



Ruddlesden geotechnical

Phase 2: Geotechnical Investigation and Contamination Assessment Report



Land South of Polywell, Appledore,
Bideford, Devon

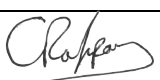
Chichester Homes Developments Ltd


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GLOSSARY OF ABBREVIATIONS/ ACRONYMS

ACEC	Aggressive Chemical Environment for Concrete
ACM	Asbestos Containing Material
AOD	Above Ordnance Datum
BGL	Below Ground Level
BGS	British Geological Survey
BS	British Standard
C4SL	Category 4 Screening Levels
CBR	California Bearing Ratio
CIEH	Chartered Institute of Environmental Health
CL:AIRE	Contaminated Land Applications in Real Environments
CLEA	Contaminated Land Exposure Assessment
GAC	Generic Assessment Criteria
GQRA	Generic Qualitative Risk Assessment
HDPE	High-Density Polyethylene
LQM	Land Quality Management
km	kilometres
m	metres
NHBC	National House Building Council
PAH	Polycyclic Aromatic Hydrocarbons
PE	Polyethylene
S4ULs	Suitable 4 Use Levels
SGV	Soil Guideline Values
TIC	Tentatively Identified Compound
TPH	Total Petroleum Hydrocarbons
UKAS	United Kingdom Accreditation Service
UKWIR	United Kingdom Water Industry Research
VOC	Volatile Organic Compounds



EXECUTIVE SUMMARY

Proposals

It is proposed to develop land south of Polywell, Appledore, Bideford, Devon, for residential purposes.

Phase 1 Desk Study Report

The site has previously been the subject of a Phase 1 Desk Study report, undertaken by Geo Consulting Engineering Ltd in February 2017 (report ref: GCE00752/R1).

The review of geological mapping indicated the site to be underlain by the Carboniferous Ashton Mudstone Member and Crackington Formation (undifferentiated), comprising mudstones and siltstones.

The review of historical Ordnance Survey mapping indicated the site to have been used for agricultural purposes since first edition mapping dated 1887.

Potential on-site sources of contamination were considered to include agricultural chemicals (e.g. pesticides/herbicides) and natural metals/ metalloids from mineralisation processes.

Geotechnical hazards were considered to include volume change potential of soils, variable depths to competent bearing stratum, underground services, shallow bedrock and sulphate bearing stratum.

Intrusive investigation, comprising machine-excavated trial pits, was recommended to provide information for both contamination and geotechnical assessment purposes.

Additional Geological Information

Whilst not mentioned within the previous Phase 1 Desk Study report undertaken by Geo Consulting Engineering Ltd, according to the accompanying geological memoir for Sheet 292, a thin mantle of glacial deposits are mapped within the region.

Ground Conditions Encountered

Eight trial pits revealed the ground conditions to comprise Glacial deposits to the maximum depth of the investigation (3.50m). These were typically recorded to comprise firm to stiff variably sandy, gravelly and silty clay, to depths of between 1.40m and 2.20m, underlain by (loose to medium dense) and (medium dense), locally (loose), gravelly clayey/ silty sand, or sandy clayey/ silty gravel, with occasional cobbles, to depths of between 2.80m and 3.20m.

However, beneath the surficial sand/ gravel deposits within the centre and east of the site, (loose), locally (very loose), clayey sand was encountered, to depths of between 3.00m and 3.50m.

One of the trial pits (TP03 – northeast corner of the site) was terminated at a depth of 2.50m, due to the presence of (very dense) sandy gravel.

No groundwater was encountered within the trial pits undertaken.



Foundations	<p>Given the variable strength of the Glacial deposits recorded, and that the lowest strength soils were typically encountered in the east of the site at depths of between 1.90m and >3.50m (i.e. at the depths of the proposed foundations within this area of the site), it is not currently possible to provide an allowable bearing capacity for foundation design for the soils encountered.</p> <p>In order to provide an allowable bearing capacity for use in foundation design, further work comprising boreholes and standard penetration testing (SPTs) is required (see further work below).</p> <p>Consideration will need to be given to the existing ~3m-deep foul drainage pipe located beneath proposed Plots 1 to 6. Deep made ground is likely to be present along the existing route and will therefore impact on foundations for these plots.</p>
Roads	<p>A CBR value of 3% is recommended for use in road pavement design for the natural soils encountered.</p>
Contamination Risk Assessment	<p>A contamination risk assessment has shown that the levels of contamination recorded in this investigation are not potentially harmful to human health given the proposed end use or to the water environment.</p>
Contamination Remedial Measures	<p>No further action or specific remedial measures are required given the proposed end use.</p>
Off-site Soil Disposal	<p>Laboratory testing and HazWasteOnline have been used to classify the soils for off-site disposal purposes.</p> <p>The results from HazWasteOnline indicate that all of the soil samples tested from both the topsoil and underlying natural soils (Glacial deposits) to be classified as Non-Hazardous Waste and 17 05 04 in the European Waste Catalogue.</p> <p>The WAC testing results indicate that the natural Glacial soils are suitable to be disposed of at an inert waste landfill.</p>
Radon/ Ground Gas	<p>No radon protection measures are required and no additional ground gas protection measures are considered to be necessary.</p>
Further Work	<p>In order to provide an allowable bearing capacity for use in foundation design, further work comprising boreholes with in-situ strength testing is required.</p> <p>Should the soils encountered be found to have insufficient bearing capacity to provide a suitable founding stratum, the boreholes should be used to determine the ground conditions at greater depth beneath the site, to provide information for use in piled foundation design.</p>



Should further information be required for detailed piled foundation design, additional combined percussive/ rotary boreholes may be required.

Groundwater monitoring wells should also be installed to provide information on groundwater levels, to enable temporary works and permanent retaining wall design.

Additional testing and material classification for off-site soil disposal purposes may be required by the tip operator.

This executive summary is to be read in conjunction with, and not in isolation from, the full report text and appendices.



1 INTRODUCTION

1.1 General

In July and August 2019, a Phase 2: Geotechnical Investigation and Contamination Assessment was undertaken by Ruddlesden geotechnical on behalf of Chichester Homes Developments Ltd at land south of Polywell, Appledore, Bideford, Devon.

The investigation was undertaken to determine subsurface ground conditions, to provide recommendations for foundations and associated structures, and to assess the extent of contamination at the site.

The investigation comprised a review of a previous desk study, followed by the formation of eight trial pits with in-situ and laboratory testing.

1.2 Development Proposals

It is understood that the site is to be developed for residential purposes with the construction of ten conventional two-storey brick-built houses, with associated private gardens and a new access road.

The proposed layout is shown on the exploratory hole location plan (Dwg. No. 19342/02), presented in Appendix D of this report.

Given the sloping nature of the site, some cutting and filling is proposed as part of the development works.

The provided cross-section drawing (Dwg. No. 18 127 EXT 02, included in Appendix D), indicates that levels are to be cut by up to approximately 3.5m in the eastern part of the site (proposed Plots 7 to 10), and up to approximately 2.0m in the west (proposed Plots 1 to 6). It is understood that retaining walls will therefore be required to accommodate the proposed changes in levels.

A foul-drainage pipe passes through the western part of the site, trending approximately northeast to southwest (i.e. parallel to Torridge Road), at a depth of approximately 3m. It is assumed that this will be diverted as part of the proposed development, as this is currently situated beneath proposed Plots 1 to 6.

1.3 Scope of Investigation

This Phase 2 investigation has been undertaken following a Phase 1 Desk Study report, produced by Geo Consulting Engineering Ltd in February 2017 (report ref: GCE00752/R1), which should be read in conjunction with this report.

The investigation covers geotechnical and contamination aspects relating to the development. The scope of investigation comprised the following:

- review the previous desk study information;
- undertake machine-excavated trial pits;
- establish the ground conditions across the site;
- schedule geotechnical and contamination laboratory testing, including waste acceptance criteria (WAC) testing;
- make recommendations for foundation design;
- carry out in-situ CBR (TRL DCP method) testing and provide recommendations for road pavement design;



- make recommendations relating to excavations and groundwater;
- undertake a contamination risk assessment;
- undertake a ground gas assessment;
- provide details of contamination remedial measure requirements (if required); and
- undertake a basic waste classification exercise for the off-site disposal of soils, using the contamination testing results.

1.4 Scope of Report

The report is presented as a description of the procedures employed and the data obtained. This is followed by a thorough description of the ground and groundwater conditions, together with an assessment of the ground profile. The final part of the report comprises analysis, recommendations and conclusions, which are provided in two separate parts: geotechnical and contamination.



2 THE SITE

2.1 Site Location

The site is located at land south of Polywell, Appledore, Bideford, Devon, see Appendix D (Dwg. Nos. 19342/01 and 19342/AP). The British National Grid Reference of the site is 245861, 130717 and the nearest postcode is EX39 1SG.

The site is located within a mixed rural and residential area, within the western extents of the village of Appledore, which is located approximately 2km to the northeast of the town of Westward Ho!. The site is situated upon a hillside which slopes steeply down towards the Taw/ Torridge Estuary, approximately 30m to the west.

Access to the site is gained via Torridge Road, to the west.

2.2 Site Description

The site is roughly rectangular in shape, measuring approximately 75m (north-south) by 60m (east-west) (~0.5 hectares), and slopes down moderately towards the west. Site levels step down by approximately 1m along the western site boundary, towards Torridge Road.

The site comprises a vacant field, which is understood to have been used historically for agricultural purposes. The field comprises rough grass at the surface.

An old water tank was observed within the north of the site and an associated water drainage pipe (flowing) was observed adjacent to the tank, which appeared to be coming from an adjacent property to the north.

It is understood that a foul drainage pipe passes through the western part of the site, trending approximately northeast to southwest (i.e. parallel to Torridge Road), at a depth of approximately 3m. Areas of ground settlement (up to approximately 0.5m) were observed at the surface within the area of the mapped pipe.

The site is bordered to the north by residential properties along Polywell (road), to the east and south by similar agricultural fields, and to the west by Torridge Road, before a narrow field. Beyond the narrow field to the west of the site, a cliff-face is present, with ground levels falling by approximately 5m down to the Taw-Torridge Estuary.

Photographs of the site are presented in Appendix B of this report.



3 DESK STUDY

3.1 Previous Phase 1 Report

A Phase 1 Desk Study report, has been produced by Geo Consulting Engineering Ltd in February 2017 (report ref: GCE00752/R1). The reader is referred to this report for further information, though, for clarity, the salient points are provided below.

The report referred to three proposed developments zones (Zones 1 to 3), with Zone 1 relating to the current development site boundary.

The review of geological mapping indicated the site to be underlain by the Carboniferous Ashton Mudstone Member and Crackington Formation (undifferentiated), comprising mudstones and siltstones.

No superficial deposits were found to be mapped beneath the site, although a surficial depth of Head was anticipated, overlying the bedrock geology.

The review of historical Ordnance Survey mapping indicated the site to have been used for agricultural purposes since first edition mapping, dated 1887.

Potential on-site sources of contamination were considered to include agricultural chemicals (e.g. pesticides/ herbicides) and natural metals/ metalloids from mineralisation processes. Potential off-site contamination sources were considered to include a historical ceramic business, 69m to the northeast, and a lime kiln, 80m to the north.

The report found that no radon protective measures are required in the construction of new properties and extensions.

As part of the geotechnical risk assessment, the following hazards were identified:

- volume change potential of the near surface soils;
- variable depth to competent bearing stratum;
- sulphate content of near surface soils;
- bedrock at shallow depth; and
- buried infrastructure/ underground services.

Geo Consulting Engineering Ltd recommended that further intrusive investigation be undertaken to address the identified geotechnical and contamination risks. It was recommended that trial pitting be undertaken, including soil contamination and geotechnical laboratory testing.

3.2 Additional Geological Information

Whilst not mentioned within the previous Phase 1 Report undertaken by Geo Consulting Engineering Ltd, according to the accompanying geological memoir for Sheet 292, a thin mantle of Glacial deposits are mapped within the region, associated with an ice sheet advancing southwards across the Irish Sea, between 100,000 to 200,000 years ago.



4 FIELDWORK

4.1 General

All fieldwork was undertaken on 06 August 2019. The siting and setting out of all the exploratory holes was the responsibility of Ruddlesden geotechnical, who also determined the extent of testing and sampling.

The exploratory holes were located on-site using a hand-held GPS device, typically accurate to 4m.

All fieldwork was undertaken in general accordance with the principles outlined in BS 5930 (2015): Code of Practice for Ground Investigations, BS 10175 (2017): Investigation of Potentially Contaminated Sites – Code of Practice and Eurocode 7 (2007): Part 2 Ground Investigation and Testing.

4.2 Sampling and Analysis Plan

In order to confirm the above conceptual site models, an intrusive ground investigation was undertaken.

Based on the recommendations within the previous Phase 1 report (Geo Consulting Ltd), trial pits were undertaken at the site. The trial pits were located so as to provide a reasonable spread of information and an accurate representation of subsurface ground conditions.

In-situ Dynamic Cone Penetrometer (DCP) testing was undertaken to provide an indication of California Bearing Ratio (CBR) value for use in road pavement design.

Atterberg limits testing was undertaken to determine the volume change potential of the soil for foundation design. Soil samples were also scheduled for a suite of chemical tests in accordance with BRE SD1, to determine concrete class requirements. Samples were taken for geotechnical testing from four different locations, at different depths, from different strata, where applicable.

Representative samples were taken and tested for general inorganics, heavy metals/ metalloids, speciated polyaromatic hydrocarbons (PAH), total petroleum hydrocarbons (TPH), total phenols and asbestos, which provides a broad and general range of contaminants that may be present. Where detectable levels of TPH were recorded, speciated TPH and monoaromatics testing was undertaken, in line with current UK best practice (Environment Agency (2005): The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils).

In order to determine the presence of pesticides and herbicides, five soil samples were also tested for a broad range of semi-volatile organic compounds (SVOCs), which provides an indication of whether these contaminants are potentially present.

Samples were selected for contamination testing from seven locations, from a range of depths within the near surface deposits, as, in accordance with the CLEA model, contamination is assumed to be within the near surface deposits for most exposure pathways.

Samples were selected for testing to provide an accurate representation of ground conditions encountered.



4.3 Trial Pits

Eight trial pits were excavated to depths of between 2.50m and 3.20m using a JCB 3CX (seven-tonne wheeled excavator).

Samples and observations were made from inside the pit, where safe to do so, from the surface and from samples recovered from the excavator bucket. The supervising geologist provided a detailed description of the ground conditions, groundwater and stability and also obtained samples at representative locations, which were placed into suitable containers. The trial pits were not shored.

In-situ shear vane testing was undertaken within suitable cohesive soils to obtain an estimate of undrained shear strength

Details of ground and groundwater conditions encountered can be found on the trial pit logs (Appendix A) and photographs (Appendix B). The trial pit locations are shown on the exploratory hole location plan (Dwg. No. 19342/02, Appendix D).

4.4 In-Situ CBR Testing (TRL DCP Method)

In-situ Dynamic Cone Penetrometer (DCP) testing was undertaken at four locations along the line of the proposed access road, as shown on the exploratory hole location plan (Dwg. No. 19342/02, Appendix D).

The Transport Research Laboratory (TRL) DCP uses an 8kg hammer dropping through a height of 575mm and a 60° cone having a maximum diameter of 20mm. The penetration and number of blows are recorded up to a maximum depth of 1.00m BGL. The penetration rate is recorded as the cone is driven into the subgrade and is used to calculate the strength of the material (CBR value) through which the cone is passing. A change in penetration rate indicates a change in strength between materials, thus allowing layers to be identified and the thickness and strength of each to be determined.



5 LABORATORY TESTING

5.1 General

All laboratory testing was scheduled by Ruddlesden geotechnical and the results are presented in Appendix C of this report. Unless stated otherwise, the laboratory testing was UKAS accredited.

5.2 Geotechnical Testing

The programme of laboratory testing was carried out in accordance with BS 1377 (1990): Methods of Test for Soils for Civil Engineering Purposes.

The following tests were carried out on four samples:

- water content;
- Atterberg limits;
- percentage passing 425µm sieve; and
- BRE SD1 Suite.

5.3 Contamination Testing

In order to test the conceptual site model (see previous Phase 1 report), seven soil samples were tested for the following suites of tests:

Asbestos

Presence & identification.

General Inorganics

pH, soluble sulphate, organic matter.

Heavy Metals/ Metalloids

Arsenic, boron, cadmium, chromium (VI), chromium (total), copper, lead, mercury, nickel, selenium, zinc.

Speciated Polyaromatic Hydrocarbons (PAH)

Acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h) anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, pyrene.

Total Phenols

Total Phenols (monohydric).

Petroleum Hydrocarbons

Total Petroleum Hydrocarbons (TPH).



Where detectable levels of TPH were recorded, the following analysis was undertaken:

Speciated Total Petroleum Hydrocarbons (TPH)

TPH aliphatic >C5-C6; TPH aliphatic >C6-C8; TPH aliphatic >C8-C10; TPH aliphatic >C10-C12; TPH aliphatic >C12-C16; TPH aliphatic >C16-C21; TPH aliphatic >C21-C35; TPH aromatic >C5-C7; TPH aromatic >C7-C8; TPH aromatic >C8-C10; TPH aromatic >C10-C12; TPH aromatic >C12-C16; TPH aromatic >C16-C21; TPH aromatic >C21-C35.

Pesticides and Herbicides

In order to determine the presence of pesticides and herbicides, five soil samples were also tested for a broad range of semi-volatile organic compounds (SVOCs), which provides an indication of whether these contaminants are potentially present. The results of this testing are then used by the laboratory and matched with tentatively identified compounds (TICs), if present.

Waste Acceptance Criteria (WAC) Analysis

Two soil samples were also tested for Waste Acceptance Criteria (WAC) analysis, to provide information for off-site soil disposal purposes.



6 RESULTS OF THE INVESTIGATION

6.1 General

The following sections provide a summary of ground conditions encountered, groundwater and laboratory testing. Further details are provided in the appendices of this report.

The results of this investigation broadly concur with the predicted conceptual site model.

6.2 Ground Conditions Encountered

6.2.1 Topsoil

Brown sandy gravelly silt was typically encountered to depths of between 0.20m and 0.60m below existing ground levels.

6.2.2 Natural Geology

Glacial deposits

Beneath the topsoil, firm, firm to stiff or stiff yellowish/ orangish and greyish brown, variably sandy, gravelly and silty clay, with localised cobbles, was encountered to depths of between 1.40m and 2.20m.

The surficial clay soils were underlain by (loose to medium dense) or (medium dense), locally (loose), brown, orangish brown and greyish brown gravelly clayey/ silty sand, or sandy clayey/ silty gravel, with occasional cobbles and localised pockets of firm clay, to the base of most of the trial pits, to depths of between 2.80m and 3.20m.

Some difficult excavation was encountered within the gravel and sand deposits encountered, due to the presence of cobbles.

Within TP03 (northeast corner of the site), (medium dense) becoming (very dense) sandy gravel, with occasional pockets of firm clay, was encountered to the base of the trial pit, to a depth of 2.50m (terminated due to difficult excavation).

