the equipment used was taken as 60%.

The River Terrace Deposits recorded equivalent SPT “N60” values between 3 and 9 in cohesive beds and between 6 and 50+ in granular beds. The cohesive soils were classified as very low to medium strength, with undrained cohesive strength ranging between 10kPa and 45kPa. The granular beds, observed to overly the cohesive beds, were classified as loose to very dense relative density.

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

3.2 Infiltration Tests

Infiltration tests were performed in trial pits TP1, TP2 and TP3, to provide guidance on the suitability of the ground for the adoption of a surface water drainage system. The tests were undertaken within the cohesive beds of the River Terrace Deposits to depths of 2.20m, 2.63m and 2.90m below ground level (bgl). Granular soils of the River Terrace Deposits were not reached within the depth of the trial pits. The tests comprised piping clean water via a water tanker into the open trial hole, the drop in water level (head) over time was then recorded to give an indication of soakage potential.

BRE 365 states that for an accurate infiltration rate to be obtained, a soakage pit needs to be filled three times in quick succession. Each test is completed once 75% of the water present has drained away, to determine whether the underlying ground conditions were suitable for surface water drainage.

A single test was completed within TP1, ending once 75% of the water had drained away. A test was carried out in both TP2 and TP3, which did not complete within the monitoring period. The data from the incomplete tests were extrapolated to give an indicative infiltration rate.

The results are outlined in Table 3.1.

Table 3.1 Infiltration Rates

Trial Hole (Test No.)	Test Stratum	Pit Depth (m bgl)	Depth to Water at Start (m bgl)	Infiltration Rate (m/sec)	Notes
TPI (1)	RTD	2.90	1.96	6.26×10^{-5}	
TPI (2)	RTD	2.90	1.89	2.45×10^{-5}	Data extrapolated after 110 mins
TP2	RTD	2.20	1.07	6.17×10^{-7}	Data extrapolated after 190 mins
TP3	RTD	2.63	1.61	2.64×10^{-6}	Data extrapolated after 160 mins

Section 4 Determination of Chemical Analysis

4.1 Site Characterisation and Revised Conceptual Site Model

The Phase I Desk Study undertaken by Soils Limited (report ref: 17028/DS dated November 2016) identified a low to moderate risk of ground contamination and from previous usage of the site and offsite sources.

The intrusive site investigation encountered soils described as Made Ground in all twelve trial holes from ground level to depths ranging between 0.30m and 1.10m bgl and inferred to 1.50m bgl within DP5. The Made Ground typically comprised black, brown and grey slightly sandy gravelly SILT/CLAY. Gravel was fragments of flint, brick, concrete glass and ash.

Superficial deposits of River Terrace Deposits were encountered underlying the Made Ground and persisted to the full investigatory depth of 5.00m bgl.

4.2 Determination of Chemical Analysis

The driver for determination of the analysis suite was the information obtained from the Preliminary Investigation Report and Main Investigation Report intrusive investigation. Table 4.1 outlines the specification for each sample tested.

Table 4.1 Chemical Analysis Specification

Substance	Locations: Depths (m bgl)					
	SP1 ^s	SP2 ^s	TP2:0.20 ^s	TP3:0.10 ^s	TP5:0.20 ^s	TP5:0.90 ^s
Asbestos Screen	✓	✓	✓	✓	✓	✓
Total Phenols	✓	✓	✓	✓	✓	✓
Total Cyanide	✓	✓	✓	✓	✓	✓
Organic Matter	✓	✓	✓	✓	✓	✓
pH	✓	✓	✓	✓	✓	✓
Metals	✓	✓	✓	✓	✓	✓
Metalloids	✓	✓	✓	✓	✓	✓
Organics	✓	✓	✓	✓	✓	✓
PAHs	✓	✓	✓	✓	✓	✓
TPH-CWG	✓	✓	✓	✓	✓	
BTEX	✓	✓	✓	✓	✓	
WAC	✓	✓				

Notes: Metals: Cd, Cr, Pb, Hg, Ni, Se, CN, S, Cu, Zn, Bo, V. metalloids: As. organics: USEPA 16 speciated PAH, TPH-CWG (speciated TPH), BTEX, VOC/SVOC Asbestos screening was undertaken in accordance with HSG 248.

^s = Soil sample.

Section 5 Qualitative Risk Assessment

5.1 Assessment Criteria

The assessment criteria used to determine risks to human health are derived and explained within Appendix B.5.

5.2 Representative Contamination Criteria - Soil

The proposed development comprised erection of 24No. residential units including two, three and four-bedroom detached, semi-detached and terraced houses. The development was to include areas of hard landscaping such as access roads, pavements and driveways, and areas of soft landscaping including communal open space and private gardens.

In compiling this report reliance was placed on drawing number 1701/2.10/P8, dated March 2017, prepared by Crossley Design Architecture. Any change or deviation from the scheme outlined in the drawing could invalidate the recommendations presented within this report. Soils Limited must be notified about any such changes.

The chemical laboratory results were compared against the representative contaminants concentration for human health receptor to Soil Guideline Values (SGV), Category 4 Screening Levels (C4SL's) or Suitable 4 Use Level (S4UL) based on a residential with plant uptake land-use scenario.

Table 5.1 outlines the samples that have exceeded their relevant assessment criteria. The full laboratory report is presented in Appendix B.2.

Table 5.1 Summary of Chemical Analysis of Soils Sample Exceedance

Substance	Sample locations where adopted SGV, C4SL or S4UL were exceeded for the 'Residential with Plant Uptake' land-use scenario
Lead	654mg/kg against 200mg/kg – TP3:0.10 (C4SL)

To assess the potential toxicity to the human health receptor from the concentrations of organic compounds tested for, Soil Organic Matter (SOM) tests were undertaken on the samples submitted for chemical testing, which revealed SOM values of between 1.2% and 2.8%. For each soil sample tested, the Soil Organic Matter recorded was used to derive the appropriate guideline value for organic determinants.

In summary, one of the samples tested showed concentrations in excess of the relevant C4SL for a residential with plant uptake land-use scenario for Lead. In TP3 at 0.10m bgl, lead was recorded at a concentration of 654mg/kg against the residential with plant uptake end-use C4SL of 200mg/kg.

None of the other substances tested recorded concentrations above the residential with

plant uptake end-use screening values.

5.2.1 Asbestos

No Asbestos Containing Material (ACM) was detected within the samples provided to the laboratory. If encountered, care must be taken to ensure any such material is separated and disposed of in an appropriate manner to a licensed waste facility.

5.3 Risk to Groundwater

The Phase I Desk Study undertaken on the site identified a moderate risk to the groundwater receptor from previous onsite activities. The site is situated on superficial deposits and bedrock designated as Secondary A Aquifer and Principal Aquifer respectively.

Soil chemical analysis identified one sample with a lead concentration in excess of guideline values for a residential with plant uptake land-use scenario. Based on the proposed site layout, and shallow depth of the sample, the contamination hot-spot is anticipated to be removed during construction. Therefore, the risk to the groundwater receptor is considered negligible.

5.4 Tier I Quantitative Risk Assessment

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

5.4.1 Soils

One sample recorded concentrations in excess of the relevant screening levels for a residential with plant uptake land use scenario. TP3 at 0.10m bgl, lead was recorded in exceedance of the relevant guideline values.

The Tier 1 Quantitative risk assessment therefore established that there was **a risk to the human health receptors** of construction workers or future end-users.

5.4.2 Groundwater

Based on the soil chemical analysis results on samples obtained from shallow soils across the site, and the proposed site layout, the risk to the groundwater receptor was negligible.

5.4.3 Soil Gas

The Phase I Desk Study identified a moderate risk of soil gas generation associated with an infilled pond adjacent to the site.

At the time of reporting, a full soil gas risk assessment had not been commissioned.

5.5 Remedial Objective

Soil chemical analysis recorded one sample with substance concentrations in excess of the relevant C4SL for a residential with plant uptake land-use scenario.

Based on the proposed site layout at the time of reported (Crossley Design Architecture drawing ref.: 1701/2, dated March 2017), the contamination 'hot-spot' lay within the proposed building footprint of units 6 and 7, which comprise two semi-detached properties. Therefore, remediation was not considered necessary.

The remedial objective for the site is to ensure site clean-up removes any unacceptable risk to the identified receptors of Human Health, Building Structures and Services and Groundwater receptor. In essence the remedial objective should sever any source-pathway-receptor pollutant linkages that have been established.

5.6 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.

To prevent exposure to airborne dust by both the general public and construction personnel the site should be kept damp during dry weather and at other times when dust is generated as a result of construction activities. The site should be securely fenced at all times to prevent unauthorised access.

Washing facilities should be provided and eating restricted to mess huts.

5.7 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 should always be sought.

The amount, type and nature of the material to be removed will in part determine the amount and type of analysis that may be required to comply with current waste guidance, and thereby allow a competent person to suitably classify the material. Often this data is uncertain or unavailable, especially in the early stages of a project, and therefore further investigation, testing and analysis may be required as additional information regarding the development becomes available.

Wastes must be classified and defined by their solid characteristics to comply with

current waste guidance. Existing information and analysis derived for environmental purposes may therefore be suitable for use in this context. Waste Acceptance Criteria (WAC) report the leachability of materials and therefore cannot be used to classify, characterise or define wastes. The only purpose of a WAC analysis is to determine the suitability of a given material for acceptance at one of the three different types of available licenced landfills (inert, stable non-reactive hazardous or hazardous).

Other options are available that may lead to significant savings against disposal to landfill and expert advice should always be sought from a competent person to advise on their relative costs or benefits and advise on any additional analysis, sampling or investigation that may be required to reduce remaining uncertainties and comply with current guidance. Further consideration of results using HazWasteOnline was undertaken on to give an indication of potentially hazardous properties in the materials analysed. The results are discussed in Section 5.8.

5.8 Risk Based Hazard Assessment of Waste

The analysis results of the chemical laboratory testing undertaken as part of report, prepared by QTS Environmental Ltd., were used for the Hazardous Waste Classification process. The determination is outlined in Appendix B.3.

Soil-based stockpiles location on site were tested as samples SP1 and SP2 and did not record any determinants in exceedance of their relevant guideline values. Concrete-based stockpiles were visually inspected onsite, and no hazardous substances were identified.

Asbestos was not encountered during the intrusive investigation. Waste containing asbestos would either need to be pre-treated onsite, removing the asbestos, before removing to landfill, or sent to a specialist landfill which can deal with waste containing asbestos.

5.9 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.

Under the EPR, material that is contaminated but otherwise suitable for re-use is also classified as waste and its re-use should be in accordance with the Environmental Permitting Regulations 2007 (EPR). Environmental Permit Exemptions (EPE) are for the re-use of non-hazardous or inert waste only; hazardous waste cannot be re-used under a permit exemption. EPE apply only to imported inert waste materials; inert material arising on site and recovered on site is not classified as waste and does not require an exemption. It is possible that materials arising on-site will be classified as inert and would not need an exemption.

Environmental Permit Exemptions are only allowed for certain activities, placing controls on the quantities that can be stored and re-used. The re-use of waste shall be within areas and levels defined in planning applications and permissions for the development. An EPE requires a site-specific risk assessment for the receptor site to demonstrate that the materials are suitable for use, i.e. that they will not give rise to harm to human health or pollution of the environment.

Under the CL:AIRE voluntary code of practice (CoP) materials excavated on-site are not deemed contaminated if suitable for re-use at specified locations or generally within the site.

Material that may have been classified as hazardous waste under the EPR may be re-used. The CoP regime requires that a 'Qualified Person' as defined under the CoP reviews the development of the Materials Management Plan, including review of Risk Assessments and Remediation Strategy/Design Statement together with documentation relating to Planning and Regulatory issues, and signs a Declaration which is forwarded to the Environment Agency and which confirms compliance with the CoP.

Should it be necessary to import materials from another site where materials are excavated and which is not material from a quarry or produced under a WRAP protocol, then an EPE would be necessary for the imported material whether the work was managed under the CoP or the EPR.

5.10 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.

5.11 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.

Care should be taken during excavation works especially to investigate any soils, which appear by eye (e.g. such as fibrous materials, large amounts of ash and unusual discolouration), odour (e.g. fuel, oil and chemical type odours or unusual odours such as sweet odours or fishy odours) or wellbeing (e.g. light headedness and/or nausea, burning of nasal passages and blistering or reddening of skin due to contact with soil) to be contaminated or of unusual and/or different character to standard soils or those analysed.

In the event of any discovery of potentially contaminated soils or materials, this discovery

should be quarantined and reported to the most senior member of site staff or the designated responsible person at the site for action. The location, type and quantity must be recorded and the Local Authority, and a competent and appropriate third-party Engineer/Environmental consultant notified immediately. An approval from the Local authority must be sought prior to implementing any proposed mitigation action.

The discovery strategy must remain on site at all times and must demonstrate a clear allocation of responsibility for reporting and dealing with contamination. A copy of the strategy must be placed on the health and safety notice board and /or displayed in a prominent area where all site staff are able to take note of and consult the document at any time. Any member of the workforce entering the site to undertake any excavation must be made aware of the potential to discover contamination and the discovery strategy.

Section 6 Preliminary Geotechnical Considerations

6.1 General

A preliminary engineering appraisal of the soil types encountered during the site investigation and likely to be encountered during the redevelopment of this site is presented below. Soil descriptions are based on disturbed samples taken from the trial holes. Please note; in the absence of geotechnical laboratory analysis (which did not form part of the brief of any of the phases of investigation undertaken to date), the foundation considerations must be taken as preliminary until supplementary works are undertaken.

6.1.1 Made Ground and Topsoil

The terms *Fill* and *Made Ground* are used to describe material, which has been placed by man either for a particular purpose e.g. to form an embankment, or to dispose of unwanted material. For the former use, the Fill and/or Made Ground may well have been selected for the purpose and placed and compacted in a controlled manner. With the latter, great variations in material type, thickness and degree of compaction invariably occur and there can be deleterious or harmful matter, as well as potentially methanogenic organic material.

The BSI Code of Practice for Foundations, BS 8004:1986, Clause 2.2.2.3.5 Made Ground and Fill, includes the caveat that *'all Topsoil should be treated as suspect, because of the likelihood of extreme variability'*.

Soils described as Made Ground were encountered in all twelve trial holes from ground level to depths ranging between 0.30m and 1.10m bgl and inferred to 1.50m bgl within DP5. The Made Ground typically comprised black, brown and grey slightly sandy gravelly SILT/CLAY. Gravel was fragments of flint, brick, concrete glass and ash. The depths of Made Ground have been included in Table 2.3.

A result of the inherent variability, particularly of uncontrolled Topsoil, Fill and/or Made Ground is that it is usually unpredictable in terms of bearing capacity and settlement characteristics. Foundations should, therefore, be taken through any Topsoil and/or Made Ground and either into, or onto a suitable underlying natural stratum of adequate bearing characteristics.

6.1.2 River Terrace Deposits

Soils described as River Terrace Deposits were encountered in all twelve trial holes underlying the Made Ground and persisted to full investigatory depths of between 1.40m and 5.00m bgl. The River Terrace Deposits underlying the site were observed to comprise both cohesive and granular horizons, with cohesive soils persisting to depths ranging between 3.00m and 4.00m bgl and described as orangish brown slightly fine sandy silty CLAY. The granular horizon was observed underlying the cohesive beds within the windowless sampler boreholes and described as light brown gravelly clayey SAND and sandy clayey GRAVEL. Gravel

was fine to medium angular clasts of flint.

The results from DPSH testing inferred that the cohesive soils of the River Terrace Deposits were of a very low to medium strength, with undrained cohesions of between 10kPa and 45kPa. The granular soils were inferred as loose to very dense relative density.

The soils of the River Terrace Deposits were described to comprise both cohesive and granular horizons. In the absence of geotechnical laboratory analysis on representative soil samples, high volume change potential must be assumed for the cohesive horizons in accordance with NHBC Standards Chapter 4.2.

The granular horizons of the River Terrace Deposits should be assumed to have a volume change potential in accordance with both BRE Digest 240 and NHBC Standards Chapter 4.2.

In the interest of achieving a more economic foundation design, additional intrusive investigations should be undertaken to obtain soil samples from both granular and cohesive horizons of the River Terrace Deposits for geotechnical laboratory testing.

Soils of the River Terrace Deposits are normally consolidated and are expected to display low to moderate bearing capacities with moderate to high settlement characteristics depending on the fines content, with inferior engineering parameters within the cohesive soils. The soils of the River Terrace Deposits were considered suitable for the proposed development.

6.1.3 Roots

Roots/rootlets were observed in ten of the twelve trial holes, persisted to depths ranging between 0.70m and full investigatory depth of 2.00m bgl. 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.

6.1.4 Groundwater

No groundwater was recorded within any of the exploratory trial holes at the time of investigations. Changes in groundwater level occur for a number of reasons including seasonal effects and variations in drainage. The investigations were undertaken around November (2015 & 2016), when groundwater would be rising from its lowest level which is typically observed around September. The highest groundwater levels typically occur around March.

