Appendix E: Combined Geotechnical and Ground Contamination Risk Assessment

Inland Revenue
Durrington Bridge House
Barrington Road
Worthing
West Sussex

Combined Geotechnical and Ground Contamination Risk Assessment

Report No. LW26215
September 2015

Report prepared for the benefit of:

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The risk assessment presented in this report follows 'source-pathway-receptor' techniques for the determination of whether a site is contaminated. This is standard practice in the UK, being intrinsic to Part 2A of the Environmental Protection Act 1990 as amended.

The report considers the proposed end users as the most sensitive human health receptors. If significant risks to construction workers are identified by the preliminary assessment attention is drawn to this, although it is noted that no assessment of risk from acute exposure has been undertaken in this connection.

This report is not intended to be either an ecological, archaeological or flood risk assessment. An appropriate specialist should be consulted about any concerns that may arise in this regard.

EXECUTIVE SUMMARY

At present development proposals for the site are still under consideration, although it is understood that the intention is to demolish the existing office buildings and provide either a purely residential development, or a mixed use commercial and residential development. The following presents a summary of the main findings of the ground investigation. It is emphasised that no reliance should be placed on any individual point until the whole of the report has been read as other sections of the report may put into context the information contained herein.

Reference to geological datasets indicated that the site was expected to be underlain by the River Terrace Deposits overlying the White Chalk Subgroup. The former was confirmed by the ground investigation, which showed the underlying soils to comprise a shallow thickness of made ground, overlying River Terrace Deposits, generally comprising undisturbed firm to very stiff slightly gravelly silty clay deposits. The Chalk deposits were not encountered during the course of the investigation, which was limited to a maximum of 3m depth.

The River Terrace Deposits are classed as a Secondary B Aquifer. The White Chalk Subgroup is classed as a Principal Aquifer. The site does not lie within an Environment Agency Source Protection Zone with regard to the protection of the quality of groundwater that is abstracted for potable supply. No groundwater was encountered during the investigation.

Precautions against shrinkage and heave for any new foundation system should assume a medium volume change potential for the fine grained River Terrace Deposit soils and take into account current guidance such as that given by the Building Research Establishment (BRE) or the National House Builders Council (NHBC). The undisturbed sand and gravel soils of the River Terrace Deposits may be considered to be non-plastic and hence non-shrinkable.

A net allowable bearing capacity of 100kN/m^2 may be assumed for spread (pad or strip) foundations up to 1.5m across bearing within the River Terrace Deposits of minimum firm consistency. An increased bearing capacity of 150kN/m^2 may be assumed for similar sized footings where foundations are deepened to bear within the soils of minimum firm to stiff consistency or medium dense relative density, typically encountered below depths of between 1.5m and 2.0m below ground level.

All made ground or coarse grained natural soils exposed in excavations should be assumed to be unstable, even in the short term. Where stable excavations are required excavations should either be suitably supported or side slopes should be battered back to a safe angle of repose.

A DS-1 Design Sulfate Class and an AC-1s ACEC classification may be assumed as a minimum for the design of concrete in contact with the ground.

In view of the variable thickness of made ground and the presence of soils of medium volume change potential, it is recommended that ground floors for all sensitive structures should be suspended. Ground bearing floors may be considered where the conditions outlined in this report are met.

A design equilibrium CBR value of no greater than 3% should be assumed for the design of pavement bearing on the River Terrace Deposits and derived made ground. The subgrade is not likely to be susceptible to frost heave.

In situ testing indicates that the coarser grained soils of the River Terrace Deposits should be capable of disposing of stormwater using infiltration systems.

The ground investigation has identified elevated concentrations of arsenic, lead and PAH compounds within the made ground soils beneath the site. Whilst widespread petroleum hydrocarbon, BTEX compound, volatile organic compounds and PCB congeners have not been recorded by the investigation there remains the potential for localised contamination to be present beneath the facilities maintenance area, and electricity substations.

There remains the potential for ground gases to pose a risk to end users of the site, however a separate ground gas risk assessment will be undertaken on completion of the monitoring programme to further assess the risk from this source.

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1. INTRODUCTION

It is proposed to redevelop the existing Inland Revenue site at Durrington Bridge House, Barrington Road, Worthing, West Sussex. At the time of the present investigation there are no firm development proposals for the site, although it is understood that the intention is to demolish the existing office buildings and provide either a purely residential development, or a mixed use commercial and residential development.

Ashdown Site Investigation Limited was commissioned to carry out a combined geotechnical and quantitative ground contamination risk assessment of the site by Mr C Hemmings of WYG, The Pavilion, 1st Floor, Botleigh Grange Office Campus, Hedge End, Southampton, Hampshire SO30 2AF.

The scope of the commission and the terms and conditions under which the work was undertaken are set out within the offer letter Q14-1021/rev1 dated 26th May 2015. The instruction to proceed was received on behalf of the client Mapeley STEPS Ltd in an email dated 15th July 2015.

The objectives of the works were to:

a) Establish the expected geology and hydrogeology at the site;
b) Investigate the shallow ground and groundwater conditions prevailing at the site;
c) Provide advice to assist others in undertaking design of spread foundations, ground floors, road pavement and soakaways;
d) Test for the presence of potentially significant contamination and gas in the ground; and
e) Develop a quantitative conceptual model of the site identifying potentially significant pollutant linkages relating to end users of the development, to controlled waters or off-site sensitive receptors.

This report should be read in conjunction with the preliminary ground contamination assessment report for the site prepared by Ashdown Site Investigation Limited, Report Numbers LW25338/ds, dated December 2014. It is noted that the preliminary ground contamination assessment encompassed a slightly larger site area including an area of dense woodland and vegetation to the south west of the main site, which was not investigated as part of the present phase of works.

2. SITE CONTEXT

2.1 Site Description

The site comprises an approximately rectangular shaped plot of land located at Barrington Road, Worthing, West Sussex, and is centred on the approximate Ordnance Survey national grid reference TQ 1182 0308. A site location plan and site plan are presented as Figure 1 and Figure 2, respectively.

The site is bounded by a railway line to the north, an office building and associated car parking to the east, residential properties to the south and west and an area of overgrown scrubland to the north west.

At the time of the intrusive works the main part of the site was occupied by a partially vacant office complex along with associated areas of car parking.

The smaller, western part of the site, comprising a heavily overgrown field was excluded from the present investigation.

Access to the main part of the site is off Barrington Road in the south eastern corner of the site. An internal asphalt surfaced access road runs approximately halfway up the eastern edge of the site before running west across the centre of the main part of the site. An electrical substation is located in the south eastern corner.

To the south of the access road is a single storey brick office building, comprising a narrow section of building running east to west with multiple extensions leading off to the south. Areas of soft landscaping are present between each extension. The southern boundary of the site is marked by a number of large trees and bushes.

To the north of the access road are a number of single and multi-storey office buildings of concrete construction. In the north east of the site, located between two of these buildings, the footings of a now demolished building were noted to be present.

Toward the western edge of this complex of buildings are a number of small facility maintenance buildings. Located within this part of the site is a large chimney associated with 6 liquid fuel boilers housed within one of the buildings, a gas bottle and chemical storage compound, electricity generators and electrical substation and 5 bunded above ground tanks in two blocks (a block of three very large outdoor tanks feeding the boilers, and a block of two smaller internal tanks feeding generators). A metal shipping container used as a wood workshop and for storage is also located in the area.

Mature trees form the northern boundary of the main part of the site, separating the site from the railway line to the north which lies at around the same level as the site, although to the west it runs in a shallow cutting. Two large turfed mounds were noted in an area of soft landscaping around halfway along the northern boundary.

A large asphalt surfaced car parking area occupied the western edge of the main part of the site. A surface water interceptor was located in a soft landscaped area in the south eastern corner of the car park.

2.2 Expected Geology

The stratigraphic succession that may be expected to underlie the site, as presented in the following table, has been determined from reference to the British Geological Survey lexicon of named rock units and British Geological Survey mapping data.

Table 1. Expected Geological Strata

Type	Stratum
Superficial Deposits	River Terrace Deposits
Bedrock Deposits	White Chalk Subgroup

2.2.1 River Terrace Deposits

The River Terrace Deposits in this area were formerly denoted as the Brickearth and comprise brown sandy (fine) silt or clay largely originating from the solution weathering of the previously existing chalk. The material will have been reworked by water flow to produce some lateral variability in the grain size of the soil (sand and gravel) and can be expected to contain a variable content of flint.

2.2.2 White Chalk Subgroup

The White Chalk Subgroup comprises a weak, white chalk locally with flint bands together with scattered nodular flints. It may be expected to have a deeply convoluted upper surface as a result of solution weathering. The presence of natural cavities in the chalk is very rare and solution features, if present, can be expected to be infilled with Quaternary deposits such as the River Terrace Deposits.

The infill material may be significantly weaker than the surrounding chalk. Solution features can comprise pipes extending to several metres deep into the chalk or conical depressions and basin shaped structures.

2.3 Hydrogeology

2.3.1 Aquifer Classification

The Environment Agency designates aquifers in accordance with the Water Framework Directive. These designations reflect not only the importance of aquifers in terms of groundwater as a resource (drinking water supply) but also their role in supporting surface water flows and wetland ecosystems. The aquifer designation data is based on geological mapping provided by the British Geological Survey.

The River Terrace Deposits expected beneath the site are classified as a Secondary B Aquifer. Secondary B Aquifers are typically lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.

The White Chalk Subgroup expected beneath the site is classified as a Principal Aquifer. Principal Aquifers comprise deposits that have high intergranular and/or fracture permeability,

usually providing a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

2.3.2 Groundwater Source Protection Zones

The site does not lie within an Environment Agency Source Protection Zone with regard to the protection of the quality of groundwater that is abstracted for potable supply.

3. GROUND INVESTIGATION

3.1 Introduction

The ground investigation comprised the excavation of a series of dynamic sampler boreholes with accompanying (super heavy) dynamic probing and TRL dynamic cone penetrometer testing. Gas and groundwater monitoring standpipes were installed in some of the exploratory holes and were monitored on subsequent site visits. The fieldwork was carried out between 23rd July 2015 and 28th August 2015. The exploratory hole locations are shown on Figure 2.

Descriptions of the strata encountered and comments on groundwater conditions are shown in the exploratory hole records given in Appendix A, together with notes to assist in their interpretation.

3.2 Exploratory Holes

3.2.1 Dynamic Sampler Boreholes

Twelve boreholes (designated WS1 to WS6 and WS8 to WS13) were drilled to depths of between 1.00m and 3.00m below ground level. Borehole WS7 was abandoned at shallow depth due to a significant thickness of concrete surfacing.

The boreholes were formed by a series of 1.0m long, open ended, hollow steel tubes of up to 100mm diameter, each containing a removable plastic liner. The tubes, progressively reducing in diameter, were driven into the ground by means of a track-mounted drop weight. Each tube was extracted from the ground using a hydraulically operated jack and the enclosed sample was recovered in its plastic liner.

The system enables sub-samples to be taken for detailed examination and laboratory testing.

3.3 Sampling

Disturbed samples of soil were taken at the depths shown in the exploratory hole records and were collected in plastic liners, plastic bags, plastic tubs or amber jars fitted with gas tight lids.

On collection the amber jars were stored in cool boxes with cooling blocks to maintain temperatures below 4°C until transferred to refrigerators upon return to the office and subsequently forwarded to the external accredited chemical testing laboratory.

3.4 In Situ Testing

The depths of in situ testing, together with the test results, are either given on the exploratory hole records or are summarised separately in Appendix A. Notes providing additional information on the tests performed are included in the appendix.

3.4.1 DPSH Dynamic Probe (Super Heavy) Testing

Continuous dynamic probe tests were undertaken adjacent to boreholes WS1 to WS6 and WS9 to WS13 to depths of between 2.90m to 5.00m below ground level. Probing was undertaken in accordance with BS EN ISO 22476-2:2005 using a super heavy DPSH-B probing geometry.

The DPSH-B configuration is similar to that of the standard penetration test (SPT); the main differences being that the tip comprises a 90° cone, the driving rods are lighter than those used for SPT testing and the blow counts are recorded over 100mm increments rather than 300mm, as is the case for the SPT.

The blow counts recorded and the calculated dynamic point resistances, which account for inertia of the anvil and driving rods, are presented on the borehole records and separately in Appendix A.

3.4.2 Undrained Shear Strength

Undrained shear strength determinations were made in situ within the fine grained soils using a Geonor hand shear vane.

Additionally undrained shear strength determinations were made within samples of the fine grained soils held in the dynamic sampler liners using a hand penetrometer.

3.4.3 California Bearing Ratio Tests

Testing to determine the in situ California Bearing Ratio (CBR) of soils was conducted at shallow depths adjacent to boreholes WS1, WS3, WS5, WS10, WS11 and WS13 using a Transport Road Laboratory (TRL) cone penetrometer. The tests were carried out to a maximum depth of 0.87m below existing ground level.

3.4.4 Soakage Testing

Falling head soakage tests were undertaken in boreholes WS2, WS4, WS10 and WS13 with the holes at a depth of 3.00m within the River Terrace Deposits. The tests were carried out in general accordance with The Soakaway Design Guide published by Kent County Council (2000).

3.5 Installations

Gas and groundwater monitoring standpipes were installed to depths of between 0.70m and 2.70m in seven boreholes. Descriptions of the installations are shown on the exploratory hole records in Appendix A.

The concentrations of gases and vapours and the depths to groundwater are scheduled to be recorded within the standpipes on six occasions. The monitoring programme is currently on-going and the results will be provided under separate cover on completion.

3.6 Laboratory Testing

Laboratory testing was scheduled by Ashdown Site Investigation Ltd. Results from the laboratory tests are provided in Appendix B.

3.6.1 Geotechnical Testing

Geotechnical testing was undertaken by Ashdown Site Investigation Ltd in accordance with the methods given in BS1377:1990 Parts 1 to 8 'Methods of test for soils for civil engineering purposes'. Chemical testing to enable classification of the chemical environment of soils in accordance with BRE SD1 was undertaken by an external UKAS accredited laboratory. Notes to assist with the interpretation of the tests are contained within Appendix B.

3.6.2 Chemical Testing

Chemical testing of selected samples was undertaken by a laboratory with recognised (UKAS and MCERTS) accreditation for quality control.

4. GROUND CONDITIONS

4.1 Stratigraphy

4.1.1 Surface Covering

In general, the exploratory holes were located within areas of soft landscaping and were excavated through a surface cover of topsoil some 100mm to 150mm in thickness.

Within boreholes WS9 and WS11 to WS13 asphalt some 100mm to 200mm thick was recorded. Concrete was present at the surface of borehole WS7.

No surfacing materials were encountered in borehole WS4 or WS6.