Beneath the sand/ gravel deposits within TP04 and TP05, TP07 (centre and east of the site), (loose), locally (very loose), orangish brown clayey sand was encountered, from depths as shallow as 1.90m, to the base of the trial pits, to depths of between 3.00m and 3.50m.

Estimates of undrained shear strength obtained from in-situ shear vane testing at a depth of 1.00m, within the clay Glacial deposits, typically ranged between 80kN/m² and 120kN/m².

The density of the granular deposits was estimated from a visual assessment only, i.e. ease of excavation and stability of trial pit sides.

6.3 Groundwater

No groundwater was encountered in any of the trial pits during the investigation, although within TP04, TP05 and TP07, the soils were recorded to be damp at depths below 2.50m.



6.4 In-Situ CBR Testing (TRL DCP Method)

The results of the in-situ Dynamic Cone Penetrometer (DCP) testing are presented in Appendix A of this report.

From the DCP testing, estimated CBR values ranging from 3% to 18% have been obtained.

6.5 Geotechnical Laboratory Testing

All the geotechnical laboratory testing results are presented in Appendix C of this report. The results are summarised in the table below:

Table 6.1: Summary of Geotechnical Laboratory Testing Results

	TP01 2.00m	TP02 3.00m	TP04 2.50m	TP07 1.00m
Strata Type	CLAY	CLAY	SAND	CLAY
Geological Formation	Glacial deposits	Glacial deposits	Glacial deposits	Glacial deposits
Water Content (%)	12	16	11	26
Liquid Limit (%)	35	35	25	51
Plastic Limit (%)	20	20	NP	27
Plasticity Index (%)	15	15	-	24
% Passing 425µm Sieve	71	80	97	98
Modified Plasticity Index (%)	11	12	0	24
Volume Change Potential	Low	Low	Non-shrinkable	Medium
Plasticity	Intermediate	Intermediate	Low	High
pH Value	8.0	8.0	7.9	8.0
Soluble Sulphate Content (mg/kg)	96.0	14.1	10.5	15.0

6.6 Contamination Laboratory Testing

All the laboratory testing results, together with the Generic Assessment Criteria to which they have been compared, are presented in Appendix C of this report and the implications are discussed in section 8 of this report.

In summary, no significantly elevated levels of contamination were recorded in any of the seven soil samples tested.



7 GEOTECHNICAL ASSESSMENT

7.1 Proposals

It is understood that the site is to be developed for residential purposes with the construction of ten conventional two-storey brick-built houses, with associated private gardens and a new access road.

The proposed layout is shown on the exploratory hole location plan (Dwg. No. 19342/02), presented in Appendix D of this report.

Given the sloping nature of the site, some cutting and filling is proposed as part of the development works.

The provided cross-section drawing (Dwg. No. 18 127 EXT 02, included in Appendix D), indicates that levels are to be cut by up to 3.5m in the eastern part of the site (proposed Plots 7 to 10), and up to approximately 2.0m in the west (proposed Plots 1 to 6). It is understood that retaining walls will therefore be required to accommodate the proposed changes in levels.

A foul-drainage pipe passes through the western part of the site, trending approximately northeast to southwest (i.e. parallel to Torridge Road), at a depth of approximately 3m. It is assumed that this will be diverted as part of the proposed development, as this is currently situated beneath proposed Plots 1 to 6.

7.2 Ground Profile

The ground conditions encountered have been summarised in section 6 of this report and the individual trial pit logs, photographs and laboratory testing results should be referred to for further details. Within this section of the report the general ground profile is reviewed and the engineering significance of individual layers is discussed.

Made ground was not encountered at the site. However, it is expected that some significant depths of made ground, anticipated to comprise re-worked natural material, may be present locally along the line of the existing foul-drainage pipe, which crosses the far west of the site at a depth of approximately 3m. This material does not provide a suitable founding stratum due to its likely low and variable bearing properties and all foundations must be built below it or foundations designed to span over it.

Beneath a surface covering of topsoil, Glacial deposits were encountered to the maximum depth of the investigation (3.50m below existing site levels).

Beneath the topsoil, these were typically recorded to comprise firm to stiff variably sandy, gravelly and silty clay, to depths of between 1.40m and 2.20m. In-situ shear vane testing of this stratum provided shear strength estimates of between 80kN/m² and 120kN/m², indicating that the clay deposit may provide a suitable founding stratum for the proposed development. However, it is noted that site levels are to be reduced by up to approximately 2.0m in the west of the site and 3.5m in the east, likely resulting in all, or at least most, of this deposit being removed. Therefore, foundations would need to be placed on the underlying granular material, described below.

The clay deposits were underlain by (loose to medium dense) and (medium dense), locally (loose), gravelly clayey/ silty sand, or sandy clayey/ silty gravel, with occasional cobbles, to depths of between 2.80m and 3.20m.

In addition, beneath the surficial sand/ gravel deposits within the centre and east of the site, (loose), locally (very loose), clayey sand was encountered, from depths



as shallow as 1.90m, to the base of the trial pits, to depths of between 3.00m and 3.50m.

However, within TP03, (northeast corner of the site), (medium dense) becoming (very dense) sandy gravel, was encountered to the base of the trial pit, to a depth of 2.50m, and was subsequently terminated due to difficult excavation.

It is noted that, due to the investigation technique (trial pits), no quantitative in-situ strength testing was able to be undertaken within the granular deposits and the strength information provided above is conjectural only.

7.3 Foundations

7.3.1 General

The trial pits recorded Glacial deposits to be present beneath the site, as opposed to bedrock strata of the Ashton Mudstone Member and Crackington Formation, which are recorded to underlie the site on geological mapping.

Given the anticipated variable strength of the Glacial deposits recorded, that no quantitative information is available for the strength of these deposits and that the lowest strength soils were typically encountered in the east of the site at depths of between 1.90m and >3.50m (i.e. at the depths of the proposed foundations within this area of the site), it is not currently possible to provide an allowable bearing capacity for foundation design for the soils encountered.

In order to provide an allowable bearing capacity for use in foundation design, further work, comprising boreholes, is required. Standard Penetration Testing (SPT) should be carried out within the boreholes to provide quantitative strength information for the Glacial deposits encountered during this investigation, so that an allowable bearing capacity can be provided. Further details are provided in section 9 of this report.

Should the soils encountered be found to have insufficient bearing capacity to provide a suitable founding stratum, the boreholes should be used to determine the ground conditions at greater depth beneath the site, to provide information for use in deep (piled) foundation design.

The geotechnical laboratory testing undertaken indicates the clay strata within the Glacial deposits to be of low or medium volume change potential in accordance with NHBC Standards, Chapter 4.2, and the granular strata to be non-shrinkable.

Careful consideration should be made once foundation depths are known as to the potential for over-stressing of the underlying granular materials. Ruddlesden geotechnical should be contacted for further advice.

7.3.2 Other Considerations

Consideration will need to be given to the existing ~3m-deep foul-drainage pipe located beneath proposed Plots 1 to 6. Deep made ground is likely to be present along the existing route and will therefore impact on foundation design for these plots. Foundations may need deepening beneath, or designing to span across, these deposits.

7.3.3 Retaining Walls

The provided cross-section drawing (Dwg. No. 18 127 EXT 02, included in Appendix D), indicates that that levels are to be cut significantly, by up to approximately



3.5m. It is therefore envisaged that retaining walls will be required to accommodate the proposed changes in levels.

Given the variable ground conditions encountered during this investigation, further works are required to enable retaining wall parameters to be provided (see section 9).

7.3.4 Ground Floor Slabs

Where NHBC building near trees requirements mean that foundation depths are greater than 1.50m or where soft/ loose soil or non-engineered made ground is present at formation depth, fully suspended ground floor slabs are required.

If NHBC building near trees requirements mean that foundation depths are less than 1.50m, and competent natural soil or engineered fill is present at formation depth, and provided construction is undertaken when the soils are not seasonally desiccated, i.e. in winter/ spring, ground bearing floor slabs may be adopted.

All ground floor slabs should be designed in accordance with NHBC standards.

Should piled foundations be necessary, suspended ground floor slabs would be required for the affected plots.

7.3.5 Sulphate and pH Aggressivity

As part of the investigation, representative soil samples were scheduled for a suite of chemical tests in accordance with BRE SD1, to determine the concrete class requirements at the site.

In summary, pH values of between 7.9 and 8.1, and soluble sulphate concentrations of between 7.8mg/kg and 96.0mg/kg, were recorded within the Glacial deposits tested.

In order to determine whether pyrite is likely to be present, the results of the testing have been used to calculate the amount of oxidisable sulphides. In summary, the results indicate that pyrite is unlikely to be present within the soil samples tested.

The results of the pH and soluble sulphate tests have therefore been compared to Table C1 of BRE Special Digest 1: Concrete in Aggressive Ground. This comparison indicates the Design Sulphate Class for the site to be DS-1. As the site is considered to be greenfield, groundwater can be treated as static and pH values greater than 2.5 were recorded, Aggressive Chemical Environment for Concrete (ACEC) class AC-1s is required for all buried concrete at this site, i.e. no special precautions.

This classification should be confirmed following the recommended further works (see section 9). This should include testing of soils of the Ashton Mudstone Member and Crackington Formation (if present within influencing distance of the proposed foundations), as this deposit was not encountered during this investigation.

7.3.6 Radon Protective Measures

The previous Phase 1 Desk Study Report, undertaken by Geo Consulting Engineering Ltd in February 2017 (report ref: GCE00752/R1), found that no radon protective measures are required at this site.

7.4 Groundwater and Excavations



No groundwater was encountered in any of the trial pits during the investigation, although within TP04, TP05 and TP07, the soils were recorded to be damp at depths below 2.50m. Whilst no de-watering of excavations is likely to be required for shallow excavations (i.e. <2.5m), given the depths of cutting proposed (up to 3.50m), it is recommended that groundwater monitoring be undertaken, to determine the groundwater levels at depth beneath the site. This information would be used to inform both temporary works and permanent retaining wall design.

It is noted that groundwater levels fluctuate according to the season and from year to year. In the weeks prior to the investigation the weather had been average for the time of year. Therefore, higher groundwater levels may be encountered during periods of wetter weather.

Some collapse of trial pits was recorded during the investigation. Therefore, some shoring of temporary excavations may be required.

No problems with excavatability are foreseen. However, it is noted that some difficult excavation was encountered within the sand and gravel deposits encountered, due to the presence of cobbles. In addition, TP03 was terminated due to difficult excavation at a depth of 2.50m, due to the dense nature of the gravel/cobble deposits at this location. Therefore, heavier plant may be required locally to achieve the required depths.

7.5 Roads

In-situ CBR testing (TRL DCP method) produced estimated CBR values ranging from 6% to 18% from the beneath the topsoil to a maximum depth of 0.94m.

The TRL DCP can sometimes produce artificially high CBR values where contact is made with granular material within the test substrate. The laboratory testing results showed the near surface clays to be of low to high plasticity. With reference to the Equilibrium Subgrade CBR Estimation Table within Highways Agency Interim Advice Note IAN 73/06, the laboratory testing results and anticipated long-term groundwater levels, it is recommended that a CBR value of 3% be used for road pavement design at this site for the natural soils.

This design CBR value should be confirmed prior to construction by additional in-situ CBR testing at road formation level, particularly within areas where significant cutting is proposed. If highways are to be adopted, this is likely to be a requirement of the adopting authority.

Based on the exploratory hole logs and laboratory testing result, it is considered that the soils are frost-susceptible.



8 CONTAMINATION ASSESSMENT

8.1 General

It is understood that the site is to be developed for residential purposes with the construction of ten conventional two-storey brick-built houses, with associated private gardens and a new access road.

The proposed layout is shown on the exploratory hole location plan (Dwg. No. 19342/02), presented in Appendix D of this report.

Given the moderately sloping nature of the site, some cutting and filling is proposed as part of the proposed development.

The contamination assessment has been carried out in accordance with the latest guidance using a source-pathway-receptor analysis method, to assess whether or not the recorded levels of contamination are safe and suitable for use and to determine the extent of further assessment or remedial measures that might be necessary. In particular, reference has been made to the following documents:

- Defra (2014): SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. Final Project Report;
- Defra (2014): SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. Policy Companion Document;
- Defra & Environment Agency (2004): CLR 11: Model Procedures for the Management of Land Contamination;
- Defra (2012): Environmental Protection Act 1990: Part 2A: Contaminated Land Statutory Guidance;
- Department for Communities and Local Government (2012): National Planning Policy Framework;
- Environment Agency (2005): The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils;
- Environment Agency (2006): Remedial Targets Methodology: Hydrogeological Risk Assessment for Land Contamination;
- Environment Agency (2009): Human Health Toxicological Assessment of Contaminants in Soil (SR2);
- Environment Agency (2009): Updated Technical Background to the CLEA Model (SR3); and
- LQM/ CIEH (2015): The LQM/ CIEH S4ULs for Human Health Risk Assessment. Publication No. S4UL3408.

8.2 Human Health Risk Assessment

8.2.1 Generic Assessment Criteria

A Generic Qualitative Risk Assessment (GQRA) has been undertaken to assess the level of risk posed to human health by soil contamination.

The results of the contamination laboratory testing have been compared to Generic Assessment Criteria (GAC) to aid the evaluation of the extent of contamination at the site. If any of the GAC are exceeded, this may be indicative of an unacceptable



risk to the health of site users and that further investigation and/ or remediation is required.

The proposed end use of residential with home grown produce land use has been used in this risk assessment.

Suitable 4 Use Levels (S4ULs), published by Land Quality Management (LQM) and the Chartered Institute of Environmental Health (CIEH), have been used for comparison. The S4ULs have been derived in accordance with UK legislation and Environment Agency guidance using a modified version of the Environment Agency CLEA software. They are fully based on the concept of minimal or tolerable risk as described in SR2 (Environment Agency (2009): Human Health Toxicological Assessment of Contaminants in Soil). The S4ULs have adopted Defra's (2014) revised exposure assumptions and so are considered to be more applicable and up-to-date than the Soil Guideline Values (SGVs), published by Environment Agency (2009) and also derived from the CLEA model. The S4ULs are therefore considered to be applicable under the planning regime in demonstrating whether a site is safe and suitable for use.

In the absence of any other authoritative guidance for lead, the Category 4 Screening Levels (C4SL) for lead, published by Contaminated Land Applications in Real Environments (CL:AIRE), and supported by Defra, has been used for comparison. C4SLs are generic screening levels that are more pragmatic but still strongly precautionary compared to the existing SGVs and other similarly derived numbers. The C4SLs are cautious estimates of contaminant concentrations in soil that are still considered to present an acceptable level of risk, within the context of Part 2A, by combining latest information on human health toxicology, exposure assessment and normal ambient levels of contaminants in the environment.

8.2.2 Comparison of Testing Results to GAC

Of the seven soil samples tested, none of the Generic Assessment Criteria were exceeded for a residential with home grown produce land use.

It is noted that the comparison of total petroleum hydrocarbons (TPH) to the screening value of 10mg/kg provides an initial indication of TPH contamination only. Total petroleum hydrocarbons are made of many constituent organic chemicals. The more detailed, speciated TPH analysis, which divided the TPH into individual fractions, shows the recorded levels of TPH not to be potentially harmful to human health given the proposed end use.

The SVOC testing undertaken, to identify the presence of pesticides and herbicides, did not record any tentatively identified compounds (TICs) to be present, with levels of SVOCs all below the respective laboratory limits of detection.

No potential asbestos containing materials (ACM) were recorded in any of the samples tested at the contamination laboratory.

8.3 Controlled Waters Risk Assessment

In order for land affected by contamination to cause harm, there must be a source of contamination, a receptor that can be harmed and a pathway by which the receptor can be exposed to the contamination.

As no significantly elevated levels of contamination were recorded (i.e. there is no source) and no groundwater was encountered (i.e. there is no pathway), it is considered that the levels of contamination recorded at this site are unlikely to cause significant pollution to the water environment.



8.4 Ground Gas Assessment

The previous Phase 1 Desk Study Report, undertaken by Geo Consulting Engineering Ltd in February 2017 (report ref: GCE00752/R1), found that no radon protective measures are required at this site.

In order to assess the risks posed by ground gas, the principles outlined in BS 8485 (2015): Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings and NHBC Report No. 10627-RO1 (2007): Guidance on Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present have been followed.

The breakdown of organic material in made ground can produce ground gas, though it may also be produced by other, natural, sources (e.g. coal, peat). The principal components of ground gas are methane (potentially explosive) and carbon dioxide (potential asphyxiant).

There are no recorded landfill sites within 250m of the site and no made ground was encountered.

Therefore, ground gas protection measures are not considered to be required at this site.

However, it is noted that, should any filling activities be undertaken to facilitate the proposed development, all surface vegetation and topsoil should be removed prior to placement to avoid the creation of new potential ground gas sources.

From an assessment of the ground conditions encountered and laboratory testing results, significant levels of volatile organic compounds (VOCs) are unlikely to be present. A hydrocarbon vapour resistant membrane is therefore not considered to be necessary.

8.5 Revised Conceptual Site Model

The previous Phase 1 Desk Study report considered that some potential contamination sources were present at the site, primarily associated with agricultural chemicals (e.g. pesticides/ herbicides) and natural metals/ metalloids from mineralisation processes.

However, the results of this investigation have indicated that the levels of contamination present are unlikely to be harmful to human health given the proposed end use and are unlikely to cause significant pollution to the water environment.

Therefore, there is no source-pathway-receptor linkage.

8.6 Discussion and Recommendations

The contamination risk assessments indicate that, due to the absence of a contamination source, the levels of contamination recorded in this investigation are not potentially harmful to human health given the proposed end use or to the water environment. Therefore, no further action or specific remedial measures are required for the proposed end use.

However, it is likely that made ground is present within the area of the existing foul drainage pipe. This material should be sampled and tested for contamination purposes, as, should it comprise material other than reworked locally sourced soils, it could foreseeably contain different levels of contaminants to those recorded within this investigation.



In addition, if any unexpected discoveries are encountered during construction activities (i.e. anything substantially different from the findings of this investigation), Ruddlesden geotechnical should be contacted so that appropriate recommendations may be provided.

Also, in line with general good practice, comprehensive and accurate site records should be kept, including details of where soil has been moved to or from site and tip receipts.

If contamination aspects are a planning condition, these recommendations are subject to the approval of the local authority.

8.7 Water Pipe Selection Site Assessment

A site assessment has been undertaken in accordance with the UKWIR document 'Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites'. Based on the desk study, exploratory hole logs and laboratory testing information, upgraded water supply pipes are not considered to be necessary at this site.

However, as previously stated, additional testing of made ground within the area of the existing foul drainage pipe should undertaken for contamination purposes, as this material could foreseeably contain elevated levels of contamination not identified during this investigation.

8.8 Off-Site Disposal of Excavated Soils

8.8.1 Basic Waste Classification

HazWasteOnline has been used to provide a basic characterisation of the soils at the site, using the contamination laboratory test data obtained from this investigation. The salient information is provided in the table below and a copy of the contamination testing results and the waste classification report are presented within Appendix C.