Further groundwater monitoring was conducted within the standpipes installed on site following completion of site works and has been presented in Table 2.6.

The results from further monitoring recorded groundwater within WS1 on two occasions, 17th December 2015 and 8th January 2016 at a depth of 3.84m and 3.85m bgl respectively subsequently found to be dry on remaining observations. All

wells were recorded as dry on the remaining monitoring visits.

6.2 Foundation Scheme - General

The proposed development comprised erection of 24No. residential units including two, three and four-bedroom detached, semi-detached and terraced houses. The development was to include areas of hard landscaping such as access roads, pavements and driveways, and areas of soft landscaping including communal open space and private gardens.

In compiling this report reliance was placed on drawing number 1701/2.10/P8, dated March 2017, prepared by Crossley Design Architecture. Any change or deviation from the scheme outlined in the drawing could invalidate the recommendations presented within this report. Soils Limited must be notified about any such changes.

Development plans provided by the client are presented in Appendix D.

6.2.1 Guidance on Shrinkable Soils

The Building Research Establishment (BRE) Digests 240, 241 and 242 provide guidance on 'best practice' for the design and construction of foundations on shrinkable soils.

In the absence of geotechnical laboratory analysis on samples of the River Terrace Deposits, a high-volume change potential must be adopted where foundations pass through or found within the River Terrace Deposits.

The BRE Digest 241 states: *"An increasingly common, potentially damaging situation is where trees or hedges have been cut down prior to building. The subsequent long-term swelling of the zone of clay desiccated by the roots, as moisture slowly returns to the ground, can be substantial. The rate at which the ground recovers is very difficult to predict and if there is any doubt that recovery is complete then bored pile foundations with suspended beams and floors should be used"*.

The stated intention of the NHBC is to ensure that shrinkage and swelling of plastic soils does not adversely affect the structural integrity of foundations to such a degree that remedial works would be required to restore the serviceability of the building. It must be borne in mind that adherence to the NHBC tables and design recommendations may not, in all cases, totally prevent foundation movement and cracking of brickwork might occur.

The BRE Digest 240 suggests: *"Two courses of action are open:*

Estimate the potential for swelling or shrinkage and try to avoid large changes in the water content, for example by not planting trees near the foundations.

Accept that swelling or shrinkage will occur and take account of it. The foundations can be designed to resist resulting ground movements or the superstructure can be designed to accommodate movement without damage."

The design of foundations suitable to withstand movements is presented in BRE Digest 241 "Low-rise buildings on shrinkable clay soils: Part 2"

6.3 Foundation Scheme - Preliminary

Based on the ground and groundwater conditions encountered within the exploratory trial holes, it is considered that a conventional strip foundation solution may be suitable for lightly loaded structures within the proposed development, founding within cohesive River Terrace Deposits. No geotechnical laboratory tested was commissioned as part of the works. Additional intrusive investigations to include both in-situ and laboratory geotechnical testing are required to inform on the most economical foundation design.

Given the lateral and vertical variability observed within the River Terrace Deposits and low blow counts recorded within the cohesive soils present to depths of up to 4.00m bgl, a varied approach to the foundations will likely be required depending on further intrusive investigations and the location within the development site. A piled foundation solution is likely required where depth of root penetrated cohesive soils exceeds that of traditional strip foundations, and where higher bearing pressures are required. Further investigation via deep boreholes would be required to inform the design of piled foundations, if required.

6.3.1 Strip Foundations into the River Terrace Deposits

Preliminary information suggests that a shallow strip foundation strategy terminating within cohesive River Terrace Deposits may be suitable for lightly loaded structures within the proposed development. Additional intrusive investigations to include laboratory geotechnical testing is required to assess final bearing values and to inform the most economical design for a possible shallow foundation solution.

6.3.2 Ground Floor Slab

NHBC Standards 2018, Chapter 5.2, Suspended Ground Floors, states:

- *"Ground floors should be constructed as suspended floors where the depth of fill exceeds 600mm".*
- *"Suspended slabs should be adopted where the foundation depth dictated by the NHBC Standards 2018, Chapter 4.2, Appendix 4.2-C would exceed 1.5m bgl."*

For areas where Made Ground or reworked ground is encountered to depths greater than 0.60m bgl, or where foundation deepening due to tree influence is greater than 1.50m bgl, suspended floor slabs should be adopted.

For areas beyond the influence of trees, ground bearing floor slabs are considered suitable.

6.3.3 Piled Foundations

If required, piled foundations must be taken through any Made Ground/Topsoil and River Terrace Deposits into suitable strength soils of the Lewes Nodular Chalk 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 a piled foundation solution be adopted, additional intrusive investigation via cable percussive boreholes or CPTu would be required to enable testing and sampling at greater depth to obtain parameters to aid the design.

6.4 Excavations

Shallow excavations in the Made Ground/Topsoil are likely to be marginally stable in the short term at best.

Deeper excavations taken into the River Terrace Deposits are likely to be stable in the short term. Unsupported earth faces formed during excavation may be liable to collapse without warning and suitable safety precautions should therefore be taken to ensure that such earth faces are adequately supported or battered back to a safe angle of repose before excavations are entered by personnel.

Excavations beneath the groundwater table are likely to be unstable and dewatering of foundation trenches may be necessary.

6.5 Soakaways

Given the observed infiltration over the test period, it is considered that the site would be suitable for the adoption of a surface water soakaway system, located within the granular horizons relating to the River Terrace Deposits.

Where infiltration was observed, infiltration rates varied between 6.26×10^{-5} and $6.17 \times 10^{-7} \text{ ms}^{-1}$. In the case of TP1 (2), TP2 and TP3, data has been extrapolated to calculate infiltration rates and therefore should be used with caution. The results from groundwater monitoring previously conducted should be taken into consideration when designing the soakaway as the base of any soakaway structure should be of the order of 1.00m above the phreatic zone.

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Appendix B Chemical Laboratory Testing

Appendix B.1 Conceptual Site Model

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Appendix B.3 Waste Classification Report

Appendix B.4 Determination of Hazardous Waste Classification

Appendix B.5 General Assessment Criteria

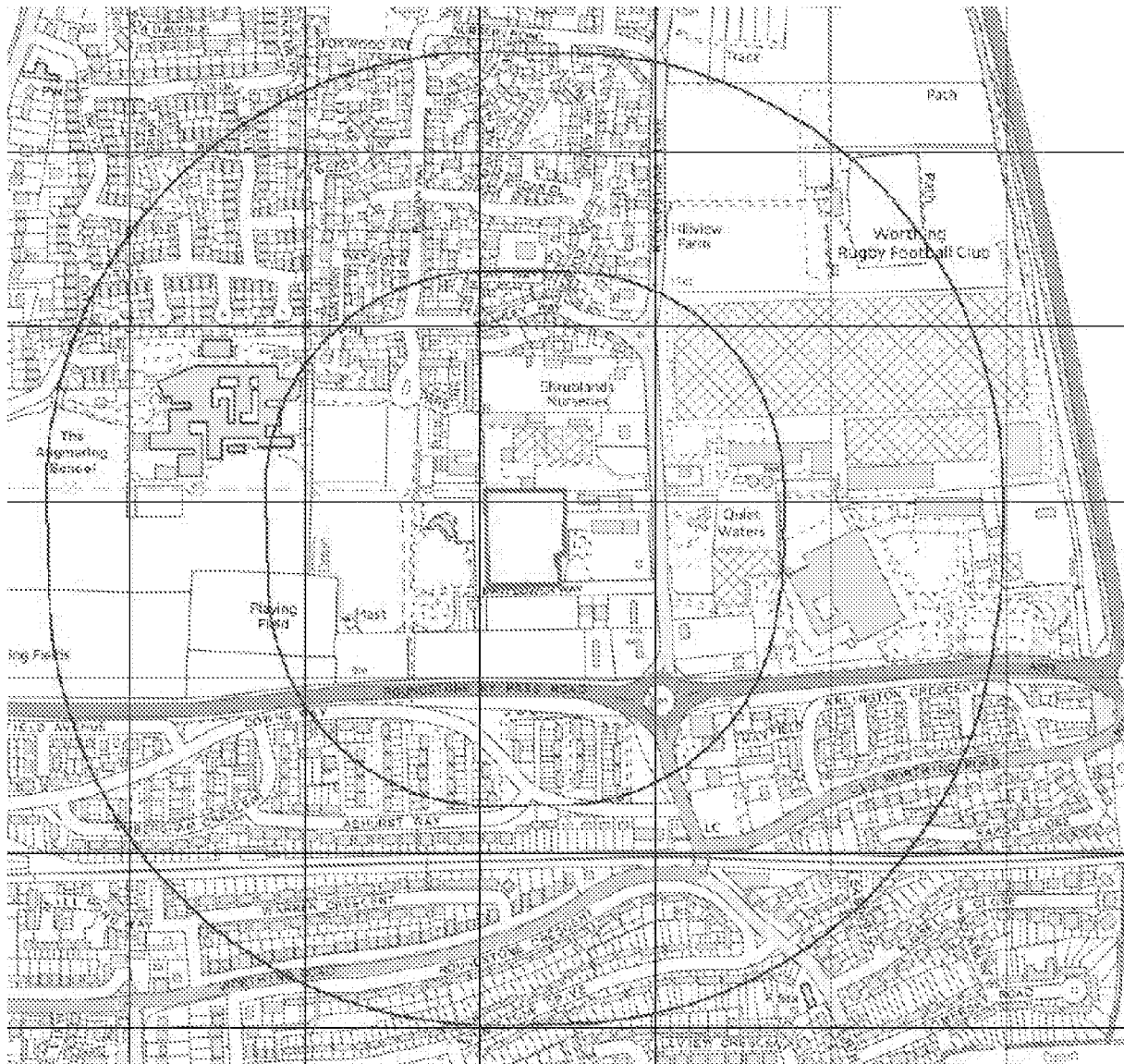
Appendix C Geotechnical In-Situ and Laboratory Testing

Appendix C.1 Classification

Appendix C.2 Interpretation

Appendix C.3 Geotechnical In-Situ and Laboratory Results

Appendix D Information Provided by the Client

**Figure 1 – Site Location Map**

Job Number
17403

Project
Land North of Mayflower Way, Angmering, Littlehampton, West Sussex BN16 4AY

Client
Peter Taylor &
Crayfern Homes

Date
February 2019



Figure 2 – Aerial Photograph

Project

Land North of Mayflower Way,
Angmering, Littlehampton, West
Sussex BN16 4AY

Client

Peter Taylor & Crayfern Homes

Date

February 2019

Job Number

17403



Figure 3 – Trial Hole Plan

Project

Land North of Mayflower Way,
Angmering, Littlehampton, West
Sussex BN16 4AY

Client

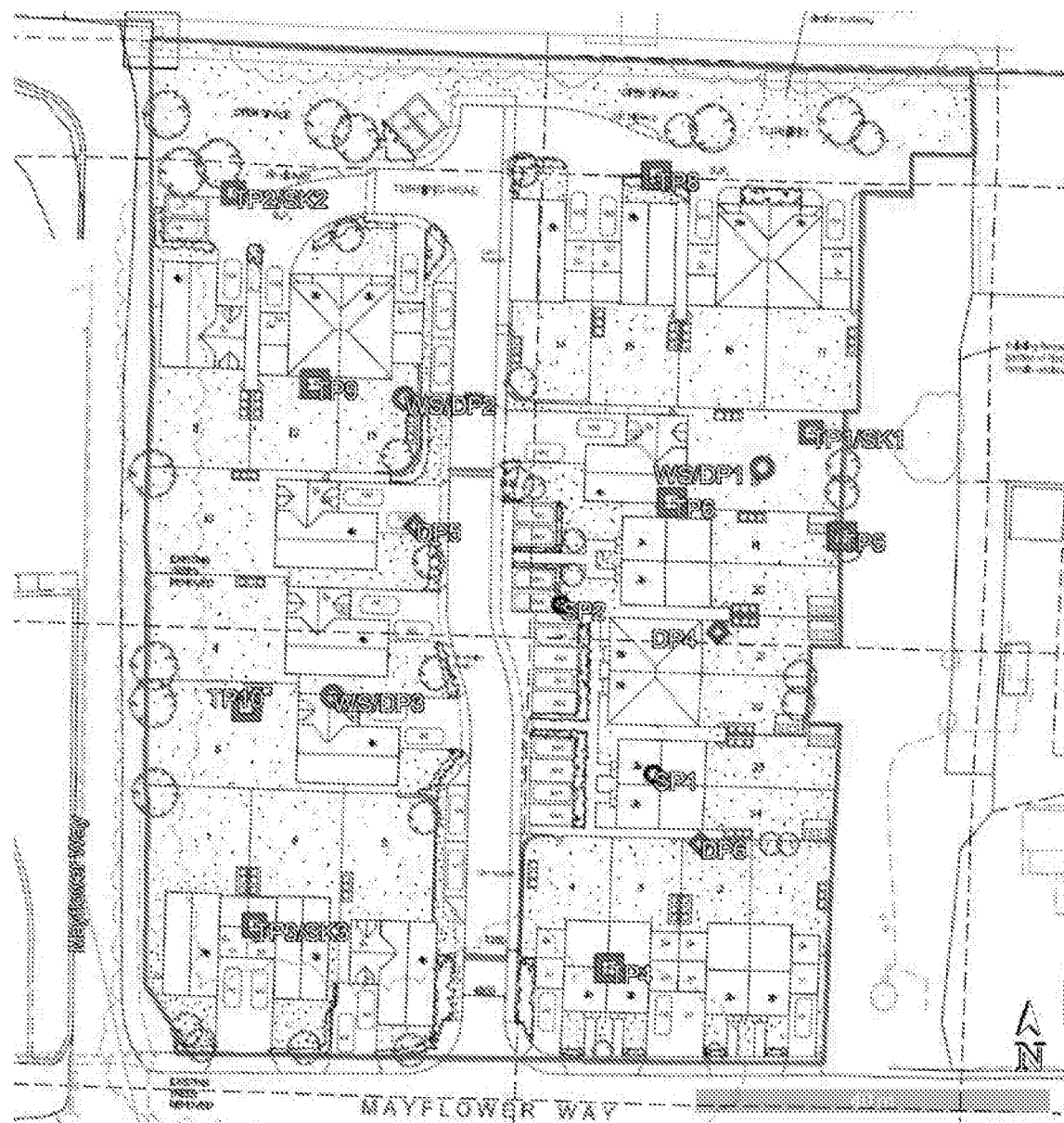
Peter Taylor & Crayfern Homes

Date

February 2019

Job Number

17403



Appendix A Field Work

Appendix A.1 Engineers Logs

**Soils Limited**

Newton House, Cross Road, Tadworth KT20 5SR

Tel: 01727 844224 Email: admin@soilslimited.co.uk

Borehole Log

Borehole No.

WS1

Sheet 1 of 1

Project Name: Land North of Mayflower Way

Project No.: 17028

Co-ords:

Hole Type
WS

Location: Angmering, West Sussex BN14 4AY

Level:

Scale
1:50

Client: Mr. Peter Taylor and Crayfern Homes

Dates: 05-01-2016

Logged By

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (mAOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.40			Very soft dark grey sandy silty CLAY. Sand is fine to medium. Occasional fine to medium sub-angular flint gravels. Occasional fine to medium brick tile and glass fragments. Occasional carbonated material. MADE GROUND.	
								Saturated sample Soft brown slightly sandy silty CLAY becoming light brown at 3.0 to 4.0. Sand is fine. Occasional fine to medium sub-angular flint gravels becoming rare fine at 0.4 to 0.80. A fine piece of plastic wire at 0.60.	1
								~70% recovery	
								~60% recovery	2
					3.00			Light brown clayey sandy fine to coarse sub-angular flint GRAVEL. Sand is fine to coarse.	3
								~20% recovery	
					4.00			End of Borehole at 4.00m	4
									5
									6
									7
									8
									9
									10

General Remarks:

Fine roots and rootlets to 1.0.

Groundwater Remarks:

Borehole Type

CP: Cable Percussive
WS: Windowless Sampler
RC: Rotary Cored

Sample Types

D: Disturbed
B: Bulk
J: Jar
W: Water
U: Undisturbed

In-Situ Testing

SPT: Split spoon - Standard Penetration Test
CPT: Cone - Standard Penetration Test

**Soils Limited**

Newton House, Cross Road, Tadworth KT20 5SR

Borehole Log

Borehole No.