4.1.2 Made Ground

Made ground, generally comprising slightly gravelly clay was recorded to depths of between 0.40m and 1.60m below ground level. The gravel fraction comprised variable quantities of flint, brick, concrete, charcoal, clinker, chalk, glass, crystalline rock and ash.

At borehole position WS1, made ground/reworked slightly gravelly clay was recorded to a depth of 0.70m.

The base of the made ground was not proved in borehole WS8, which was terminated at a depth of 1m below ground level on a concrete obstruction. Also, as noted earlier in this report, borehole WS7 was abandoned due to the presence of concrete just below the ground surface.

4.1.3 River Terrace Deposits

Underlying the made ground, the investigation progressed into undisturbed firm to very stiff slightly gravelly silty clay deposits. Within a number of boreholes on the southern and western sides of the site medium dense to very dense slightly gravelly sand or slightly sandy silty gravel was encountered between the depths of 1.90m and 2.60m.

These soils, considered to be representative of the River Terrace Deposits soils indicated on the published geology map, were proved throughout to the full depth of the investigation. The chalk deposits expected to underlie the River Terrace Deposits were not encountered within any of the exploratory holes, which were terminated at depths of up to 3.0m below ground level.

4.2 Stability

Instability was recorded locally within the coarse grained soils.

4.3 Groundwater Conditions

Each exploratory hole was recorded to be dry during excavation and also during the standpipe-monitoring visits undertaken to date.

5. GEOTECHNICAL ASSESSMENT

At the time of preparation of this report no specific development proposal for the site had been finalised. However it is understood that the intention is to demolish the existing office buildings and provide either a purely residential development, or a mixed use commercial and residential development. No details were available concerning the specific loads likely to be applied to the foundations.

It should be noted that further works may be required in order to provide further information on the underlying ground conditions given that some areas of the site remained covered by existing buildings limiting the spatial coverage across the site.

5.1 Foundations

5.1.1 Soil Shrinkage/Heave Potential

The fine grained soils of the River Terrace Deposits have been classified as clays of low to intermediate plasticity and with plasticity indices in the range of 8% to 29% the soils may be expected to exhibit a negligible to medium volume change potential.

The undisturbed sand and gravel soils of the River Terrace Deposits may be considered to be non-plastic and hence non-shrinkable.

The River Terrace Deposits have been found to be variable in composition both laterally and vertically across the site. It is therefore recommended that the design of precautions against shrinkage and heave for any new foundation system should assume a medium volume change potential for the fine grained River Terrace Deposits soils and take into account current guidance such as that given by the Building Research Establishment (BRE) or the National House Builders Council (NHBC).

Whilst this report has been prepared to provide advice to assist designers in undertaking detailed design, the report itself does not represent a detailed design statement. It is recommended that an arboricultural survey of the site should be conducted to establish the species and maturity of the existing trees in the areas of the proposed new buildings. The survey should be extended to include a review of historical photographs and detailed site plans (if available) to establish the species and location of any felled trees that may affect foundation design. The information obtained from the arboricultural survey, information on proposed planting schemes and the findings of this report should be provided to the structural engineer responsible for the detailed design of foundation systems, including assessment of minimum founding depths for spread foundations, and requirements for placement of void formers et cetera.

5.1.2 Spread Foundations

Unless evidence exists to the contrary, all made ground and any soils disturbed by the construction or removal of any previously existing foundations or services should be regarded as being variable in nature and state of compaction and, as such, unsuitable as a founding medium for shallow footings. New footings should be constructed so as to bear below such soils and onto undisturbed, competent, natural deposits.

Attention is drawn to the concrete encountered at 1.0m depth in borehole WS8. The potential for further obstructions to be present across the site should not be overlooked.

For design purposes, a net allowable bearing capacity of 100kN/m^2 may be assumed for spread (pad or strip) foundations up to 1.5m across bearing within the undisturbed River Terrace Deposits of minimum firm consistency. An increase bearing capacity of 150kN/m^2 may be assumed for similar sized footings where foundations are deepened to bear within the soils of minimum firm to stiff consistency and/or medium dense relative density, typically encountered below depths of between 1.5m and 2.0m below ground level.

The quoted bearing capacities are expected to limit settlement to less than 25mm. In general a minimum depth to formation of 0.9m should be adopted, although foundations should be deepened where made ground is found to extend below this depth or where there is a requirement to protect foundations against seasonal soil volume changes induced by trees.

Attention is drawn to the presence of interbedded fine grained and coarse grained soils beneath the site. As there is the potential for mixed soil conditions to be present beneath footings, designers should consider the need for foundations to be reinforced due to the potential for differential cracking to develop as a result of coarse grained and fine grained soils settling at different rates under loading.

It is recommended that, where a bearing capacity in excess of 100kN/m^2 is to be utilised, the foundation formations should be inspected by suitably qualified persons to confirm the consistency /relative density of the soils at formation level.

5.2 Groundwater

Groundwater was not encountered during either the intrusive works or the standpipe-monitoring visits that have been carried out to date.

It is possible that heavy precipitation during construction could lead to the ingress of perched groundwater or surface water run-off into excavations. In such circumstances it would be expected that water entering into excavations would be adequately managed by either pumping from sumps or by natural drainage within the coarser grained soils, or a combination of the two.

5.3 Stability of Excavations

All made ground or coarse grained natural soils exposed in excavations should be assumed to be unstable, even in the short term. Where stable excavations are required excavations should either be suitably supported or side slopes should be battered back to a safe angle of repose.

All excavations requiring human entry must be shored or battered as necessary to conform to current best practice, as accepted by the Health and Safety Executive (HSE); relevant guidance is given on the HSE website (www.hse.gov.uk). Current legislation requires that where personnel access is required into any excavation a competent person must inspect excavation supports or battering of slopes at the start of the working shift and at other specified times. No work should take place until the excavation is safe. Excavations should also be inspected after any event that may have affected their stability, such as a significant weather event, changes in surcharge loadings imposed by temporary storage of materials or

changes in site traffic plans or alteration of support systems. Inspections should be formally recorded and any faults that are found should be corrected immediately.

Particular attention must be paid to ensuring the stability of nearby structures, services and neighbouring sites as well as the road frontages and railways.

5.4 Aggressivity to Concrete

In view of the soils encountered beneath the site it is considered that 'natural ground conditions' may be assumed for the purpose of assessing the aggressivity of the chemical environment for concrete classification (ACEC class). Given that groundwater was not encountered, 'static groundwater' conditions may be assumed.

Assessment of the chemical analysis of the soil indicates a sulphate content falling into Design Sulfate Class DS-1 of Table C1 of the Building Research Establishment Special Digest No 1 "Concrete in aggressive ground", 2005. The results of the pH tests indicate that the underlying soils are alkaline.

In accordance with the digest, a DS-1 Design Sulfate Class and an AC-1s ACEC classification may be assumed as a minimum for the design of concrete in contact with the ground.

5.5 Ground Floors

In view of the variable thickness of made ground and the presence of soils of medium volume change potential, it is recommended that ground floors for all sensitive structures should be suspended.

Current guidance suggests that ground bearing floor slabs may, however, be considered where made ground soils are not present or are to be removed from beneath building footprints and the depth of foundations required to protect against seasonal soil volume changes close to trees is less than 1.5m. In such circumstances further works should be undertaken to demonstrate, that close to the time of construction, no significant soil desiccation is present. If ground bearing floors are adopted it is recommended that the potential for differential movement, both between the floor slab and walls and across the floor slab itself, should be anticipated. Such floors should be fully debonded from walls. Formations should be adequately proof rolled and any excessively soft materials excavated and replaced with a suitable, well graded granular fill. The depth of any fill should be limited to a maximum of 600mm unless placed to an engineering specification designed to limit internal settlement of the fill materials to a tolerance to be advised by the designer.

The detailing of services through, or under, ground-bearing floors should incorporate flexible connections and, where appropriate, enhanced falls.

5.6 Pavement Design

Cone penetrometer tests undertaken to establish the California bearing ratio (CBR) of the in situ soils indicated CBR values ranging between 2% and >50% but typically in the range 2% to 15% in the underlying River Terrace Deposits or made ground at the time of the investigation. It is noted that CBR values are, in part, dependent on the moisture content of the tested soils and are consequently subject to seasonal variation.

Equilibrium CBR values (with reference to Transport Research Laboratory (TRL) Report LR1132 'Structural design of Bituminous Roads') are derived from knowledge of soil classification data (plasticity index for soils exhibiting cohesion (clay type) and particle size distribution for granular soils), the location of the water table, pavement thickness, and weather conditions at the time of construction. This guidance document suggests a design equilibrium CBR value of 3% to 5% would be applicable to the natural soils for the construction of thin (300mm) pavement under poor to average construction conditions and assuming a low groundwater table.

Based upon review of the in situ test results and the quoted guidance it is recommended that, for the River Terrace Deposits or derived made ground soils, a CBR value of no greater than 3% should be adopted for preliminary pavement design.

All formations should be proof rolled and any excessively large, soft, degradable or otherwise unsuitable materials thus identified should be removed and be replaced with well compacted coarse grained fill. Prepared subgrades should be protected from severe adverse weather by ensuring they are graded to falls to prevent ponding, and they should be reasonably protected from trafficking during construction.

The subgrade may be assumed not to be susceptible to frost heave.

If new roads are to be adopted the local highway authority should be consulted with reference to the acceptability of the proposed CBR figures prior to designs being finalised and construction undertaken.

5.7 Stormwater Infiltration Systems

In situ infiltration testing was undertaken in accordance with 'The Soakaway Design Guide' published by Kent County Council (July 2000). From the results of the tests, calculations were made in accordance with the guide to estimate the infiltration rate that could be expected for soakaways constructed to discharge into the underlying soils within the test zone.

For the test carried out in boreholes WS4, only a 30mm fall in the water level was recorded during the 60 minute test period.

The infiltration rates derived from the tests are summarised in the following table.

Table 2. Calculated Infiltration Rates

Exploratory Hole	Test Response Zone Depth (m)		Stratum	Infiltration Rate (f) (m/sec)	Driving Head of Water (m)
	Top	Bottom			
WS2	1.00	2.00	River Terrace Deposits	1.5×10^{-5}	1.0
WS4	2.00	3.00	River Terrace Deposits	Negligible	-
WS10 – Test 1	2.00	3.00	River Terrace Deposits	2.0×10^{-4}	1.0
WS10 – Test 2	2.00	3.00	River Terrace Deposits	1.3×10^{-5}	1.0
WS13	2.00	3.00	River Terrace Deposits	1.2×10^{-5}	2.0

The value 'f' is equivalent to the soil infiltration coefficient 'q' quoted in the Construction Industry Research and Information Association (CIRIA) Report 156.

The test results indicate that the coarser grained soils of the River Terrace Deposits should be capable of disposing of stormwater using infiltration systems.

To minimise the risk of subsidence, point discharging infiltration systems (conventional ring or trench soakaways) should be constructed a minimum of 5.0m away from proposed or existing buildings.

In the event that discharge to ground via infiltration systems is proposed, it is recommended that designers refer to Pollution Prevention Guidance Notes (PPGs) published by the Environment Agency for advice on legal requirements and good practice to reduce risks to groundwater. In particular reference should be made to PPGs 1 and 3, providing general advice on the prevention of pollution and the use and design of oil separators in surface water drainage systems, respectively. The Local Authority and/or relevant water company should be consulted in relation to consent for discharge of water from rooftops, areas of hardstanding and roadways to drains.

6. QUANTITATIVE CONTAMINATION ASSESSMENT

6.1 Introduction

This risk assessment takes into account the findings of the intrusive works and laboratory testing along with on-site observations in order to quantify risk associated with the potential pollutant linkages identified by the preliminary ground contamination risk assessment.

6.2 Preliminary Conceptual Model

The preliminary conceptual model for the proposed development is presented in the following table.

Table 3. Preliminary Conceptual Model

Potential Sources Identified	Potential Contaminants	Receptor	Potential Pathways	Potential Pathway Present?	Probability	Consequence	Overall Assessment of Risk	Complete Pollutant Linkage Present?
Electrical substation in the south eastern corner of the site.	Localised PCB	Human Health (End Users)	a) Dermal contact with soil and dust (indoor & outdoor).	Yes	Very Low	Moderate	Low	Yes
			b) Ingestion of soil and indoor dust.	Yes	Very Low	Moderate	Low	Yes
			c) Consumption of homegrown produce and attached soil.	Yes	Very Low	Moderate	Low	Yes
			d) Inhalation of soil dust (indoor and outdoor).	Yes	Very Low	Moderate	Low	Yes
			e) Contamination of incoming services.	Yes	Very Low	Moderate	Low	Yes
			f) Inhalation of soil vapours.	Yes	Very Low	Moderate	Low	Yes
			g) Inhalation of soil gases.	No	N/A	N/A	N/A	No
		Groundwater	h) Migration to groundwater.	Yes	Very Low	Very Minor	Negligible	No
Made ground from demolition works.	Heavy metal, PAH compounds and asbestos	Human Health (End Users)	a) Dermal contact with soil and dust (indoor & outdoor).	Yes	Low	Moderate	Low/ Moderate	Yes
			b) Ingestion of soil and indoor dust.	Yes	Low	Moderate	Low/ Moderate	Yes
			c) Consumption of homegrown produce and attached soil.	Yes	Low	Moderate	Low/ Moderate	Yes
			d) Inhalation of soil dust (indoor and outdoor).	Yes	Low	Moderate	Low/ Moderate	Yes
			e) Contamination of incoming services.	No	N/A	N/A	N/A	No
			f) Inhalation of soil vapours.	No	N/A	N/A	N/A	No
			g) Inhalation of soil gases.	No	N/A	N/A	N/A	No
		Groundwater	h) Migration to groundwater.	Yes	Very Low	Very Minor	Negligible	No