As part of this assessment, where the contamination testing results were recorded below the laboratory limit of detection (e.g. SVOCs), these results have not been entered into the HazWasteOnline software.

Table 8.1: Waste Classification Summary

Sample No.	Sample Depth (m)	Strata	Asbestos Presence/Quantification	Classification	European Waste Catalogue (EWC) Code
TP01	0.05	Topsoil	None Detected	Non-Hazardous	17 05 04
TP02	0.50	Topsoil	None Detected	Non-Hazardous	17 05 04
TP02	1.00	Glacial deposits	None Detected	Non-Hazardous	17 05 04
TP03	0.10	Topsoil	None Detected	Non-Hazardous	17 05 04
TP05	2.20	Glacial deposits	None Detected	Non-Hazardous	17 05 04
TP06	0.10	Topsoil	None Detected	Non-Hazardous	17 05 04
TP07	0.70	Glacial deposits	None Detected	Non-Hazardous	17 05 04

Table 8.1 Notes

Green Cells = Non-Hazardous Waste Classification



8.8.2 Waste Acceptance Criteria (WAC) Testing

Waste Acceptance Criteria (WAC) analysis was undertaken on two of the soil samples obtained. The results have been screened against the respective landfill waste acceptance criteria limits (transposed from Council Decision annex 2003/33/EC) and a summary is provided in Table 8.2, below:

Table 8.2: Summary of Waste Acceptance Criteria (WAC) Testing

Sample No.	Sample Depth (m)	Strata	Landfill Waste Acceptance Criteria	Determinands Exceeded
TP02	1.00	Glacial deposits	Inert Waste Landfill	None
TP05	2.20	Glacial deposits	Inert Waste Landfill	None

Table 8.2 Notes

Green Cells = Inert Landfill

8.8.3 Discussion

The results from HazWasteOnline indicate that all of the soil samples tested from both the topsoil and underlying natural soils (Glacial deposits) to be classified as Non-Hazardous Waste and 17 05 04 (soil and stones other than those mentioned in 17 05 03) in the European Waste Catalogue.

Asbestos was not detected to be present within any of the seven soil samples tested. It is therefore considered that the non-hazardous waste classification remains appropriate.

As shown within Table 8.2, both of the WAC testing results indicate that the natural Glacial soils are suitable to disposed of at an inert waste landfill.

It is recommended that these results be passed to a tip operator in order to determine the above waste classification.

Given the volumes of soil requiring disposal, further chemical testing is likely to be required by the tip operator at a later date, to confirm the above classifications and, although currently considered unlikely to change, the above recommendations should be treated as preliminary. This further testing would likely be undertaken once the soils have been excavated and stockpiled for off-site disposal.

Should the made ground anticipated to be present within the area of the existing foul drainage pipe require depositing off-site, this should be sampled and tested for contamination and assessment purposes, as this material could foreseeably contain elevated levels of contamination not identified during this investigation.



9 FURTHER WORKS

In order to provide an allowable bearing capacity for use in foundation design, further work, comprising percussive boreholes, is required. It is considered that windowless sample boreholes are likely to provide the most economical option for assessment of the ground conditions, as they allow Standard Penetration Testing (SPT) to be carried out to provide quantitative strength information for the Glacial deposits encountered during this investigation, so that an allowable bearing capacity can be provided.

Should the soils encountered be found to have insufficient bearing capacity to provide a suitable founding stratum, the boreholes should be used to determine the ground conditions at greater depth beneath the site, to provide preliminary information for use in piled foundation design.

Should information be required for detailed pile design, additional combined percussive/ rotary boreholes may also be required.

Should piled foundations be required, additional sulphate testing and assessment should be undertaken to provide information to inform concrete class design.

Given the depths of cutting proposed (up to approximately 3.50m), and that retaining walls are proposed to support the change in levels, it is recommended that groundwater monitoring wells be installed as part of the borehole investigation and subsequent monitoring be undertaken, to determine the groundwater levels beneath the site. This information would provide information for use in temporary works and permanent retaining wall design.

Additional testing and material classification for off-site soil disposal purposes may be required by the tip operator. If required, this is likely to be undertaken following excavation, during stockpiling of the material.



10 REFERENCES

- British Standards Institution (1990): BS 1377 Methods of Test for Soils for Civil Engineering Purposes.
- British Standards Institution (2011): BS 10175: Investigation of Potentially Contaminated Sites – Code of Practice.
- British Standards Institution (2015): BS 5930: Code of Practice for Ground Investigations.
- British Standards Institution (2015): BS 8485: Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings.
- Building Research Establishment (2005): Special Digest 1: Concrete in Aggressive Ground.
- Building Research Establishment (2015): Report BR 211: Radon: Guidance on Protective Measures for New Buildings.
- CIRIA Report 143: The Standard Penetration Test (SPT): Methods and Use (2005).
- Defra & Environment Agency (2004): CLR 11: Model Procedures for the Management of Land Contamination.
- Defra (2012): Environmental Protection Act 1990: Part 2A: Contaminated Land Statutory Guidance.
- Defra (2014): SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. Final Project Report.
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- Environment Agency (2009): Human Health Toxicological Assessment of Contaminants in Soil (SR2).
- Environment Agency (2009): Updated Technical background to the CLEA Model (SR3).
- Eurocode 7 (2007): Part 2 Ground Investigation and Testing.
- Highways Agency (2006): Design Guidance for Road Pavement Foundations (Draft HD 25). Interim Advice Note IAN 73/06.
- LQM/ CIEH (2015): The LQM/ CIEH S4ULs for Human Health Risk Assessment. Publication No. S4UL3408.
- NHBC (2019): NHBC Standards.
- NHBC (2007): Report No 10627-RO1: Guidance on Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present.
- UKWIR (2011): Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites.



11 LIMITATIONS

1. The comments given in this report assume that ground conditions do not vary beyond the range revealed by the investigation. There may, however, be conditions at or adjacent to the site that have not been disclosed by the investigation and which, therefore, have not been considered in this report. Accordingly, a careful watch should be maintained during any future groundworks and the recommendations of this report reviewed as necessary.
2. All comments and recommendations relating to groundwater are based on conditions encountered at the time of investigation. It should be noted that groundwater levels might fluctuate according to the season and from year to year. This may have implications on other recommendations, including foundations and excavations. It should also be noted that observations of groundwater flowing into exploratory holes, whilst useful for giving recommendations on the practicalities of construction, may not accurately reflect the long-term groundwater pressures. The latter, which may be relevant for the assessment of slope stability or the design of geotechnical structures such as retaining walls, for example, can only be fully understood through the installation of groundwater monitoring instruments.
3. All third-party data referred to in the report, e.g. environmental searches and laboratory testing, has been obtained in good faith from bona-fide sources. Ruddlesden geotechnical Ltd cannot be held liable for any incorrect information supplied to us.
4. The location of exploratory holes was limited by the presence of underground services in the west of the site.
5. Proposed foundation loads were not provided at the time of writing this report and it has therefore been assumed that loadings akin to standard lightweight residential dwellings up to two storeys in height are proposed.
6. The presence of asbestos containing materials (ACM) within buildings and invasive plants are outside the scope of this report and should be addressed by respective suitably qualified experts, if necessary.
7. The infiltration rates provided within this report are applicable to the locations and depths tested only.



12 TERMS AND CONDITIONS

1. The copyright of this report is owned by Ruddlesden geotechnical Ltd. With the exception of the named client, who may copy and distribute the report for purposes directly relating to its commission, this report may not be reproduced, published or adapted without written consent of Ruddlesden geotechnical Ltd.
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3. New information and updated practices and legislation may necessitate an alteration to this report in whole or in part after its submission. Therefore, with any change in circumstances, including changes to site conditions, this report should be referred to Ruddlesden geotechnical Ltd for reassessment and, if necessary, reappraisal.
4. Whilst confident in the findings of this report, the recommendations may not necessarily be accepted by other authorities without question. It is advisable that, where appropriate, the report be submitted to the relevant statutory authorities and approval obtained before detailed design, site works or other irrevocable action is undertaken.
5. All samples recovered during this investigation shall be disposed of upon the expiry of 28 days after the issue date of this report, unless agreed otherwise in writing.



APPENDICES



APPENDIX A

EXPLORATORY HOLE RECORDS AND FIELD DATA



Key to Trial Pit and Borehole Logs (Common Symbols)

Strata legend



Made Ground

Topsoil

Clay

Silt

Sand

Gravel

Peat

Composite soil types will be signified by combined symbols, e.g. silty sand



Chalk

Limestone

Coal

Mudstone

Siltstone

Sandstone

Fine grained igneous rock (e.g. basalt)

Medium grained igneous rock (e.g. granite)

Fine grained metamorphic rock (e.g. slate)

Groundwater



Groundwater strike



Standing groundwater level

Installations



Cement seal

Bentonite seal

Filter pack (slotted pipe)

Samples

D	Small disturbed sample
J	Small disturbed sample (amber glass jar)
B	Disturbed bulk sample
U100	Undisturbed sample (100mm diameter)
W	Water sample

Rotary drilling

TCR	Total core recovery (%)
SCR	Solid core recovery (%)
RQD	Rock quality designation (%)
FI	Fracture index (fractures/m)
NI	Non-intact

In-situ testing

SPT	Standard Penetration Test (split spoon sampler)
SPT(C)	Standard Penetration Test (solid cone)
V	Shear vane test
CBR	California Bearing Ratio

SPT results (examples)

30	N-Value (blows recorded for 300mm penetration, following 150mm seating drive)
50/125	50 blows for 125mm penetration

Field Identification and Description of Soils (Based on Table 7 of BS 5930: 2015)

SOIL GROUP	Very coarse soils			Coarse soils						Fine soils					
PRINCIPAL SOIL TYPE	BOULDERS		COBBLES	GRAVEL			SAND			SILT			CLAY		
Particle size (mm)	Large boulder	Boulder	Cobble	Coarse	Medium	Fine	Coarse	Medium	Fine	Coarse	Medium	Fine			
	>630	630-200	200-63	63-20	20-6.3	6.3-2.0	2.0-0.63	0.63-0.2	0.2-0.063	0.063-0.02	0.02-0.0063	0.0063-0.002	<0.002		
Visual identification	Only seen complete in pits or exposures. Difficult to recover whole from boreholes.			Easily visible to naked eye; particle shape can be described; grading can be described.			Visible to naked eye; no cohesion when dry; grading can be described.			Only coarse silt visible with hand lens; exhibits little plasticity and marked dilatancy; slightly granular or silky to the touch; disintegrates in water; lumps dry quickly; possesses cohesion but can be powdered easily between fingers.			Dry lumps can be broken but not powdered between the fingers; dry lumps disintegrate under water but more slowly than silt; smooth to the touch; exhibits plasticity but no dilatancy; sticks to the fingers and dries slowly; shrinks appreciably on drying usually showing cracks.		
Density/ Consistency	No terms defined. Qualitative description of packing by inspection and ease of excavation.			Classification of relative density on the basis of N-value, or field assessment using hand tests may be made. SPT N-values = 0 – 4 = Very loose 4 – 10 = Loose 10 – 30 = Medium dense 30 – 50 = Dense >50 = Very dense						Term	Very soft	Soft	Firm	Stiff	Very stiff
										Field test	Finger easily pushed in up to 25mm. Exudes between fingers.	Fingers pushed in up to 10mm. Moulded by light finger pressure.	Thumb makes impression easily. Cannot be moulded by fingers. Rolls to thread.	Can be indented slightly by thumb. Crumbles in rolling thread. Remoulds.	Can be indented by thumb nail. Cannot be moulded, crumbles.
Discontinuities	Describe spacing of features such as fissures, shears, partings, isolated beds or laminae, desiccation cracks, rootlets, etc. Fissured: breaks into blocks along unpolished discontinuities. Sheared: breaks into blocks along polished discontinuities.					Scale of spacing of discontinuities	Term	very widely	widely	medium	closely	very closely	extremely closely		
							Mean spacing (mm)	>2000	2000-600	600-200	200-60	60-20	<20		
Bedding	Describe thickness of beds in accordance with geological definition. Alternating layers of materials are inter-bedded or inter-laminated and should be described by thickness term if in equal proportions, or by a thickness of and spacing between subordinate layers where unequal.					Scale of bedding thickness	Term	very thickly bedded	thickly bedded	medium bedded	thinly bedded	very thinly bedded	thickly laminated	thinly laminated	
							Mean thickness (mm)	>2000	2000-600	600-200	200-60	60-20	20-6	<6	
Colour	HUE can be preceded by LIGHTNESS and/ or CHROMA Red/ Pink/ Orange/ Yellow/ Cream/ Brown/ Green/ Blue/ White/ Grey/ Black Light/ -/ Dark Reddish/ Pinkish/ Orangish/ Yellowish/ Brownish/ Greenish/ Bluish/ Greyish Colours may be mottled More than 3 colours is multicoloured														
Secondary constituents	For mixtures including very coarse soils see section 33.4.4.2 of BS 5930 (2015).		Terms in coarse soils	slightly (sandy) ^{B)}	(sandy) ^{B)}	very (sandy) ^{B)}	SAND AND GRAVEL		Terms in fine soil	slightly sandy ^{D)}	(sandy) ^{D)}	very (sandy) ^{F)}	Silty CLAY Clayey SILT	Terms used to reflect secondary fine constituents where this is important	
			Proportion secondary ^{A)}	<5%	5-20% ^{C)}	>20% ^{C)}	About 50%		Proportion secondary ^{A)}	<35%	35-65% ^{E)}	>65% ^{E)}			
Mineralogy	Terms can include: glauconitic/ micaceous/ shelly/ organic/ calcareous. For example: slightly (glauconitic)/ (glauconitic)/ very (glauconitic). Carbonate Content: slightly calcareous – weak or sporadic effervescence from HCl/ calcareous – clear but not sustained effervescence from HCl/ highly calcareous – strong, sustained effervescence from HCl. Organic soils contain secondary finely divided or discrete particles of organic matter often with distinctive smell, might oxidise rapidly. For example: slightly organic-grey/ organic-dark grey/ very organic-black.														
Particle shape	Very angular/ Angular/ Sub-angular/ Sub-rounded/ Rounded/ Well-rounded A dominant shape can be described, for example: Cubic/ Flat/ Elongate														
PRINCIPAL SOIL TYPE	LARGE BOULDERS	BOULDERS	COBBLES	GRAVEL			SAND			SILT			CLAY		
Tertiary constituents	Example terms include: shell fragments/ pockets of peat/ gypsum crystals/ pyrite nodules/ calcareous concretions/ flint gravel/ brick fragments/ rootlets/ plastic bags. Qualitative proportions can be given: with rare/ with occasional/ with numerous/ frequent/ abundant. Proportions are defined on a site or material specific basis, or subjectively.														
Geological unit	Name in accordance with published geological maps, memoirs or sheet explanations. For example: River Terrace Deposits/ Glacial Sand And Gravel/ Made Ground/ Crackington Formation/ Weathered Heavitree Breccia Formation/ Meadfoot Group/ Upper Devonian Slates/ Alluvium/ Topsoil/ Laminated Beds/ Bude Formation/ Sherwood Sandstone Group.														

A) Percentage coarse or fine soil type assessed excluding cobbles and boulders.

B) Gravelly or sandy and/ or silty or clayey.

C) Can be described as fine soil depending on mass behaviour.

D) Gravelly and/ or sandy.

E) Can be described as coarse soil depending on mass behaviour.

F) Gravelly or sandy.

TRIAL PIT LOGS

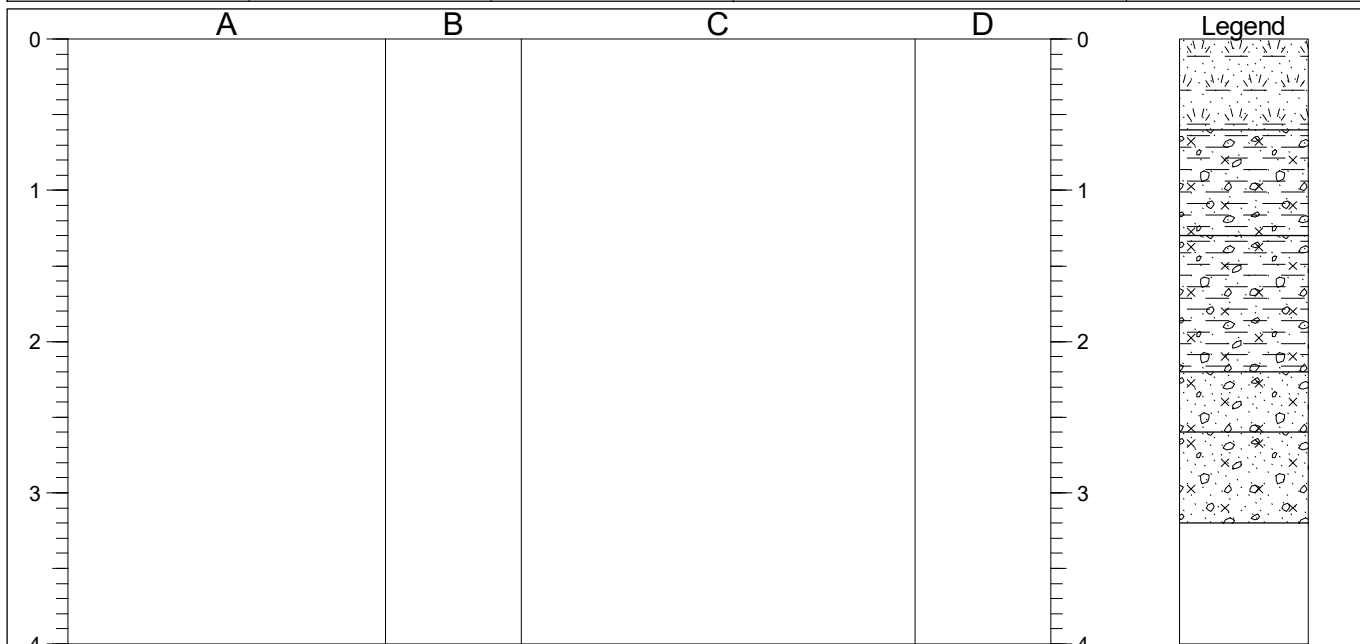




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Telephone: 01392 678082

TRIAL PIT LOG

Project Land South of Polywell, Appledore, Bideford, Devon				TRIAL PIT No TP01
Job No 19342	Date 06-08-19	Ground Level (mAOD)	Co-Ordinates (BNG) E 245821 N 1307004	
Contractor	Method/ Plant JCB 3CX			Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.60		TOPSOIL: Brown slightly gravelly sandy slightly clayey silt.	0.05	J	
0.60-1.30		Firm yellowish brown slightly gravelly sandy silty CLAY. Gravel is fine to coarse angular to subangular sandstone (Glacial Deposits).	1.00	D/ V	80 kPa
1.30-2.20		Firm greyish and yellowish brown slightly sandy gravelly silty CLAY. Gravel is fine to coarse angular to rounded of sandstone, quartz and mudstone (Glacial Deposits).	2.00	D	
2.20-2.60		(Medium dense) orangish and greyish brown gravelly silty SAND with occasional cobbles. Gravel is fine to coarse angular to subangular sandstone. Some difficult excavation locally due to cobbles (Glacial Deposits).	3.00	B	
2.60-3.20		(Loose to medium dense) dark grey gravelly silty SAND. Gravel is fine to coarse angular to rounded of sandstone and mudstone. Occasional cobble of sandstone (Glacial Deposits). 3.00 ...loose and locally orangish brown			