WS2

Sheet 1 of 1

Project Name: Land North of Mayflower Way

Project No.: 17028

Co-ords:

Hole Type
WS

Location: Angmering, West Sussex BN14 4AY

Level:

Scale
1:50

Client: Mr. Peter Taylor and Crayfern Homes

Dates: 05-01-2016

Logged By

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (mAOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.90			Multicoloured very gravelly fine to coarse SAND. Gravel is fine to cobble sized flint brick concrete and tarmac. Frequent sharp sand. Occasional fine roots and rootlets. MADE GROUND. <u>Saturated sample</u>	
					2.00			Soft brown slightly sandy silty CLAY. Sand is fine. Occasional fine to medium sub-angular flint gravels. A pocket of grey gravelly fine to coarse SAND at 1.5 to 1.8. Sand is fine to coarse. Gravel is fine to coarse sub-angular flint brick and concrete. A grey possible hydrocarbon staining at 1 to 1.30. Rare fine roots and rootlets. MADE GROUND. <u>Hydrocarbon type odour</u>	1
					3.00			Soft light brown slightly sandy silty CLAY. Sand is fine. <u>~70% recovery</u>	2
					4.00			Light brown clayey fine SAND. Occasional fine to medium angular flint gravels. <u>~70% recovery</u>	3
					5.00			Light brown clayey gravelly fine SAND. Gravel is fine to medium angular flint.	4
								End of Borehole at 5.00m	5
									6
									7
									8
									9
									10

General Remarks:

Fine roots and rootlets to 2.0.

Groundwater Remarks:**Borehole Type**CP: Cable Percussive
WS: Windowless Sampler
RC: Rotary Cored**Sample Types**D: Disturbed
B: Bulk
J: Jar
W: Water
U: Undisturbed**In-Situ Testing**SPT: Split spoon - Standard Penetration Test
CPT: Cone - Standard Penetration Test

**Soils Limited**

Newton House, Cross Road, Tadworth KT20 5SR

Borehole Log

Borehole No.

WS3

Sheet 1 of 1

Project Name: Land North of Mayflower Way

Project No.: 17028

Co-ords:

Hole Type
WS

Location: Angmering, West Sussex BN14 4AY

Level:

Scale
1:50

Client: Mr. Peter Taylor and Crayfern Homes

Dates: 05-01-2016

Logged By

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (mAOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.60			Very soft grey and dark grey mixed gravelly sandy silty CLAY. Sand is fine to medium. Gravel is fine to coarse sub-angular flint brick and concrete. Occasional carbonated material. Occasional fine roots and rootlets. MADE GROUND. <u>Saturated sample</u>	
								Soft light brown slightly sandy silty CLAY. Sand is fine. Occasional black staining. A grey possible hydrocarbon staining at 1.0 to 1.30. MADE GROUND. <u>Hydrocarbon type odour</u> <u>~70% recovery</u>	1
					3.00			Stiff light brown slightly sandy silty CLAY. Sand is fine. Rare fine to medium angular flint gravels. A pocket of fine to medium angular flint gravels at 2.90 to 3.0. Occasional black staining. <u>No sample received</u>	3
					4.00			Light brown clayey fine SAND.	4
					5.00			End of Borehole at 5.00m	5
									6
									7
									8
									9
									10

General Remarks:

Fine roots and rootlets to 1.0.

Groundwater Remarks:**Borehole Type**CP: Cable Percussive
WS: Windowless Sampler
RC: Rotary Cored**Sample Types**D: Disturbed
B: Bulk
J: Jar
W: Water
U: Undisturbed**In-Situ Testing**SPT: Split spoon - Standard Penetration Test
CPT: Cone - Standard Penetration Test



Soils Limited
Newton House, Cross Road, Tadworth KT20 5SR

Trial Pit Log

Trial Pit No.

TP1

Sheet 1 of 1

Project Name: Land North of Mayflower Way

Project No.: 17028

Method:

Plant:

Support:

Hole Type

TP

Scale

1:25

Logged By

Dates: 24-11-2016

Level:

Co-ords:

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	J+D					Black and brown slightly gravelly SILT. Gravel is fine to coarse fragments of concrete, flint and brick and occasional ash. MADE GROUND	
	0.40	J+D						
	1.00	J+D		1.00			Soft light brown very silty CLAY	1
	1.20	J+D						
	1.90	J+D		1.80			Soft light brown slight silty CLAY	2
	2.30	J+D					Rare fine to coarse sub-angular flint gravels	
	2.60	J+D		2.60			Soft light greyish brown slightly gravelly sandy CLAY. Gravel is fine to coarse angular fragments of flint. Sand is fine	
	2.90	J+D		2.80			End of Pit at 2.90m	3
								4
								5

General Remarks:

No roots observed

Sample Type

D: Disturbed

B: Bulk

J: Jar

W: Water

Groundwater Remarks:



Soils Limited
Newton House, Cross Road, Tadworth KT20 5SR

Trial Pit Log

Trial Pit No.

TP2

Sheet 1 of 1

Project Name: Land North of Mayflower Way

Project No.: 17028

Method:

Plant:

Support:

Hole Type

TP

Scale

1:25

Logged By

Dates: 24-11-2016

Level:

Co-ords:

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	J+D					Soft grey gravelly silty CLAY. Gravel is fine to coarse flint, brick and concrete. Organic odour. Occasional fine to medium roots and rootlets. MADE GROUND	
	0.50 - 0.80	B					Concrete and brick slab	
	0.80	J+D		0.90			Soft light brown slightly sandy CLAY. Sand is fine. Rare fine to coarse rootlets to 1.50m bgl.	1
	1.40	J+D						
	1.80	J+D						2
	2.20	J+D		2.20			End of Pit at 2.20m	3
								4
								5

General Remarks:

Groundwater Remarks:

Sample Type

D: Disturbed
B: Bulk
J: Jar
W: Water



Soils Limited
Newton House, Cross Road, Tadworth KT20 5SR
[REDACTED]

Trial Pit Log

Trial Pit No.
TP3
Sheet 1 of 1

Project Name: Land North of Mayflower Way		Project No.: 17028		Method:		Hole Type TP
Location: Angmering, West Sussex BN14 4AY				Plant:		
Client: Mr. Peter Taylor and Crayfern Homes		Trial Pit Length: m		Trial Pit Width: m		
Dates: 24-11-2016		Level:		Co-ords:		Scale 1:25
						Logged By

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	J+D					Brown slightly clayey gravelly sandy SILT. Gravel is fine to cobble sized fragments of flint, brick, concrete, glass and occasional fine ash. Occasional roots and rootlets. MADE GROUND	
	0.30 - 0.50	B						
	0.50	J						
	0.80	J		0.80				
				1.00			Brown slightly gravelly clayey SILT. Gravel is fine to medium fragments of ash and brick. Soft light orangish brown slightly silty CLAY.	1
							Soft light orangish brown slightly silty CLAY.	
	1.30	D						
	2.00	D						2
	2.60	D		2.60			Becoming slightly gravelly. Gravel is fine to coarse sub-angular flint	
							End of Pit at 2.60m	
								3
								4
								5

General Remarks:	Sample Type D: Disturbed B: Bulk J: Jar W: Water
Groundwater Remarks:	

**Soils Limited**Newton House, Cross Road, Tadworth KT20 5SR
[REDACTED] uk**Trial Pit Log**

Trial Pit No.

TP4

Sheet 1 of 1

Project Name: Land North of Mayflower Way

Project No.: 17028

Method:

Plant:

Support:

Hole Type

TP

Scale

1:25

Logged By

Location: Angmering, West Sussex BN14 4AY

Client: Mr. Peter Taylor and Crayfern Homes

Trial Pit Length: m

Trial Pit Width: m

Dates: 24-11-2016

Level:

Co-ords:

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	J+D					Brown slightly sandy gravelly SILT. Gravel is fine to coarse sub-angular fragments of brick, flint, tile and glass and fine ash. Sand is fine to coarse. Occasional rootlets. MADE GROUND	
	0.70	J+D		0.70			Fine light brown slightly gravelly slightly sandy SILT. Gravel is rare fragments of brick, tile and chalk. Sand is fine to medium.	
	1.10	J+D		1.10			Concrete	1
	1.40	D		1.40			Light brown slightly sandy SILT. Sand is fine.	
							End of Pit at 1.40m	
								2
								3
								4
								5

General Remarks:

Sample Type

D: Disturbed
B: Bulk
J: Jar
W: Water

Groundwater Remarks:



Soils Limited

Newton House, Cross Road, Tadworth, KT20 5SP
[Redacted]

Trial Pit Log

Trial Pit No.

TP5

Sheet 1 of 1

Project Name: Land North of Mayflower Way

Project No.: 17028

Method:

Plant:

Support:

Hole Type

TP

Scale

1:25

Logged By

Dates: 24-11-2016

Level:

Co-ords:

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	J+D					Brown slightly gravelly SILT. Gravel is fine to coarse sub-angular fragments of chalk, brick, concrete and occasional fine ash and glass. Occasional roots and rootlets. MADE GROUND <i>Tarmac Cobbles</i>	
	0.60	J+D					<i>Frequent fine to coarse fragments of ash.</i> <i>Concrete block</i>	
	0.90	J+D		0.80			Soft light orangey brown slightly sandy CLAY. Sand is fine.	1
	1.30 - 1.60	B						
	1.40	D						
	1.90	D		1.90			End of Pit at 1.90m	2
								3
								4
								5

General Remarks:

Sample Type

D: Disturbed
B: Bulk
J: Jar
W: Water

Groundwater Remarks:

**Soils Limited**Newton House, Cross Road, Tadworth KT20 5SR
[REDACTED] uk**Trial Pit Log**

Trial Pit No.

TP6

Sheet 1 of 1

Project Name: Land North of Mayflower Way

Project No.: 17028

Method:

Plant:

Support:

Hole Type

TP

Scale

1:25

Logged By

Dates: 24-11-2016

Level:

Co-ords:

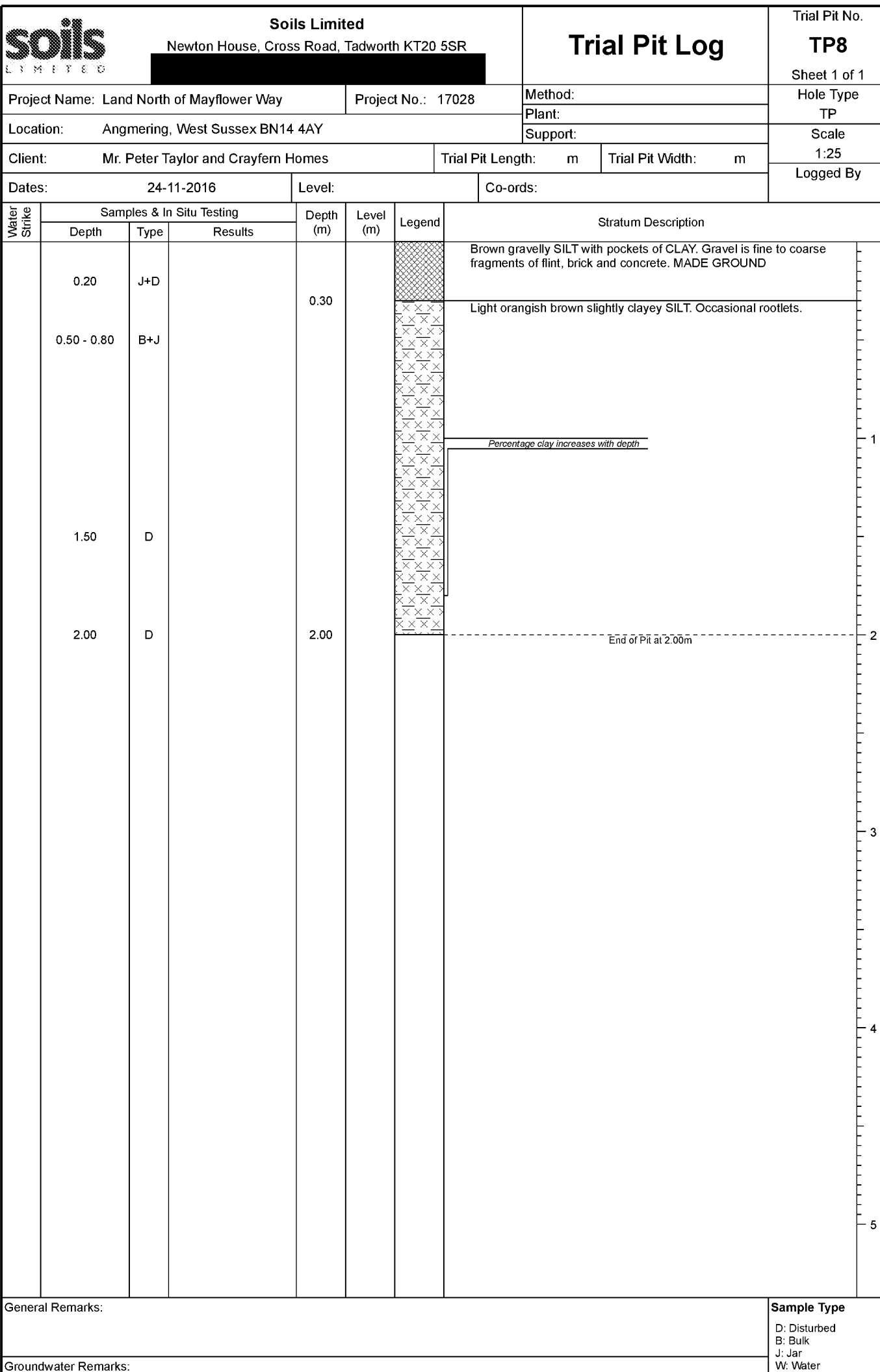
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	J+D					Brown gravelly SILT. Gravel is fine to coarse flint, brick, glass, concrete, ash and wood. Occasional black staining. MADE GROUND	
	0.50	D+B						
				0.80			Soft light brown slightly gravelly silty CLAY. Gravel is fine to coarse fragments of flint. Rare black staining.	1
	1.20	D						
	1.70	D		1.70				
							End of Pit at 1.70m	2
								3
								4
								5

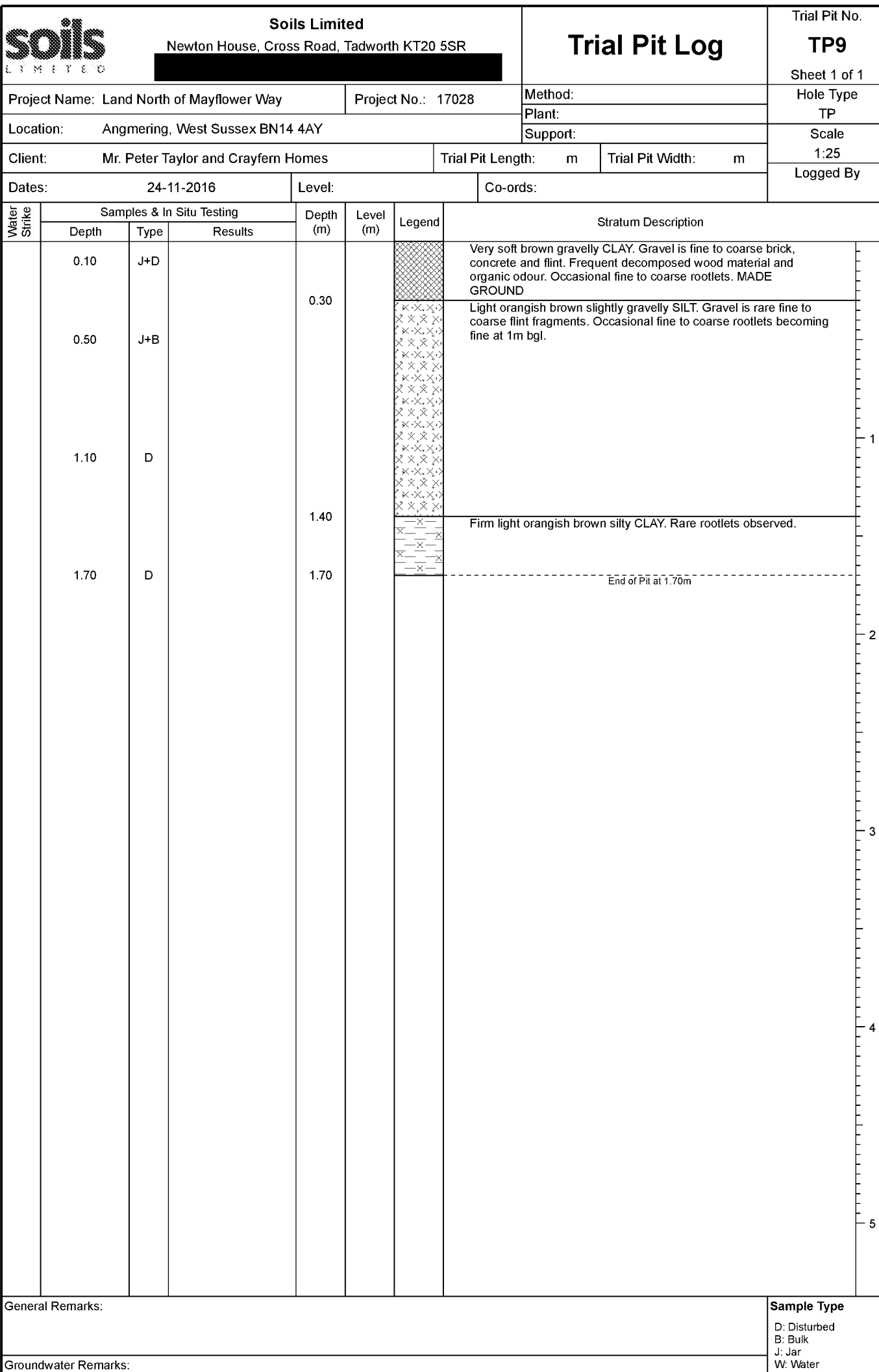
General Remarks:

Groundwater Remarks:

Sample Type

D: Disturbed
B: Bulk
J: Jar
W: Water







Soils Limited

Newton House, Cross Road, Tadworth KT20 5SR

Trial Pit Log

Trial Pit No.