Potential Sources Identified	Potential Contaminants	Receptor	Potential Pathways	Potential Pathway Present?	Probability	Consequence	Overall Assessment of Risk	Complete Pollutant Linkage Present?
Tanks, chimney and electricity substation in the facilities maintenance area.	Localised PCB, VOC, petroleum hydrocarbon, BTEX, heavy metal and PAH compounds	Human Health (End Users)	a) Dermal contact with soil and dust (indoor & outdoor).	Yes	Moderate	Moderate	Moderate	Yes
			b) Ingestion of soil and indoor dust.	Yes	Moderate	Moderate	Moderate	Yes
			c) Consumption of homegrown produce and attached soil.	Yes	Moderate	Moderate	Moderate	Yes
			d) Inhalation of soil dust (indoor and outdoor).	Yes	Moderate	Moderate	Moderate	Yes
			e) Contamination of incoming services.	Yes	Moderate	Moderate	Moderate	Yes
			f) Inhalation of soil vapours.	Yes	Moderate	Moderate	Moderate	Yes
			g) Inhalation of soil gases.	No	N/A	N/A	N/A	No
		Groundwater	h) Migration to groundwater.	Yes	Very Low	Minor	Very Low	Yes
Interceptor in the south western corner of the car park.	Localised petroleum hydrocarbon	Human Health (End Users)	a) Dermal contact with soil and dust (indoor & outdoor).	Yes	Low	Moderate	Low/ Moderate	Yes
			b) Ingestion of soil and indoor dust.	Yes	Low	Moderate	Low/ Moderate	Yes
			c) Consumption of homegrown produce and attached soil.	Yes	Low	Moderate	Low/ Moderate	Yes
			d) Inhalation of soil dust (indoor and outdoor).	Yes	Low	Moderate	Low/ Moderate	Yes
			e) Contamination of incoming services.	Yes	Low	Moderate	Low/ Moderate	Yes
			f) Inhalation of soil vapours.	Yes	Low	Moderate	Low/ Moderate	Yes
			g) Inhalation of soil gases.	No	N/A	N/A	N/A	No
		Groundwater	h) Migration to groundwater.	Yes	Very Low	Very Minor	Negligible	No

Potential Sources Identified	Potential Contaminants	Receptor	Potential Pathways	Potential Pathway Present?	Probability	Consequence	Overall Assessment of Risk	Complete Pollutant Linkage Present?
Worked ground and potential backfill associated with historical brick field.	Heavy metal, PAH compounds, asbestos and ground gases	Human Health (End Users)	a) Dermal contact with soil and dust (indoor & outdoor).	Yes	Low	Moderate	Low/ Moderate	Yes
			b) Ingestion of soil and indoor dust.	Yes	Low	Moderate	Low/ Moderate	Yes
			c) Consumption of homegrown produce and attached soil.	Yes	Low	Moderate	Low/ Moderate	Yes
			d) Inhalation of soil dust (indoor and outdoor).	Yes	Low	Moderate	Low/ Moderate	Yes
			e) Contamination of incoming services.	No	N/A	N/A	N/A	No
			f) Inhalation of soil vapours.	No	N/A	N/A	N/A	No
			g) Inhalation of soil gases.	Yes	Very Low	Moderate	Low	Yes
		Groundwater	h) Migration to groundwater.	Yes	Very Low	Very Minor	Negligible	No
Potential backfilled filter beds to the west of the site.	Ground gases	Human Health (End Users)	a) Dermal contact with soil and dust (indoor & outdoor).	No	N/A	N/A	N/A	No
			b) Ingestion of soil and indoor dust.	No	N/A	N/A	N/A	No
			c) Consumption of homegrown produce and attached soil.	No	N/A	N/A	N/A	No
			d) Inhalation of soil dust (indoor and outdoor).	No	N/A	N/A	N/A	No
			e) Contamination of incoming services.	No	N/A	N/A	N/A	No
			f) Inhalation of soil vapours.	No	N/A	N/A	N/A	No
			g) Inhalation of soil gases.	Yes	Very Low	Moderate	Low	Yes
		Groundwater	h) Migration to groundwater.	No	N/A	N/A	N/A	No

Potential Sources Identified	Potential Contaminants	Receptor	Potential Pathways	Potential Pathway Present?	Probability	Consequence	Overall Assessment of Risk	Complete Pollutant Linkage Present?
Historical gas holder to the north west.	Heavy metal, PAH compounds, petroleum hydrocarbon, cyanide, phenol and thiocyanate	Human Health (End Users)	a) Dermal contact with soil and dust (indoor & outdoor).	Yes	Low	Moderate	Low/ Moderate	Yes
			b) Ingestion of soil and indoor dust.	Yes	Low	Moderate	Low/ Moderate	Yes
			c) Consumption of homegrown produce and attached soil.	Yes	Low	Moderate	Low/ Moderate	Yes
			d) Inhalation of soil dust (indoor and outdoor).	Yes	Low	Moderate	Low/ Moderate	Yes
			e) Contamination of incoming services.	Yes	Low	Moderate	Low/ Moderate	Yes
			f) Inhalation of soil vapours.	Yes	Low	Moderate	Low/ Moderate	Yes
			g) Inhalation of soil gases.	No	N/A	N/A	N/A	No
		Groundwater	h) Migration to groundwater.	No	N/A	N/A	N/A	No

6.3 Assessment Strategy

The design of the ground investigation considered the potential contaminant sources identified by the desk study. The strategy employed for positioning the exploratory holes to enable further assessment of the potential risks posed is detailed in the following table.

Table 4. Investigation Works Carried Out

Contaminant source	Exploratory Positions
Electrical substation in the south eastern corner of the site.	Borehole WS1.
Made ground from demolition works.	All exploratory holes.
Tanks, chimney and electricity substation in the facilities maintenance area.	Boreholes WS7, WS8 and WS9.
Interceptor in the south western corner of the car park.	Borehole WS10.
Worked ground and potential backfill associated with historical brick field.	All exploratory holes and gas monitoring standpipes in boreholes WS2, WS3, WS5, WS6, WS9, WS11 and WS13.
Potential backfilled filter beds to the west of the site.	Gas monitoring standpipes within boreholes WS2, WS3, WS5, WS6, WS9, WS11 and WS13.
Historical gas holder to the north west.	Boreholes WS11, WS12 and WS13.

It is noted that this phase of works is preliminary in nature and that further works may be required in order to further assess the potential sources of contamination, particularly in areas currently not accessible due to the presence of existing buildings and infrastructure.

6.4 Analysis of Contamination Test Results

A quantitative assessment of the risk to human health has initially been undertaken by comparing soil contaminant concentrations recorded by laboratory testing against appropriate soil screening values (SSVs). These screening values comprise the 'Suitable For Use Levels' (S4ULs) calculated as a joint project between LQM and CIEH and published in 'The LQM/CIEH Suitable 4 Use Levels, 2015'. In lieu of an S4UL screening value for lead, the Category 4 Screening Level (C4SL) was used, as published within SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. Final Project Report, published by DEFRA, 2014.

In view of the proposed development the assessment has been made against SSVs calculated using the generic "Residential" land use as defined within Science Report SC050021/SR3, January 2009, with the amendments discussed in the LQM/CIEH report. The critical receptor for this land use is considered to be a young female child resident on site from birth to age 6. Exposure routes that are considered include the potential for direct ingestion of the soil, the

outdoor and indoor ingestion of dust, the potential inhalation of dust and vapours, ingestion of site grown vegetables and ingestion of soil attached to vegetables.

For the assessment of risk to controlled waters a qualitative assessment has been undertaken based upon the concentrations of contaminants recorded within the soil samples and the information obtained about the sensitivity of the underlying strata or nearby surface water receptors.

6.4.1 Data Sets and Statistical Analysis

Statistical analysis of the concentrations of heavy metals and polycyclic aromatic hydrocarbon (PAH) compounds within the twelve samples of the shallow made ground soils (samples were tested from depths of up to 1.0m below ground level) has been undertaken in line with guidance set out in 'Comparing Soil Contamination Data with a Critical Concentration' report, published by the CIEH/ CL:AIRE (May 2008).

The CIEH/CL:AIRE guidance provides a framework for assessing measured contaminant concentrations on a site against user defined critical concentrations – or indicators of risk.

Under a planning scenario, the null hypothesis tested is that the true population mean is greater than a "critical concentration". The critical concentration used within this assessment is the relevant screening value for the proposed end use.

The null hypothesis can be rejected if it can be shown (with a sufficient degree of confidence) that the true population mean lies below the critical concentration. The confidence level recommended within the guidance is 95% i.e. the statistical evidence must show that there is 95% likelihood that the true population mean lies below the critical concentration. In this instance the site is considered suitable for the proposed use.

Where there is insufficient evidence to reject the null hypothesis, further risk assessment and/or remediation may be necessary.

Guidance on comparing soil contamination data with a critical concentration is provided in Appendix C along with the summary sheets from the statistical analysis.

The sample of made ground tested from borehole WS8 was present above a concrete obstruction. It is considered likely that this concrete represents a relict structure and as such this layer of made ground is regarded as being separate to the made ground encountered across the rest of the site. The results of the tests for contaminants within this made ground layer have been compared directly with the soil screening values.

6.5 Heavy Metals

The following table summarises the laboratory test results, soil screening values, sample means and 95th percentile upper confidence limits for the shallow made ground soils.

Table 5. Summary of Test Results and Statistical Analysis for Heavy Metals

Contaminant	SSV (mg/kg)	No. of Samples	Minimum Concentration (mg/kg)	Maximum concentration (mg/kg)	Limit of Detection (mg/kg)	Sample Mean (mg/kg)	95% Upper Confidence Limit (mg/kg)	No of exceedances	Can H_o be rejected
Arsenic	37	12	8.8	107	1	20.73	55.37	1	No
Cadmium	11	12	<LOD	0	0.5	0.25	0.25	0	Yes
Chromium	910	12	16.2	77.2	5	29.52	49.76	0	Yes
Copper	2400	12	12.6	31.2	5	21.65	25.11	0	Yes
Lead	200	12	11.2	504	5	75.22	248.56	1	No
Mercury	40	12	<LOD	0	0.5	0.25	0.25	0	Yes
Nickel	180	12	12.2	27.1	5	19.50	21.46	0	Yes
Selenium	250	12	<LOD	3.2	1	0.79	1.79	0	Yes
Zinc	3700	12	48.7	98.4	45	55.74	68.46	0	Yes
Hexavalent Chromium	6	12	<LOD	0	0.8	0.40	0.40	0	Yes
Water Soluble Boron	290	12	<LOD	1.4	0.5	0.59	0.98	0	Yes

The statistical analysis has identified elevated concentrations of arsenic and lead compared with the soil screening values for a residential development.

The made ground associated with a possible relict structure in WS8 did not record any elevated heavy metals above the relevant soil screening values.

There is considered to be a risk to end users of the site from the elevated lead and arsenic within the made ground encountered beneath the site.

Notwithstanding the above, in general relatively low concentrations of metals have been recorded in the made ground soils. In view of this and given the general urban context of the area surrounding the site heavy metals are not considered to pose an abnormal risk to groundwater.

6.6 Cyanide

Two samples of the made ground taken from boreholes WS11 and WS13, located in the north western part of the site to target the historical gas holder, were tested for total cyanide.

Neither of the two samples recorded total cyanide above the detection limit of the test.

There is not considered to be a significant risk to either end users of the site or groundwater from cyanide contamination at the site.

6.7 Asbestos

Ten samples of the made ground from across the site, and the sample of made ground likely to be associated with backfill to a relict structure taken from borehole WS8, were screened for the presence of asbestos.

With the exception of the sample taken from borehole WS8, which recorded the presence of fibres and a bound fragment of chrysotile and amosite asbestos, none of the remaining samples of made ground were identified to contain asbestos. No suspected asbestos containing materials were noted within any of the exploratory holes undertaken at the site.

Given that asbestos has only been recorded within the made ground likely to be associated with backfill to a relict structure, it is considered that, based on the findings of this investigation, no significant risk to end users is posed by asbestos within the general made ground soils. However given the potential for localised asbestos containing materials to be encountered within any made ground associated with relict or existing structures it would be prudent for all stripped formations in these areas of soft landscaping be inspected for the presence of potential asbestos containing materials.

It is noted that an asbestos survey carried out by others of the existing buildings identified asbestos materials in various forms to be present within the fabric of the buildings across the site. However provided that all demolition works are undertaken in accordance with current regulations and best practice guidance regarding the handling and disposal of asbestos materials, then the presence of asbestos within the existing building fabric is unlikely to represent a significant risk to any future development of the site. However, evidence that the demolition and disposal works have been carried out correctly should be obtained for provision in the site Health and Safety file.

6.8 Organic Contaminants

6.8.1 Polycyclic Aromatic Hydrocarbon (PAH) Compounds

The following table summarises the laboratory test results, soil screening values, sample means and 95th percentile upper confidence limits for PAH compounds within the shallow made ground soils.

Table 6. Summary of Test Results and Statistical Analysis for PAH Compounds

Contaminant	SSV (mg/kg)	No. of Samples	Minimum Concentration (mg/kg)	Maximum concentration (mg/kg)	Limit of Detection (mg/kg)	Sample Mean (mg/kg)	95% Upper Confidence Limit (mg/kg)	No of exceedances	Can H_o be rejected
Naphthalene	2.3	12	<LOD	0.1	0.1	0.06	0.09	0	Yes
Acenaphthylene	170	12	<LOD	1.1	0.1	0.19	0.58	0	Yes
Acenaphthene	210	12	<LOD	0.3	0.1	0.08	0.17	0	Yes
Fluorene	170	12	<LOD	0.2	0.1	0.07	0.12	0	Yes
Phenanthrene	95	12	<LOD	1	0.1	0.28	0.68	0	Yes
Anthracene	2400	12	<LOD	1	0.1	0.18	0.54	0	Yes

Contaminant	SSV (mg/kg)	No. of Samples	Minimum Concentration (mg/kg)	Maximum concentration (mg/kg)	Limit of Detection (mg/kg)	Sample Mean (mg/kg)	95% Upper Confidence Limit (mg/kg)	No of exceedances	Can H_o be rejected
Fluoranthene	280	12	<LOD	2.9	0.1	0.74	2.01	0	Yes
Pyrene	620	12	<LOD	3.3	0.1	0.82	2.33	0	Yes
Benz(a)anthracene	7.2	12	<LOD	1.8	0.1	0.44	1.28	0	Yes
Chrysene	15	12	<LOD	1.9	0.1	0.58	1.50	0	Yes
Benzo(b)fluoranthene	2.6	12	<LOD	2.8	0.1	0.76	1.98	1	Yes
Benzo(k)fluoranthene	77	12	<LOD	2.3	0.1	0.57	1.66	0	Yes
Benzo(a)pyrene	2.2	12	<LOD	2.8	0.1	0.73	1.98	2	Yes
Indeno(123-cd)pyrene	27	12	<LOD	2.6	0.1	0.63	1.86	0	Yes
Dibenz(ah)anthracene	0.24	12	<LOD	1.2	0.1	0.23	0.66	3	No
Benzo(ghi)perylene	320	12	<LOD	2.2	0.1	0.61	1.77	0	Yes

The statistical analysis has identified elevated concentrations of dibenz(ah)anthracene PAH compound compared with the soil screening values for a residential development.

The made ground associated with the possible relict structure in WS8 did not recorded any elevated concertation of PAH compounds compared to the residential soil screening values.

As with the heavy metals, given the relatively very low concentrations of PAH compounds recorded and the general urban context of the environs of the site, PAH compounds are not considered to pose an abnormal risk to groundwater.