<div>Shoring/Support: None.</div> <div>Stability: Slight collapse.</div> <div>Groundwater: None encountered.</div> <div><p>A diagram showing a rectangular trial pit. The top width is labeled 'A', the bottom width is labeled 'C', the left depth is labeled 'D', and the right depth is labeled 'B'.</p></div>	GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: Chichester Homes Developments Ltd	Logged By CR
--	--	-----------------

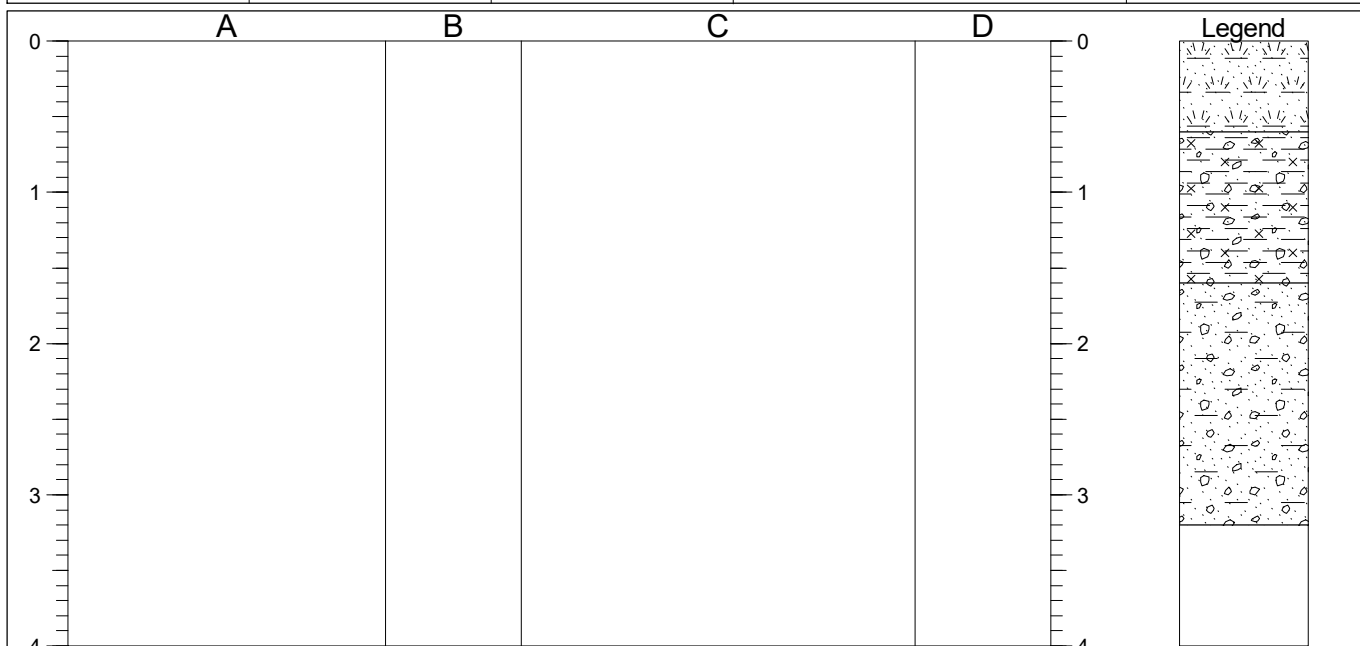
AGS3 UK TP 19342 - LAND SOUTH OF POLYWELL, APPLIEDORE, BIDEFORD.GPJ AGS 3_1.GDT 10/9/19



Ruddlesden geotechnical
The Stables, 65 Langaton Lane
Pinhoe, Exeter EX1 3SP
Telephone: 01392 678082

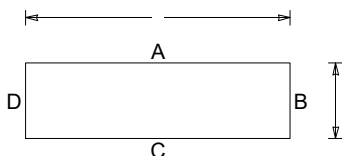
TRIAL PIT LOG

Project Land South of Polywell, Appledore, Bideford, Devon				TRIAL PIT No TP02
Job No 19342	Date 06-08-19	Ground Level (mAOD)	Co-Ordinates (BNG) E 245851 N 130742	
Contractor	Method/ Plant JCB 3CX			Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.60		TOPSOIL: Brown slightly gravelly sandy slightly clayey silt. Occasional ceramic.			
0.60-1.60		Stiff yellowish brown slightly gravelly sandy silty CLAY. Gravel is fine to coarse subangular sandstone (Glacial Deposits).	0.50	J	
			1.00	VANE	120 kPa
1.60-3.20		(Medium dense) orangish brown gravelly SAND with frequent pockets of firm sandy CLAY. Pockets of loose sand also present. Gravel is fine to coarse subangular sandstone (Glacial Deposits). 2.00 - 2.10 ...frequent coarse sandstone fragments 2.50 ...(loose to medium dense)	1.50	D	
			2.50	B	
			3.00	B	

Shoring/Support: None.
Stability: Slight collapse.
Groundwater: None encountered.



GENERAL REMARKS

All dimensions in metres
Scale 1:50

Client:

Chichester Homes Developments Ltd

Logged By CR

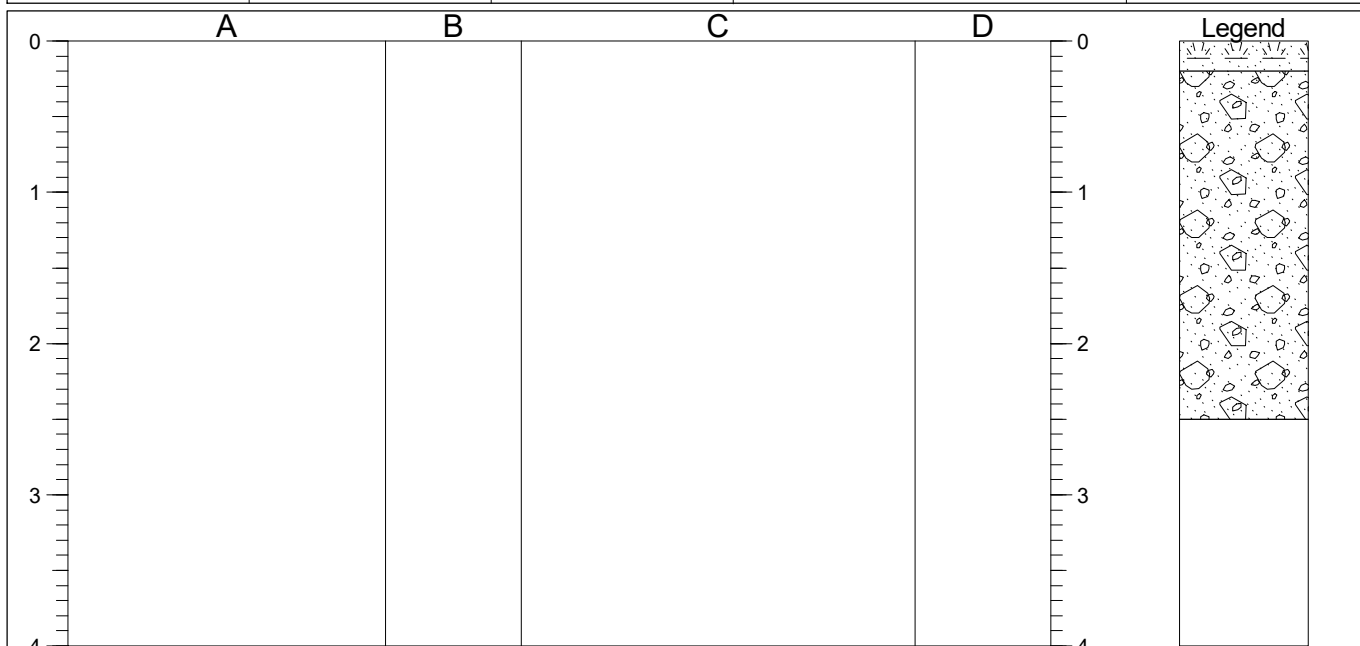
AGS3 UK TP 19342 - LAND SOUTH OF POLYWELL, APPLIEDORE, BIDEFORD.GPJ AGS 3_1.GDT 10/9/19



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The Stables, 65 Langaton Lane
Pinhoe, Exeter EX1 3SP
Telephone: 01392 678082

TRIAL PIT LOG

Project Land South of Polywell, Appledore, Bideford, Devon				TRIAL PIT No TP03
Job No 19342	Date 06-08-19	Ground Level (mAOD)	Co-Ordinates (BNG) E 245909 N 130717	
Contractor	Method/ Plant JCB 3CX			Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		TOPSOIL: Brown sandy gravelly silt. Occasional brick and ceramic.	0.10	J	
0.20-2.50		(Medium dense) light greyish and orangish brown sandy GRAVEL with occasional cobbles. Gravel is fine to coarse angular to subangular sandstone (Glacial Deposits). 0.50 ...(dense) difficult excavation 0.70 ...occasional pockets of stiff grey clay			
			1.00	B	
			2.20	B	
		2.40 ...(very dense)			

Shoring/Support: None. Stability: Stable. Groundwater: None encountered.		GENERAL REMARKS 1. Trial pit terminated at 2.50m due to difficult excavation.	

All dimensions in metres Scale 1:50	Client: Chichester Homes Developments Ltd	Logged By CR
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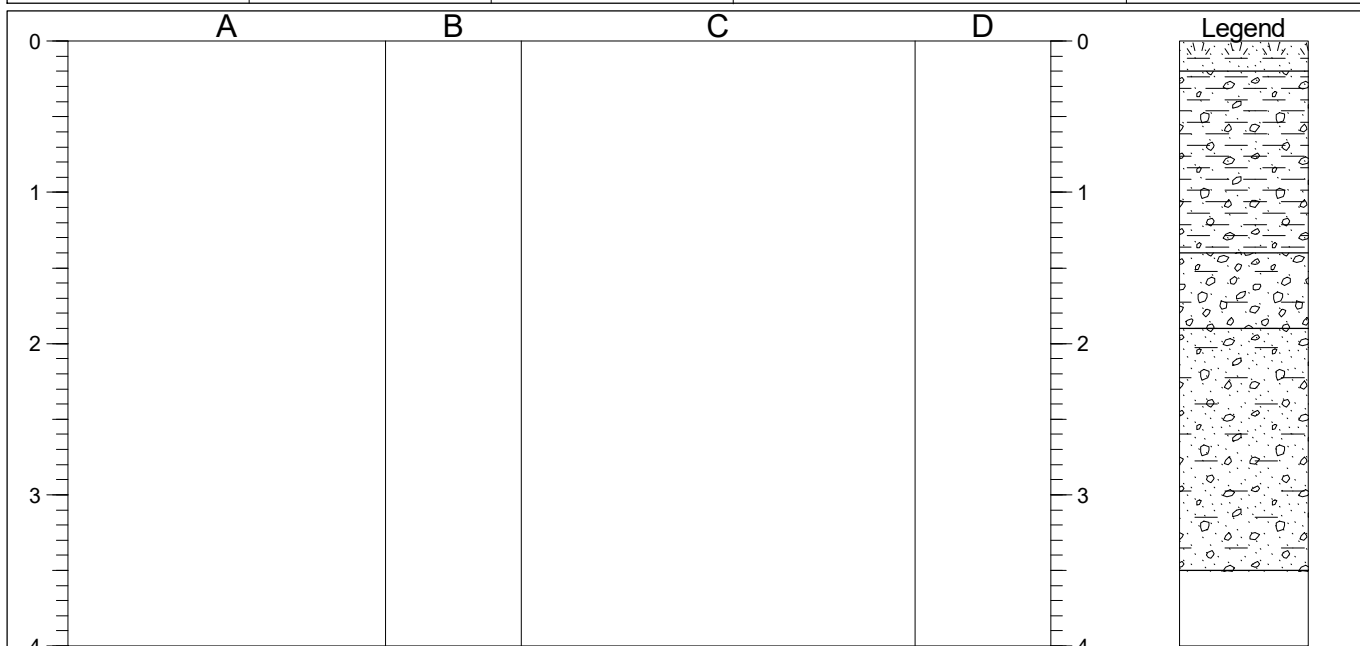
AGS3 UK TP 19342 - LAND SOUTH OF POLYWELL, APPLIEDORE, BIDEFORD.GPJ AGS 3_1.GDT 10/9/19



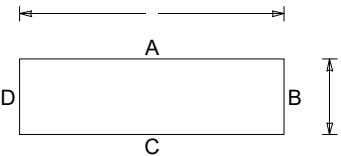
Ruddlesden geotechnical
The Stables, 65 Langaton Lane
Pinhoe, Exeter EX1 3SP
Telephone: 01392 678082

TRIAL PIT LOG

Project Land South of Polywell, Appledore, Bideford, Devon				TRIAL PIT No TP04
Job No 19342	Date 06-08-19	Ground Level (mAOD)	Co-Ordinates (BNG) E 245884 N 130698	
Contractor	Method/ Plant JCB 3CX			Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		TOPSOIL: Brown sandy gravelly silt.	0.25	J	
0.20-1.40		Firm orangish brown sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded sandstone. (Glacial Deposits).			
		0.90 ...very gravelly, occasional cobbles	1.00	D/ V	120 kPa
1.40-1.90		(Medium dense) brown, orangish brown and greyish brown sandy slightly clayey GRAVEL with occasional cobbles. Gravel is fine to coarse angular to subrounded sandstone (Glacial Deposits).			
1.90-3.50		(Loose) orangish brown clayey SAND. Occasional fine to coarse subrounded to rounded gravel of mudstone and sandstone (Glacial Deposits).	2.50	B	
		2.50 ...damp			

<p>Shoring/Support: None.</p> <p>Stability: Stable.</p> <p>Groundwater: None encountered.</p> <div></div>	GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: Chichester Homes Developments Ltd	Logged By CR
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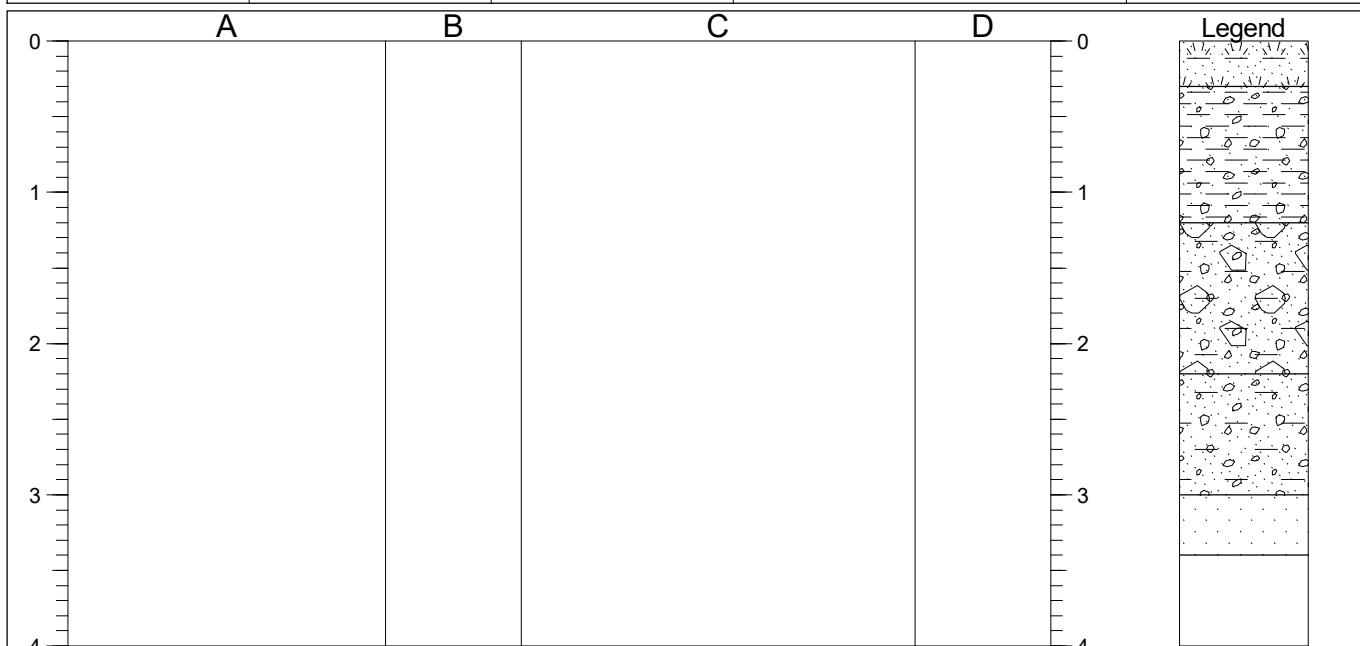
AGS3 UK TP 19342 - LAND SOUTH OF POLYWELL, APPLIEDORE, BIDEFORD.GPJ AGS 3_1.GDT 10/9/19



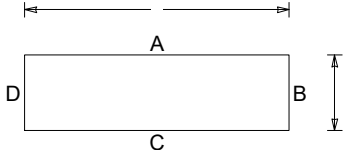
Ruddlesden geotechnical
The Stables, 65 Langaton Lane
Pinhoe, Exeter EX1 3SP
Telephone: 01392 678082

TRIAL PIT LOG

Project Land South of Polywell, Appledore, Bideford, Devon				TRIAL PIT No TP05
Job No 19342	Date 06-08-19	Ground Level (mAOD)	Co-Ordinates (BNG) E 245861 N 130677	
Contractor	Method/ Plant JCB 3CX			Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		TOPSOIL: Brown sandy gravelly silt.			
0.30-1.20		Firm to stiff light yellowish brown sandy gravelly CLAY. Gravel is fine to coarse angular to subangular sandstone (Glacial Deposits).			
		1.00 ...very gravelly	0.75	J	Too gravelly
1.20-2.20		Firm brown and greyish brown sandy gravelly CLAY with occasional cobbles. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone (Glacial Deposits).	1.00	VANE	
			1.50	D	
2.20-3.00		(Medium dense) brown gravelly clayey SAND. Gravel is fine to coarse angular to subrounded of sandstone and mudstone (Glacial Deposits).	2.50	B	
3.00-3.40		(Loose) possibly (very loose) orangish brown SAND. Damp (Glacial Deposits).	3.30	B	