TP10

Sheet 1 of 1

Project Name: Land North of Mayflower Way

Project No.: 17028

Method:

Plant:

Support:

Hole Type

TP

Scale

1:25

Logged By

Client: Mr. Peter Taylor and Crayfern Homes

Trial Pit Length: m

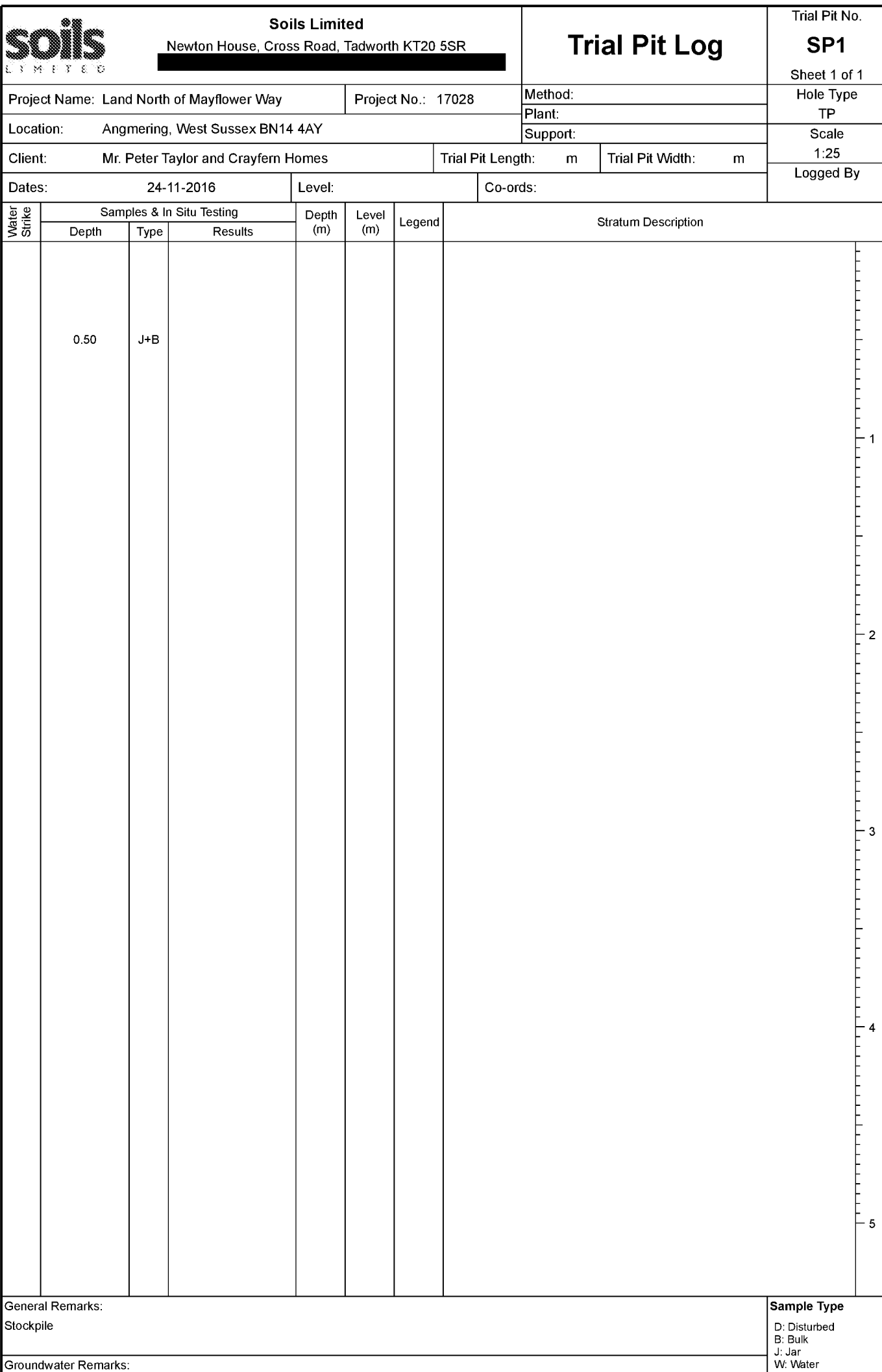
Trial Pit Width: m

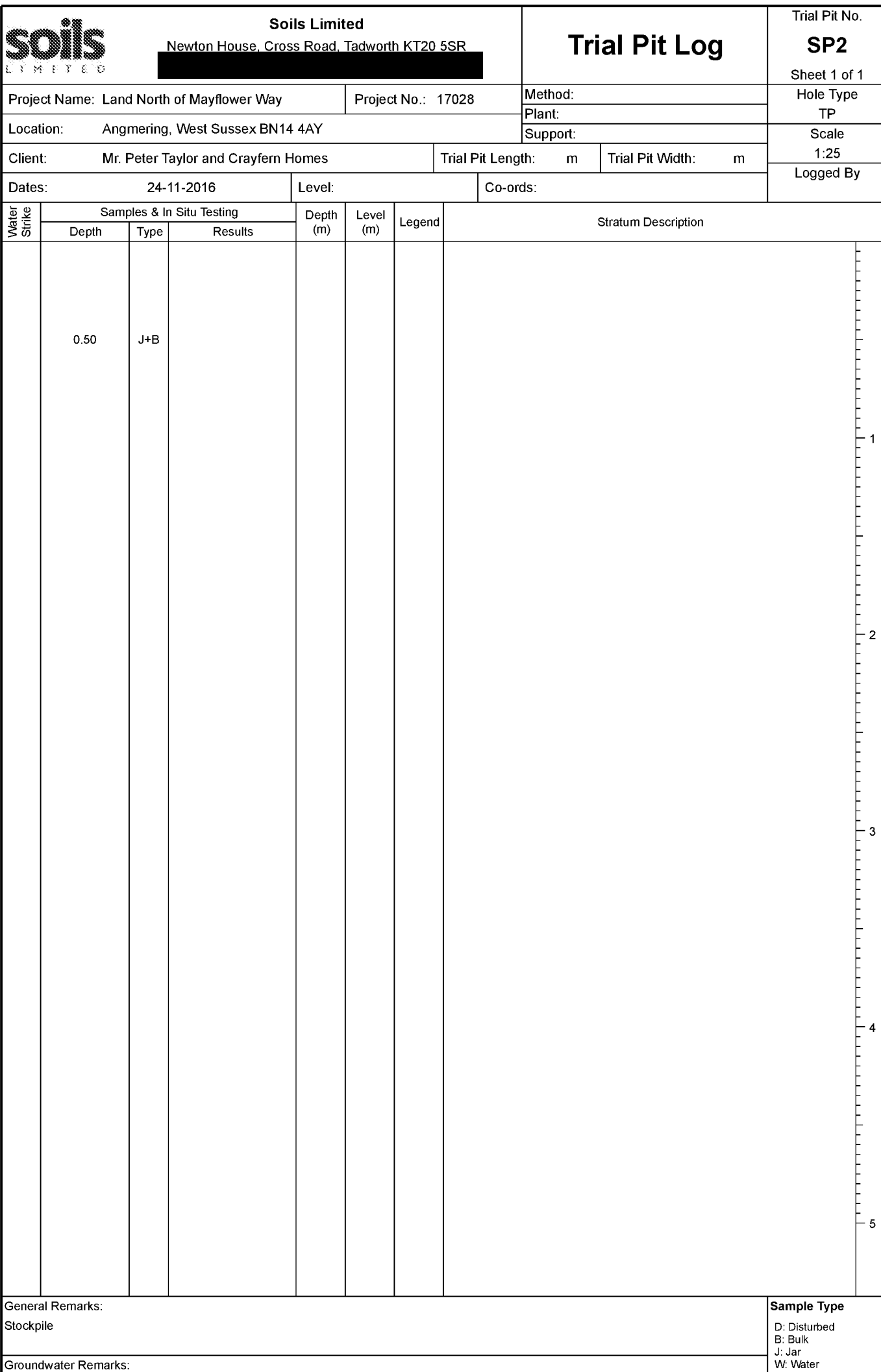
Dates: 24-11-2016

Level:

Co-ords:

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	J+D		0.30			Dark brown gravelly SILT. Gravel is fine to coarse fragments of flint, brick and concrete. Frequent decomposed plant material. MADE GROUND	1





Appendix B Chemical Laboratory Testing

Appendix B.1 Conceptual Site Model

Table B.I.I CSM Revised Post Testing

Source	Potential Contaminant	Exposure Pathway	Receptor	Initial Assessment from Desk Study and Main Investigation Report Information			Comments	Proposed Investigation
				Severity	Probability	Risk		
Nursery, builders yard and stockpiled debris. Previous onsite contaminative processes.	Metals and semi-metals	Inhalation of dust	Site Workers/Site Maintenance	Minor	Unlikely	Very low	One of six soil samples obtained from surface soils and stockpiled materials recorded a concentration of lead in excess of guideline values for a residential with plant uptake land-use scenario. Given the shallow depth of the soil sample and the proposed site layout, the contamination hot-spot will be removed as part of the development.	No remediation necessary.
			End Users	Mild	Unlikely	Very low		
			Off-site Users	Minor	Unlikley	Very low		
	Metals and semi-metals	Ingestion and absorption via direct contact	Site Workers/Site Maintenance	Minor	Unlikely	Very low		
			End Users	Mild	Unlikely	Very low		
	Metals and semi-metals	Migration via surface runoff	Surface Water	Minor	Unlikely	Very low		
		Migration in solution via groundwater	Surface Water	Minor	Unlikely	Very low		
			Shallow Aquifer	Minor	Unlikely	Very low		
Infilled Pond Offsite source.	Soil-Gas	Inhalation of Vapour/gases (including Radon)	Deep Aquifer				Infilled pond identified 24m east of the site. Potential for soil gas generation and migration through permeable soils.	Soil Gas Risk Assessment required.
			Site Workers/Site Maintenance	Minor	Unlikely	Very low		
			End Users	Mild	Low	Low		
			Off-site Users	Minor	Unlikely	Very low		
	Soil-Gas	Migration of gases via permeable soils	Site Workers/Site Maintenance	Minor	Unlikely	Very low		
			End Users	Mild	Low	Low		
			Off-site Users	Minor	Unlikely	Very low		
			Building and confined spaces	Mild	Low	Low		

Appendix B.2 Chemical Laboratory Results



Tim Rudkin
Soils Ltd
Newton House
Cross Road
Tadworth
Surrey
KT20 5SR



QTS Environmental Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lerham Heath
Kent
ME17 2JN

QTS Environmental Report No: 16-52293

Site Reference: Mayflower Way

Project / Job Ref: 15306

Order No: 17632

Sample Receipt Date: 30/11/2016

Sample Scheduled Date: 30/11/2016

Report Issue Number: 1

Reporting Date: 06/12/2016

Authorised by:

Russell Jarvis
Associate Director of Client Services

Authorised by:

Ela Mysiana
Inorganics & ICP Section Head

Soil Analysis Certificate						
QTS Environmental Report No: 16-53793	Date Sampled	24/11/16	24/11/16	24/11/16	24/11/16	24/11/16
Sells Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Mayflower Way	TP / BH No	SP1	SP2	TP2	TP3	TP5
Project / Job Ref: 15386	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 17632	Depth (m)	None Supplied	None Supplied	0.20	0.10	0.20
Reporting Date: 06/12/2016	QTS Sample No	240897	240898	240899	240910	240911

Determinand	Unit	RI	Accreditation	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Asbestos (Bulk)	mg/kg	798	ISO 17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH (Unf)	pH	7.5	PCRATS	8.1	7.5	8.0	7.8	8.0
Total Cystite	mg/kg	< 2	PCRATS	< 2	< 2	< 2	< 2	< 2
W/S Sulphate as SO ₄ (2:1)	mg/kg	< 10	PCRATS	83	53	62	49	110
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	PCRATS	0.08	0.05	0.06	0.05	0.11
Sulphide	mg/kg	< 5	PCRATS	< 5	< 5	< 5	< 5	< 5
Organic Matter	%	< 0.1	PCRATS	2.1	1.2	2.6	2.4	2.8
Total Organic Carbon (TOC)	%	< 0.1	PCRATS	1.2	0.7	1.5	1.4	1.6
Antimony (Sb)	mg/kg	< 1	PCRATS	1.2	1.2	1.3	6.5	2.6
Arsenic (As)	mg/kg	< 2	PCRATS	19	7	12	13	31
Beryllium (Be)	mg/kg	< 0.1	PCRATS	0.6	< 0.1	0.7	0.7	0.7
W/S Boron	mg/kg	< 3	PCRATS	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	PCRATS	< 0.2	< 0.2	< 0.2	0.3	< 0.2
Chromium (Cr)	mg/kg	< 2	PCRATS	17	32	20	16	20
Chromium (hexavalent)	mg/kg	< 2	PCRATS	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	PCRATS	24	139	31	62	53
Lead (Pb)	mg/kg	< 3	PCRATS	63	38	58	654	115
Mercury (Hg)	mg/kg	< 1	PCRATS	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	PCRATS	11	9	15	11	13
Selenium (Se)	mg/kg	< 3	PCRATS	< 3	< 3	< 3	< 3	< 3
Vanadium (V)	mg/kg	< 2	PCRATS	37	26	31	25	32
Zinc (Zn)	mg/kg	< 3	PCRATS	84	55	58	285	132
Total Fines (monofraction)	mg/kg	< 2	PCRATS	< 2	< 2	< 2	< 2	< 2

Analysis results are expressed on a dry weight basis where samples are oven-dried at less than 10°C.

Analysis carried out on the dried sample is corrected for the dry content.

The samples have been examined to identify the presence of asbestos/minerals by polarizing light microscopy and dispersion testing techniques in-house. Procedures (1) S0200 Determination of Asbestos in Bulk Materials; Asbestos in Soils/Sediments (face screening and identification).

This report refers to samples as received, and QTS Environmental Ltd, takes no responsibility for the accuracy or completeness of sampling by others.

The material description shall be repeated as verbatim and listed in full in our scope of UKAS Accreditation.

Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation.

Asbestos Analyst: Rosie Head

RL - Reporting Unit

Blank Test: Where blank test is positive it is reported "Loose Fibres - PF" with type(s).

Subcontracted analysis: 10



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maldstone
Kent ME17 2JN



Soil Analysis Certificate					
QTS Environmental Report No: 16-52293	Date Sampled	24/11/16			
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	
Site Reference: Mayflower Way	TP / BH No	TP5			
Project / Job Ref: 15306	Additional Refs	None Supplied	None Supplied	None Supplied	
Order No: 17632	Depth (m)	0.00			
Reporting Date: 06/12/2016	QISE Sample No	240812			

Determinand	Unit	RL	Accreditation	Not Detected	Not Detected	Not Detected
Asbestos Screen	g/g	N/A	ISO 17025	Not Detected	Not Detected	Not Detected
g/g	g/g	N/A	ISO 17025	Not Detected	Not Detected	Not Detected
Total Cyanide	mg/kg	< 2	NOE	< 2		
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	ISO 17025	19		
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	ISO 17025	0.02		
Sulphide	mg/kg	< 5	NOE	< 5		
Organic Matter	%	< 0.1	ISO 17025	1.0		
Total Organic Carbon (TOC)	%	< 0.1	ISO 17025	0.0		
Antimony (Sb)	mg/kg	< 1	NOE	1.5		
Arsenic (As)	mg/kg	< 2	ISO 17025	10		
Beryllium (Be)	mg/kg	< 0.5	NOE	0.6		
W/S Boron	mg/kg	< 1	NOE	< 1		
Cadmium (Cd)	mg/kg	< 0.2	ISO 17025	< 0.2		
Chromium (Cr)	mg/kg	< 2	ISO 17025	19		
Chromium (hexavalent)	mg/kg	< 2	NOE	< 2		
Copper (Cu)	mg/kg	< 5	ISO 17025	25		
Lead (Pb)	mg/kg	< 3	ISO 17025	22		
Mercury (Hg)	mg/kg	< 1	NOE	< 1		
Nickel (Ni)	mg/kg	< 3	ISO 17025	13		
Selenium (Se)	mg/kg	< 3	NOE	< 3		
Vanadium (V)	mg/kg	< 3	NOE	27		
Zinc (Zn)	mg/kg	< 3	ISO 17025	44		
Total Phenols (monohydric)	mg/kg	< 2	NOE	< 2		

Analysis results are expressed on a dry weight basis where samples are analysed at less than 30°C.