6.8.2 Volatile Organic Compounds (VOC)

Two samples of the made ground taken from boreholes WS8 and WS9, located in the vicinity of the tanks, chimney and electricity substation in the facilities maintenance area, were tested for volatile organic compounds.

Neither of the two samples recorded volatile organic compounds above the detection limit of the tests.

There is not considered to be a significant risk posed to either end users of the site or groundwater from widespread VOC contamination. However there remains the potential for localised VOC contamination to be present directly beneath the facilities maintenance area.

6.8.3 Petroleum Hydrocarbons and BTEX compounds

Fourteen samples were tested to determine the total concentrations of petroleum hydrocarbons with the results speciated by equivalent carbon weight fractions. Seven of these samples were also tested for concentrations of BTEX compounds.

The following table lists the screening values for petroleum hydrocarbon equivalent carbon weight fractions calculated for 1% organic content.

Table 7. Soil Screening Values for petroleum hydrocarbon equivalent carbon weight fractions

Petroleum Hydrocarbon Fraction	SSV (mg/kg)	Petroleum Hydrocarbon Fraction	SSV (mg/kg)
Aliphatic EC 5-6	42	Aromatic EC 5-7	70
Aliphatic EC >6-8	100	Aromatic EC >7-8	130
Aliphatic EC >8-10	27	Aromatic EC >8-10	34
Aliphatic EC >10-12	130	Aromatic EC >10-12	74
Aliphatic EC >12-16	1100	Aromatic EC >12-16	140
Aliphatic EC >16-35	65000	Aromatic EC >16-21	260
Aliphatic EC >35-44	65000	Aromatic EC >21-35	1100
		Aromatic EC >35-44	1100

Table 8. Soil Screening Values for BTEX Compounds (shown as mg/kg and μg/kg)

BTEX Compound	SSV (mg/kg)	SSV (μg/kg)
Benzene	0.87	870
Toluene	130	130,000
Ethylbenzene	47	47,000
p-Xylene[1]	56	56,000

[1] Xylene has three structural isomers, the SSV presented is for *p*-Xylene, which has the most conservative SSV.

Full speciation of petroleum hydrocarbons by aromatic and aliphatic fractions was not undertaken. However, the results of the testing undertaken can still be compared with the more stringent of the screening values for the respective equivalent carbon weight fraction and, where the concentration recorded is found to be lower, then it can be concluded that no significant risk is present.

Total concentrations of petroleum hydrocarbons of between <1.0mg/kg and 140g/kg were recorded. None of these recorded concentrations are above their respective screening values for residential development. None of the samples recorded concentrations of BTEX compounds above the detection limit of the tests.

As with the volatile organic compounds, there is not considered to be a significant risk posed to either end users of the site or groundwater from widespread petroleum hydrocarbon and BTEX compound contamination at the site. However there remains the potential for localised petroleum hydrocarbon and/or BTEX contamination to be present directly beneath the facilities maintenance area and beneath the footprint of the existing buildings.

6.9 Phenols

Two samples of the made ground taken from boreholes WS11 and WS13, located in the north western part of the site to target the historical off site gas holder, were tested for a range of phenols.

Neither of the two samples recorded phenols above the detection limit of the test.

There is not considered to be a significant risk to either end users of the site or groundwater from phenol contamination at the site.

6.9.1 Polychlorinated Biphenyl (PCB) Compounds

PCB compounds are a family of chemicals that were used in electrical components, such as transformers, switchgear and capacitors, because of their good electrical insulation properties, fire resistance and chemical stability. They were found to affect the immune system and to cause cancer and liver damage. In Britain their use declined rapidly in the 1970s. As a result of their toxicity and persistence in the environment they have been banned internationally since 1986. It should be assumed that any transformer or capacitor made before 1976 would contain PCB compounds and that PCB compounds may still be present in components manufactured between 1976 and 1986.

Three samples of the made ground taken from boreholes WS1, WS8 and WS9, located adjacent to the electricity substations in the south eastern part of the site or facilities maintenance area were tested for PCB congeners. In addition three further samples of made ground were tested from boreholes WS3, WS6 and WS10 for total PCB concentrations as part of a general suite of testing.

None of the samples tested recorded concentrations of PCB congeners above the detection limit of the tests.

There is not considered to be a significant risk to either end users of the site or groundwater from PCB contamination. However there remains the potential for localised PCB contamination to be present directly beneath the electricity substations which may pose a risk to end users should they be removed from the site.

6.10 Ground Gases

Monitoring of the gas concentrations within the standpipes installed within boreholes WS2, WS3, WS5, WS6, WS9, WS11 and WS13 is currently ongoing. The ground gas risk assessment will be provided under separate cover on completion of the monitoring programme.

6.11 Quantitative Contamination Risk Assessment

The quantitative risk assessment for the site considers the sources of contamination identified, the receptors that may be present in view of the development proposals and the contaminant pathways by which these may be linked.

A complete pollutant linkage is only deemed to exist where all three are present and a site is considered suitable for use where no complete pollutant linkages are identified.

Where a complete pollutant linkage is considered to be present, an assessment of the level of risk associated with the pollutant linkage has been carried out in line with guidance published within "Contaminated Land Risk Assessment: A guide to good practice" published by CIRIA (C552, 2001).

The level of risk is determined using the risk matrix presented in the following table. Classifications of probability, consequence and risk are presented in Appendix D.

Table 9. Risk Assessment Matrix

		Probability			
		Very Low	**Low**	**Moderate**	**High**
Consequence	**Very Minor**	Negligible	Very Low	Low	Low/Moderate
	Minor	Very Low	Low	Low/Moderate	Moderate
	Moderate	Low	Low/Moderate	Moderate	High
	Severe	Low/Moderate	Moderate	High	Very High

The assessment of risk has been undertaken on the basis that the proposed development for the site will include the provision of new residential buildings along with areas of private garden where direct soil contact and the growing of fruit and vegetables may occur.

6.11.1 Quantitative Conceptual Model

The quantitative conceptual model for the proposed development is presented in the following table. A plan indicating the location of the contaminant sources identified is presented as Figure 3.

Table 10. Quantitative Conceptual Model

Sources Identified	Contaminants	Receptor	Potential Pathways	Potential Pathway Present?	Probability	Consequence	Overall Assessment of Risk	Complete Pollutant Linkage Present?
Potential worked ground and backfill associated with historical brick field and potential backfilled filter beds to the west of the site.	Potential Ground Gases	Human Health (End Users)	a) Dermal contact with soil and dust (indoor & outdoor).	No	n/a	n/a	n/a	No
			b) Ingestion of soil and indoor dust.	No	n/a	n/a	n/a	No
			c) Consumption of homegrown produce and attached soil.	No	n/a	n/a	n/a	No
			d) Inhalation of soil dust (indoor and outdoor).	No	n/a	n/a	n/a	No
			e) Contamination of incoming services.	No	n/a	n/a	n/a	No
			f) Inhalation of soil vapours.	No	n/a	n/a	n/a	No
			g) Inhalation of soil gases.	Yes	Moderate	Moderate	Moderate	Yes
		Groundwater	h) Migration to groundwater.	No	n/a	n/a	n/a	No
Made Ground beneath the site.	Elevated arsenic, lead and dibenz(ah)anthracene PAH compound	Human Health (End Users)	a) Dermal contact with soil and dust (indoor & outdoor).	Yes	Low	Moderate	Low/ Moderate	Yes
			b) Ingestion of soil and indoor dust.	Yes	Low	Moderate	Low/ Moderate	Yes
			c) Consumption of homegrown produce and attached soil.	Yes	Low	Moderate	Low/ Moderate	Yes
			d) Inhalation of soil dust (indoor and outdoor).	Yes	Low	Moderate	Low/ Moderate	Yes
			e) Contamination of incoming services.	No	n/a	n/a	n/a	No
			f) Inhalation of soil vapours.	No	n/a	n/a	n/a	No
			g) Inhalation of soil gases.	No	n/a	n/a	n/a	No
		Groundwater	h) Migration to groundwater.	Yes	Very Low	Very Minor	Negligible	No

Sources Identified	Contaminants	Receptor	Potential Pathways	Potential Pathway Present?	Probability	Consequence	Overall Assessment of Risk	Complete Pollutant Linkage Present?
The area directly beneath the tanks, chimney and electricity substation in the facilities maintenance area, and the area beneath the electricity substation in the south eastern part of the site.	Potential localised petroleum hydrocarbon, BTEX compounds, VOC and/or PCB congeners.	Human Health (End Users)	a) Dermal contact with soil and dust (indoor & outdoor).	Yes	Low	Moderate	Low/ Moderate	Yes
			b) Ingestion of soil and indoor dust.	Yes	Low	Moderate	Low/ Moderate	Yes
			c) Consumption of homegrown produce and attached soil.	Yes	Low	Moderate	Low/ Moderate	Yes
			d) Inhalation of soil dust (indoor and outdoor).	Yes	Low	Moderate	Low/ Moderate	Yes
			e) Contamination of incoming services.	Yes	Low	Moderate	Low/ Moderate	Yes
			f) Inhalation of soil vapours.	Yes	Low	Moderate	Low/ Moderate	Yes
			g) Inhalation of soil gases.	No	n/a	n/a	n/a	No
		Groundwater	h) Migration to groundwater.	Yes	Low	Moderate	Low/ Moderate	Yes

6.12 Risks to Other Potential Receptors

The following general guidance is given with regard to other potential on site receptors, which may not necessarily be statutory drivers for remedial works.

As a minimum and in accordance with industry best practice all ground-workers should be issued with the appropriate PPE and should be instructed in safe working methods, particularly in view of the potential for asbestos to be encountered locally, such as in the made ground soils in the vicinity of borehole WS8.

As a precautionary measure instructions should be given in the recognition of potentially hazardous materials, including oily and odorous soil and water and discoloured or fibrous substances. Any oil-like substances contacting the skin must be washed off immediately using an appropriate cleanser. Operatives should be warned to avoid contact between hands and mouth before washing. The consumption of food and smoking must be confined to designated clean areas. Suitable welfare (washing) facilities should be provided. These precautions should be taken in addition to anything highlighted by a site specific risk assessment which should be undertaken by any contractor prior to commencing work.

Particular attention should be paid to minimising dust arising from soils and appropriate precautions in this regard should include damping down of soils when in dry conditions. Should any suspected asbestos containing materials be encountered, they should be left in situ and appropriate advise sought immediately.

All site personnel should be appropriately briefed on what actions to take in the event that evidence of significant contamination is identified or suspected.

The presence of possible Asbestos Containing Materials within the fabric of the existing units has been identified by others. Demolition and site clearance should be undertaken by a suitably experienced contractor and appropriate working procedures and PPE should be employed to ensure the health and safety of the site operatives.

6.13 Recommendations

The ground investigation undertaken has identified a low to moderate risk to proposed end users from heavy metals and PAH compounds in the general made ground across the site and as such it is considered that remedial measures will be required as part of the proposed development.

The potential for further contaminants to be present beneath areas presently inaccessible has also been identified. There also remains the potential for ground gases to pose a risk to end users of the site. A separate ground gas risk assessment will be undertaken on completion of the monitoring programme to further assess the risk from this source.

Given the sources of contamination identified at the site it is considered that the remedial works likely to be required would comprise provision of a cover system of suitable soils where contaminated made ground is to remain within any private garden or soft landscaped areas. Based on the results available at this stage all the made ground across the site should be assumed to be contaminated. However further works, particularly in areas that have not yet been investigated, may provide a more robust data set and indicate only localised areas of contaminated soils which may minimise the remedial measures that are required at the site.

Ultimately, the remediation works adopted should be detailed within a separate remediation strategy, along with a verification plan. This should be produced once this risk assessment report has been reviewed and approved by the appropriate authority.

A comparison of the test results with the screening criteria set out within Table 3.1 of the "Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites" published by UK Water Industry Research in 2010 indicates that the protection of water supply services is unlikely to be required. However it is noted that the testing undertaken to date does not encompass all of the contaminants that may be required by water supply companies for assessment purposes. It is therefore strongly recommended that designers should consult with the proposed water supply company to ascertain whether they require further laboratory testing and assessment specific to proposed routes of services.

Whilst the presence of potential asbestos with the general made ground is not considered to pose a significant risk to end users, in view of the presence of this contaminant in the vicinity of borehole WS8, it would be prudent for all stripped formations, specifically in areas of soft landscaping to be inspected for the presence of potential asbestos containing materials. In addition, it would also be prudent to ensure that all service trenches within the made ground are over excavated and backfilled with materials verified as being free from asbestos to prevent any future workers from coming into contact with the made ground materials.

In addition to the above, should materials not previously identified by the investigation and that are suspected of being 'contaminants' be encountered during the course of the works, advice should be sought immediately on their identification and how they should be treated.

If necessary the newly identified contaminants will be subject to a revised risk assessment and remediation strategy.

6.14 Handling and Disposal of Waste and Quality of Imported Materials

6.14.1 Waste Management

Soils and other materials taken for disposal should be handled, transferred and disposed of as controlled waste in accordance with the requirements of the Waste Management, Duty of Care Regulations. Copies of waste transfer notes detailing the site address, the waste type, details of the haulage contractor and full details of the disposal site must be kept.

Specifically, the removal and disposal of any asbestos containing materials should be undertaken by appropriately trained personnel. The disposal of such material should be undertaken in accordance with the Hazardous Waste Regulations 2005, as amended.

Waste classification of the samples tested has been carried out using the HazWasteOnline tool. The output sheets are presented in Appendix E. All samples of the made ground tested from across the site have been classified as non-hazardous construction and demolition waste, with a code from the List of Waste (LoW) of 17-05-04.

However, it is noted that made ground soils contained a single bundle of asbestos fibres and a small piece of insulation board. The layer of made ground was located above a layer of concrete in WS8 and is located in the area of historical relict structures.

The "Waste Classification - Guidance on the classification and assessment of waste" (1st edition 2015), Technical Guidance WM3 states:

"If the waste contains fibres that are free and dispersed then the waste will be hazardous if the waste as a whole contains 0.1% or more asbestos.

If the waste contains any identifiable pieces of suspected asbestos containing material they must be assessed as set out below. This would also apply to any dispersed fibres produced by deliberately breaking up such identifiable pieces.

Where the waste contains identifiable pieces of asbestos containing material (i.e. any particle of a size that can be identified as potentially being asbestos by a competent person if examined by the naked eye), then these pieces must be assessed separately. The waste is hazardous if the concentration of asbestos in the piece of asbestos containing material is 0.1% or more."

Given the amount of asbestos fibres detected it would be considered unlikely that the waste soils would contain >0.1% of asbestos by weight.