Shoring/Support: None. Stability: Stable. Groundwater: None encountered. 	GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: Chichester Homes Developments Ltd	Logged By CR
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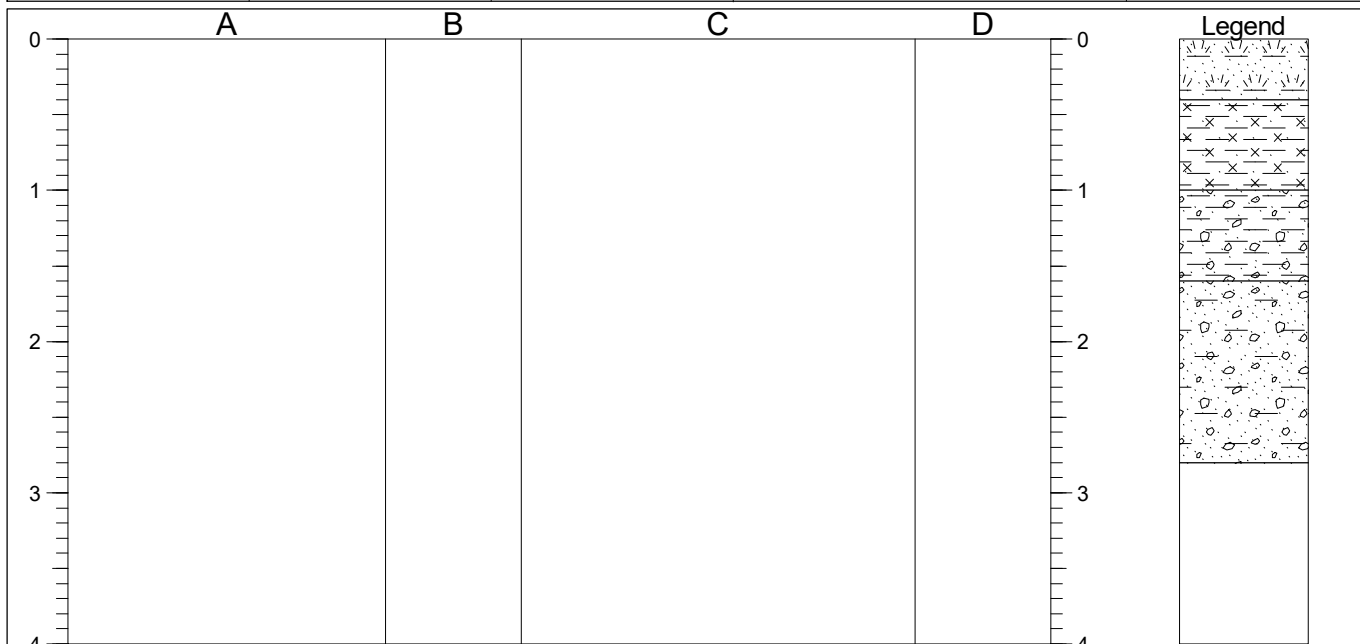
AGS3 UK TP 19342 - LAND SOUTH OF POLYWELL, APPLIEDORE, BIDEFORD.GPJ AGS 3_1.GDT 10/9/19



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The Stables, 65 Langaton Lane
Pinhoe, Exeter EX1 3SP
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TRIAL PIT LOG

Project Land South of Polywell, Appledore, Bideford, Devon				TRIAL PIT No TP06
Job No 19342	Date 06-08-19	Ground Level (mAOD)	Co-Ordinates (BNG) E 245853 N 130689	
Contractor	Method/ Plant JCB 3CX			Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.40		TOPSOIL: Dark brown sandy gravelly silt.	0.10	J	
0.40-1.00		Firm yellowish brown slightly sandy silty CLAY (Glacial Deposits). 0.70 ...firm to stiff with occasional gravel and cobbles of sandstone	0.90	D	
1.00-1.60		Firm to stiff greyish and light orangish brown sandy gravelly CLAY with occasional cobbles. Gravel is fine to coarse subangular sandstone (Glacial Deposits).	1.00	VANE	90 kPa
1.60-2.80		(Medium dense) orangish brown gravelly slightly clayey SAND. Gravel is fine to coarse subangular to subrounded sandstone and mudstone. Locally (dense) with cobbles of sandstone (Glacial Deposits). 2.50 ...very gravelly with frequent cobbles			

<div>Shoring/Support: None.</div> <div>Stability: Slight collapse.</div> <div>Groundwater: None encountered.</div> <div></div>	GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: Chichester Homes Developments Ltd	Logged By CR
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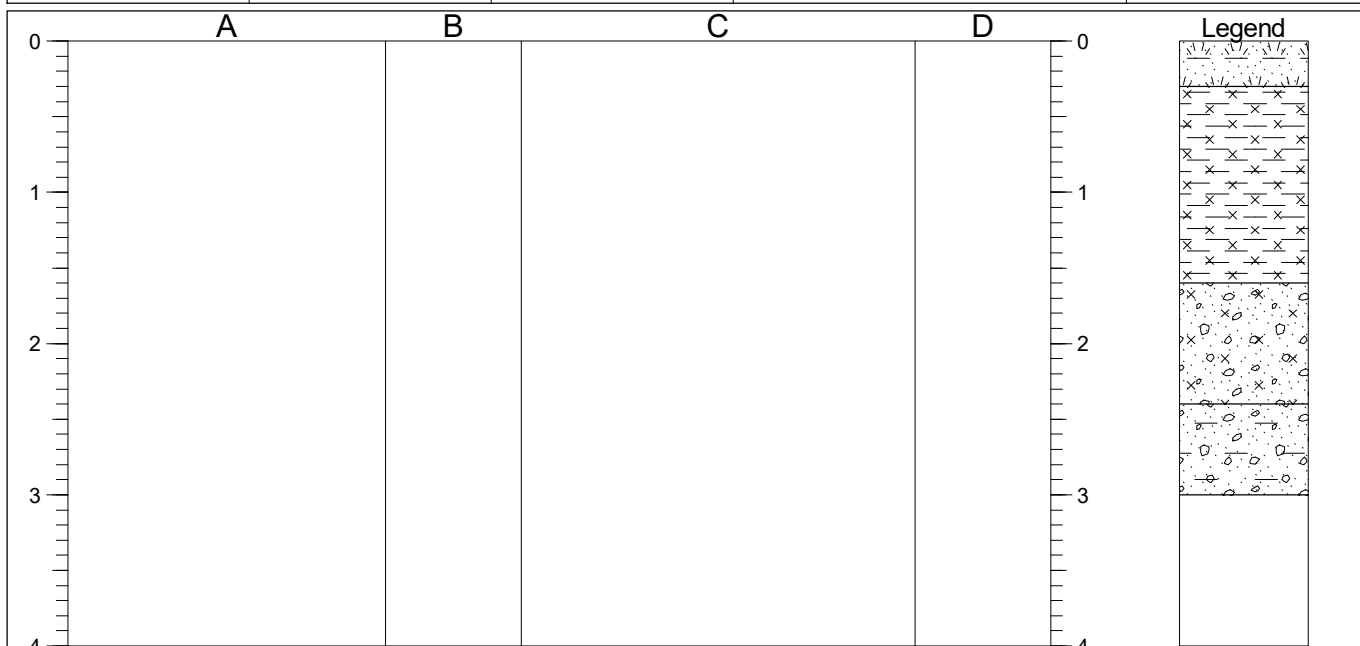
AGS3 UK TP 19342 - LAND SOUTH OF POLYWELL, APPLIEDORE, BIDEFORD.GPJ AGS 3_1.GDT 10/9/19



Ruddlesden geotechnical
The Stables, 65 Langaton Lane
Pinhoe, Exeter EX1 3SP
Telephone: 01392 678082

TRIAL PIT LOG

Project Land South of Polywell, Appledore, Bideford, Devon				TRIAL PIT No TP07
Job No 19342	Date 06-08-19	Ground Level (mAOD)	Co-Ordinates (BNG) E 245856 N 130715	
Contractor	Method/ Plant JCB 3CX			Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		TOPSOIL: Brown sandy gravelly silt. Occasional ceramic and brick.			
0.30-1.60		Stiff light yellowish brown silty CLAY (Glacial Deposits).	0.70	J	
1.60-2.40		(Medium dense) brown gravelly silty SAND. Gravel is fine to coarse angular to subangular sandstone and mudstone (Glacial Deposits). 2.00 ...(loose to medium dense)			
2.40-3.00		(Loose) orangish brown gravelly slightly clayey SAND. Gravel is fine to coarse subangular of sandstone (Glacial Deposits). 2.50 ...single large cobble, strata damp	3.00	D	

Shoring/Support: None. Stability: Stable. Groundwater: None encountered. 	GENERAL REMARKS	

All dimensions in metres Scale 1:50	Client: Chichester Homes Developments Ltd	Logged By CR
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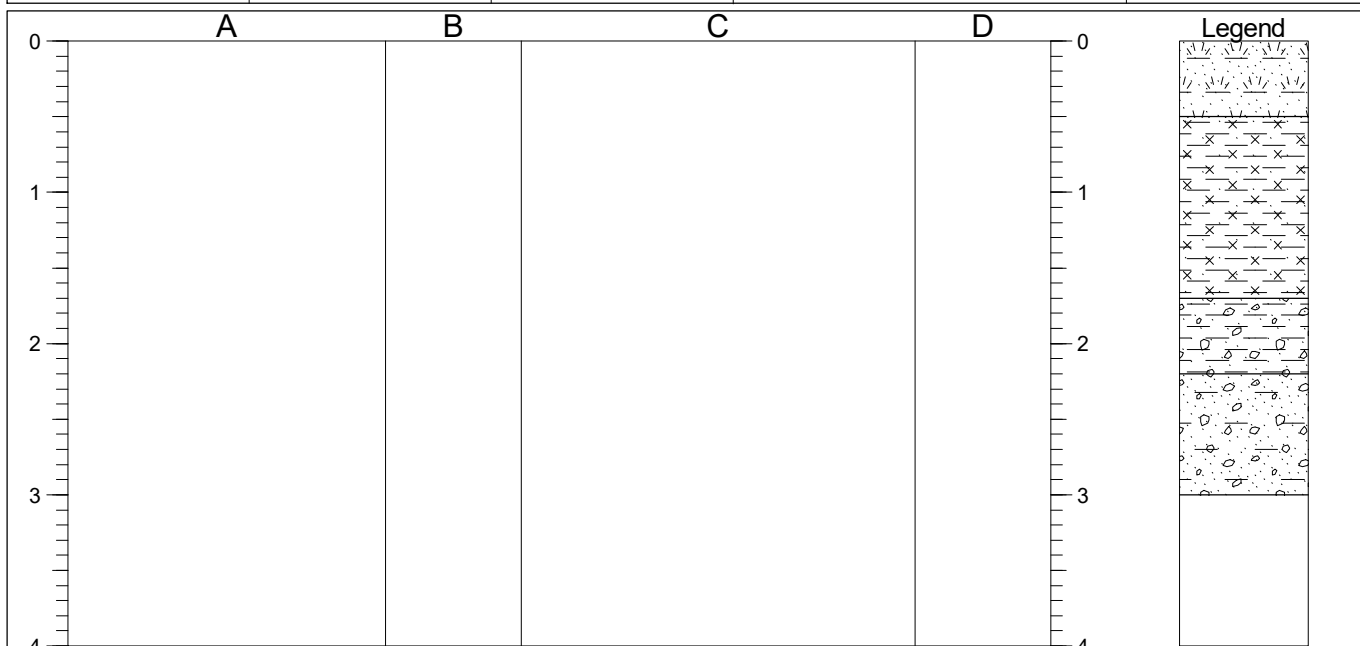
AGS3 UK TP 19342 - LAND SOUTH OF POLYWELL, APPLIEDORE, BIDEFORD.GPJ AGS 3_1.GDT 10/9/19



Ruddlesden geotechnical
The Stables, 65 Langaton Lane
Pinhoe, Exeter EX1 3SP
Telephone: 01392 678082

TRIAL PIT LOG

Project Land South of Polywell, Appledore, Bideford, Devon				TRIAL PIT No TP08
Job No 19342	Date 06-08-19	Ground Level (mAOD)	Co-Ordinates (BNG) E 245878 N 130734	
Contractor	Method/ Plant JCB 3CX			Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.50		TOPSOIL: Brown sandy gravelly silt.	0.30	J	
0.50-1.70		Firm light yellowish brown slightly sandy silty CLAY with occasional gravel/ cobbles of sandstone (Glacial Deposits).			
1.70-2.20		(Medium dense) greyish and orangish brown sandy gravelly CLAY. Gravel is fine to coarse subangular sandstone (Glacial Deposits).			
2.20-3.00		(Medium dense) orangish brown slightly gravelly clayey SAND. Gravel is fine to coarse subrounded sandstone and mudstone. Frequent partings of sandy silty clay (Glacial Deposits).			

<p>Shoring/Support: None.</p> <p>Stability: Slight collapse.</p> <p>Groundwater: None encountered.</p> <div>A diagram of a rectangular trial pit. Above the rectangle is a horizontal dimension line labeled 'A'. To the right of the rectangle is a vertical dimension line labeled 'B'. Below the rectangle is a horizontal dimension line labeled 'C'. To the left of the rectangle is a vertical dimension line labeled 'D'.</div>	GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: Chichester Homes Developments Ltd	Logged By CR
--	--	-----------------

AGS3 UK TP 19342 - LAND SOUTH OF POLYWELL, APPLIEDORE, BIDEFORD.GPJ AGS 3_1.GDT 10/9/19

IN-SITU CBR TEST RESULTS (TRL DCP METHOD)

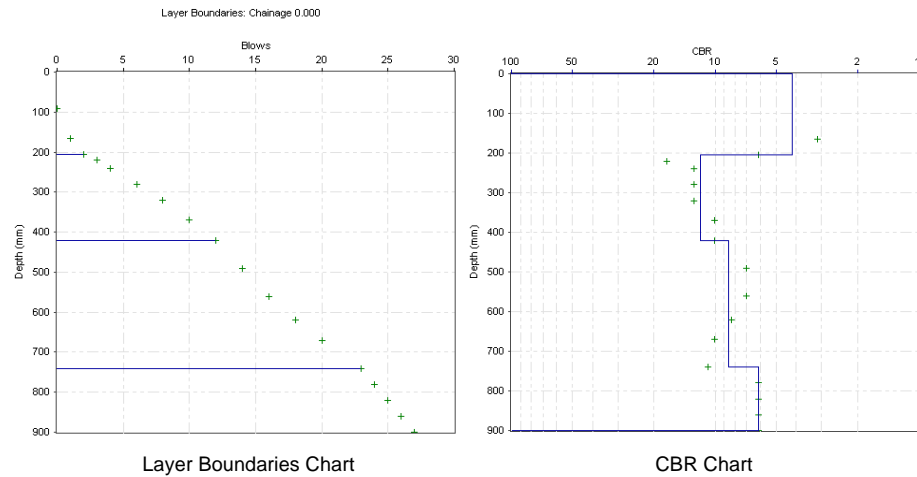


DCP Layer Strength Analysis Report

Project Name: DCP01

Chainage (km): 0.000
 Direction:
 Location/Offset: Lay-by / other
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 06/08/2019

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted



Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	57.50	4	205	205
2	21.50	12	215	420
3	29.09	9	320	740
4	40.00	6	160	900

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

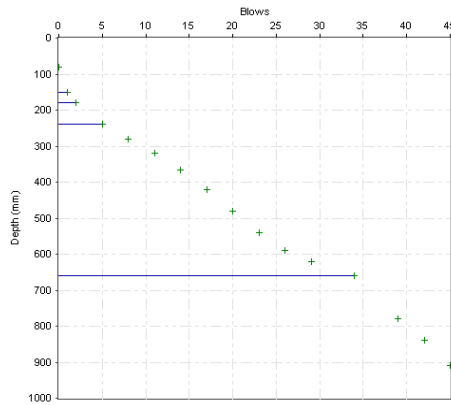
DCP Layer Strength Analysis Report

Project Name: DCP02

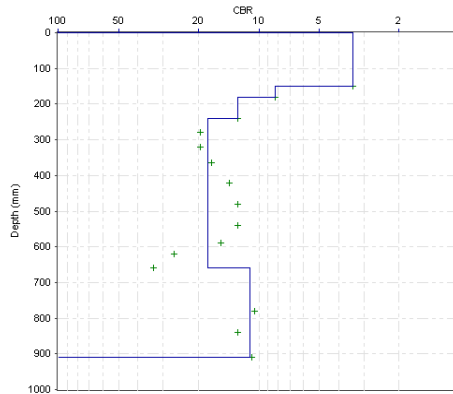
Chainage (km): 0.000
 Direction:
 Location/Offset: Lay-by / other
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 06/08/2019

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 0.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	70.00	3	150	150
2	30.00	8	30	180
3	20.00	13	60	240
4	14.48	18	420	660
5	22.73	11	250	910

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

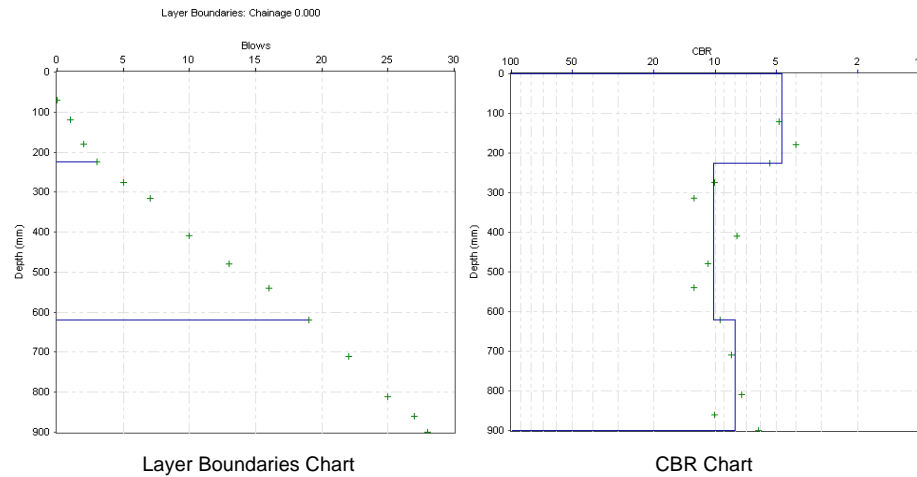
Report produced by

DCP Layer Strength Analysis Report

Project Name: DCP03

Chainage (km): 0.000
 Direction:
 Location/Offset: Lay-by / other
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 06/08/2019

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted



Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	51.67	5	225	225
2	24.69	10	395	620
3	31.11	8	280	900

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

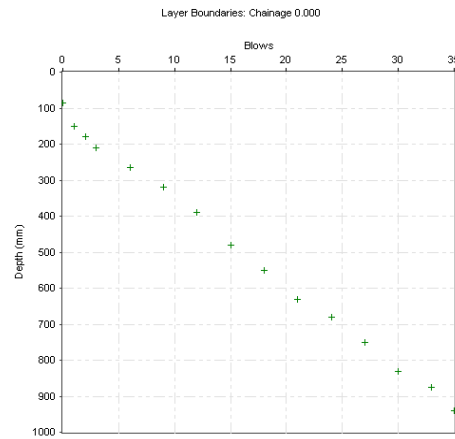
Report produced by

DCP Layer Strength Analysis Report

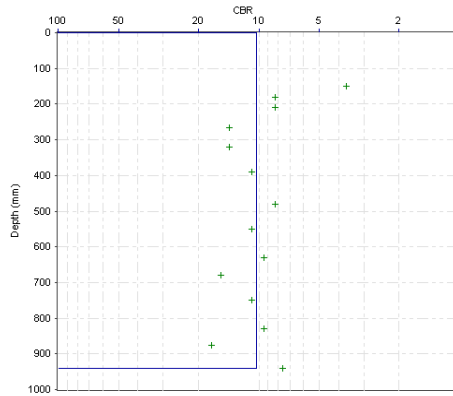
Project Name: DCP04

Chainage (km): 0.000
 Direction:
 Location/Offset: Lay-by / other
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 06/08/2019

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	24.43	10	940	940

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

APPENDIX B

PHOTOGRAPHS



**Plate 1**

Ground conditions encountered within TP01.