Analysis carried out on the dried sample is corrected for the same content.

The samples have been examined to identify the presence of asbestos minerals by polarising light microscopy and dispersion staining techniques to In-house Procedures QTS000 Determination of Asbestos in Bulk Potentially Asbestos in Soil/Sediments (Pre-screening and Identification).

This report refers to samples as received, and QTS Environmental Ltd, takes no responsibility for the accuracy or competence of sampling by others.

The material description shall be regarded as tentative and is not included in our scope of UKAS Accreditation.

Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation.

Asbestos Analyst: Faye Mead

RL: Reporting Limit

Patch Test: Where patch test is positive it is reported "Trace Blues - PT" with type(s).

Subcontracted analysis: (S)

Determinand	Unit	RI	Accreditation						
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 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	< 0.1
Benaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 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	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	0.30	< 0.1	0.50	0.20	0.10	0.10
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.20	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	1.32	0.20	1.61	0.90	1.12	1.12
Pyrene	mg/kg	< 0.1	MCERTS	1.28	0.21	1.59	0.92	1.15	1.15
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.57	< 0.1	0.50	0.30	0.40	0.40
Chrysene	mg/kg	< 0.1	MCERTS	0.64	0.14	0.63	0.44	0.52	0.52
Benz(b)fluoranthene	mg/kg	< 0.1	MCERTS	1.24	0.21	1.07	0.90	1.03	1.03
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.44	< 0.1	0.36	0.37	0.35	0.35
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.81	0.16	0.67	0.60	0.60	0.60
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.53	< 0.1	0.35	0.27	0.20	0.20
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	mg/kg	< 0.1	MCERTS	0.50	< 0.1	0.30	0.36	0.45	0.45
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	7.7	< 1.6	6.0	5.3	6.0	6.0

Analytical results are expressed on a dry weight basis when samples are assayed dried at less than 30°C.



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN



Soil Analysis Certificate - Speciated PAHs					
QTS Environmental Report No: 16-52293	Date Sampled	24/11/16	Analysis	Reference	
Soils Ltd	Yms Sampled	None Supplied	Analysis	Reference	
Site Reference: Mayflower Way	TP / RH No	TPS	Analysis	Reference	
Project / Job Ref: 15306	Additional Refs	None Supplied	Analysis	Reference	
Order No: 17632	Depth (m)	0.50	Analysis	Reference	
Reporting Date: 06/12/2016	QTS Sample No	240812	Analysis	Reference	

Determinand	Unit	RL	Accreditation	Result	Limit	Pass/Fail
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	Pass
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	Pass
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	Pass
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	Pass
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	Pass
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	Pass
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	Pass
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	Pass
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	Pass
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	Pass
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	Pass
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	Pass
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	Pass
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	Pass
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	Pass
Benzo(g,h,i)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	Pass
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	Pass

Analysed results are expressed on a dry weight basis where samples are assayed dried at less than 30°C



QTS Environmental Ltd
Unit 3, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maldstone
Kent ME17 2JN



Soil Analysis Certificate - TPH LQM Banded

QTS Environmental Report No: 16-52293	Date Sampled	24/11/16	24/11/16	24/11/16	24/11/16	24/11/16
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Mayflower Way	TP / BH No	SP1	SP2	TP2	TP3	TP5
Project / Job Ref: 15306	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 17032	Depth (m)	None Supplied	None Supplied	0.20	0.10	0.20
Reporting Date: 06/12/2016	QTS Sample No	240807	240808	240809	240810	240811

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 2	PCRTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12	mg/kg	< 2	PCRTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16	mg/kg	< 3	PCRTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C16 - C35	mg/kg	< 10	PCRTS	< 10	< 10	< 10	< 10	< 10
Aliphatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C44)	mg/kg	< 30	NONE	< 30	< 30	< 30	< 30	< 30
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 2	PCRTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12	mg/kg	< 2	PCRTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16	mg/kg	< 2	PCRTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C16 - C21	mg/kg	< 3	PCRTS	< 3	< 3	< 3	< 3	< 3
Aromatic >C21 - C35	mg/kg	< 10	PCRTS	11	< 10	12	< 10	24
Aromatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10	< 10
Aromatic (>C5 - C44)	mg/kg	< 30	NONE	< 30	< 30	< 30	< 30	< 30
Total >C5 - C44	mg/kg	< 60	NONE	< 60	< 60	< 60	< 60	< 60

Analytical results are expressed on a dry weight basis, where samples are analysed dried at less than 10°C



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Soil Analysis Certificate - BTEX / MTBE

QTS Environmental Report No: 16-52293	Date Sampled	24/11/16	24/11/16	24/11/16	24/11/16	24/11/16
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Mayflower Way	TP / BH No	SP1	SP2	TP2	TP2	TP5
Project / Job Ref: 15306	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 17632	Depth (m)	None Supplied	None Supplied	0.20	0.10	0.20
Reporting Date: 06/12/2016	QTS Sample No	240807	240808	240809	240810	240811

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

Analysed results are expressed on a dry weight basis where samples are analysed-dried at less than 10°C



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Waste Acceptance Criteria Analytical Certificate - BS EN 12457/3

QTS Environmental Report No: 16-S2293		Date Sampled	24/11/16	Landfill Waste Acceptance Criteria Limits		
Soils Ltd		Time Sampled	None Supplied			
Site Reference: Mayflower Way		IP / BH No	SP1			
Project / Job Ref: 15386		Additional Refs	None Supplied			
Order No: 17632		Depth (m)	None Supplied			
Reporting Date: 06/12/2016		QTS Sample No	240807			
Determinand	Unit	MDL		Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non hazardous Landfill	Hazardous Waste Landfill
DOC ^{1,2}	%	< 0.1	1.2			
Loss on Ignition	%	< 0.01	2.00			
ATEX ^{1,2}	mg/kg	< 0.05	< 0.05			
Sum of PCBs	mg/kg	< 0.1	< 0.1			
Mineral Oil ^{1,2}	mg/kg	< 10	< 10			
Total PAH ^{1,2}	mg/kg	< 1.7	7.7			
pH ^{1,2}	pH Unit	N/A	8.1			
Acid Neutralisation Capacity	mg/kg (+/-)	< 1	1.3			

Slurte Analysis		2:1 mg/l	8:1 mg/l	Cumulative 10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-3 at 1/5 10 l/kg (mg/kg)		
Arsenic ¹		< 0.01	< 0.01	< 0.2	0.5	2	25
Barium ¹		0.03	< 0.02	0.2	20	100	300
Cadmium ¹		< 0.0005	< 0.0005	< 0.02	0.04	1	5
Chromium ¹		< 0.005	< 0.005	< 0.20	0.5	10	70
Copper ¹		< 0.01	< 0.01	< 0.5	2	50	100
Mercury ¹		< 0.005	< 0.005	< 0.01	0.01	0.2	2
Molybdenum ¹		0.004	0.003	< 0.1	0.5	10	30
Nickel ¹		< 0.007	< 0.007	< 0.2	0.4	10	40
Lead ¹		< 0.005	< 0.005	< 0.2	0.5	10	50
Antimony ¹		< 0.005	< 0.005	< 0.05	0.08	0.7	5
Selenium ¹		< 0.005	< 0.005	< 0.1	0.1	0.5	7
Zinc ¹		< 0.005	< 0.005	< 0.2	4	50	200
Chloride ¹		15	3	0	600	15000	25000
Fluoride ¹		1.5	1.2	12.2	35	150	500
Sulphate ¹		60	9	132	1000	20000	30000
TDS		254	96	1007	4000	60000	100000
Phenol Index		< 0.01	< 0.01	< 0.5	1	-	-
DOC		2.1	4.5	45.6	500	600	1000

Leach Test Information

Sample Mass (kg)		0.20					
Dry Matter (%)		89.7					
Moisture (%)		11.6					
Stage 1							
Volume Eluate L2 (litres)		0.33					
Filtered Eluate V03 (litres)		0.14					

Results are expressed on a dry weight basis, after correction for moisture content, where applicable.
Stated limits are for guidance only and QTS Environmental cannot be held responsible for any discrepancies with current legislation.
14 Denotes MCS101's accredited test
1 Denotes ISO 9001 accredited test



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Soil Analysis Certificate - Sample Descriptions

QTS Environmental Report No: 16-52293

Soils Ltd

Site Reference: Playflower Way

Project / Job Ref: 15306

Order No: 17632

Reporting Date: 06/12/2016

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
240507	SP1	None Supplied	None Supplied	10.3	Brown sandy clay with stones
240508	SP2	None Supplied	None Supplied	12.8	Brown clay with stones
240607	TP1	None Supplied	0.20	13.8	Brown clayey sand with stones
240810	TP3	None Supplied	0.10	15.1	Brown sandy clay with brick and concrete
240811	TP5	None Supplied	0.20	17.4	Brown clayey sand with stones and brick
240912	TP5	None Supplied	0.90	17	Brown clay
240913					
240914					

Moisture content is part of procedure BS03 & is not an accredited test

Intelligent Sample™

Intelligent Sample™



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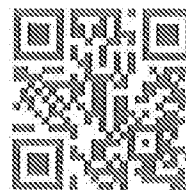
Soil Analysis Certificate - Methodology & Miscellaneous Information	
QTS Environmental Report No: 16-52293	
Soils Ltd	
Site Reference: Mayflower Way	
Project / Job Ref: 15308	
Order No: 17632	
Reporting Date: 05/12/2016	

Matrix	Analysed On	Determinant	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, isolation of 1,5 diphanyl arsides 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	Diethyl Panto Chromate (C10 - C24)	Determination of diethyl panto chromate 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 10	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. C5 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E008
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 @ 450°C	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 reduction 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 CYG (alc: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, 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 (alc: C5-C5, 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

Appendix B.3 Waste Classification Report

Waste Classification Report



2FCG4-67AMG-6T9PU

Job name

15306 Mayflower Way

Waste Stream

Default Contaminated Land

Comments

Project

Site

Classified by

Name:
Ainsworth, Rob
Date:
08/12/2016 11:54 UTC
Telephone:
[REDACTED]

Company:
Soils Ltd
Thomas Telford House
Sun Valley Business Park, Winnall Close
Winchester
SO23 0LB

Report

Created by: Ainsworth, Rob
Created date: 08/12/2016 11:54 UTC

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazardous properties	Page
1	SP1/		Non Hazardous		2
2	SP2/		Non Hazardous		4
3	TP2/0.20		Non Hazardous		6
4	TP3/0.10		Non Hazardous		8
5	TP5/0.20		Non Hazardous		10
6	TP5/0.80		Non Hazardous		12

Appendices

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

Classification of sample: SP1/

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

Sample details

Sample Name:	LoW Code:
SP1/	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0 m	
Moisture content: 0% (no correction)	

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 antimony trioxide: (Cation conc. entered: 1.7 mg/kg, converted to compound conc.:2.035 mg/kg or 0.000204%)
 arsenic trioxide: (Cation conc. entered: 10 mg/kg, converted to compound conc.:13.203 mg/kg or 0.00132%)
 benzene: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
 benzo[a]anthracene: (Whole conc. entered as: 0.57 mg/kg or 0.000057%)
 benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 0.81 mg/kg or 0.000081%)
 benzo[b]fluoranthene: (Whole conc. entered as: 1.24 mg/kg or 0.000124%)
 benzo[ghi]perylene: (Whole conc. entered as: 0.58 mg/kg or 0.000058%)
 benzo[k]fluoranthene: (Whole conc. entered as: 0.44 mg/kg or 0.000044%)
 beryllium oxide: (Cation conc. entered: 0.6 mg/kg, converted to compound conc.:1.665 mg/kg or 0.000167%)
 diboron trioxide; boric oxide: (Cation conc. entered: <1 mg/kg, converted to compound conc.:<3.22 mg/kg or <0.000322%) IGNORED Because: "<LOD"
 cadmium oxide: (Cation conc. entered: <0.2 mg/kg, converted to compound conc.:<0.228 mg/kg or <0.0000228%)
 IGNORED Because: "<LOD"
 chromium(III) oxide: (Cation conc. entered: 17 mg/kg, converted to compound conc.:24.846 mg/kg or 0.00248%)
 chromium(VI) oxide: (Cation conc. entered: <2 mg/kg, converted to compound conc.:<3.846 mg/kg or <0.000385%)
 IGNORED Because: "<LOD"
 chrysene: (Whole conc. entered as: 0.64 mg/kg or 0.000064%)
 dicopper oxide; copper (I) oxide: (Cation conc. entered: 24 mg/kg, converted to compound conc.:27.021 mg/kg or 0.0027%)
 salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex: (Cation conc. entered: <2 mg/kg, converted to compound conc.:<3.768 mg/kg or <0.000377%) IGNORED Because: "<LOD"
 ethylbenzene: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
 fluoranthene: (Whole conc. entered as: 1.32 mg/kg or 0.000132%)
 fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 indeno[123-cd]pyrene: (Whole conc. entered as: 0.53 mg/kg or 0.000053%)
 lead chromate: (Cation conc. entered: 64 mg/kg, converted to compound conc.:99.828 mg/kg or 0.00998%, Note 1 conc.: 0.0064%)
 mercury dichloride: (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.353 mg/kg or <0.000135%)
 IGNORED Because: "<LOD"
 naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 nickel chromate: (Cation conc. entered: 11 mg/kg, converted to compound conc.:32.739 mg/kg or 0.00327%)
 pH: (Whole conc. entered as: 8.1 pH, converted to conc.:8.1 pH or 8.1 pH)

phenanthrene: (Whole conc. entered as: 0.3 mg/kg or 0.00003%)
 phenol: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
 pyrene: (Whole conc. entered as: 1.28 mg/kg or 0.000128%)
 selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex: (Cation conc. entered: <3 mg/kg, converted to compound conc.:<7.661 mg/kg or <0.000766%) IGNORED Because: "<LOD"
 toluene: (Whole conc. entered as: <5 mg/kg or <0.0005%) IGNORED Because: "<LOD"
 TPH (C6 to C40) petroleum group: (Whole conc. entered as: <60 mg/kg or <0.006%) IGNORED Because: "<LOD"
 xylene: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
 zinc chromate: (Cation conc. entered: 84 mg/kg, converted to compound conc.:233.028 mg/kg or 0.0233%)

Notes utilised in assessment

C14: Step 5

"Identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "arsenic trioxide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]anthracene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[b]fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[ghi]perylene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[k]fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "chromium(III) oxide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "chrysene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "dicopper oxide; copper (I) oxide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "nickel chromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "phenanthrene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "pyrene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "zinc chromate"

Note 1 , used on:

Test: "HP 5 on STOT SE 2; H371, STOT RE 2; H373" for determinand: "lead chromate"
 Test: "HP 7 on Carc. 1A; H350, Carc. 1B; H350, Carc. 1A; H350i, Carc. 1B; H350i" for determinand: "lead chromate"
 Test: "HP 10 on Repr. 1A; H360, Repr. 1A; H360D, Repr. 1A; H360Df, Repr. 1A; H360F, Repr. 1A; H360Fd, Repr. 1A; H360FD, Repr. 1B; H360, Repr. 1B; H360D, Repr. 1B; H360Df, Repr. 1B; H360F, Repr. 1B; H360Fd, Repr. 1B; H360FD" for determinand: "lead chromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"

Determinand notes

Note 1 , used on:

determinand: "lead chromate"

Note A , used on:

determinand: "zinc chromate"

Classification of sample: SP2/

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

Sample details

Sample Name:	LoW Code:
SP2/	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0 m	
Moisture content: 0% (no correction)	