However, as any asbestos containing board will contain more than 0.1% then made ground soils in the vicinity of WS8 above the concrete associated with the relic structure, should be stockpiled separately and further inspection and sampling undertaken for the presence of asbestos. Alternatively, soils in this area would be classified as a hazardous mixed waste with LoW codes of 17-05-04 and 17-06-05* (construction materials containing asbestos).

The WAC testing undertaken indicates that the general made ground soils tested are likely to be suitable for disposal at a landfill licensed to accept inert waste.

It is noted that the disposal site have the final decision on whether to accept any materials and it is recommended that all testing and classification information be provided to them.

6.14.2 Quality of Imported Soils

Full details of the source of any imported soils should be documented (including topsoil). Any material from a potentially contaminated (e.g. industrial) site should be rejected. It is recommended that chemical (contamination) testing results should be obtained and supplied for comment prior to accepting the soils on site.

All materials must comply with current CLEA guidance for the proposed end use of the site. Sufficient verification testing should be carried out to demonstrate this compliance.

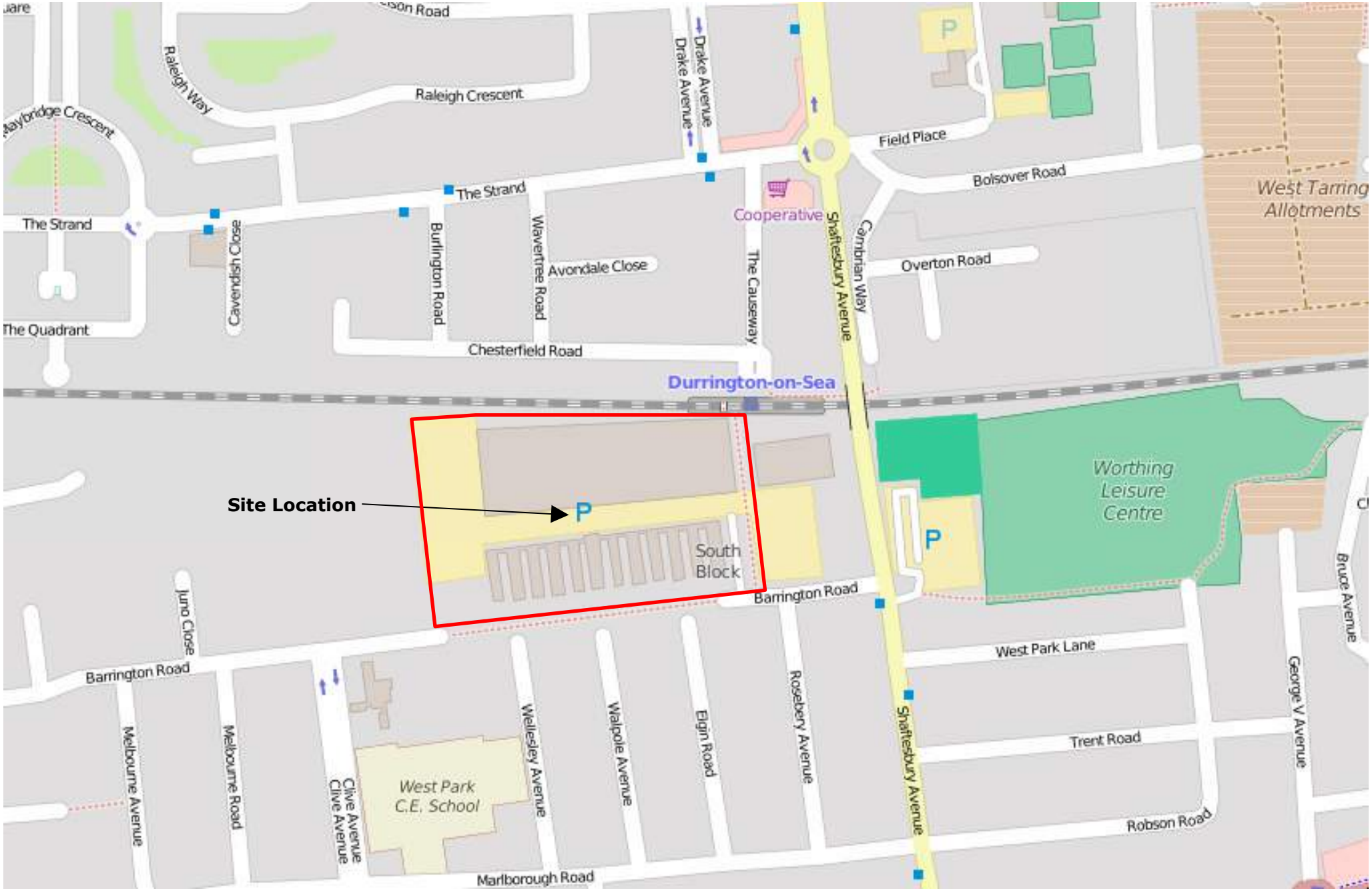
Topsoil should, when inspected visually, be free from propagules of aggressive weeds, fragments of glass, bricks, concrete, wire or other potentially hazardous foreign matter and bulk vegetative growth, in order to ensure negligible risk of subsequent weed problems (introduced in the soil) or traumatic injury.

It is stressed that the quality of any materials imported onto the site is critical to the successful completion of any remediation works.

Ashdown Site Investigation Ltd.
September 2015

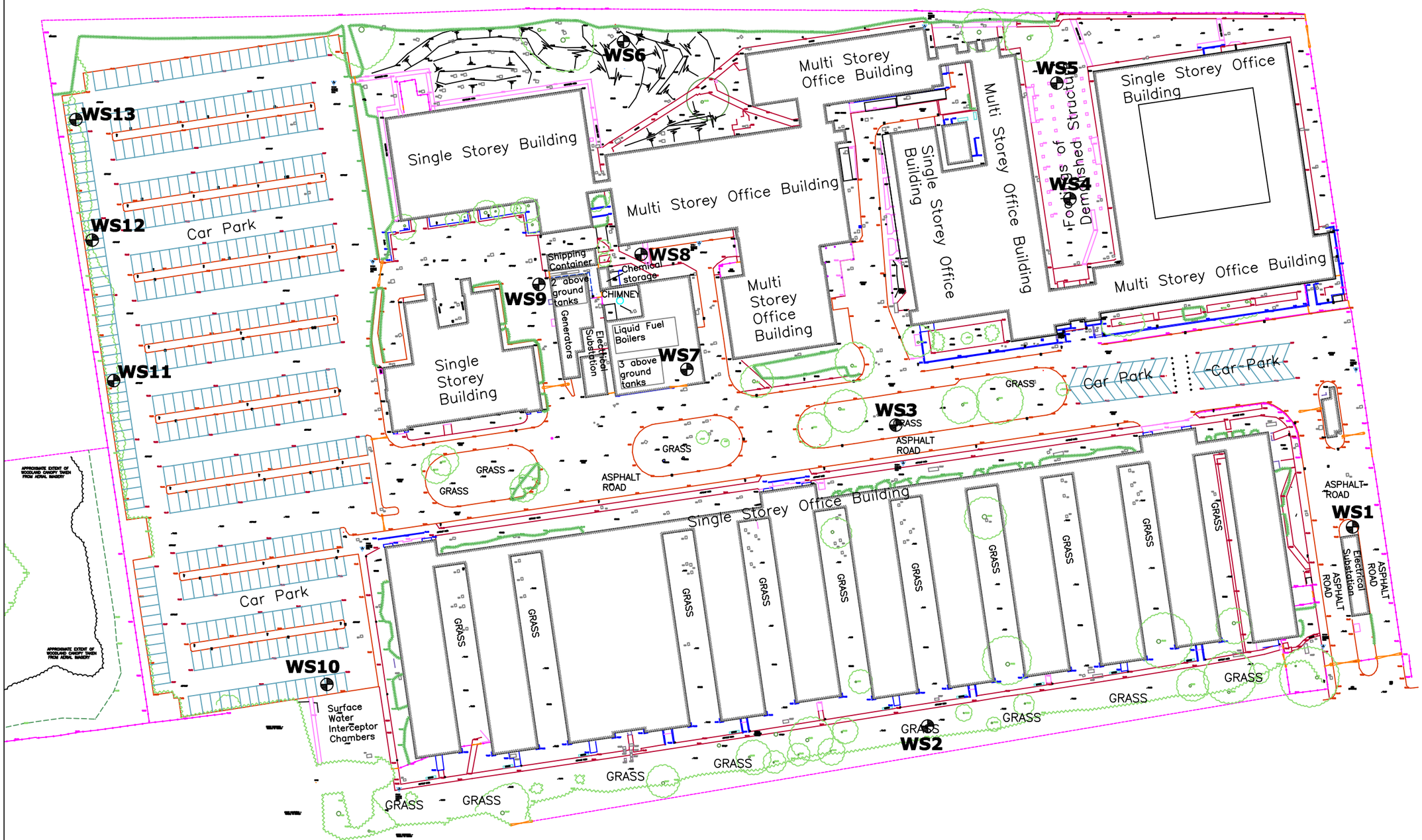
FIGURES

Figure 1 Site Location Plan
Figure 2 Site Plan
Figure 3 Identified Contamination Source Plan



© OpenStreetMap contributors, CC BY-SA

ASHDOWN SITE INVESTIGATION LIMITED	Site: Inland Revenue, Durrington Bridge House, Barrington Road, Worthing, West Sussex.	Site Location Plan. Not To Scale	Figure 1 LW26215



ASHDOWN SITE INVESTIGATION LIMITED

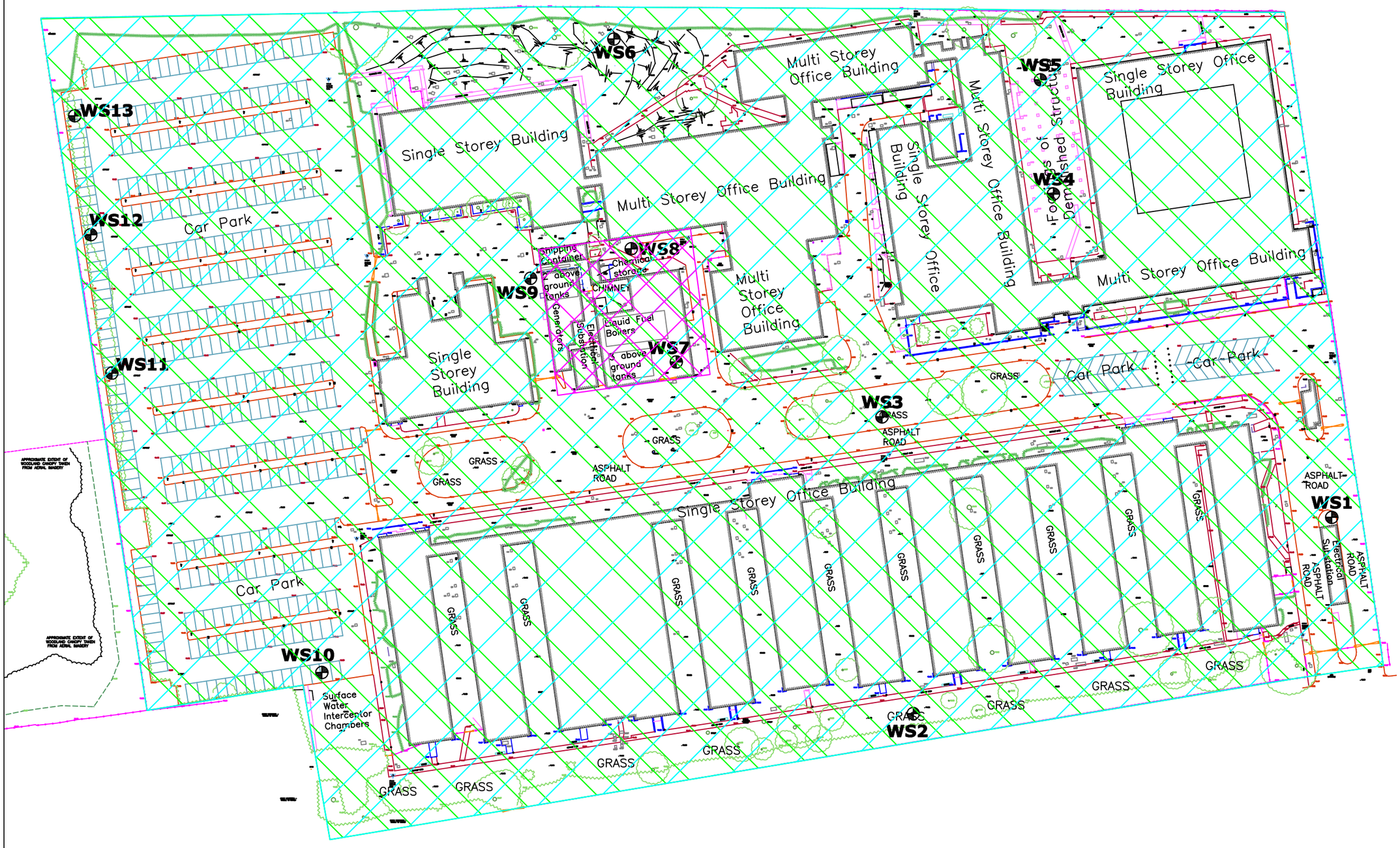
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DRAWN BY:	DATE:	SCALE (at A3):
TSH	Sept 2015	1:1000

SITE:
Inland Revenue
Durrington Bridge House
Barrington Road
Worthing
West Sussex

REPORT REF.:	FIGURE NO.:
LW26215	2

DRAWING TITLE:
Site Plan



Potential ground gases from brick fields and filter beds to west.

Elevated arsenic, lead and PAH in made ground soils.

Potential localised petroleum hydrocarbon, BTEX, VOC and PCB in facilities maintenance area and electricity substation.