**Plate 2**

Ground conditions encountered within TP02.

**Plate 3**

Ground conditions encountered within TP03.

**Plate 4**

Ground conditions encountered within TP04.

**Plate 5**

Ground conditions encountered within TP05.

**Plate 6**

Ground conditions encountered within TP06.

**Plate 7**

Ground conditions encountered within TP07.

**Plate 8**

Ground conditions encountered within TP08.

APPENDIX C

LABORATORY TESTING RESULTS



GEOTECHNICAL LABORATORY TESTING





Test Report

South West Geotechnical Ltd
Unit 3 Brooklands,
Howden Road,
Tiverton,
Devon
EX16 5HW

SOUTH WEST GEOTECHNICAL

Job No:	11718	Date Received:	13/08/19
Job Name:	Land South of Polywell, Appledore, Bideford, Devon	Date Sent:	27/08/19
Client Name:	Ruddlesden geotechnical ltd	Transmittal Number:	T4948
Client Job No:	19342	Senders Initials:	DT
Client Address	The Stables, 65 Langaton Lane, Exeter, Devon, EX1 3SP	Report Revision No.	1
		Sampled by SWG lab staff?	NO

[illegible]

Sampling not performed by South West Geotechnical laboratory staff. Results apply to the samples as received.

Approved Signatories:

David Trowbridge (Laboratory Manager)

Dan Ayre (Quality Manager)

Matt Stokes (Senior Technician)

The results contained within this report only relate to the samples tested, as received from the client.
This certificate shall not be reproduced except in full, without prior written approval of the laboratory.



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Accredited to
ISO/IEC
17025:2017



Summary of Classification Test Results

Unit 3 Brooklands,
Howden Road,
Tiverton,
Devon
EX16 5HW

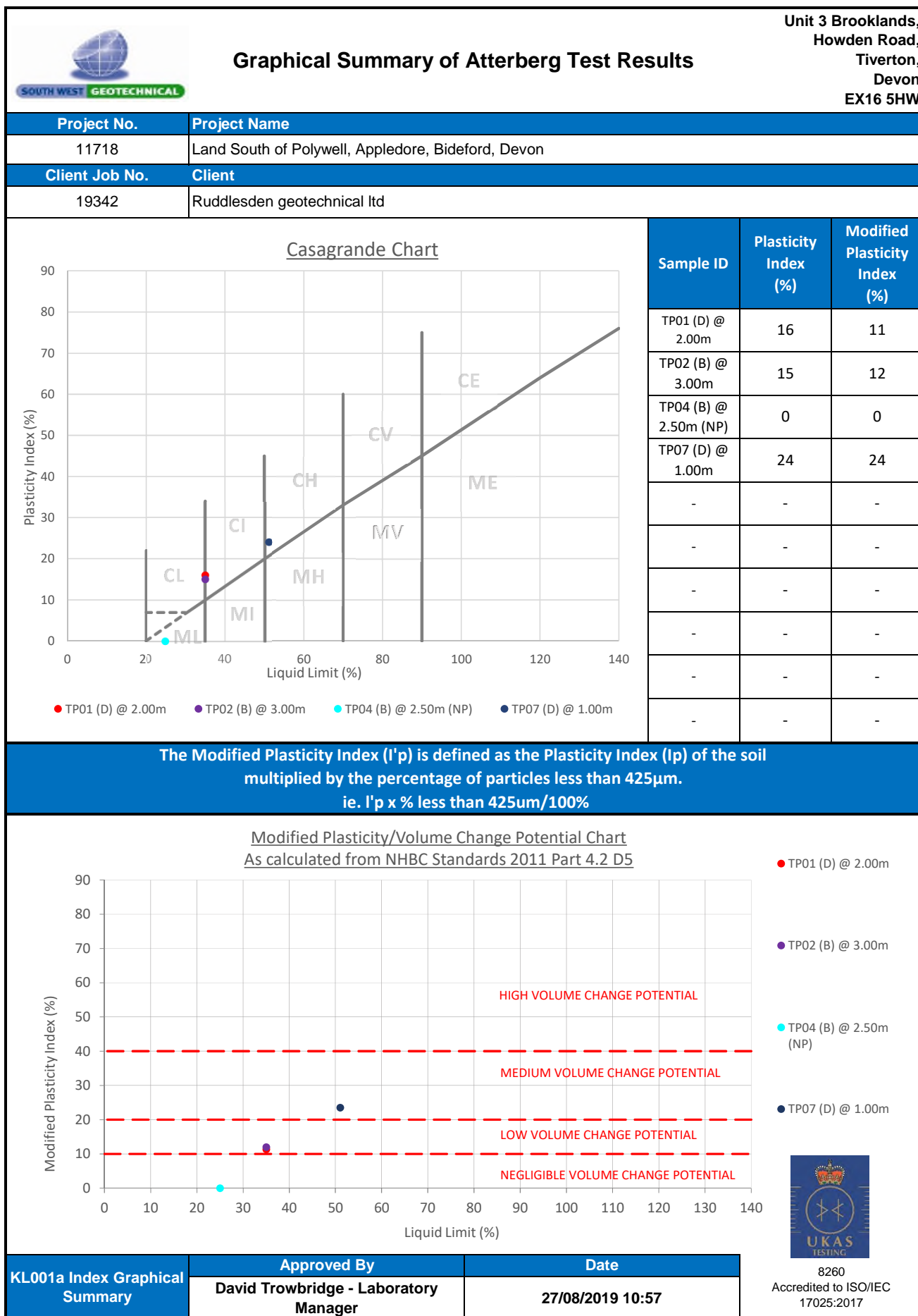


8260
Accredited to
ISO/IEC
17025:2017

Project No.		Project Name										
11718		Land South of Polywell, Appledore, Bideford, Devon										
Client Job No.		Client										
19342		Ruddlesden geotechnical ltd										
Hole No.	Sample				Soil Description	mc	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Type	Top	Base	Ref		CI.3.2			CI5.3	CI5.4		
						%	%	%	%	%	Mg/m3	
TP01	D	2.00		-	Light grey mottled brown slightly gravelly slightly sandy CLAY	12	71 - Sieved	35	20	15	-	
TP02	B	3.00		-	Yellowish brown slightly gravelly slightly sandy CLAY	16	80 - Sieved	35	20	15	-	
TP04	B	2.50		-	Brown slightly gravelly silty SAND	11	97 - Sieved	25 - 1pt	NP	-	-	
TP07	D	1.00		-	Grey mottled orangish brown slightly gravelly slightly sandy CLAY	26	98 - Sieved	51	27	24	-	
						-	-	-	-	-	-	
						-	-	-	-	-	-	
						-	-	-	-	-	-	
						-	-	-	-	-	-	
						-	-	-	-	-	-	
						-	-	-	-	-	-	

Preparation Clauses: Particle Density (BS1377:Part 1: 1990: CL7.4.4) Atterberg Limits (BS1377:Part 1: 1990: CL7.4.3) Moisture Content (BS1377: Part 1: 1990: CL7.3.3 & 7.4.2)

Key						Date	Approved By	Page No.	1
Atterberg Limits BS1377-2:1990 4pt cone (CL.4.3) unless : 1pt - single point test (CL.4.4) 4.2.3 - Natural 4.2.4 - Sieved Moisture Content (mc) %						27/08/2019	Matt Stokes - Senior Technician	KL001R Index Summary	
Particle density BS1377-2:1990 sp - small pyknometer CL.8.3 gj - gas jar CL.8.2									



CONTAMINATION LABORATORY TESTING



**Charles Rafipay**

Ruddlesden Geotechnical Ltd
The Stables
65 Langaton Lane
Pinhoe
Exeter
EX1 3SP

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01392 678082

e: Ruddlesden -

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-53820

Project / Site name:	Land South of Polywell, Appledore, Bideford, Devon	Samples received on:	08/08/2019
Your job number:	19342	Samples instructed on:	08/08/2019
Your order number:	19342	Analysis completed by:	19/08/2019
Report Issue Number:	1	Report issued on:	19/08/2019
Samples Analysed:	9 soil samples		

Signed: Karolina Marek

Karolina Marek
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 19-53820

Project / Site name: Land South of Polywell, Appledore, Bideford, Devon
Your Order No: 19342

Lab Sample Number	1287568	1287569	1287570	1287571	1287572
Sample Reference	TP01	TP02	TP03	TP06	TP07
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.05	0.50	0.10	0.10	0.70
Date Sampled	07/08/2019	07/08/2019	07/08/2019	07/08/2019	07/08/2019
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	8.7	6.6
Total mass of sample received	kg	0.001	NONE	0.50	0.45

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.8	8.0	6.1	7.4	7.8
Total Sulphate as SO ₄	%	0.005	MCERTS	-	-	-	-	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.010	0.0090	0.012	0.0097	0.012
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	-	-	-
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-	-	-
Ammonium as NH ₄	mg/kg	0.5	MCERTS	-	-	-	-	-
Ammonium as NH ₄ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	-	-	-	-	-
Organic Matter	%	0.1	MCERTS	3.2	2.5	3.8	4.1	0.2
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
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Analytical Report Number: 19-53820

Project / Site name: Land South of Polywell, Appledore, Bideford, Devon
Your Order No: 19342

Lab Sample Number	1287568	1287569	1287570	1287571	1287572
Sample Reference	TP01	TP02	TP03	TP06	TP07
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.05	0.50	0.10	0.10	0.70
Date Sampled	07/08/2019	07/08/2019	07/08/2019	07/08/2019	07/08/2019
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	15	17	20	11
Boron (water soluble)	mg/kg	0.2	MCERTS	1.6	0.5	1.1	2.1	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16	15	19	17	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	27	19	32	32	26
Lead (aqua regia extractable)	mg/kg	1	MCERTS	61	45	74	62	15
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.4	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	16	23	20	26
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	71	50	84	73	49

Magnesium (water soluble)	mg/kg	5	NONE	-	-	-	-	-
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	-	-	-

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
o-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	-	-

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	16	< 10	< 10	< 10	< 10
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TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	13	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	15	-	-	-	-



Analytical Report Number: 19-53820

Project / Site name: Land South of Polywell, Appledore, Bideford, Devon
Your Order No: 19342

Lab Sample Number	1287568	1287569	1287570	1287571	1287572
Sample Reference	TP01	TP02	TP03	TP06	TP07
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.05	0.50	0.10	0.10	0.70
Date Sampled	07/08/2019	07/08/2019	07/08/2019	07/08/2019	07/08/2019
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2	-	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	< 0.2	-	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3	-	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3	-	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05

Analytical Report Number: 19-53820

Project / Site name: Land South of Polywell, Appledore, Bideford, Devon

Your Order No: 19342

Lab Sample Number				1287568	1287569	1287570	1287571	1287572
Sample Reference				TP01	TP02	TP03	TP06	TP07
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.05	0.50	0.10	0.10	0.70
Date Sampled				07/08/2019	07/08/2019	07/08/2019	07/08/2019	07/08/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs TICs

SVOCs TICs Compound Name		N/A	NONE	0	-	0	-	0
SVOC % Match	%	N/A	NONE	0	-	0	-	0
SVOCs TICs Compound Name		N/A	NONE	0	-	0	-	0
SVOC % Match	%	N/A	NONE	0	-	0	-	0
SVOCs TICs Compound Name		N/A	NONE	0	-	0	-	0
SVOC % Match	%	N/A	NONE	0	-	0	-	0
SVOCs TICs Compound Name		N/A	NONE	0	-	0	-	0
SVOC % Match	%	N/A	NONE	0	-	0	-	0
SVOCs TICs Compound Name		N/A	NONE	0	-	0	-	0
SVOC % Match	%	N/A	NONE	0	-	0	-	0
SVOCs TICs Compound Name		N/A	NONE	0	-	0	-	0
SVOC % Match	%	N/A	NONE	0	-	0	-	0
SVOCs TICs Compound Name		N/A	NONE	0	-	0	-	0
SVOC % Match	%	N/A	NONE	0	-	0	-	0
SVOCs TICs Compound Name		N/A	NONE	0	-	0	-	0
SVOC % Match	%	N/A	NONE	0	-	0	-	0
SVOCs TICs Compound Name		N/A	NONE	0	-	0	-	0
SVOC % Match	%	N/A	NONE	0	-	0	-	0
SVOCs TICs Compound Name		N/A	NONE	0	-	0	-	0
SVOC % Match	%	N/A	NONE	0	-	0	-	0

Analytical Report Number: 19-53820

Project / Site name: Land South of Polywell, Appledore, Bideford, Devon

Your Order No: 19342

Lab Sample Number	1287573	1287574	1287575	1287576	
Sample Reference	TP01	TP02	TP04	TP07	
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)	2.00	3.00	2.50	1.00	
Date Sampled	07/08/2019	07/08/2019	07/08/2019	07/08/2019	
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	4.4	9.6
Total mass of sample received	kg	0.001	NONE	0.16	0.16

Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.0	8.0	7.9	8.0	
Total Sulphate as SO ₄	%	0.005	MCERTS	0.030	0.015	0.020	0.019	
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.096	0.014	0.011	0.015	
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	96.0	14.1	10.5	15.0	
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	2.5	6.0	1.9	4.8	
Total Sulphur	%	0.005	MCERTS	0.017	0.005	0.007	0.015	
Ammonium as NH ₄	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5	< 0.5	
Ammonium as NH ₄ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Organic Matter	%	0.1	MCERTS	-	-	-	-	
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	-	-	
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Analytical Report Number: 19-53820

Project / Site name: Land South of Polywell, Appledore, Bideford, Devon
Your Order No: 19342

Lab Sample Number				1287573	1287574	1287575	1287576	
Sample Reference				TP01	TP02	TP04	TP07	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				2.00	3.00	2.50	1.00	
Date Sampled				07/08/2019	07/08/2019	07/08/2019	07/08/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	-	
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	-	-	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	-	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Magnesium (water soluble)	mg/kg	5	NONE	17	7.7	11	8.7	
Magnesium (leachate equivalent)	mg/l	2.5	NONE	8.6	3.9	5.5	4.3	

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	-	-	-	-	
Toluene	µg/kg	1	MCERTS	-	-	-	-	
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	
o-xylene	µg/kg	1	MCERTS	-	-	-	-	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	

Analytical Report Number: 19-53820

Project / Site name: Land South of Polywell, Appledore, Bideford, Devon
Your Order No: 19342

Lab Sample Number				1287573	1287574	1287575	1287576
Sample Reference				TP01	TP02	TP04	TP07
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	3.00	2.50	1.00
Date Sampled				07/08/2019	07/08/2019	07/08/2019	07/08/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
SVOCs							
Aniline	mg/kg	0.1	NONE	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-

Analytical Report Number: 19-53820

Project / Site name: Land South of Polywell, Appledore, Bideford, Devon

Your Order No: 19342

Lab Sample Number				1287573	1287574	1287575	1287576	
Sample Reference				TP01	TP02	TP04	TP07	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				2.00	3.00	2.50	1.00	
Date Sampled				07/08/2019	07/08/2019	07/08/2019	07/08/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs TICs

SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	
SVOC % Match	%	N/A	NONE	-	-	-	-	
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	
SVOC % Match	%	N/A	NONE	-	-	-	-	
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	
SVOC % Match	%	N/A	NONE	-	-	-	-	
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	
SVOC % Match	%	N/A	NONE	-	-	-	-	
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	
SVOC % Match	%	N/A	NONE	-	-	-	-	
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	
SVOC % Match	%	N/A	NONE	-	-	-	-	
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	
SVOC % Match	%	N/A	NONE	-	-	-	-	
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	
SVOC % Match	%	N/A	NONE	-	-	-	-	
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	
SVOC % Match	%	N/A	NONE	-	-	-	-	
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	
SVOC % Match	%	N/A	NONE	-	-	-	-	



Analytical Report Number : 19-53820

Project / Site name: Land South of Polywell, Appledore, Bideford, Devon

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1287568	TP01	None Supplied	0.05	Brown sandy clay with gravel and vegetation.
1287569	TP02	None Supplied	0.50	Brown sandy loam with gravel and vegetation.
1287570	TP03	None Supplied	0.10	Brown sandy loam with gravel and vegetation.
1287571	TP06	None Supplied	0.10	Brown sandy loam with gravel and vegetation.
1287572	TP07	None Supplied	0.70	Light brown clay.
1287573	TP01	None Supplied	2.00	Light brown clay with gravel.
1287574	TP02	None Supplied	3.00	Light brown clay and sand with gravel.
1287575	TP04	None Supplied	2.50	Brown sand.
1287576	TP07	None Supplied	1.00	Light brown clay and sand.

Analytical Report Number : 19-53820

Project / Site name: Land South of Polywell, Appledore, Bideford, Devon

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH ₄ in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests. 2:1 extraction.	L082-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests ^{mm}	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Tentatively identified compounds (SVOC) in soil	Determination of semi-volatile organic compounds total ion count in soil by extraction with dichloromethane and hexane followed by GC-MS followed by a full library scan.	In-house method based on USEPA 8270	L064-PL	D	NONE

Iss No 19-53820-1 Land South of Polywell, Appledore, Bideford, Devon 19342

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The results included within the report are representative of the samples submitted for analysis.

Page 11 of 12

Analytical Report Number : 19-53820

Project / Site name: Land South of Polywell, Appledore, Bideford, Devon

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/cleanup.	L088/76-PL	W	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.



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Analytical Report Number : 19-53795

Project / Site name: Land South of Polywell, Appledore,
Bideford, Devon

Your job number: 19342

Your order number: 19342

Report Issue Number: 1

Samples Analysed: 2 soil samples

Samples received on: 08/08/2019

Samples instructed on: 08/08/2019

Analysis completed by: 16/08/2019

Report issued on: 16/08/2019

Signed: 

Rexona Rahman
Head of Customer Services
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 19-53795

Project / Site name: Land South of Plywell, Appledore, Bideford, Devon

Your Order No: 19342

Lab Sample Number				1287437	1287438			
Sample Reference				TP02	TP05			
Sample Number				None Supplied	None Supplied			
Depth (m)				1.00	2.20			
Date Sampled				06/08/2019	06/08/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	10	9.6			
Total mass of sample received	kg	0.001	NONE	1.3	2.0			

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	8.0			
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.016	0.0078			
Organic Matter	%	0.1	MCERTS	0.1	< 0.1			

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80			
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	11			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.5			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	26			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	26			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	13	16			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	46			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	55	87			

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	< 10	< 10			
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Analytical Report Number : 19-53795

Project / Site name: Land South of Plywell, Appledore, Bideford, Devon

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1287437	TP02	None Supplied	1.00	Light brown sandy clay with gravel and vegetation.
1287438	TP05	None Supplied	2.20	Brown sandy clay with gravel.