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 antimony trioxide: (Cation conc. entered: 1.2 mg/kg, converted to compound conc.:1.437 mg/kg or 0.000144%)
 arsenic trioxide: (Cation conc. entered: 7 mg/kg, converted to compound conc.:9.242 mg/kg or 0.000924%)
 benzene: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
 benzo[a]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 0.16 mg/kg or 0.000016%)
 benzo[b]fluoranthene: (Whole conc. entered as: 0.21 mg/kg or 0.000021%)
 benzo[ghi]perylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 benzo[k]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 beryllium oxide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<1.388 mg/kg or <0.000139%)
 IGNORED Because: "<LOD"
 diboron trioxide; boric oxide: (Cation conc. entered: <1 mg/kg, converted to compound conc.:<3.22 mg/kg or <0.000322%) IGNORED Because: "<LOD"
 cadmium oxide: (Cation conc. entered: <0.2 mg/kg, converted to compound conc.:<0.228 mg/kg or <0.0000228%)
 IGNORED Because: "<LOD"
 chromium(III) oxide: (Cation conc. entered: 12 mg/kg, converted to compound conc.:17.539 mg/kg or 0.00175%)
 chromium(VI) oxide: (Cation conc. entered: <2 mg/kg, converted to compound conc.:<3.846 mg/kg or <0.000385%)
 IGNORED Because: "<LOD"
 chrysene: (Whole conc. entered as: 0.14 mg/kg or 0.000014%)
 dicopper oxide; copper (I) oxide: (Cation conc. entered: 134 mg/kg, converted to compound conc.:150.869 mg/kg or 0.0151%)
 salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex: (Cation conc. entered: <2 mg/kg, converted to compound conc.:<3.768 mg/kg or <0.000377%) IGNORED Because: "<LOD"
 ethylbenzene: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
 fluoranthene: (Whole conc. entered as: 0.24 mg/kg or 0.000024%)
 fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 indeno[123-cd]pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 lead chromate: (Cation conc. entered: 39 mg/kg, converted to compound conc.:60.833 mg/kg or 0.00608%, Note 1 conc.: 0.0039%)
 mercury dichloride: (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.353 mg/kg or <0.000135%)
 IGNORED Because: "<LOD"
 naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 nickel chromate: (Cation conc. entered: 9 mg/kg, converted to compound conc.:26.786 mg/kg or 0.00268%)

pH: (Whole conc. entered as: 7.9 pH, converted to conc.:7.9 pH or 7.9 pH)
 phenanthrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 phenol: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
 pyrene: (Whole conc. entered as: 0.21 mg/kg or 0.000021%)
 selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex: (Cation conc. entered: <3 mg/kg, converted to compound conc.:<7.661 mg/kg or <0.000766%) IGNORED Because: "<LOD"
 toluene: (Whole conc. entered as: <5 mg/kg or <0.0005%) IGNORED Because: "<LOD"
 TPH (C6 to C40) petroleum group: (Whole conc. entered as: <60 mg/kg or <0.006%) IGNORED Because: "<LOD"
 xylene: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
 zinc chromate: (Cation conc. entered: 55 mg/kg, converted to compound conc.:152.578 mg/kg or 0.0153%)

Notes utilised in assessment

C14: Step 5

"Identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "arsenic trioxide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[b]fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "chromium(III) oxide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "chrysene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "dicopper oxide; copper (I) oxide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "nickel chromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "pyrene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "zinc chromate"

Determinand notes

Note 1 , used on:

determinand: "lead chromate"

Note A , used on:

determinand: "zinc chromate"

Classification of sample: TP2/0.20

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

Sample details

Sample Name:	LoW Code:
TP2/0.20	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0 m	
Moisture content: 0% (no correction)	

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
anthracene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
antimony trioxide: (Cation conc. entered: 1.9 mg/kg, converted to compound conc.:2.274 mg/kg or 0.000227%)
arsenic trioxide: (Cation conc. entered: 12 mg/kg, converted to compound conc.:15.844 mg/kg or 0.00158%)
benzene: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
benzo[a]anthracene: (Whole conc. entered as: 0.58 mg/kg or 0.000058%)
benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 0.67 mg/kg or 0.000067%)
benzo[b]fluoranthene: (Whole conc. entered as: 1.07 mg/kg or 0.000107%)
benzo[ghi]perylene: (Whole conc. entered as: 0.38 mg/kg or 0.000038%)
benzo[k]fluoranthene: (Whole conc. entered as: 0.36 mg/kg or 0.000036%)
beryllium oxide: (Cation conc. entered: 0.7 mg/kg, converted to compound conc.:1.943 mg/kg or 0.000194%)
diboron trioxide; boric oxide: (Cation conc. entered: <1 mg/kg, converted to compound conc.:<3.22 mg/kg or <0.000322%) IGNORED Because: "<LOD"
cadmium oxide: (Cation conc. entered: <0.2 mg/kg, converted to compound conc.:<0.228 mg/kg or <0.0000228%)
IGNORED Because: "<LOD"
chromium(III) oxide: (Cation conc. entered: 20 mg/kg, converted to compound conc.:29.231 mg/kg or 0.00292%)
chromium(VI) oxide: (Cation conc. entered: <2 mg/kg, converted to compound conc.:<3.846 mg/kg or <0.000385%)
IGNORED Because: "<LOD"
chrysene: (Whole conc. entered as: 0.63 mg/kg or 0.000063%)
dicopper oxide; copper (I) oxide: (Cation conc. entered: 31 mg/kg, converted to compound conc.:34.903 mg/kg or 0.00349%)
salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex: (Cation conc. entered: <2 mg/kg, converted to compound conc.:<3.768 mg/kg or <0.000377%) IGNORED Because: "<LOD"
ethylbenzene: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
fluoranthene: (Whole conc. entered as: 1.81 mg/kg or 0.000181%)
fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
indeno[123-cd]pyrene: (Whole conc. entered as: 0.35 mg/kg or 0.000035%)
lead chromate: (Cation conc. entered: 58 mg/kg, converted to compound conc.:90.469 mg/kg or 0.00905%, Note 1 conc.: 0.0058%)
mercury dichloride: (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.353 mg/kg or <0.000135%)
IGNORED Because: "<LOD"
naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
nickel chromate: (Cation conc. entered: 15 mg/kg, converted to compound conc.:44.644 mg/kg or 0.00446%)
pH: (Whole conc. entered as: 8 pH, converted to conc.:8 pH or 8 pH)

phenanthrene: (Whole conc. entered as: 0.9 mg/kg or 0.00009%)
phenol: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
pyrene: (Whole conc. entered as: 1.59 mg/kg or 0.000159%)
selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex: (Cation conc. entered: <3 mg/kg, converted to compound conc.:<7.661 mg/kg or <0.000766%) IGNORED Because: "<LOD"
toluene: (Whole conc. entered as: <5 mg/kg or <0.0005%) IGNORED Because: "<LOD"
TPH (C6 to C40) petroleum group: (Whole conc. entered as: <60 mg/kg or <0.006%) IGNORED Because: "<LOD"
xylene: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
zinc chromate: (Cation conc. entered: 98 mg/kg, converted to compound conc.:271.866 mg/kg or 0.0272%)

Notes utilised in assessment

C14: Step 5

"Identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "anthracene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "arsenic trioxide"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]anthracene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[b]fluoranthene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[ghi]perylene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[k]fluoranthene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "chromium(III) oxide"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "chrysene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "dicopper oxide; copper (I) oxide"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "fluoranthene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "nickel chromate"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "phenanthrene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "pyrene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "zinc chromate"

Note 1 , used on:

Test: "HP 5 on STOT SE 2; H371, STOT RE 2; H373" for determinand: "lead chromate"
Test: "HP 7 on Carc. 1A; H350, Carc. 1B; H350, Carc. 1A; H350i, Carc. 1B; H350i" for determinand: "lead chromate"
Test: "HP 10 on Repr. 1A; H360, Repr. 1A; H360D, Repr. 1A; H360Df, Repr. 1A; H360F, Repr. 1A; H360Fd, Repr. 1A; H360FD, Repr. 1B; H360, Repr. 1B; H360D, Repr. 1B; H360Df, Repr. 1B; H360F, Repr. 1B; H360Fd, Repr. 1B; H360FD" for determinand: "lead chromate"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"

Determinand notes

Note 1 , used on:

determinand: "lead chromate"

Note A , used on:

determinand: "zinc chromate"

Classification of sample: TP3/0.10

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

Sample details

Sample Name:	LoW Code:
TP3/0.10	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0 m	
Moisture content: 0% (no correction)	

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 antimony trioxide: (Cation conc. entered: 6.5 mg/kg, converted to compound conc.:7.781 mg/kg or 0.000778%)
 arsenic trioxide: (Cation conc. entered: 13 mg/kg, converted to compound conc.:17.164 mg/kg or 0.00172%)
 benzene: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
 benzo[a]anthracene: (Whole conc. entered as: 0.39 mg/kg or 0.000039%)
 benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 0.6 mg/kg or 0.00006%)
 benzo[b]fluoranthene: (Whole conc. entered as: 0.98 mg/kg or 0.000098%)
 benzo[ghi]perylene: (Whole conc. entered as: 0.3 mg/kg or 0.00003%)
 benzo[k]fluoranthene: (Whole conc. entered as: 0.37 mg/kg or 0.000037%)
 beryllium oxide: (Cation conc. entered: 0.7 mg/kg, converted to compound conc.:1.943 mg/kg or 0.000194%)
 diboron trioxide; boric oxide: (Cation conc. entered: <1 mg/kg, converted to compound conc.:<3.22 mg/kg or <0.000322%) IGNORED Because: "<LOD"
 cadmium oxide: (Cation conc. entered: 0.3 mg/kg, converted to compound conc.:0.343 mg/kg or 0.0000343%)
 chromium(III) oxide: (Cation conc. entered: 16 mg/kg, converted to compound conc.:23.385 mg/kg or 0.00234%)
 chromium(VI) oxide: (Cation conc. entered: <2 mg/kg, converted to compound conc.:<3.846 mg/kg or <0.000385%)
 IGNORED Because: "<LOD"
 chrysene: (Whole conc. entered as: 0.44 mg/kg or 0.000044%)
 dicopper oxide; copper (I) oxide: (Cation conc. entered: 62 mg/kg, converted to compound conc.:69.805 mg/kg or 0.00698%)
 salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex: (Cation conc. entered: <2 mg/kg, converted to compound conc.:<3.768 mg/kg or <0.000377%) IGNORED Because: "<LOD"
 ethylbenzene: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
 fluoranthene: (Whole conc. entered as: 0.99 mg/kg or 0.000099%)
 fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 indeno[123-cd]pyrene: (Whole conc. entered as: 0.27 mg/kg or 0.000027%)
 lead chromate: (Cation conc. entered: 654 mg/kg, converted to compound conc.:1020.119 mg/kg or 0.102%, Note 1 conc.: 0.0654%)
 mercury dichloride: (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.353 mg/kg or <0.000135%)
 IGNORED Because: "<LOD"
 naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 nickel chromate: (Cation conc. entered: 11 mg/kg, converted to compound conc.:32.739 mg/kg or 0.00327%)
 pH: (Whole conc. entered as: 7.8 pH, converted to conc.:7.8 pH or 7.8 pH)
 phenanthrene: (Whole conc. entered as: 0.28 mg/kg or 0.000028%)

phenol: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
 pyrene: (Whole conc. entered as: 0.92 mg/kg or 0.000092%)
 selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex: (Cation conc. entered: <3 mg/kg, converted to compound conc.:<7.661 mg/kg or <0.000766%) IGNORED Because: "<LOD"
 toluene: (Whole conc. entered as: <5 mg/kg or <0.0005%) IGNORED Because: "<LOD"
 TPH (C6 to C40) petroleum group: (Whole conc. entered as: <60 mg/kg or <0.006%) IGNORED Because: "<LOD"
 xylene: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
 zinc chromate: (Cation conc. entered: 286 mg/kg, converted to compound conc.:793.406 mg/kg or 0.0793%)

Notes utilised in assessment

C14: Step 5

"Identify whether any individual ecotoxic substance is present at or above a cut-off value ...", used on:

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "arsenic trioxide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]anthracene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[b]fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[ghi]perylene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[k]fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "cadmium oxide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "chromium(III) oxide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "chrysene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "dicopper oxide; copper (I) oxide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "nickel chromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "phenanthrene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "pyrene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "zinc chromate"

Determinand notes

Note 1 , used on:

determinand: "lead chromate"

Note A , used on:

determinand: "zinc chromate"

Classification of sample: TP5/0.20

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

Sample details

Sample Name:	LoW Code:
TP5/0.20	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0 m	
Moisture content: 0% (no correction)	

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 antimony trioxide: (Cation conc. entered: 2.4 mg/kg, converted to compound conc.:2.873 mg/kg or 0.000287%)
 arsenic trioxide: (Cation conc. entered: 11 mg/kg, converted to compound conc.:14.524 mg/kg or 0.00145%)
 benzene: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
 benzo[a]anthracene: (Whole conc. entered as: 0.46 mg/kg or 0.000046%)
 benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 0.67 mg/kg or 0.000067%)
 benzo[b]fluoranthene: (Whole conc. entered as: 1.03 mg/kg or 0.000103%)
 benzo[ghi]perylene: (Whole conc. entered as: 0.45 mg/kg or 0.000045%)
 benzo[k]fluoranthene: (Whole conc. entered as: 0.35 mg/kg or 0.000035%)
 beryllium oxide: (Cation conc. entered: 0.7 mg/kg, converted to compound conc.:1.943 mg/kg or 0.000194%)
 diboron trioxide; boric oxide: (Cation conc. entered: <1 mg/kg, converted to compound conc.:<3.22 mg/kg or <0.000322%) IGNORED Because: "<LOD"
 cadmium oxide: (Cation conc. entered: <0.2 mg/kg, converted to compound conc.:<0.228 mg/kg or <0.0000228%)
 IGNORED Because: "<LOD"
 chromium(III) oxide: (Cation conc. entered: 20 mg/kg, converted to compound conc.:29.231 mg/kg or 0.00292%)
 chromium(VI) oxide: (Cation conc. entered: <2 mg/kg, converted to compound conc.:<3.846 mg/kg or <0.000385%)
 IGNORED Because: "<LOD"
 chrysene: (Whole conc. entered as: 0.52 mg/kg or 0.000052%)
 dicopper oxide; copper (I) oxide: (Cation conc. entered: 33 mg/kg, converted to compound conc.:37.154 mg/kg or 0.00372%)
 salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex: (Cation conc. entered: <2 mg/kg, converted to compound conc.:<3.768 mg/kg or <0.000377%) IGNORED Because: "<LOD"
 ethylbenzene: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
 fluoranthene: (Whole conc. entered as: 1.12 mg/kg or 0.000112%)
 fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 indeno[123-cd]pyrene: (Whole conc. entered as: 0.4 mg/kg or 0.00004%)
 lead chromate: (Cation conc. entered: 115 mg/kg, converted to compound conc.:179.379 mg/kg or 0.0179%, Note 1 conc.: 0.0115%)
 mercury dichloride: (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.353 mg/kg or <0.000135%)
 IGNORED Because: "<LOD"
 naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 nickel chromate: (Cation conc. entered: 13 mg/kg, converted to compound conc.:38.691 mg/kg or 0.00387%)
 pH: (Whole conc. entered as: 8 pH, converted to conc.:8 pH or 8 pH)

phenanthrene: (Whole conc. entered as: 0.16 mg/kg or 0.000016%)
phenol: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
pyrene: (Whole conc. entered as: 1.15 mg/kg or 0.000115%)
selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex: (Cation conc. entered: <3 mg/kg, converted to compound conc.:<7.661 mg/kg or <0.000766%) IGNORED Because: "<LOD"
toluene: (Whole conc. entered as: <5 mg/kg or <0.0005%) IGNORED Because: "<LOD"
TPH (C6 to C40) petroleum group: (Whole conc. entered as: <60 mg/kg or <0.006%) IGNORED Because: "<LOD"
xylene: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"
zinc chromate: (Cation conc. entered: 132 mg/kg, converted to compound conc.:366.187 mg/kg or 0.0366%)

Notes utilised in assessment

C14: Step 5

"Identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "arsenic trioxide"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]anthracene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[b]fluoranthene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[ghi]perylene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[k]fluoranthene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "chromium(III) oxide"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "chrysene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "dicopper oxide; copper (I) oxide"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "fluoranthene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "nickel chromate"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "phenanthrene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "pyrene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "zinc chromate"

Note 1 , used on:

Test: "HP 5 on STOT SE 2; H371, STOT RE 2; H373" for determinand: "lead chromate"
Test: "HP 7 on Carc. 1A; H350, Carc. 1B; H350, Carc. 1A; H350i, Carc. 1B; H350i" for determinand: "lead chromate"
Test: "HP 10 on Repr. 1A; H360, Repr. 1A; H360D, Repr. 1A; H360Df, Repr. 1A; H360F, Repr. 1A; H360Fd, Repr. 1A; H360FD, Repr. 1B; H360, Repr. 1B; H360D, Repr. 1B; H360Df, Repr. 1B; H360F, Repr. 1B; H360Fd, Repr. 1B; H360FD" for determinand: "lead chromate"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"

Determinand notes

Note 1 , used on:

determinand: "lead chromate"

Note A , used on:

determinand: "zinc chromate"

Classification of sample: TP5/0.90

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

Sample details

Sample Name:	LoW Code:
TP5/0.90	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0 m	
Moisture content: 0% (no correction)	