ASHDOWN SITE INVESTIGATION LIMITED

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DRAWN BY:	DATE:	SCALE (at A3):
TSH	Sept 2015	1:1000

SITE:
Inland Revenue
Durrington Bridge House
Barrington Road
Worthing
West Sussex

REPORT REF.:	FIGURE NO.:
LW26215	3

DRAWING TITLE:
Identified Contamination Source Plan

APPENDIX A

Exploratory Hole Notes
In Situ Testing Notes
Exploratory Hole Records
DPSH-B Dynamic Probe Records
Summary of In Situ TRL Cone Penetrometer (CBR) Test Results
Summary of Borehole Falling Head Soakage Test Results
Summary of Gas Analyses and Water Depths

NOTES FOR THE INTERPRETATION OF EXPLORATORY HOLE RECORDS

1 Symbols and abbreviations

Samples

U 'Undisturbed' Sample: - also known as 'U100' or 'U4' - 100mm diameter by 450mm long. The number of blows to drive in the sampling tube is shown after the test index letter in the SPT column.
Uo Sample not obtained.
U* Full penetration of sample not obtained.
U** Full penetration obtained but limited sample recovered.
Pi Piston Sample: 'Undisturbed' sample 100mm diameter by 600mm long.
D Disturbed Sample.
R Root Sample.
B Bulk Disturbed Sample.
W Water Sample.
J Jar Sample (sample taken in amber glass jar fitted with gas tight lid)
T Tub Sample
Vi Vial Sample
E Environmental Suite (including a jar sample, tub sample and vial sample)

In situ Testing

S Standard penetration test (SPT): In the borehole record the depth of the test is that at the start of the normal 450mm penetration, the number of blows to achieve the standard penetration of 300mm (the 'N' value) is shown after the test index letter, but the seating blows through the initial 150mm penetration are not reported unless the full penetration of 450mm cannot be achieved. In the latter case, the symbols below are added to the test index letter:-
S(R) Refusal of standard penetration test. Blow count reported includes seating blows. Total penetration of refused SPT reported in mm in brackets on borehole record.
So 'Split spoon' SPT sampler sank under its own weight.
The test is usually completed when the number of blows reaches 50 (25 blows for seating count). The depths of both the top and bottom of the test drive are shown in the sample column on the Borehole Record. If a sample is not recovered in the sampler, a disturbed sample is taken over the depth of the test as boring continues.

C Standard Penetration Test (SPT) conducted usually in coarse grained soils or weak rocks using the same procedure as for the SPT but with a 50mm diameter, 60º apex solid cone fitted in place of the sampler. Variations in test results are indicated by the same symbols as for the SPT (above).

V Shear Vane Test: Undrained shear strength (cohesion) (kN/m^2) shown within the Vane/Pen Test and N Value column.

H Hand penetrometer Test: Undrained shear strength (cohesion) (kN/m^2) shown within the Vane/Pen Test and N Value column.

P Perth Penetrometer Test: See "In Situ Testing Notes" for full description. Number of blows for 300mm penetration shown under Vane/Pen Test and N Value column. In sand the number of blows is approximately equivalent to the SPT "N" value.

2 Soil Description

Description and classification of soils has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of soil, Part 1 Identification and description (BS EN ISO 14688-1:2002) and Part 2 Principles of classification (BS EN 14688-2:2004) as well as the BS5930:1990 + A2:2010 code of Practice for Site Investigations.

Fine Grained Soils

The consistency of fine grained soils given in the report is based on visual inspection of the samples and the strength is based on results of in situ and/or laboratory undrained shear strength tests when carried out.

The consistency is determined on the following basis:

Consistency	**Manual Test**
Very Soft	Soil exudes between fingers when squeezed in hand
Soft	Soils can be moulded by light finger pressure
Firm	Cannot be moulded by finger but rolled to 3mm threads without breaking/crumbling
Stiff	Crumbles/breaks when rolled to 3mm thick threads but can be moulded into a lump again
Very Stiff	Cannot be moulded and crumbles under pressure, can be indented by thumbnail

Based on BS EN ISO 14688-1:2002

The terms used for the designation of the undrained shear strength are as follows:

Undrained Shear Strength	
Extremely to Very Low	<20 kPa
Low	20-40 kPa
Medium	40-75 kPa
High	75-150 kPa
Very High	150-300 kPa
Extremely high	300-600 kPa

Based on BS EN ISO 14688-2:2004

Note: The undrained shear strength of the soils is measured either by laboratory testing or in the field using hand penetrometer or shear vane.

It is recognised that any coarse grained soil that has in excess of approximately 35% fine grained soil (clay and silt) can often be expected to behave as a fine grained soil despite the dominance of coarse grained material within the soil mass. To reflect this, it is the soil type that dominates the behaviour of the soil mass that appears on the exploratory hole records.

Coarse Grained Soils

The relative densities of coarse grained soils (sand and gravel) given in the report are based on field estimations and the results of the Standard Penetration Test (SPT) and equivalent correlation from other testing. The classification in terms of "N" Values is as follows:

SPT 'N' Value	**Relative Density**
0-4	Very Loose
4-10	Loose
10-30	Medium Dense
30-50	Dense
Greater than 50	Very Dense

ASHDOWN SITE INVESTIGATION LIMITED
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Lewes, East Sussex
BN7 3PF

Borehole No.: WS1

Site Name: Inland Revenue, Durrington Bridge House, Barrington Rd, Worthing

Job No.: LW26215

Start Date: 28/08/2015 | End Date: 28/08/2015

Standpipe Installation	Samples and Testing: Sample Type	Depths: From (m)	Depths: To (m)	Vane/ Pen Test N Value	DPSH Profile Blows/100mm (5, 15, 25)	Strata: Legend	Depth / Reduced Level	Strata Descriptions
							0.00	Ground Level
	J T	0.30						Topsoil (100mm) over, MADE GROUND: Orange brown slightly gravelly clay. Gravel is subangular to subrounded fine to medium flint.
	D	0.50						
	J T	0.60					0.70	
	H	0.80		105				Firm to stiff orange brown slightly gravelly CLAY with occasional fragments of organic/ carbonaceous material. Gravel is subangular to subrounded fine to medium flint. (River Terrace Deposits)
	D	0.90						
	J T	1.00						
	H	1.30		90				
	J T	1.50						becoming sandy between 1.50m to 1.80m depth.
	D	1.60						
	H	1.80		75				
	H D	2.30		60				
	J T	2.50						becoming slightly sandy below 2.40m depth.
							2.80	
	D	3.00					3.00	Very dense orange slightly clayey fine to medium SAND. (River Terrace Deposits)
								End of Borehole

Remarks:

Borehole dry and stable on completion.

Dynamic probe carried out adjacent to borehole.

Excavation Method: Dynamic Sampler

Borehole Diameter: Various

Made By: SW

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Swanborough
Lewes, East Sussex
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Borehole No.: WS2

Site Name: Inland Revenue, Durrington Bridge House, Barrington Rd, Worthing

Job No.: LW26215

Start Date: 23/07/2015 | End Date: 23/07/2015

Standpipe Installation	Sample Type	Depths From (m)	Depths To (m)	Vane/ Pen Test N Value	DPSH Profile Blows/100mm (5 15 25)	Legend	Depth / Reduced Level	Strata Descriptions
							0.00	Ground Level
							0.10	Topsoil.
	J T	0.15					0.25	MADE GROUND: Brown slightly gravelly silty clay with rootlets. Gravel is subangular to subrounded fine to medium brick, ash and chalk.
	J T	0.30					0.40	MADE GROUND: Yellow brown slightly gravelly silty sand with rootlets. Gravel is subangular to subrounded fine to coarse flint and occasional small cobbles of flint. with a geotextile membrane at base.
	J T	0.80					0.90	MADE GROUND: Brown slightly gravelly slightly sandy silty clay. Gravel is subangular to subrounded fine to medium brick, ash, coal, glass and shells.
	H D	0.95		115				
	H	1.10		115				Firm to stiff orange brown slightly gravelly CLAY with black iron/organic staining and occasional rootlets. Gravel is subangular to subrounded fine to medium flint. (River Terrace Deposits)
	J T D	1.20						
	H	1.50		75				
	H	1.70		75				
	D	1.80						
	V	2.00		110			2.00	End of Borehole

Remarks:

Borehole dry and stable on completion.

Dynamic probe carried out adjacent to borehole.

Standpipe installed to 2.00m depth; 2.00m to 1.00m slotted pipe with gravel surround; 1.00m to ground level plain pipe with bentonite seal; completed with gas tap and security cover concreted fllush with ground surface.

Excavation Method: Dynamic Sampler

Borehole Diameter: Various

Made By: TOM

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS
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Lewes, East Sussex
BN7 3PF

Borehole No.: WS3

Site Name: Inland Revenue, Durrington Bridge House, Barrington Rd, Worthing

Job No.: LW26215

Start Date: 28/08/2015 | End Date: 28/08/2015

Standpipe Installation	Samples and Testing: Sample Type	Depths: From (m)	Depths: To (m)	Vane/ Pen Test N Value	DPSH Profile Blows/100mm (5, 15, 25)	Legend	Strata: Depth / Reduced Level	Strata Descriptions
							0.00	Ground Level
	J T	0.10						Topsoil (150mm) over, MADE GROUND: Orange brown slightly gravelly clay. Gravel is subangular to subrounded fine to medium brick, flint, charcoal, chalk and occasional clinker.
	D	0.40						
	J T	0.50					0.80	
	H	0.90		195				Very stiff orange slightly gravelly silty CLAY. Gravel is subangular to angular fine to medium flint. (River Terrace Deposits)
	V D	1.00		>130				
	J T	1.10						becoming slightly sandy below 1.10m depth.
	H	1.30		145				
	D	1.50						becoming stiff below 1.30m depth.
	H	1.80		105			1.90	
	D	2.00						Medium dense orange slightly clayey gravellly fine to coarse SAND. Gravel is sub-angular to angular fine to medium flint. (River Terrace Deposits) becoming slightly gravelly below 2.10m depth.
	J T	2.20					2.50	
	D	2.70						Medium dense yellow fine to medium SAND. (River Terrace Deposits)
							3.00	
								End of Borehole

Remarks:

Borehole dry and stable on completion.

Dynamic probe carried out adjacent to borehole.

Standpipe installed to 0.80m depth; 0.80m to 0.30m slotted pipe with gravel surround; 0.30m to ground level plain pipe with bentonite seal; completed with gas tap and security cover concreted flush with ground surface.

Excavation Method: Dynamic Sampler

Borehole Diameter: Various

Made By: SW

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BN7 3PF

Borehole No.: WS4

Site Name: Inland Revenue, Durrington Bridge House, Barrington Rd, Worthing

Job No.: LW26215

Start Date: 28/08/2015 | End Date: 28/08/2015

Standpipe Installation	Samples and Testing: Sample Type	Depths: From (m)	Depths: To (m)	Vane/ Pen Test N Value	DPSH Profile Blows/100mm (5 15 25)	Strata: Legend	Depth / Reduced Level	Strata Descriptions
							0.00	Ground Level
	J T	0.20						MADE GROUND: Brown gravelly clay. Gravel is subangular to subrounded fine to coarse brick, concrete, clinker and flint.
	J T	0.50						
							0.80	
	D	0.80						Very stiff light brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to medium flint. (River Terrace Deposits)
	H J T	0.90		170				
	D	1.30						becoming sandy between 1.10m to 1.50m depth.
	J T	1.50						
							1.80	
	H	1.80		90				Stiff orange brown slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium flint and chalk. (River Terrace Deposits)
	D	1.90						
	H D	2.30		90				
	J T	2.50						
	H	2.80		115				
	D	3.00					3.00	
								End of Borehole

Remarks:

Borehole dry and stable on completion.

Dynamic probe carried out adjacent to borehole.

Excavation Method: Dynamic Sampler

Borehole Diameter: Various

Made By: SW

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Swanborough
Lewes, East Sussex
BN7 3PF

Borehole No.: WS5

Site Name: Inland Revenue, Durrington Bridge House, Barrington Rd, Worthing

Job No.: LW26215

Start Date: 28/08/2015 | End Date: 28/08/2015

Standpipe Installation	Samples and Testing: Sample Type	Depths: From (m)	Depths: To (m)	Vane/ Pen Test N Value	DPSH Profile Blows/100mm (5 15 25)	Strata: Legend	Depth / Reduced Level	Strata Descriptions
							0.00	Ground Level
	J T	0.20						Topsoil (100mm) over, MADE GROUND: Brown slightly gravelly clay. Gravel is subangular to subrounded fine to medium brick, flint, charcoal and clinker. with a band of black gravel of clinker and ash between 0.40m to 0.55m depth. with a band of sandy clayey gravel of flint and chalk between 0.55m to 0.60m depth.
	J T	0.50						
	D	0.80						
	J T	0.90					1.10	
	H D	1.30		50				Firm orange brown CLAY with pockets of silt. (River Terrace Deposits)
	J T	1.50						
	H D	1.80		75				becoming firm to stiff below 1.80m depth.
	D	2.10						
	H	2.30		75				
	J T	2.50						becoming slightly sandy below 2.70m depth.
	H	2.80		75				
	D	3.00					3.00	
								End of Borehole

Remarks:

Borehole dry and stable on completion.

Dynamic probe carried out adjacent to borehole.

Standpipe installed to 1.00m depth; 1.00m to 0.50m slotted pipe with gravel surround; 0.50m to ground level plain pipe with bentonite seal; completed with gas tap and security cover concreted flush with ground surface.

Excavation Method: Dynamic Sampler

Borehole Diameter: Various

Made By: SW

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BN7 3PF

Borehole No.: WS6

Site Name: Inland Revenue, Durrington Bridge House, Barrington Rd, Worthing

Job No.: LW26215

Start Date: 28/08/2015 | End Date: 28/08/2015

Standpipe Installation	Samples and Testing: Sample Type	Depths: From (m)	Depths: To (m)	Vane/ Pen Test N Value	DPSH Profile Blows/100mm (5 15 25)	Strata: Legend	Depth / Reduced Level	Strata Descriptions
							0.00	Ground Level
	J T	0.20					0.30	MADE GROUND: Dark brown slightly gravelly slightly sandy clay. Gravel is subangular to angular fine to medium brick, flint, concrete, chalk and clinker.
	J T	0.50						MADE GROUND: Orange brown slightly gravelly silty clay. Gravel is subangular to angular fine to coarse concrete, flint, brick and charcoal.
	D	0.90						becoming brown below 0.80m depth.
	J T	1.00						
	D	1.30					1.60	
	J T	1.70						Stiff orange brown slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium flint. (River Terrace Deposits)
	H D	1.80		130				
	H D	2.30		90				becoming sandy at 2.10m depth.
	J T	2.50						becoming slightly sandy below 2.40m depth
	H	2.80		90				
	D	3.00					3.00	
								End of Borehole

Remarks:

Borehole excavated through mound some 0.50m to 1.00m above ground level in northern part of site.

Borehole dry and stable on completion.

Dynamic probe carried out adjacent to borehole.

Standpipe installed to 1.50m depth; 1.50m to 0.50m slotted pipe with gravel surround; 0.50m to ground level plain pipe with bentonite seal; completed with gas tap and security cover concreted flush with ground surface.

Excavation Method: Dynamic Sampler

Borehole Diameter: Various

Made By: SW

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Swanborough Farm
Swanborough
Lewes, East Sussex
BN7 3PF

Borehole No.: WS7

Site Name: Inland Revenue, Durrington Bridge House, Barrington Rd, Worthing

Job No.: LW26215

Start Date: 28/08/2015 | End Date: 28/08/2015

Standpipe Installation	Samples and Testing				Strata		
	Sample Type	Depths From (m)	Depths To (m)	Vane/ Pen Test N Value	Legend	Depth / Reduced Level	Strata Descriptions
						0.00	Ground Level
						0.10	Concrete.
							End of Borehole

Remarks:

No further progress below 0.10m - thick concrete surfacing which was not possible to progress through with had held breaker.