Analytical Report Number : 19-53795

Project / Site name: Land South of Plywell, Appledore, Bideford, Devon

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.



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Analytical Report Number : 19-53801

Project / Site name:	Land South of Polywell, Appledore, Bideford, Devon	Samples received on:	08/08/2019
Your job number:	19342	Samples instructed on:	08/08/2019
Your order number:	19342	Analysis completed by:	16/08/2019
Report Issue Number:	1	Report issued on:	16/08/2019
Samples Analysed:	2 10:1 WAC samples		

Signed: *Karolina Marek*

Karolina Marek
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.



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The results included within the report are representative of the samples submitted for analysis.



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The results included within the report are representative of the samples submitted for analysis.



Analytical Report Number : 19-53801

Project / Site name: Land South of Polywell, Appledore, Bideford, Devon

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1287472	TP02	None Supplied	1.00	Light brown sandy clay with gravel and vegetation.
1287474	TP05	None Supplied	2.20	Brown sandy clay with gravel.

Analytical Report Number : 19-53801

Project / Site name: Land South of Polywell, Appledore, Bideford, Devon

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L0738-PL	W	MCERTS
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L0338-PL	W	ISO 17025
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

GENERIC ASSESSMENT CRITERIA



Residential with Home Grown Produce Land Use Generic Assessment Criteria (GAC)

Determinand	Unit	GAC			Source of GAC
Phenols (total)	mg/kg	1% SOM 120	2.5% SOM 200	6% SOM 380	S4UL
Naphthalene	mg/kg	1% SOM 2.3	2.5% SOM 5.6	6% SOM 13	S4UL
Acenaphthylene	mg/kg	1% SOM 170	2.5% SOM 420	6% SOM 920	S4UL
Acenaphthene	mg/kg	1% SOM 210	2.5% SOM 510	6% SOM 1100	S4UL
Fluorene	mg/kg	1% SOM 170	2.5% SOM 400	6% SOM 860	S4UL
Phenanthrene	mg/kg	1% SOM 95	2.5% SOM 220	6% SOM 440	S4UL
Anthracene	mg/kg	1% SOM 2400	2.5% SOM 5400	6% SOM 11000	S4UL
Fluoranthene	mg/kg	1% SOM 280	2.5% SOM 560	6% SOM 890	S4UL
Pyrene	mg/kg	1% SOM 620	2.5% SOM 1200	6% SOM 2000	S4UL
Benzo(a)anthracene	mg/kg	1% SOM 7.2	2.5% SOM 11	6% SOM 13	S4UL
Chrysene	mg/kg	1% SOM 15	2.5% SOM 22	6% SOM 27	S4UL
Benzo(b)fluoranthene	mg/kg	1% SOM 2.6	2.5% SOM 3.3	6% SOM 3.7	S4UL
Benzo(k)fluoranthene	mg/kg	1% SOM 77	2.5% SOM 93	6% SOM 100	S4UL
Benzo(a)pyrene	mg/kg	1% SOM 2.2	2.5% SOM 2.7	6% SOM 3.0	S4UL
Indeno(1,2,3-cd)pyrene	mg/kg	1% SOM 27	2.5% SOM 36	6% SOM 41	S4UL
Dibenzo(a,h)anthracene	mg/kg	1% SOM 0.24	2.5% SOM 0.28	6% SOM 0.30	S4UL
Benzo(g,h,i)perylene	mg/kg	1% SOM 320	2.5% SOM 340	6% SOM 350	S4UL
Arsenic	mg/kg	37			S4UL
Boron (water soluble)	mg/kg	290			S4UL
Cadmium	mg/kg	11			S4UL
Chromium (VI)	mg/kg	6			S4UL
Chromium (total)	mg/kg	910			S4UL
Copper	mg/kg	2400			S4UL
Lead	mg/kg	200			C4SL
Elemental Mercury	mg/kg	1.2			S4UL
Nickel	mg/kg	130			S4UL
Selenium	mg/kg	250			S4UL
Zinc	mg/kg	3700			S4UL



Benzene	$\mu\text{g/kg}$	1% SOM	2.5% SOM	6% SOM	S4UL
		87	170	370	
Ethylbenzene	$\mu\text{g/kg}$	1% SOM	2.5% SOM	6% SOM	S4UL
		47000	110000	260000	
Toluene	$\mu\text{g/kg}$	1% SOM	2.5% SOM	6% SOM	S4UL
		130000	290000	660000	
m- & p-xylene	$\mu\text{g/kg}$	1% SOM	2.5% SOM	6% SOM	S4UL
		115000	270000	630000	
o-xylene	$\mu\text{g/kg}$	1% SOM	2.5% SOM	6% SOM	S4UL
		60000	140000	330000	
Total TPH	mg/kg	10			Screening Value
TPH (Aliphatic EC 5-6)	mg/kg	1% SOM	2.5% SOM	6% SOM	S4UL
		42	78	160	
TPH (Aliphatic EC >6-8)	mg/kg	1% SOM	2.5% SOM	6% SOM	S4UL
		100	230	530	
TPH (Aliphatic EC >8-10)	mg/kg	1% SOM	2.5% SOM	6% SOM	S4UL
		27	65	150	
TPH (Aliphatic EC >10-12)	mg/kg	1% SOM	2.5% SOM	6% SOM	S4UL
		130	330	760	
TPH (Aliphatic EC >12-16)	mg/kg	1% SOM	2.5% SOM	6% SOM	S4UL
		1100	2400	4300	
TPH (Aliphatic EC >16-35)	mg/kg	1% SOM	2.5% SOM	6% SOM	S4UL
		65000	92000	110000	
TPH (Aromatic EC 5-7)	mg/kg	1% SOM	2.5% SOM	6% SOM	S4UL
		70	140	300	
TPH (Aromatic EC >7-8)	mg/kg	1% SOM	2.5% SOM	6% SOM	S4UL
		130	290	660	
TPH (Aromatic EC >8-10)	mg/kg	1% SOM	2.5% SOM	6% SOM	S4UL
		34	83	190	
TPH (Aromatic EC >10-12)	mg/kg	1% SOM	2.5% SOM	6% SOM	S4UL
		74	180	380	
TPH (Aromatic EC >12-16)	mg/kg	1% SOM	2.5% SOM	6% SOM	S4UL
		140	330	660	
TPH (Aromatic EC >16-21)	mg/kg	1% SOM	2.5% SOM	6% SOM	S4UL
		260	540	930	
TPH (Aromatic EC >21-35)	mg/kg	1% SOM	2.5% SOM	6% SOM	S4UL
		1100	1500	1700	

Key:

1. S4UL = Suitable for Use Level
2. C4SL = Category 4 Screening Level
3. Screening Value = Laboratory detectable level of Total TPH. If detectable levels of TPH are recorded, speciated TPH analysis is undertaken.

Notes:

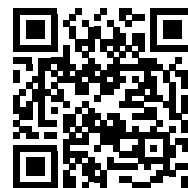
1. *Italic* entries indicate GAC exceeded.
2. Based on a sandy loam soil, as defined in SR3 (Environment Agency (2009): Updated Technical background to the CLEA Model) and 6% SOM (unless otherwise stated).
3. S4ULs for phenols, polyaromatic hydrocarbons and total petroleum hydrocarbons will vary according to SOM for all land uses.
4. Values are rounded to two significant figures.
5. S4ULs assume that free phase contamination is not present.
6. S4ULs are based on a sub-surface soil to indoor air correction factor of 1.
7. For naphthalene, the S4UL is based on a comparison of inhalation exposure with the $\text{TDI}_{\text{inhal}}$ for localised effects.
8. For chromium (VI), the S4UL is based on comparison of inhalation exposure with inhalation ID.
9. Exposure to all xylene isomers should be considered together, because the HCV is based on the intake of total xylene and not an individual isomer in isolation.



WASTE CLASSIFICATION REPORT



Waste Classification Report



X9UAA-H8TYN-USZLS

Job name

19342 - Land South of Polywell, Appledore

Description/Comments

Project

Site

Related Documents

#	Name	Description
None		

Waste Stream Template

RSS1

Classified by

Name:
Charles Rafipay
Date:
29 Aug 2019 10:35 GMT
Telephone:
01392 678082

Company:
Ruddlesden Geotechnical Ltd
65 Langaton Lane
Pinhoe
Exeter
EX1 3SP

Report

Created by: Charles Rafipay
Created date: 29 Aug 2019 10:35 GMT


Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	TP01	0.05	Non Hazardous		2
2	TP02	0.50	Non Hazardous		5
3	TP02[2]	1.00	Non Hazardous		7
4	TP03	0.10	Non Hazardous		9
5	TP05	2.20	Non Hazardous		11
6	TP06	0.10	Non Hazardous		13
7	TP07	0.70	Non Hazardous		15

Appendices

	Page
Appendix A: Classifier defined and non CLP determinands	17
Appendix B: Rationale for selection of metal species	18
Appendix C: Version	19

Classification of sample: TP01


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

Sample details

















Sample Name:	LoW Code:
TP01	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.05 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
8.7%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 8.7% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	 pH 		PH		6.8	pH		6.8	pH	6.8 pH		
2	 phenol 604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
3	 naphthalene 601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4	 acenaphthylene 	205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
5	 acenaphthene 	201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6	 fluorene 	201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7	 phenanthrene 	201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8	 anthracene 	204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9	 fluoranthene 	205-912-4	206-44-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10	 pyrene 	204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
11	 benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
12	 chrysene 601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
13	 benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
14	 benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
15	 benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16	 indeno[123-cd]pyrene 	205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
17	dibenz[a,h]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
18	benzo[ghi]perylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		205-883-8	191-24-2								
19	arsenic { arsenic trioxide }				17 mg/kg	1.32	20.649 mg/kg	0.00206 %		✓	
	033-003-00-0	215-481-4	1327-53-3								
20	boron { boron tribromide/trichloride/trifluoride (combined) }				1.6 mg/kg	13.43	19.768 mg/kg	0.00198 %		✓	
			10294-33-4, 10294-34-5, 7637-07-2								
21	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %			<LOD
	048-010-00-4	215-147-8	1306-23-6								
22	chromium { chromium(III) oxide }				16 mg/kg	1.462	21.513 mg/kg	0.00215 %		✓	
		215-160-9	1308-38-9								
23	copper { dicopper oxide; copper (I) oxide }				27 mg/kg	1.126	27.966 mg/kg	0.0028 %		✓	
	029-002-00-X	215-270-7	1317-39-1								
24	lead { lead chromate }			1	61 mg/kg	1.56	87.533 mg/kg	0.00561 %		✓	
	082-004-00-2	231-846-0	7758-97-6								
25	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
26	nickel { nickel dihydroxide }				19 mg/kg	1.579	27.609 mg/kg	0.00276 %		✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
27	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %			<LOD
	034-002-00-8										
28	zinc { zinc chromate }				71 mg/kg	2.774	181.2 mg/kg	0.0181 %		✓	
	024-007-00-3										
29	benzene				<1 mg/kg		<1 mg/kg	<0.0001 %			<LOD
	601-020-00-8	200-753-7	71-43-2								
30	toluene				<1 mg/kg		<1 mg/kg	<0.0001 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
31	ethylbenzene				<1 mg/kg		<1 mg/kg	<0.0001 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
32	xylene				<1 mg/kg		<1 mg/kg	<0.0001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
33	TPH (C6 to C40) petroleum group				16 mg/kg		14.719 mg/kg	0.00147 %		✓	
			TPH								
Total:									0.0379 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because The levels of TPH recorded are not flammable in soil.


Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00147%)

Classification of sample: TP02


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

Sample details

Sample Name:	TP02	LoW Code:	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	0.50 m	Entry:		17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:	6.6%			
(dry weight correction)				

Hazard properties

None identified

Determinands

Moisture content: 6.6% Dry Weight Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	pH				8 pH		8	pH	8pH		
2	phenol				<1 mg/kg		<1	mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2								
3	naphthalene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
	601-052-00-2	202-049-5	91-20-3								
4	acenaphthylene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8								
5	acenaphthene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9								
6	fluorene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		201-695-5	86-73-7								
7	phenanthrene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		201-581-5	85-01-8								
8	anthracene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		204-371-1	120-12-7								
9	fluoranthene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		205-912-4	206-44-0								
10	pyrene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		204-927-3	129-00-0								
11	benzo[a]anthracene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
	601-033-00-9	200-280-6	56-55-3								
12	chrysene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
	601-048-00-0	205-923-4	218-01-9								
13	benzo[b]fluoranthene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2								
14	benzo[k]fluoranthene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
	601-036-00-5	205-916-6	207-08-9								
15	benzo[a]pyrene; benzo[def]chrysene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
	601-032-00-3	200-028-5	50-32-8								
16	indeno[123-cd]pyrene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		205-893-2	193-39-5								

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number								
17		dibenz[a,h]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD	
		601-041-00-2	200-181-8	53-70-3								
18	■	benzo[ghi]perylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD	
			205-883-8	191-24-2								
19	🧪	arsenic { arsenic trioxide }				15 mg/kg	1.32	18.579 mg/kg	0.00186 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
20	🧪	boron { ■ boron tribromide/trichloride/trifluoride (combined) }				0.5 mg/kg	13.43	6.299 mg/kg	0.00063 %	✓		
				10294-33-4, 10294-34-5, 7637-07-2								
21	🧪	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD	
		048-010-00-4	215-147-8	1306-23-6								
22	🧪	chromium { ■ chromium(III) oxide }				15 mg/kg	1.462	20.566 mg/kg	0.00206 %	✓		
			215-160-9	1308-38-9								
23	🧪	copper { dicopper oxide; copper (I) oxide }				19 mg/kg	1.126	20.067 mg/kg	0.00201 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
24	🧪	lead { lead chromate }			1	45 mg/kg	1.56	65.846 mg/kg	0.00422 %	✓		
		082-004-00-2	231-846-0	7758-97-6								
25	🧪	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD	
		080-010-00-X	231-299-8	7487-94-7								
26	🧪	nickel { nickel dihydroxide }				16 mg/kg	1.579	23.707 mg/kg	0.00237 %	✓		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
27	🧪	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD	
		034-002-00-8										
28	🧪	zinc { zinc chromate }				50 mg/kg	2.774	130.119 mg/kg	0.013 %	✓		
		024-007-00-3										
29	■	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD	
				TPH								
								Total:	0.0277 %			

Key

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

Classification of sample: TP02[2]


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

Sample details

Sample Name:	LoW Code:
TP02[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1.00 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
10%	
(dry weight correction)	

Hazard properties

None identified

Determinands

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


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	pH				8.1 pH		8.1 pH	8.1 pH		
2	phenol				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
3	naphthalene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
4	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
5	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
6	fluorene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-695-5	86-73-7							
7	phenanthrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-581-5	85-01-8							
8	anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		204-371-1	120-12-7							
9	fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-912-4	206-44-0							
10	pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		204-927-3	129-00-0							
11	benzo[a]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
12	chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
13	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
14	benzo[k]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
15	benzo[a]pyrene; benzo[def]chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
16	indeno[123-cd]pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-893-2	193-39-5							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
17	dibenz[a,h]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
18	benzo[ghi]perylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		205-883-8	191-24-2								
19	arsenic { arsenic trioxide }				11 mg/kg	1.32	13.203 mg/kg	0.00132 %		✓	
	033-003-00-0	215-481-4	1327-53-3								
20	boron { boron tribromide/trichloride/trifluoride (combined) }				0.5 mg/kg	13.43	6.105 mg/kg	0.00061 %		✓	
			10294-33-4, 10294-34-5, 7637-07-2								
21	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %			<LOD
	048-010-00-4	215-147-8	1306-23-6								
22	chromium { chromium(III) oxide }				22 mg/kg	1.462	29.231 mg/kg	0.00292 %		✓	
		215-160-9	1308-38-9								
23	copper { dicopper oxide; copper (I) oxide }				22 mg/kg	1.126	22.518 mg/kg	0.00225 %		✓	
	029-002-00-X	215-270-7	1317-39-1								
24	lead { lead chromate }			1	13 mg/kg	1.56	18.434 mg/kg	0.00118 %		✓	
	082-004-00-2	231-846-0	7758-97-6								
25	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
26	nickel { nickel dihydroxide }				22 mg/kg	1.579	31.59 mg/kg	0.00316 %		✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
27	selenium { selenium compounds with the exception of cadmium selenosulfide and those specified elsewhere in this Annex }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %			<LOD
	034-002-00-8										
28	zinc { zinc chromate }				55 mg/kg	2.774	138.707 mg/kg	0.0139 %		✓	
	024-007-00-3										
29	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %			<LOD
			TPH								
Total:									0.0268 %		

Key

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

Classification of sample: TP03


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

Sample details

Sample Name:	LoW Code:
TP03	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.10 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
5.3%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 5.3% Dry Weight Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	pH				6.1 pH		6.1 pH	6.1 pH		
2	phenol				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
3	naphthalene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
4	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
5	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
6	fluorene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-695-5	86-73-7							
7	phenanthrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-581-5	85-01-8							
8	anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		204-371-1	120-12-7							
9	fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-912-4	206-44-0							
10	pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		204-927-3	129-00-0							
11	benzo[a]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
12	chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
13	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
14	benzo[k]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
15	benzo[a]pyrene; benzo[def]chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
16	indeno[123-cd]pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-893-2	193-39-5							

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number								
17		dibenz[a,h]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD	
		601-041-00-2	200-181-8	53-70-3								
18	■	benzo[ghi]perylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD	
			205-883-8	191-24-2								
19	🧪	arsenic { arsenic trioxide }				17 mg/kg	1.32	21.316 mg/kg	0.00213 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
20	🧪	boron { ■ boron tribromide/trichloride/trifluoride (combined) }				1.1 mg/kg	13.43	14.029 mg/kg	0.0014 %	✓		
				10294-33-4, 10294-34-5, 7637-07-2								
21	🧪	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD	
		048-010-00-4	215-147-8	1306-23-6								
22	🧪	chromium { ■ chromium(III) oxide }				19 mg/kg	1.462	26.372 mg/kg	0.00264 %	✓		
			215-160-9	1308-38-9								
23	🧪	copper { dicopper oxide; copper (I) oxide }				32 mg/kg	1.126	34.215 mg/kg	0.00342 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
24	🧪	lead { lead chromate }			1	74 mg/kg	1.56	109.617 mg/kg	0.00703 %	✓		
		082-004-00-2	231-846-0	7758-97-6								
25	🧪	mercury { mercury dichloride }				0.4 mg/kg	1.353	0.514 mg/kg	0.0000514 %	✓		
		080-010-00-X	231-299-8	7487-94-7								
26	🧪	nickel { nickel dihydroxide }				23 mg/kg	1.579	34.5 mg/kg	0.00345 %	✓		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
27	🧪	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD	
		034-002-00-8										
28	🧪	zinc { zinc chromate }				84 mg/kg	2.774	221.299 mg/kg	0.0221 %	✓		
		024-007-00-3										
29	■	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD	
				TPH								
								Total:	0.0437 %			