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 antimony trioxide: (Cation conc. entered: 1.5 mg/kg, converted to compound conc.:1.796 mg/kg or 0.00018%)
 arsenic trioxide: (Cation conc. entered: 10 mg/kg, converted to compound conc.:13.203 mg/kg or 0.00132%)
 benzo[a]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 benzo[b]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 benzo[ghi]perylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 benzo[k]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 beryllium oxide: (Cation conc. entered: 0.6 mg/kg, converted to compound conc.:1.665 mg/kg or 0.000167%)
 diboron trioxide; boric oxide: (Cation conc. entered: <1 mg/kg, converted to compound conc.:<3.22 mg/kg or <0.000322%) IGNORED Because: "<LOD"
 cadmium oxide: (Cation conc. entered: <0.2 mg/kg, converted to compound conc.:<0.228 mg/kg or <0.0000228%)
 IGNORED Because: "<LOD"
 chromium(III) oxide: (Cation conc. entered: 19 mg/kg, converted to compound conc.:27.77 mg/kg or 0.00278%)
 chromium(VI) oxide: (Cation conc. entered: <2 mg/kg, converted to compound conc.:<3.846 mg/kg or <0.000385%)
 IGNORED Because: "<LOD"
 chrysene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 dicopper oxide; copper (I) oxide: (Cation conc. entered: 25 mg/kg, converted to compound conc.:28.147 mg/kg or 0.00281%)
 salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex: (Cation conc. entered: <2 mg/kg, converted to compound conc.:<3.768 mg/kg or <0.000377%) IGNORED Because: "<LOD"
 fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 indeno[123-cd]pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 lead chromate: (Cation conc. entered: 29 mg/kg, converted to compound conc.:45.235 mg/kg or 0.00452%, Note 1 conc.: 0.0029%)
 mercury dichloride: (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.353 mg/kg or <0.000135%)
 IGNORED Because: "<LOD"
 naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 nickel chromate: (Cation conc. entered: 13 mg/kg, converted to compound conc.:38.691 mg/kg or 0.00387%)
 pH: (Whole conc. entered as: 8.2 pH, converted to conc.:8.2 pH or 8.2 pH)
 phenanthrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
 phenol: (Whole conc. entered as: <2 mg/kg or <0.0002%) IGNORED Because: "<LOD"

pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"

selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex: (Cation conc. entered: <3 mg/kg, converted to compound conc.: <7.661 mg/kg or <0.000766%) IGNORED Because: "<LOD"

zinc chromate: (Cation conc. entered: 44 mg/kg, converted to compound conc.: 122.062 mg/kg or 0.0122%)

Notes utilised in assessment

C14: Step 5

"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "arsenic trioxide"

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "chromium(III) oxide"

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "dicopper oxide; copper (I) oxide"

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "nickel chromate"

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "zinc chromate"

Determinand notes

Note 1 , used on:

determinand: "lead chromate"

Note A , used on:

determinand: "zinc chromate"

Appendix A: Classifier defined and non CLP determinands

acenaphthene (CAS Number: 83-32-9)

Comments: Data from C&L Inventory Database

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

Data source date: 17/07/2015

Risk Phrases: R36, R37, R38, N; R50/53, N; R51/53

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

acenaphthylene (CAS Number: 208-96-8)

Comments: Data from C&L Inventory Database

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

Data source date: 17/07/2015

Risk Phrases: R22, R26, R27, R36, R37, R38

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

anthracene (CAS Number: 120-12-7)

Comments: Data from C&L Inventory Database

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

Data source date: 17/07/2015

Risk Phrases: R36, R37, R38, R43, N; R50/53

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

benzo[ghi]perylene (CAS Number: 191-24-2)

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: 23/07/2015

Risk Phrases: N; R50/53

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

chromium(III) oxide (CAS Number: 1308-38-9)

Conversion factor: 1.462

Comments: Data from C&L Inventory Database

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

Data source date: 17/07/2015

Risk Phrases: R20, R22, R36, R37, R38, R42, R43, R50/53, R60, R61

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

dicopper oxide; copper (I) oxide (CAS Number: 1317-39-1)

CLP index number: 029-002-00-X

Data source: Regulation (EU) 2016/1179 of 19 July 2016 (ATP9)

Additional Risk Phrases: N; R50/53, N; R50/53>= 0.25%

Additional Hazard Statement(s): None.

Reason:

10/10/2016 - N; R50/53 hazard statement sourced from: WM3 v1 still uses ecotoxic risk phrases

10/10/2016 - N; R50/53>= 0.25% hazard statement sourced from: WM3 v1 still uses ecotoxic risk phrases

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

CLP index number: 006-007-00-5

Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)

Additional Risk Phrases: None.

Additional Hazard Statement(s): EUH032>= 0.2%

Reason:

14/12/2015 - EUH032>= 0.2% hazard statement sourced from: WM3, Table C12.2

ethylbenzene (CAS Number: 100-41-4)

CLP index number: 601-023-00-4

Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)

Additional Risk Phrases: None.

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

Reason:

03/06/2015 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

fluoranthene (CAS Number: 206-44-0)

Comments: Data from C&L Inventory Database

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

Data source date: 21/08/2015

Risk Phrases: Xn; R22, N; R50/53

Hazard Statements: Acute Tox. 4; H302, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

fluorene (CAS Number: 86-73-7)

Comments: Data from C&L Inventory Database

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

Data source date: 06/08/2015

Risk Phrases: N; R50/53

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

indeno[123-cd]pyrene (CAS Number: 193-39-5)

Comments: Data from C&L Inventory Database

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

Data source date: 06/08/2015

Risk Phrases: R40

Hazard Statements: Carc. 2; H351

pH (CAS Number: PH)

Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25/05/2015

Risk Phrases: None.

Hazard Statements: None.

phenanthrene (CAS Number: 85-01-8)

Comments: Data from C&L Inventory Database

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

Data source date: 06/08/2015

Risk Phrases: R22, R36, R37, R38, R40, R43, N; R50/53

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

pyrene (CAS Number: 129-00-0)

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: 21/08/2015

Risk Phrases: Xi; R36/37/38, N; R50/53

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

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

Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25/05/2015

Risk Phrases: R10, R45, R46, R51/53, R63, R65

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

Appendix B: Rationale for selection of metal species

C14: Step 5

from section: WM3: C14 in the document: "WM3 - Waste Classification"

"Identify whether any individual ecotoxic substance is present at or above a cut-off value ..."

Note 1

from section: 1.1.3.2, Annex VI in the document: "CLP Regulation"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note A

from section: 1.1.3.1, Annex VI in the document: "CLP Regulation"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

WM3: Unknown oil

from section: Chapter 3: 4. Waste oils and other wastes containing or contaminated with oil in the document: "WM3 - Waste Classification"

"If the identity of the oil is unknown, and the petroleum group cannot be established, then the oil contaminating the waste can be classified as non-carcinogenic due to the presence of oil if all three of the following criteria are met:

- the waste contains **benzo[a]pyrene (BaP)** at a concentration of less than 0.01% (1/10,000th) of the TPH concentration (This is the carcinogenic limit specified in table 3.2 of the CLP for BaP)
- this has been determined by an appropriate and representative sampling approach in accordance with the principles set out in Appendix D, and
- the analysis clearly demonstrates, for example by carbon bands or chromatograph, and the laboratory has reasonably concluded that the hydrocarbons present have not arisen from petrol or diesel

Appendix C: Version

This classification utilises the following guidance and legislation:

- WM3 - Waste Classification - May 2015
- CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
- 1st ATP - Regulation 790/2009/EC of 10 August 2009
- 2nd ATP - Regulation 286/2011/EC of 10 March 2011
- 3rd ATP - Regulation 618/2012/EU of 10 July 2012
- 4th ATP - Regulation 487/2013/EU of 8 May 2013
- Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
- 5th ATP - Regulation 944/2013/EU of 2 October 2013
- 6th ATP - Regulation 605/2014/EU of 5 June 2014
- WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
- Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014
- 7th ATP - Regulation 2015/1221/EU of 24 July 2015
- 8th ATP - Regulation (EU) 2016/918 of 19 May 2016
- 9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
- POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
- 1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010
- 2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

HazWasteOnline Classification Engine: WM3 1st Edition, May 2015

HazWasteOnline Classification Engine Version: 2016.317.3166.6295 (12 Nov 2016)

HazWasteOnline Database: 2016.315.3165.6292 (10 Nov 2016)

Appendix B.4 Determination of Hazardous Waste Classification

Software such as the HazWasteOnline produced Hazardous Waste Classification Tool, enables soils 'total' chemical testing data to be used to identify the classification of waste soils in accordance with Environment Agency guidance. The HazWasteOnline Hazardous Waste Classification Tool was designed primarily for the classification of soil wastes as identified by the European Waste Catalogue (EWC) Chapter 17 - Construction and demolition wastes (including contaminated soils).

The classification of waste as either hazardous or non-hazardous must be conducted in accordance with the 2003 Environment Agency publication Interpretation of the Definition and Classification of Hazardous Waste (Technical Guidance WM2). This establishes the regulatory framework and allows classification of wastes based on their various risk phrases. Additional guidance provided by the 2007 Environment Agency publication 'How to Find Out if Waste Oil and Wastes that Contain Oil Are Hazardous' (HWR08) provides further clarification on the classification methodology for hydrocarbon contamination.

As part of the Hazardous Waste Classification process, contaminant compounds are selected based on historical and contemporary land-use. The inclusion of such data on the input form enables the correct waste classification to be determined. For example, in cases of land associated with former gasworks, the classification of coal-tar contaminated soils can be partially determined using total PAH concentrations as opposed to TPH concentrations as coal-tar may be deemed a "substance". Hazardous (HWR08) provides further clarification on the classification methodology for hydrocarbon contamination.

Appendix B.5 General Assessment Criteria

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

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	RTD 0.40 – 2.90 Sandy CLAY	3 – 6	Very low to low ($C_u = 15 - 30\text{kPa}$)
	RTD 2.90 – 3.90 Clayey GRAVEL	9 – 17	Loose to medium dense
	RTD ¹ 3.90 – 4.70 Clayey GRAVEL	20 – 50+	Medium dense to very dense
DP2	RTD 0.90 – 3.10 Sandy CLAY	3 – 6	Very low to low ($C_u = 15 - 30\text{kPa}$)
	RTD 3.10 – 4.00 Clayey SAND	9 – 17	Loose to medium dense
	RTD 4.00 – 5.00 Gravelly SAND	20 – 35	Medium dense to dense
DP3	RTD 0.60 – 2.80 Sandy CLAY	3 – 9	Very low to medium ($C_u = 15 - 45\text{kPa}$)
	RTD 2.80 – 4.60 Gravelly SAND	12 – 50+	Medium dense to very dense
DP4	RTD ² 0.80 – 3.40 Sandy CLAY	3 – 6	Very low to low ($C_u = 15 - 30\text{kPa}$)
	RTD ² 3.40 – 4.50 Clayey GRAVEL	26 – 50+	Medium dense to very dense
	RTD ² 4.50 – 5.00 Clayey SAND	12 – 17	Medium dense
DP5	RTD ² 1.50 – 5.00 Clayey SAND	6 – 17	Loose to medium dense
DP6	RTD ² 0.80 – 3.00 Sandy CLAY	3 – 9	Very low to medium ($C_u = 15 - 45\text{kPa}$)
	RTD ² 3.00 – 3.60 Clayey GRAVEL	26 – 50+	Medium dense to very dense
	RTD ² 3.60 – 4.40 Sandy CLAY	<1 – 9	Very low to medium ($C_u = <10 - 45\text{kPa}$)

DP	Strata	Equivalent SPT N60 Blow Counts	Inferred Cohesive Strength/Granular Density
	RTD ² 4.40 – 5.00 Clayey GRAVEL	23 – 35	Medium dense to dense

Note: ¹ Ground conditions inferred past the base of windowless sampler boreholes. ² No corresponding windowless sampler boreholes

Appendix C.3 Geotechnical In-Situ and Laboratory Results



Soils Limited

New House, 100, B. 1, T. 1, W. 1, K500-500

Probe Log

Probe No.

DP1

Sheet 1 of 1

Project Name:	Land North of Mayflower Way	Project No.	17028	Co-ords:		Hole Type	DP
Location:	Angmering, West Sussex BN14 4AY	Level:	m AOD			Scale	1:50
Client:	Mr. Peter Taylor and Crayfern Homes	Dates:				Logged By	

Depth (m)	Blows/100mm				Torque (Nm)
	10	20	30	40	
0	1 2 				



Soils Limited

Newton House, Cross Road, Tadworth KT20 5SR

Probe Log

Probe No.

DP2

Sheet 1 of 1

Project Name:	Land North of Mayflower Way	Project No.	17028	Co-ords:		Hole Type	DP
Location:	Angmering, West Sussex BN14 4AY	Level:	m AOD			Scale	1:50
Client:	Mr. Peter Taylor and Crayfern Homes	Dates:				Logged By	

Depth (m)	Blows/100mm				Torque (Nm)
	10	20	30	40	
0	4				
0.1	5				
0.2	4				
0.3	5				
0.4	4				
0.5	2				
0.6	1				
0.7	3				
0.8	1				
0.9	1				
1	2				
1.1	2				
1.2	2				
1.3	2				
1.4	2				
1.5	2				
1.6	1				
1.7	2				
1.8	2				
1.9	2				
2	3				
2.1	3				
2.2	3				
2.3	3				
2.4	3				
2.5	3				
2.6	3				
2.7	3				
2.8	3				
2.9	3				
3	3				
3.1	3				
3.2	3				
3.3	3				
3.4	3				
3.5	3				
3.6	3				
3.7	3				
3.8	3				
3.9	3				
4	4				
4.1	5				
4.2	5				
4.3	6				
4.4	5				
4.5	5				
4.6	4				
4.7	4				
4.8	5				
4.9	7				
5	7				
5.1	8				
5.2	8				
5.3	8				
5.4	12				
5.5	11				
5.6	9				
5.7	10				
5.8	9				
5.9	9				
6					
6.1					
6.2					
6.3					
6.4					
6.5					
6.6					
6.7					
6.8					
6.9					
7					
7.1					
7.2					
7.3					
7.4					
7.5					
7.6					
7.7					
7.8					
7.9					
8					
8.1					
8.2					
8.3					
8.4					
8.5					
8.6					
8.7					
8.8					
8.9					
9					
9.1					
9.2					
9.3					
9.4					
9.5					
9.6					
9.7					
9.8					
9.9					
10					
Remarks	Fall Height mm		Cone Base Diameter mm		
	Hammer Weight kg		Final Depth 5m		
	Probe Type		Energy Ratio (Er) %		



Soils Limited

Newton House, Cross Road, Tadworth KT20 5SR

Probe Log

Probe No.

DP3

Sheet 1 of 1

Project Name:	Land North of Mayflower Way	Project No.	17028	Co-ords:		Hole Type	DP
Location:	Angmering, West Sussex BN14 4AY	Level:	m AOD			Scale	1:50
Client:	Mr. Peter Taylor and Crayfern Homes	Dates:				Logged By	

Depth (m)	Blows/100mm				Torque (Nm)
	10	20	30	40	
0	2				
0.1	3				
0.2	2				
0.3	3				
0.4	2				
0.5	2				
0.6	1				
0.7	1				
0.8	1				
0.9	1				
1	1				
1.1	1				
1.2	2				
1.3	1				
1.4	1				
1.5	2				
1.6	1				
1.7	2				
1.8	1				
1.9	2				
2	2				
2.1	3				
2.2	3				
2.3	3				
2.4	3				
2.5	3				
2.6	3				
2.7	6				
2.8	4				
2.9	5				
3	4				
3.1	6				
3.2	14				
3.3	14				
3.4	17				
3.5	19				
3.6	16				
3.7	12				
3.8	15				
3.9	7				
4	7				
4.1	16				
4.2	8				
4.3	14				
4.4	30				
4.5	50				
5					
6					
7					
8					
9					
10					
Remarks	Fall Height mm		Cone Base Diameter mm		
	Hammer Weight kg		Final Depth 4.6m		
	Probe Type		Energy Ratio (Er) %		



Soils Limited

Newton House, Cross Road, Tadworth KT20 5SR

Probe Log

Probe No.

DP4

Sheet 1 of 1

Project Name:	Land North of Mayflower Way	Project No.	17028	Co-ords:		Hole Type	DP
Location:	Angmering, West Sussex BN14 4AY	Level:	m AOD			Scale	1:50
Client:	Mr. Peter Taylor and Crayfern Homes	Dates:				Logged By	

Depth (m)	Blows/100mm				Torque (Nm)
	10	20	30	40	
1	1 2 3 3 3 4 3 2				
2	1 2 1 2 1 2 1 2 2 2 1				
3	2 2				



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Newton House, Cross Road, Tadworth KT20 5SR

Probe Log

Probe No.