Not able to break through concrete after 30 minutes.

Excavation Method: Dynamic Sampler

Borehole Diameter: Various

Made By: SW

ASHDOWN SITE INVESTIGATION LIMITED
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Swanborough
Lewes, East Sussex
BN7 3PF

Borehole No.: WS8

Site Name: Inland Revenue, Durrington Bridge House, Barrington Rd, Worthing

Job No.: LW26215

Start Date: 28/08/2015 | End Date: 28/08/2015

Standpipe Installation	Samples and Testing				Strata		
	Sample Type	Depths From (m)	Depths To (m)	Vane/ Pen Test N Value	Legend	Depth / Reduced Level	Strata Descriptions
						0.00	Ground Level
	J T	0.20				0.30	Topsoil (100mm) over, MADE GROUND: Orange brown slightly gravelly sand. Gravel is angular to subangular fine to coarse brick, flint and concrete.
	J T	0.40					MADE GROUND: Grey brown slightly sandy gravelly clay. Gravel is subangular to subrounded flint, brick, concrete, clinker and asphalt. with a band of weak concrete between 0.80m to 0.95m depth. becoming very gravelly clay below 0.95m depth. with concrete at base.
	J T	1.00				1.00	
							End of Borehole

Remarks:

No further progress below 1.00m- concrete obstruction.

Borehole dry and stable on completion.

Excavation Method: Dynamic Sampler

Borehole Diameter: Various

Made By: SW

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Lewes, East Sussex
BN7 3PF

Borehole No.: WS9

Site Name: Inland Revenue, Durrington Bridge House, Barrington Rd, Worthing

Job No.: LW26215

Start Date: 28/08/2015 | End Date: 28/08/2015

Standpipe Installation	Samples and Testing: Sample Type	Depths: From (m)	Depths: To (m)	Vane/ Pen Test N Value	DPSH Profile Blows/100mm (5, 15, 25)	Strata: Legend	Depth / Reduced Level	Strata Descriptions
							0.00	Ground Level
	J T	0.30					0.50	Tarmac (200mm) over, MADE GROUND: Sandy gravel of brick and concrete.
	J T	0.60					0.70	MADE GROUND: Grey brown slightly gravelly clay. Gravel is sub-angular to sub-rounded fine to medium flint, brick and clinker.
	H D J T	0.80		90				Stiff orange slightly sandy slightly gravelly CLAY. Gravel is sub-angular to sub-rounded fine to medium flint.
	J T	1.30						
	H D	1.40		50				becoming firm at 1.30m depth.
							1.70	becoming sandy gravelly clay at 1.60m depth.
	D	1.80					1.90	Orange slightly clayey slightly gravelly fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to medium flint.
	D	2.00						Yellow fine to medium SAND.
	J T	2.10						becoming gravelly at 2.20m.
	D	2.50					2.80	
	H	2.90		105				Stiff orange brown slightly gravelly CLAY. Gravel is sub-angular to sub-rounded fine to medium flint.
	D	3.00					3.00	End of Borehole

Remarks:
Borehole dry and stable on completion.

Dynamic probe carried out through base.

Standpipe installed to 0.70m depth; 0.70m to.0.20m slotted pipe with gravel surround; 0.20m to ground level plain pipe with bentonite seal; completed with gas tap and security cover concreted flush with ground surface.

Excavation Method: Dynamic Sampler

Borehole Diameter: Various

Made By: SW

ASHDOWN SITE INVESTIGATION LIMITED
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS
Swanborough Farm
Swanborough
Lewes, East Sussex
BN7 3PF

Borehole No.: WS10

Site Name: Inland Revenue, Durrington Bridge House, Barrington Rd, Worthing

Job No.: LW26215

Start Date: 28/08/2015 | End Date: 28/08/2015

Standpipe Installation	Samples and Testing: Sample Type	Depths: From (m)	Depths: To (m)	Vane/ Pen Test N Value	DPSH Profile Blows/100mm (5 15 25)	Strata: Legend	Depth / Reduced Level	Strata Descriptions
							0.00	Ground Level
	J T	0.10						Topsoil (150mm) over, MADE GROUND: Orange brown slightly gravelly clay. Gravel is subangular to subrounded. fine to medium flint, brick and charcoal.
	J T	0.30					0.40	
	J T	0.40						Very stiff orange brown slightly gravelly CLAY. (River Terrace Deposits)
	D	0.60						
	H	0.80		225				
	V	1.00		>130				
	D	1.10						
	J T	1.20						
	H	1.30		155				
								becoming stiff below 1.50m
	H D	1.80		90				
	J T	2.20						
	H D	2.30		90				becoming silty below 2.10m depth.
							2.60	
	D	2.70						Medium dense to dense orange slightly clayey slightly gravelly fine to medium SAND. Gravel is subangular to angular fine to coarse flint. (River Terrace Deposits)
	J T	3.00					3.00	becoming very dense, yellow and with no clay content below 2.80m depth.
								End of Borehole

Remarks:

Borehole dry and stable on completion.

Dynamic probe carried out adjacent to borehole.

Excavation Method: Dynamic Sampler

Borehole Diameter: Various

Made By: SW

ASHDOWN SITE INVESTIGATION L•I•M•I•T•E•D
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS
Swanborough Farm
Swanborough
Lewes, East Sussex
BN7 3PF

Borehole No.: WS11

Site Name: Inland Revenue, Durrington Bridge House, Barrington Rd, Worthing

Job No.: LW26215

Start Date: 23/07/2015 | End Date: 23/07/2015

Standpipe Installation	Samples and Testing: Sample Type	Depths: From (m)	Depths: To (m)	Vane/ Pen Test N Value	DPSH Profile Blows/100mm (5 15 25)	Strata: Legend	Depth / Reduced Level	Strata Descriptions
							0.00	Ground Level
	J T	0.30					0.20	Asphalt (100mm) over, MADE GROUND: Sandy gravel of crystalline rock.
	D	0.50					0.40	MADE GROUND; Yellow brown gravelly sand. Gravel is subangular to subrounded fine to coarse flint with fragments of plastic.
	J T	0.70					0.90	MADE GROUND: Brown slightly gravelly slightly sandy silty clay with rootlets. Gravel is subangular to subrounded fine flint and ash.
	H	1.00		>250				Very stiff brown slightly gravelly clay with black iron/organic staining. Gravel is subangular to subrounded fine to coarse flint. (River Terrace Deposits)
	D	1.10						
	J T	1.20						
	D	1.70					1.90	
	H	2.00		>250				Very stiff brown slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse flint. (River Terrace Deposits)
	D	2.10					2.50	
	D	2.70					3.00	Dense yellow brown gravelly fine to medium SAND. Gravel is subangular to subrounded fine to medium flint (River Terrace Deposits)
								End of Borehole

Remarks:

Borehole dry on completion.

Borehole collapsed to 2.80m depth.

Standpipe installed to 3.00m depth; 3.00m to 1.00m slotted pipe with gravel surround; 1.00m to ground level plain pipe witih bentonite seal; completed with gas tap and security cover concreted flush with ground surface.

Dynamic probe carried out adjacent to borehole.

Excavation Method: Dynamic Sampler

Borehole Diameter: Various

Made By: TOM

ASHDOWN SITE INVESTIGATION LIMITED
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS
Swanborough Farm
Swanborough
Lewes, East Sussex
BN7 3PF

Borehole No.: WS12

Site Name: Inland Revenue, Durrington Bridge House, Barrington Rd, Worthing

Job No.: LW26215

Start Date: 23/07/2015 | End Date: 23/07/2015

Standpipe Installation	Samples and Testing: Sample Type	Depths: From (m)	Depths: To (m)	Vane/ Pen Test N Value	DPSH Profile Blows/100mm (5, 15, 25)	Strata: Legend	Depth / Reduced Level	Strata Descriptions
							0.00	Ground Level
							0.10	Asphalt.
							0.20	MADE GROUND: Grey subangular to subrounded fine to coarse gravel of crystaline rock.
	J T	0.30					0.40	MADE GROUND: Yellow brown gravelly sand. Gravel is subangular to subrounded fine to coarse flint.
	D	0.50						Very stiff brown slightly gravelly sandy silty CLAY with rootlets and black iron/organic staining. Gravel is subangular to subrounded fine to coarse flint. (River Terrace Deposits)
	J T	0.75						
	J T	1.10						
	H D	1.20		>250				
	H	1.50		250				
	D	1.70						
	H D	2.10		225				
							2.40	
	D	2.60						Very dense to dense yellow brown sandy silty subangular to subrounded fine to coarse GRAVEL of flint. (River Terrace Deposits)
							2.80	
								End of Borehole

Remarks:

No further progress below 2.80m depth - too dense.

Borehole dry and stable on completion

Dynamic probe carried out adjacent to borehole.

Excavation Method: Dynamic Sampler

Borehole Diameter: Various

Made By: TOM

ASHDOWN SITE INVESTIGATION LIMITED
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS
Swanborough Farm
Swanborough
Lewes, East Sussex
BN7 3PF

Borehole No.: WS13

Site Name: Inland Revenue, Durrington Bridge House, Barrington Rd, Worthing

Job No.: LW26215

Start Date: 23/07/2015 | End Date: 23/07/2015

Standpipe Installation	Samples and Testing: Sample Type	Depths: From (m)	Depths: To (m)	Vane/ Pen Test N Value	DPSH Profile Blows/100mm (5, 15, 25)	Strata: Legend	Depth / Reduced Level	Strata Descriptions
							0.00	Ground Level
							0.10	Asphalt.
	J T D	0.15					0.20	MADE GROUND: Grey subangular to subrounded fine to coarse gravel of crystaline rock.
	J T D	0.35					0.45	MADE GROUND: Yellow brown gravelly sand. Gravel is subangular to subrounded fine to coarse flint.
							0.80	MADE GROUND: Orange brown slightly gravelly silty clay with occasional rootlets. Gravel is subangular to subrounded fine to coarse brick flint and ash.
	J T D	0.90						Very stiff light brown slightly gravelly silty CLAY with some iron staining. Gravel is subangular to subrounded fine to medium flint. (River Terrace Deposits)
	H J	1.50		235				
	H	1.70		130			1.75	
	D	1.80					1.90	Stiff to very stiff brown slightly silty very gravelly CLAY. Gravel is subrounded to subangular fine to coarse flint. (River Terrace Deposits)
	V	2.00		>130				
	H D	2.10		170			2.30	Very stiff orange brown slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse flint. (River Terrace Deposits)
	D	2.60					2.70	Medium dense yellow brown sandy silty subangular to subrounded fine to coarse GRAVEL of flint. (River Terrace Deposits) becoming dense to very dense towards base.
								End of Borehole

Remarks:

Borehole dry and stable on completion.

No further progress below 2.70m depth- to dense.

Standpipe installed to 2.70m depth; 2.70m to 1.00m slotted pipe with gravel surround; 1.00m to ground level plain pipe with bentonite seal; completed with gas tap and security cover concreted flush with ground surface.

Dynamic probe carried out adjacent to borehole.

Excavation Method: Dynamic Sampler

Borehole Diameter: Various

Made By: TOM

3 Rock Description

Description and classification of rocks has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of rock, Part 1 Identification and classification (BS EN ISO 14689-1:2003) as well as the BS5930:1990 + A2:2010 code of Practice for Site Investigations.

The description of rock mass includes the type of rock, structure, discontinuities and weathering.

The unconfined compressive strength of rock material is determined on the following basis:

Term	**Field Identification**	**Unconfined Compressive Strength (MPa)**
Extremely Weak	Indented by thumbnail	Less than 1
Very Weak	Crumbles under firm blows with point of geological hammer, peeled by pocket knife	1 to 5
Weak	Peeled by pocket knife with difficulty, shallow indentations made by firm blow with geological hammer	5 to 25
Medium Strong	Cannot be peeled or scraped with knife, can be fractured with single firm blow of geological hammer	25 to 50
Strong	Requires more than one blow of geological hammer to fracture	50 to 100
Very Strong	Requires may blows of geological hammer to fracture it	100 to 250
Extremely Strong	Can only be chipped with geological hammer	Greater and 250

The terms describing discontinuity and bedding spacing are as follows:

Bedding Thickness	
Very Thick	>2000mm
Thick	2000-600mm
Medium	600-200mm
Thin	200-60mm
Very Thin	60-20mm
Thickly Laminated	20-6mm
Thinly Laminated	<6mm

Discontinuity Spacing	
Very Wide	>2000mm
Wide	2000-600mm
Medium	600-200mm
Close	200-60mm
Very Close	60-20mm
Extremely Close	<20mm

Chalk

Chalk description is based on BS EN ISO 14688, BS EN ISO 14689 and BS5930. The classification of chalk generally follows the guidance offered by the Construction Industry Research and Information Association (CIRIA) C574, 'Engineering in Chalk'. This is based on assessment of chalk density, discontinuity and aperture spacing, and the proportion of intact chalk to silt of chalk. See additional chalk classification notes.