Key

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

Classification of sample: TP05


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

Sample details

Sample Name:	LoW Code:
TP05	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
2.20 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
9.6%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 9.6% Dry Weight Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	pH				8 pH		8 pH	8pH		
2	phenol				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
3	naphthalene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
4	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
5	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
6	fluorene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-695-5	86-73-7							
7	phenanthrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-581-5	85-01-8							
8	anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		204-371-1	120-12-7							
9	fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-912-4	206-44-0							
10	pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		204-927-3	129-00-0							
11	benzo[a]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
12	chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
13	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
14	benzo[k]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
15	benzo[a]pyrene; benzo[def]chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
16	indeno[123-cd]pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-893-2	193-39-5							

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number								
17		dibenz[a,h]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD	
		601-041-00-2	200-181-8	53-70-3								
18	■	benzo[ghi]perylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD	
			205-883-8	191-24-2								
19	🧪	arsenic { arsenic trioxide }				11 mg/kg	1.32	13.251 mg/kg	0.00133 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
20	🧪	boron { ■ boron tribromide/trichloride/trifluoride (combined) }				0.5 mg/kg	13.43	6.127 mg/kg	0.000613 %	✓		
				10294-33-4, 10294-34-5, 7637-07-2								
21	🧪	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD	
		048-010-00-4	215-147-8	1306-23-6								
22	🧪	chromium { ■ chromium(III) oxide }				26 mg/kg	1.462	34.672 mg/kg	0.00347 %	✓		
			215-160-9	1308-38-9								
23	🧪	copper { dicopper oxide; copper (I) oxide }				26 mg/kg	1.126	26.709 mg/kg	0.00267 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
24	🧪	lead { lead chromate }			1	16 mg/kg	1.56	22.771 mg/kg	0.00146 %	✓		
		082-004-00-2	231-846-0	7758-97-6								
25	🧪	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD	
		080-010-00-X	231-299-8	7487-94-7								
26	🧪	nickel { nickel dihydroxide }				46 mg/kg	1.579	66.293 mg/kg	0.00663 %	✓		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
27	🧪	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD	
		034-002-00-8										
28	🧪	zinc { zinc chromate }				87 mg/kg	2.774	220.211 mg/kg	0.022 %	✓		
		024-007-00-3										
29	■	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD	
				TPH								
								Total:	0.0397 %			

Key

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

Classification of sample: TP06


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

Sample details

Sample Name:	LoW Code:
TP06	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.10 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
8.5%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 8.5% Dry Weight Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	pH				7.4 pH		7.4 pH	7.4 pH		
2	phenol				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
3	naphthalene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
4	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
5	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
6	fluorene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-695-5	86-73-7							
7	phenanthrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-581-5	85-01-8							
8	anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		204-371-1	120-12-7							
9	fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-912-4	206-44-0							
10	pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		204-927-3	129-00-0							
11	benzo[a]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
12	chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
13	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
14	benzo[k]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
15	benzo[a]pyrene; benzo[def]chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
16	indeno[123-cd]pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-893-2	193-39-5							

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number								
17		dibenz[a,h]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD	
		601-041-00-2	200-181-8	53-70-3								
18	■	benzo[ghi]perylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD	
			205-883-8	191-24-2								
19	🧪	arsenic { arsenic trioxide }				20 mg/kg	1.32	24.338 mg/kg	0.00243 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
20	🧪	boron { ■ boron tribromide/trichloride/trifluoride (combined) }				2.1 mg/kg	13.43	25.994 mg/kg	0.0026 %	✓		
				10294-33-4, 10294-34-5, 7637-07-2								
21	🧪	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD	
		048-010-00-4	215-147-8	1306-23-6								
22	🧪	chromium { ■ chromium(III) oxide }				17 mg/kg	1.462	22.9 mg/kg	0.00229 %	✓		
			215-160-9	1308-38-9								
23	🧪	copper { dicopper oxide; copper (I) oxide }				32 mg/kg	1.126	33.206 mg/kg	0.00332 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
24	🧪	lead { lead chromate }			1	62 mg/kg	1.56	89.132 mg/kg	0.00571 %	✓		
		082-004-00-2	231-846-0	7758-97-6								
25	🧪	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD	
		080-010-00-X	231-299-8	7487-94-7								
26	🧪	nickel { nickel dihydroxide }				20 mg/kg	1.579	29.115 mg/kg	0.00291 %	✓		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
27	🧪	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD	
		034-002-00-8										
28	🧪	zinc { zinc chromate }				73 mg/kg	2.774	186.648 mg/kg	0.0187 %	✓		
		024-007-00-3										
29	■	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD	
				TPH								
Total:								0.0394 %				

Key

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

Classification of sample: TP07


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

Sample details

Sample Name:	LoW Code:
TP07	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.70 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
15%	
(dry weight correction)	

Hazard properties

None identified

Determinands

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

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	pH				7.8 pH		7.8 pH	7.8 pH		
2	phenol				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
3	naphthalene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
4	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
5	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
6	fluorene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-695-5	86-73-7							
7	phenanthrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-581-5	85-01-8							
8	anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		204-371-1	120-12-7							
9	fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-912-4	206-44-0							
10	pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		204-927-3	129-00-0							
11	benzo[a]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
12	chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
13	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
14	benzo[k]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
15	benzo[a]pyrene; benzo[def]chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
16	indeno[123-cd]pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-893-2	193-39-5							

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number								
17		dibenz[a,h]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD	
		601-041-00-2	200-181-8	53-70-3								
18	■	benzo[ghi]perylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD	
			205-883-8	191-24-2								
19	☠	arsenic { arsenic trioxide }				11 mg/kg	1.32	12.629 mg/kg	0.00126 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
20	☠	boron { ■ boron tribromide/trichloride/trifluoride (combined) }				0.7 mg/kg	13.43	8.175 mg/kg	0.000817 %	✓		
				10294-33-4, 10294-34-5, 7637-07-2								
21	☠	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD	
		048-010-00-4	215-147-8	1306-23-6								
22	☠	chromium { ■ chromium(III) oxide }				27 mg/kg	1.462	34.315 mg/kg	0.00343 %	✓		
			215-160-9	1308-38-9								
23	☠	copper { dicopper oxide; copper (I) oxide }				26 mg/kg	1.126	25.455 mg/kg	0.00255 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
24	☠	lead { lead chromate }			1	15 mg/kg	1.56	20.345 mg/kg	0.0013 %	✓		
		082-004-00-2	231-846-0	7758-97-6								
25	☠	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD	
		080-010-00-X	231-299-8	7487-94-7								
26	☠	nickel { nickel dihydroxide }				26 mg/kg	1.579	35.71 mg/kg	0.00357 %	✓		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
27	☠	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD	
		034-002-00-8										
28	☠	zinc { zinc chromate }				49 mg/kg	2.774	118.203 mg/kg	0.0118 %	✓		
		024-007-00-3										
29	■	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD	
				TPH								
								Total:	0.0262 %			

Key

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

Appendix A: Classifier defined and non CLP determinands

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

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

- **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 1 H310 , Acute Tox. 1 H330 , Acute Tox. 4 H302

- **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 2 H411 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

- **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

- **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Skin Irrit. 2 H315 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Carc. 2 H351 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302

- **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

- **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Acute Tox. 4 H302

- **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Irrit. 2 H315

- **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2 H351

- **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

■ **boron tribromide/trichloride/trifluoride (combined)** (CAS Number: 10294-33-4, 10294-34-5, 7637-07-2)

Conversion factor: 13.43

Description/Comments: Combines the hazard statements and the average of the conversion factors for boron tribromide, boron trichloride and boron trifluoride

Data source: N/A

Data source date: 06 Aug 2015

Hazard Statements: Skin Corr. 1B H314 , Skin Corr. 1A H314 , Acute Tox. 2 H300 , Acute Tox. 2 H330 , EUH014

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

Conversion factor: 1.462

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Repr. 1B H360FD , Skin Sens. 1 H317 , Resp. Sens. 1 H334 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302 , Acute Tox. 4 H332

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

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

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Aquatic Chronic 2 H411 , Repr. 2 H361d , Carc. 1B H350 , Muta. 1B H340 , STOT RE 2 H373 , Asp. Tox. 1 H304 , Flam. Liq. 3 H226

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

CLP index number: 601-023-00-4

Description/Comments:

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

Additional Hazard Statement(s): Carc. 2 H351

Reason for additional Hazards Statement(s)/Risk Phrase(s):

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

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Worst case species based on risk phrases

boron {boron tribromide/trichloride/trifluoride (combined)}

Worst case species based on risk phrases

cadmium {cadmium sulfide}

Worst case species based on risk phrases

chromium {chromium(III) oxide}

The levels of Chromium VI were recorded to be below the laboratory limit of detection (<4.0mg/kg).

copper {dicopper oxide; copper (I) oxide}

Most likely common species

lead {lead chromate}

Worst case species based on risk phrases

mercury {mercury dichloride}

Worst case species based on risk phrases

nickel {nickel dihydroxide}

Worst case species based on risk phrases

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

Worst case species based on risk phrases

zinc {zinc chromate}

Worst case species based on risk phrases

Appendix C: Version

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

HazWasteOnline Classification Engine Version: 2019.240.3963.8017 (28 Aug 2019)

HazWasteOnline Database: 2019.240.3963.8017 (28 Aug 2019)

This classification utilises the following guidance and legislation:

WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

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

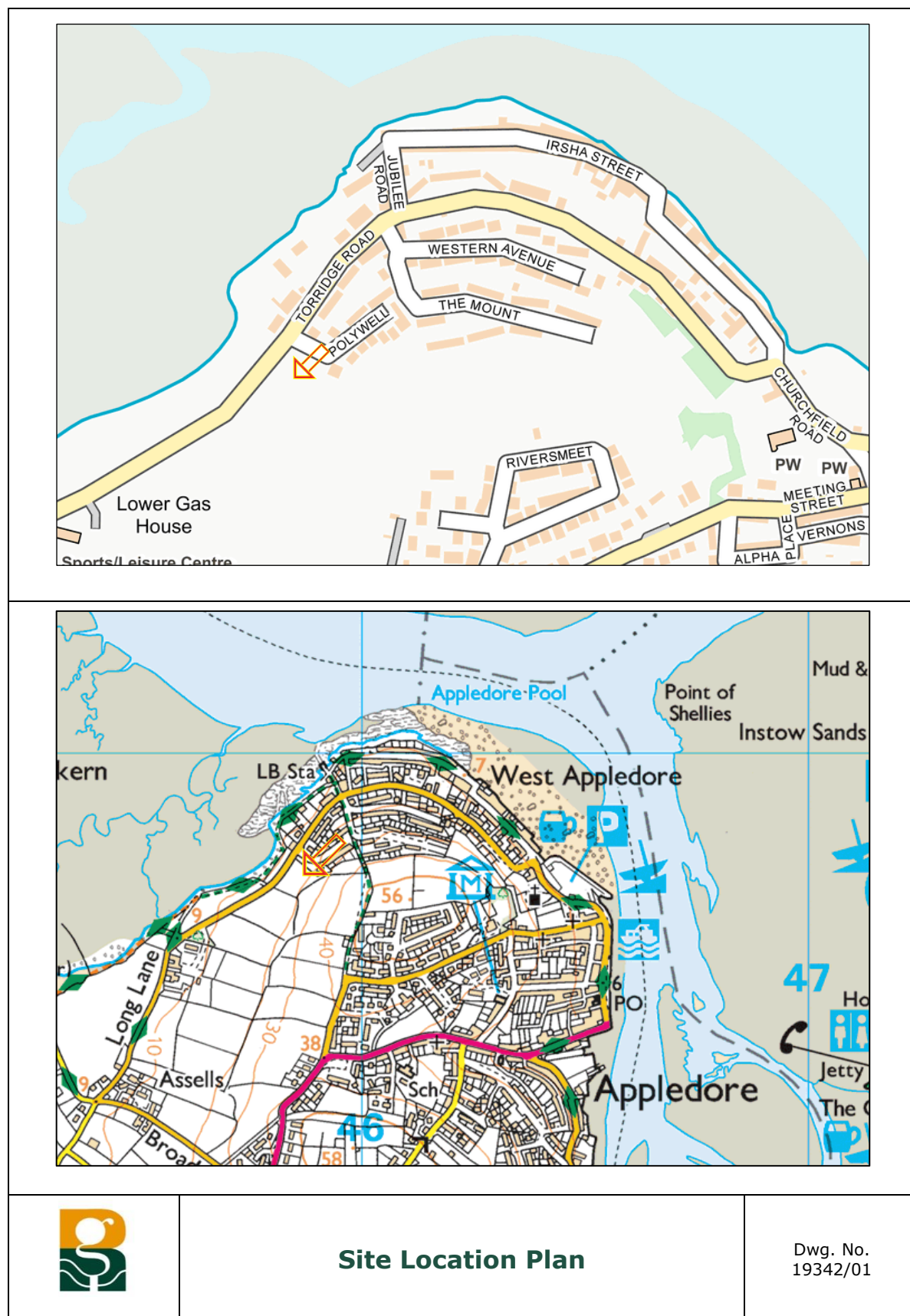
APPENDIX D

SITE PLANS



SITE LOCATION PLAN





AERIAL PHOTOGRAPH

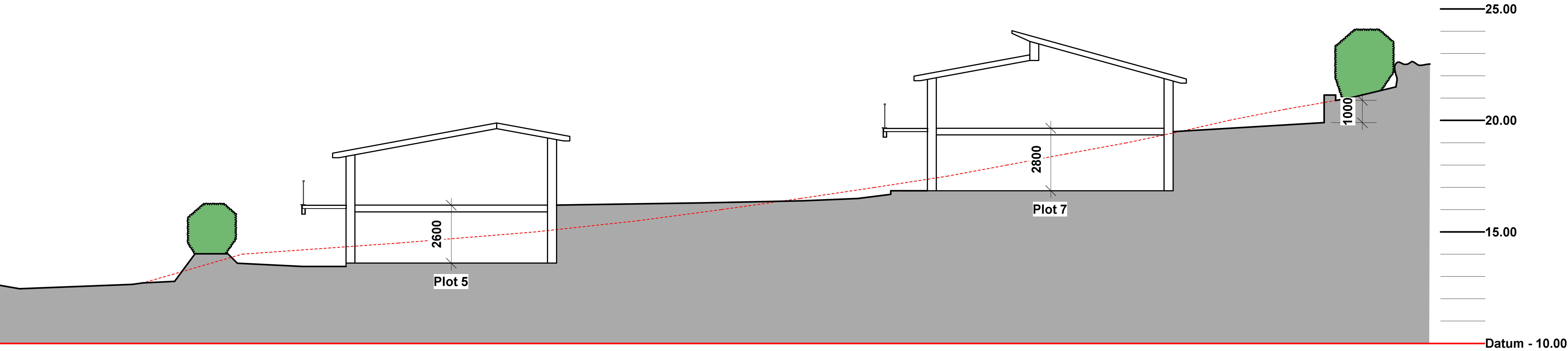


**Aerial Photograph**Dwg. No.
19342/AP

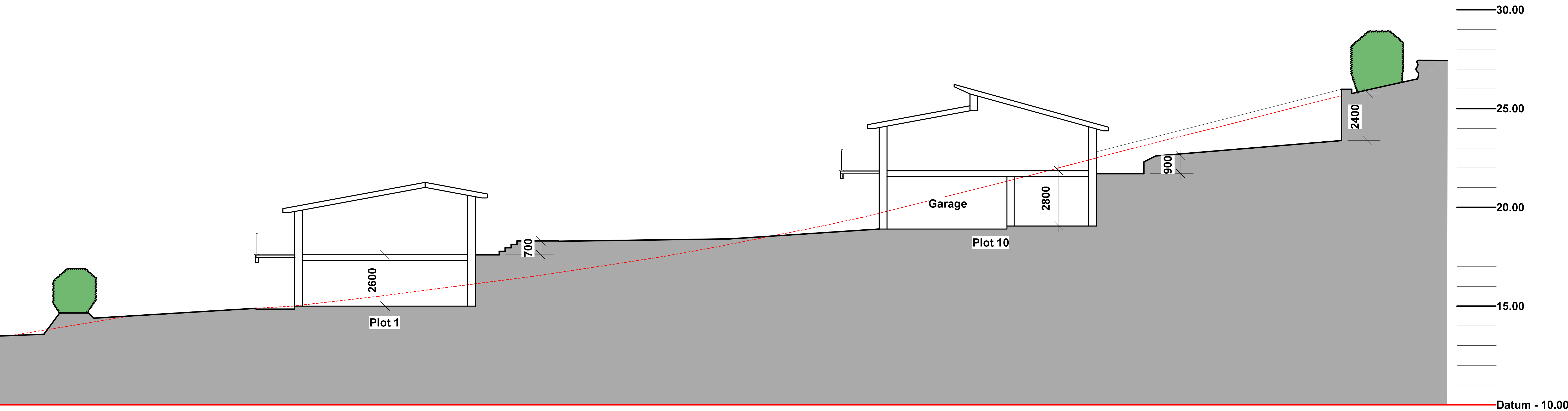
PROVIDED CROSS-SECTION DRAWING



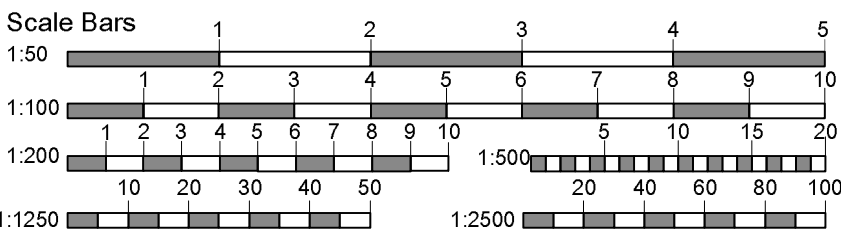
External Works Sections AA & BB



Section AA - Scale 1:100 @ A1



Section BB - Scale 1:100 @ A1




EXPLORATORY HOLE LOCATION PLAN





LEGEND:

-  Trial Pit
-  Dynamic Cone Penetrometer

NOTES:

Drawn on plan supplied by client

Job Title:	Land South of Polywell Appledore Bideford Devon
Drawing Title:	Exploratory Hole Location Plan
Client:	Chichester Homes Developments Ltd
 Ruddlesden geotechnical Ltd The Stables 65 Langaton Lane Pinhoe Exeter EX1 3SP www.ruddlesden.co.uk	
Dwg. No:	19342/02
Date:	August-19
Scale:	NTS