DP5

Sheet 1 of 1

Project Name:	Land North of Mayflower Way	Project No.	17028	Co-ords:		Hole Type	DP
Location:	Angmering, West Sussex BN14 4AY	Level:	m AOD			Scale	1:50
Client:	Mr. Peter Taylor and Crayfern Homes	Dates:				Logged By	

Depth (m)	Blows/100mm				Torque (Nm)
	10	20	30	40	
1	5 6 5 5 14 6 10 5 3				
2	5 6 9 32 36 18 4 3 3 5 2 3 2 3 4 3 4 4 3 4 3				
3	2 3 2 3 3 3 5 3 2 3 4 4 2 5 3 6 5 3 3				
4					
5					
6					
7					
8					
9					
10					
Remarks	Fall Height mm		Cone Base Diameter mm		
	Hammer Weight kg		Final Depth 5m		
	Probe Type		Energy Ratio (Er) %		



Soils Limited

Newton House, Cross Road, Tadworth KT20 5SR

Probe Log

Probe No.

DP6

Sheet 1 of 1

Project Name:	Land North of Mayflower Way	Project No.	17028	Co-ords:		Hole Type	DP
Location:	Angmering, West Sussex BN14 4AY	Level:	m AOD			Scale	1:50
Client:	Mr. Peter Taylor and Crayfern Homes	Dates:				Logged By	

Depth (m)	Blows/100mm				Torque (Nm)
	10	20	30	40	
0	7 9 8 4 4 6 4 3 2				
1	3 3 2 2 2 3 3 3 3 3 4				
2	2 2 1 1 2 2 3 3 3 3 4				
3	2 2 17 20 22 17 15 9 6 2				
4	0 0 2 2 3 4 11 12 12 8 8 10				
5					
6					
7					
8					
9					
10					
Remarks	Fall Height mm		Cone Base Diameter mm		
	Hammer Weight kg		Final Depth 5m		
	Probe Type		Energy Ratio (Er) %		

Soakaway Calculations

Seahaway Test No.	TP1 Test1
Contract:	Mayflower Way
Contract No.	15306

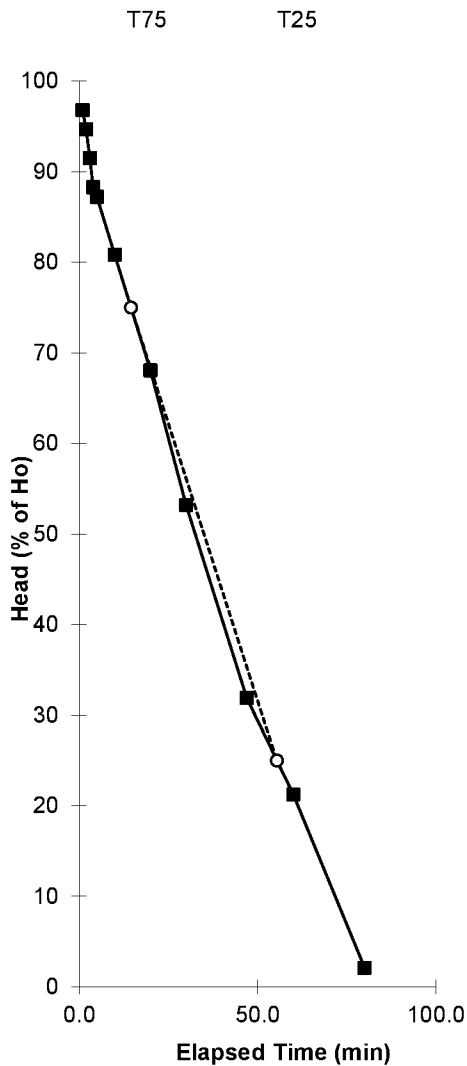
Field Test

Trial Pit Log (include details of groundwater):
See trial Pit record

Depth of Pit	2.90 m
Width of Pit	0.60 m
Length of Pit	1.90 m
Depth of Pit Soaked	0.94 m
ap50	3.49 m ²
q _{p75-25}	0.5358 m ³
t ₇₅₋₂₅	40.9 min
water used	1.0716 m ³
f	6.261E-05 m/sec.

Field Data

Depth to Water	Elapsed Time	Head of Water	Head of Water
(m)	(min)	(% of Ho)	(m)
1.96	0	100	0.94
1.99	1.0	97	0.91
2.01	2.0	95	0.89
2.04	3.0	91	0.86
2.07	4.0	88	0.83
2.08	5.0	87	0.82
2.14	10.0	81	0.76
2.26	20.0	68	0.64
2.40	30.0	53	0.50
2.60	47.0	32	0.30
2.70	60.0	21	0.20
2.88	80.0	2	0.02



T75	14.583	75
T25	55.450	25
T75-25	40.867	Derived from Best Fit

Comments

SOILS LIMITED

**Newton House, Cross Road, Tadworth
Surrey, KT20 5SR**

Soakaway Calculations

Soakaway Test No.	TP1 Test1
Contract:	Mayflower Way
Contract No.	15306

Field Test

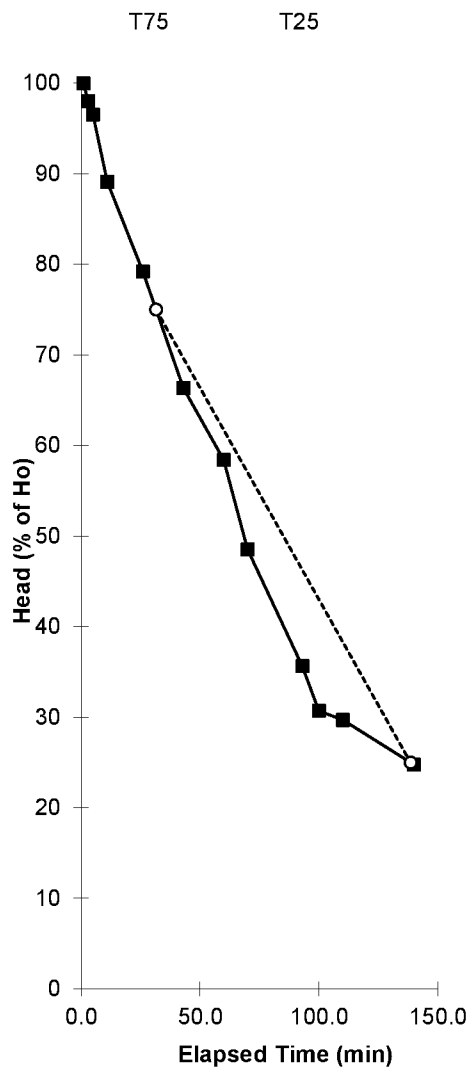
Trial Pit Log (include details of groundwater):
See trial Pit record

Depth of Pit	2.90 m
Width of Pit	0.60 m
Length of Pit	1.90 m
Depth of Pit Soaked	1.01 m

ap50	3.665 m2
Ψ_{p75-25}	0.5757 m3
ϵ_{75-25}	106.9 min
water used	1.1514 m3
$\dot{\epsilon}$	2.448E-05 m/sec.

Field Data

Depth to Water	Elapsed Time	Head of Water	Head of Water
(m)	(min)	(% of Ho)	(m)
1.89	0	100	1.01
1.89	1.0	100	1.01
1.91	3.0	98	0.99
1.93	5.0	97	0.98
2.00	11.0	89	0.90
2.10	26.0	79	0.80
2.23	43.0	66	0.67
2.31	60.0	58	0.59
2.41	70.0	49	0.49
2.54	93.0	36	0.36
2.59	100.0	31	0.31
2.60	110.0	30	0.30
2.65	140.0	25	0.25



T75	31.558	75
T25	138.500	25
T75-25	106.942	Derived from Best Fit

Comments

Extrapolated past 110 mins

SOILS LIMITED

**Newton House, Cross Road, Tadworth
Surrey, KT20 5SR**

Soakaway Calculations

Seakway Test No.	TP2 Test 1
Contract:	Mayflower Way
Contract No.	15306

Field Test

Trial Pit Log (include details of groundwater):
See trial Pit record

Depth of Pit	2.20 m
Width of Pit	0.60 m
Length of Pit	2.10 m
Depth of Pit Soaked	1.14 m

ap50	4.3245 m2
Vp75-25	0.71505 m3
t75-25	4468.9 min
water used	1.4301 m3
ϵ	6.167E-07 m/sec.

Field Data

Depth to Water	Elapsed Time	Head of Water	Head of Water
(m)	(min)	(% of Ho)	(m)
1.07	0	100	1.135
1.07	1.0	100	1.13
1.08	2.0	99	1.12
1.08	3.0	99	1.12
1.08	5.0	99	1.12
1.09	15.0	98	1.12
1.10	45.0	97	1.10
1.14	65.0	93	1.06
1.16	120.0	92	1.04
1.20	165.0	88	1.00
1.21	190.0	87	0.99
1.30	220.0	79	0.90
1.40	280.0	70	0.80
1.50	400.0	62	0.70
1.60	800.0	53	0.60
1.70	1400.0	44	0.50
1.76	2000.0	39	0.44
1.82	2800.0	33	0.38
1.87	3600.0	30	0.34
1.92	4800.0	25	0.28

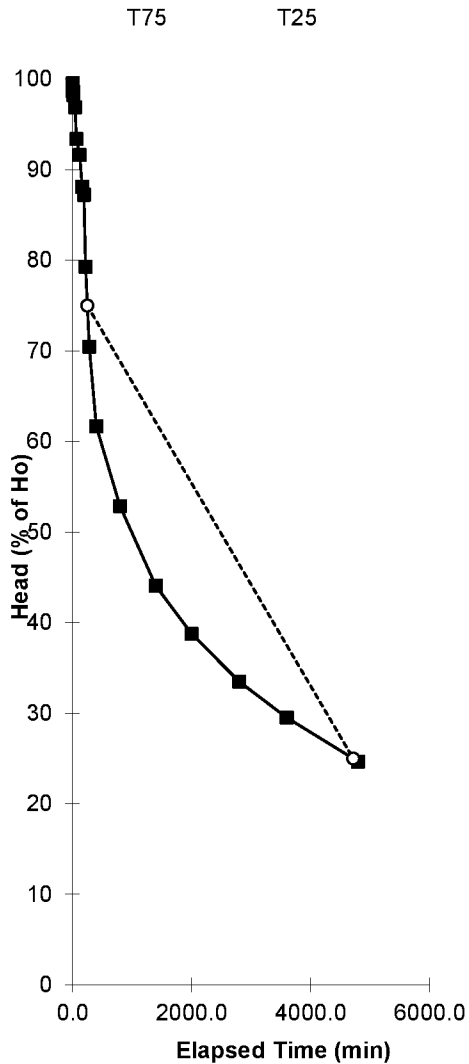
T75	249.250	75
T25	4718.182	25
T75-25	4468.932	Derived from Best Fit

Comments

Extrapolated after 190 mins

SOILS LIMITED

**Newton House, Cross Road, Tadworth
Surrey, KT20 5SR**



Soakaway Calculations

Seahway Test No.	TP3 Test 1
Contract:	Mayflower Way
Contract No.	15306

Field Test

Trial Pit Log (include details of groundwater):
See trial Pit record

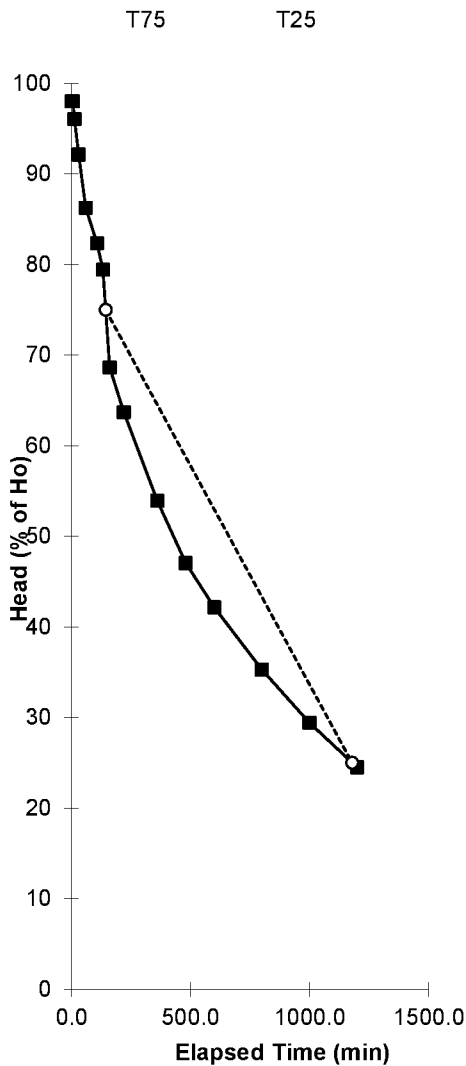
Depth of Pit	2.63 m
Width of Pit	0.60 m
Length of Pit	2.50 m
Depth of Pit Soaked	1.02 m

ap50	4.662 m2
vp75-25	0.765 m3
vt75-25	1036.5 min
water used	1.5300 m3
$\dot{t}$	2.638E-06 m/sec.

Field Data

Depth to Water	Elsaped Time	Head of Water	Head of Water
(m)	(min)	(% of Ho)	(m)
1.61	0	100	1.02
1.63	1.0	98	1.00
1.63	2.0	98	1.00
1.63	3.0	98	1.00
1.63	4.0	98	1.00
1.63	5.0	98	1.00
1.65	13.0	96	0.98
1.69	30.0	92	0.94
1.75	60.0	86	0.88
1.79	107.0	82	0.84
1.82	132.0	79	0.81
1.93	160.0	69	0.70
1.98	220.0	64	0.65
2.08	360.0	54	0.55
2.15	480.0	47	0.48
2.20	600.0	42	0.43
2.27	800.0	35	0.36
2.33	1000.0	29	0.30
2.38	1200.0	25	0.25

T75	143.455	75
T25	1180.000	25
T75-25	1036.545	Derived from Best Fit



Comments

Extrapolated after 160 mins

SOILS LIMITED

**Newton House, Cross Road, Tadworth
Surrey, KT20 5SR**

Appendix D Information Provided by the Client

NORTH

Internal building areas for Fire Appliances - Green areas or similar surfaces

Existing fence and within garden of Plot 12 to remain unaltered

ROUNDSTONE LANE

MAYFLOWER WAY

0m 5.0m 10m 15m 20m
1:500 scale @ A2

SCHEDULE OF UNITS - 24 Total
LEGEND :

- DETAILED / ORANGE SHADER APPLICATION SITE BOUNDARY
- [Pattern] INDICATES INDIVIDUAL BN STORE FOR 3 BNS IN EACH PRIVATE GARAGE
- [Pattern] INDICATES CYCLE STORE FOR 200, CYCLES TO DWELLINGS WITHIN A GARAGE
- NOTE : ALL GARAGES TO BEHAVE A MINIMUM OF 6sqm INTERNALLY. CYCLE STORAGE TO BEAR OF EACH GARAGE
- 1/20 HARVEST UNIT - INDICATES PLOT NUMBER & SIZE
- 1/20 AFFORDABLE UNIT - INDICATES PLOT NUMBER & SIZE
- 9 INDICATES GARAGE
- P INDICATES COVERED PARKING
- △ INDICATES GATE ACCESS TO REAR GARAGE
- T INDICATES TYPICAL ROAD FINISH
- B.P INDICATES BLOCK PAVED ROAD FINISH - Private drive & parking spaces are block paved
- B P REFS TO STREET SCENE ELEVATIONS - SEE SEPARATE SHEET FOR DETAILS
- [Pattern] GRANITE SETTS RIVETLE STRIP

SCHEDULE OF UNITS, 24 TOTAL

PLOTS 1 to 4, 19 & 20, 23 & 24.

2 bedroom terraced & semi detached houses @ 79 sq.m.

PLOTS 6 & 7, 14 & 15.

3 bedroom garage Linked houses @ 109 sq.m.

PLOTS 5, 8, 9, 10, 11 & 18.

4 bedroom detached houses @ 134.0 sq.m.

PLOTS 12 & 13, 16 & 17.

3 bedroom semi-detached houses @ 106.4 sq.m.

PLOTS 21 & 22.

3 bedroom semi-detached houses @ 43 sq.m.

CROSSELEY DESIGN
ARCHITECTURE

25 Hazellurst Crescent, Finton Valley, Worthing, BN14 0HW
T. 01903 877221 e. mail@crosleydesign.co.uk W. www.crosleydesign.co.uk

client
CRAFTERN HOMES

project
RESIDENTIAL DEVELOPMENT
LAND OFF MAYFLOWER WAY
ANGMERING, WEST SUSSEX
BN16 4AY

drawing
SITE PLAN

scale	date	job no.	ding no.	rev.
1:500 @A2	MAR. 17	1701	2.10	P8

Soils Limited

Geotechnical & Environmental Consultants

**Newton House
Cross Road, Tadworth
Surrey KT20 5SR**