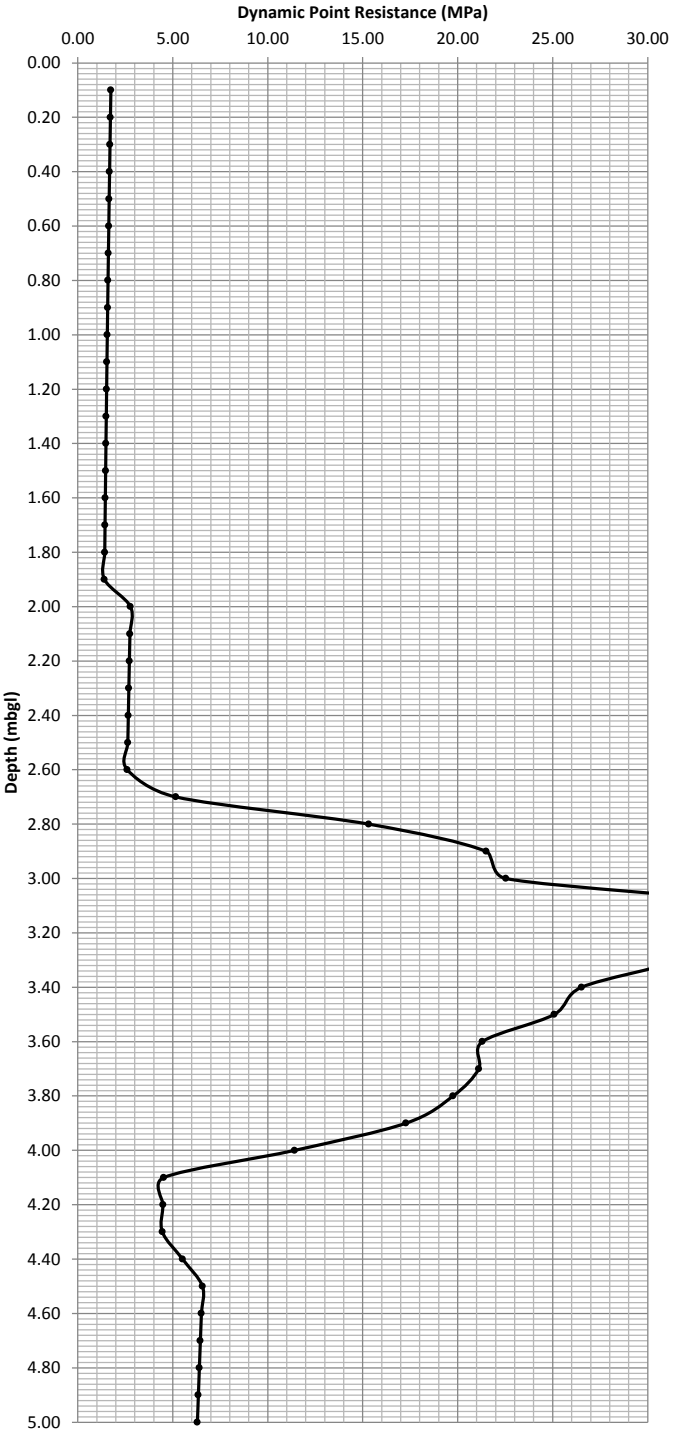
ASHDOWN SITE INVESTIGATION LTD

Dynamic Probe Record

SITE Inland Revenue, Durrington Bridge House, Barrington Road, Worthing. **Report Ref.** LW26215

Test Location Reference	WS1

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10	1	0.10	1.79	1.74
0.20	1	0.10	1.79	1.72
0.30	1	0.10	1.79	1.69
0.40	1	0.10	1.79	1.67
0.50	1	0.10	1.79	1.65
0.60	1	0.10	1.79	1.63
0.70	1	0.10	1.79	1.61
0.80	1	0.10	1.79	1.59
0.90	1	0.10	1.79	1.57
1.00	1	0.10	1.79	1.55
1.10	1	0.10	1.79	1.53
1.20	1	0.10	1.79	1.52
1.30	1	0.10	1.79	1.50
1.40	1	0.10	1.79	1.48
1.50	1	0.10	1.79	1.46
1.60	1	0.10	1.79	1.45
1.70	1	0.10	1.79	1.43
1.80	1	0.10	1.79	1.42
1.90	1	0.10	1.79	1.40
2.00	2	0.05	3.58	2.77
2.10	2	0.05	3.58	2.74
2.20	2	0.05	3.58	2.71
2.30	2	0.05	3.58	2.69
2.40	2	0.05	3.58	2.66
2.50	2	0.05	3.58	2.63
2.60	2	0.05	3.58	2.61
2.70	4	0.03	7.17	5.16
2.80	12	0.01	21.50	15.32
2.90	17	0.01	30.46	21.49
3.00	18	0.01	32.25	22.54
3.10	29	0.00	51.96	35.96
3.20	27	0.00	48.37	33.17
3.30	26	0.00	46.58	31.64
3.40	22	0.00	39.41	26.52
3.50	21	0.00	37.62	25.08
3.60	18	0.01	32.25	21.30
3.70	18	0.01	32.25	21.11
3.80	17	0.01	30.46	19.76
3.90	15	0.01	26.87	17.28
4.00	10	0.01	17.92	11.42
4.10	4	0.03	7.17	4.53
4.20	4	0.03	7.17	4.49
4.30	4	0.03	7.17	4.45
4.40	5	0.02	8.96	5.51
4.50	6	0.02	10.75	6.56
4.60	6	0.02	10.75	6.51
4.70	6	0.02	10.75	6.45
4.80	6	0.02	10.75	6.40
4.90	6	0.02	10.75	6.35
5.00	6	0.02	10.75	6.30



Notes:

Hammer Mass	63.5	kg
Fall Height	0.76	m
Cone Area	0.0019	m^2
E_{theor}	473	J
Energy Ratio	0.719	
Anvil Mass	1	kg
Rod Mass	8.79	kg/m

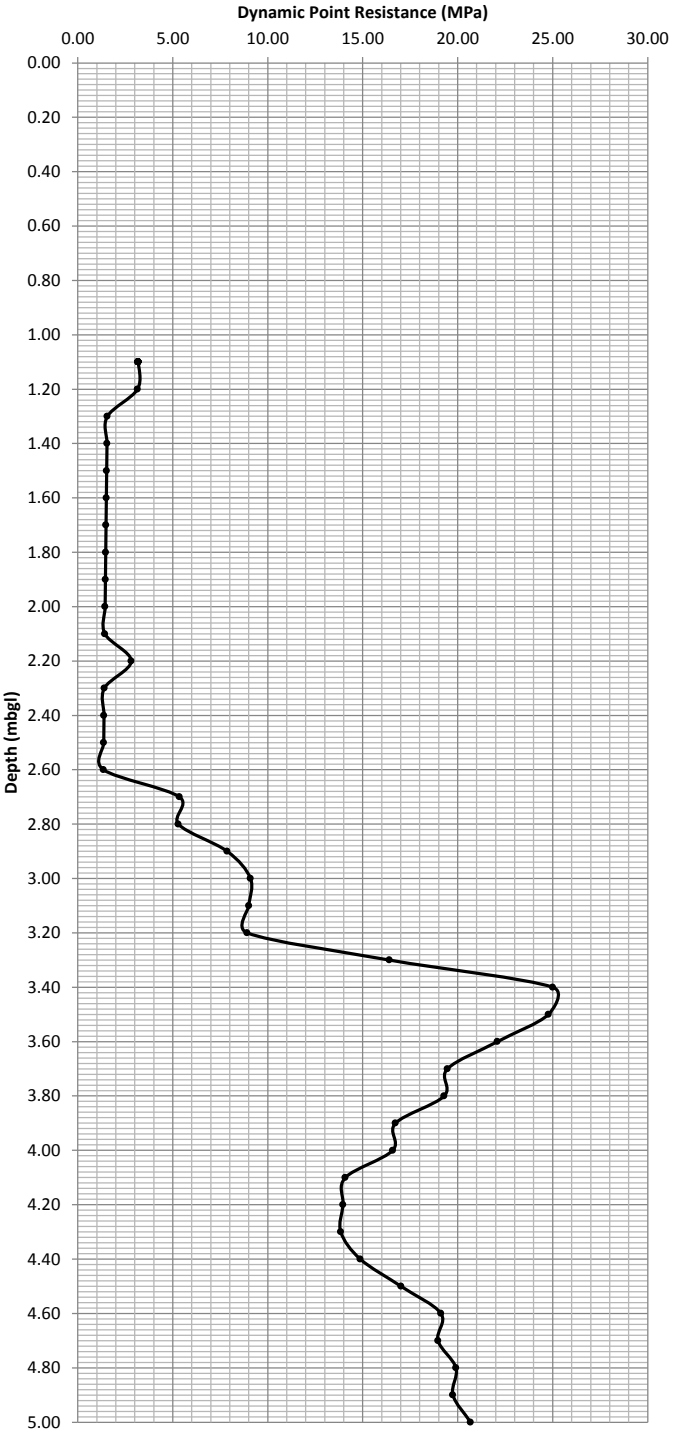
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Dynamic Probe Record

SITE Inland Revenue, Durrington Bridge House, Barrington Road, Worthing. **Report Ref.** LW26215

Test Location Reference	WS2

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10				
0.20				
0.30				
0.40				
0.50				
0.60				
0.70				
0.80				
0.90				
1.00				
1.10	2	0.05	3.72	3.18
1.20	2	0.05	3.72	3.14
1.30	1	0.10	1.86	1.55
1.40	1	0.10	1.86	1.54
1.50	1	0.10	1.86	1.52
1.60	1	0.10	1.86	1.50
1.70	1	0.10	1.86	1.49
1.80	1	0.10	1.86	1.47
1.90	1	0.10	1.86	1.45
2.00	1	0.10	1.86	1.44
2.10	1	0.10	1.86	1.42
2.20	2	0.05	3.72	2.82
2.30	1	0.10	1.86	1.39
2.40	1	0.10	1.86	1.38
2.50	1	0.10	1.86	1.36
2.60	1	0.10	1.86	1.35
2.70	4	0.03	7.43	5.35
2.80	4	0.03	7.43	5.30
2.90	6	0.02	11.15	7.87
3.00	7	0.01	13.01	9.09
3.10	7	0.01	13.01	9.00
3.20	7	0.01	13.01	8.92
3.30	13	0.01	24.16	16.41
3.40	20	0.01	37.16	25.01
3.50	20	0.01	37.16	24.78
3.60	18	0.01	33.45	22.09
3.70	16	0.01	29.73	19.46
3.80	16	0.01	29.73	19.29
3.90	14	0.01	26.01	16.73
4.00	14	0.01	26.01	16.58
4.10	12	0.01	22.30	14.09
4.20	12	0.01	22.30	13.96
4.30	12	0.01	22.30	13.84
4.40	13	0.01	24.16	14.87
4.50	15	0.01	27.87	17.01
4.60	17	0.01	31.59	19.12
4.70	17	0.01	31.59	18.96
4.80	18	0.01	33.45	19.91
4.90	18	0.01	33.45	19.75
5.00	19	0.01	35.30	20.68



Notes:

Hammer Mass	63.5	kg
Fall Height	0.76	m
Cone Area	0.0019	m^2
E_{theor}	473	J
Energy Ratio	0.7457	
Anvil Mass	1	kg
Rod Mass	8.79	kg/m

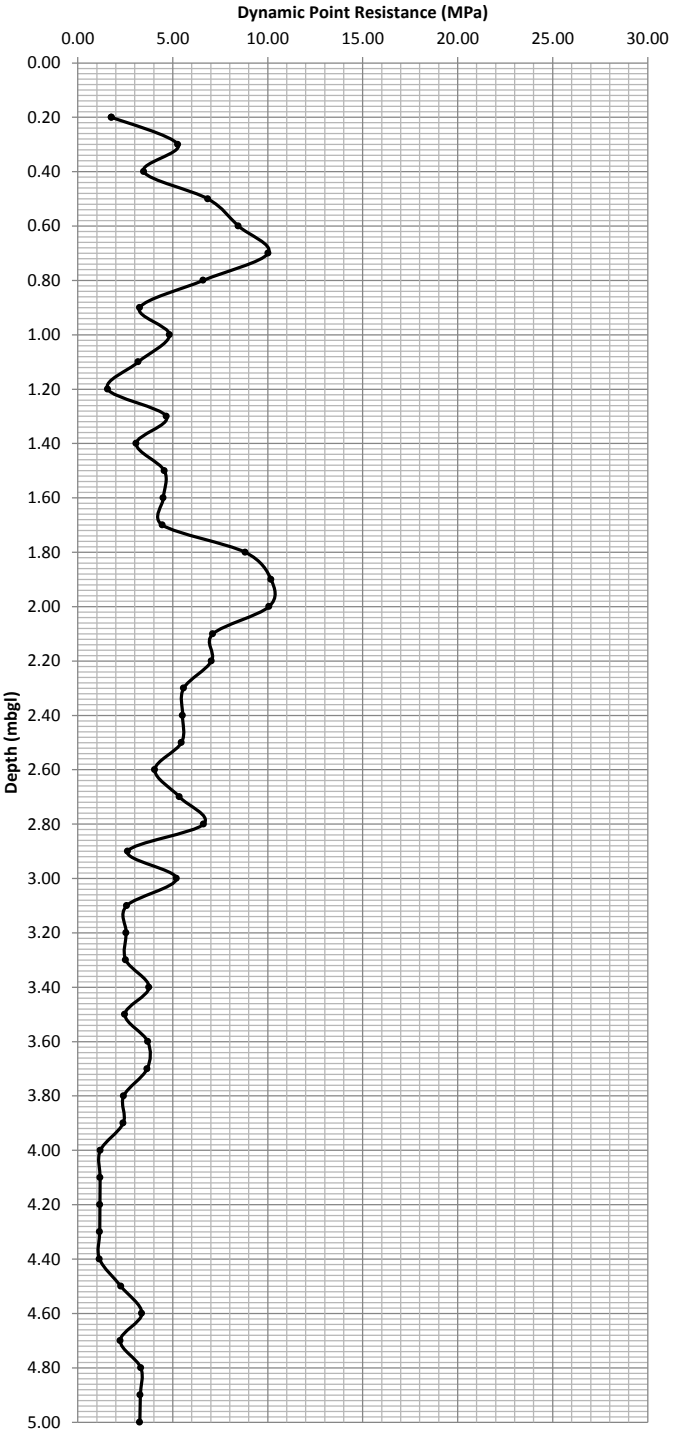
ASHDOWN SITE INVESTIGATION LTD

Dynamic Probe Record

SITE Inland Revenue, Durrington Bridge House, Barrington Road, Worthing. **Report Ref.** LW26215

Test Location Reference	WS3

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10				
0.20	1	0.10	1.86	1.78
0.30	3	0.03	5.57	5.27
0.40	2	0.05	3.72	3.47
0.50	4	0.03	7.43	6.85
0.60	5	0.02	9.29	8.46
0.70	6	0.02	11.15	10.02
0.80	4	0.03	7.43	6.60
0.90	2	0.05	3.72	3.26
1.00	3	0.03	5.57	4.83
1.10	2	0.05	3.72	3.18
1.20	1	0.10	1.86	1.57
1.30	3	0.03	5.57	4.66
1.40	2	0.05	3.72	3.07
1.50	3	0.03	5.57	4.56
1.60	3	0.03	5.57	4.51
1.70	3	0.03	5.57	4.46
1.80	6	0.02	11.15	8.81
1.90	7	0.01	13.01	10.17
2.00	7	0.01	13.01	10.06
2.10	5	0.02	9.29	7.11
2.20	5	0.02	9.29	7.04
2.30	4	0.03	7.43	5.57
2.40	4	0.03	7.43	5.51
2.50	4	0.03	7.43	5.46
2.60	3	0.03	5.57	4.05
2.70	4	0.03	7.43	5.35
2.80	5	0.02	9.29	6.62
2.90	2	0.05	3.72	2.62
3.00	4	0.03	7.43	5.19
3.10	2	0.05	3.72	2.57
3.20	2	0.05	3.72	2.55
3.30	2	0.05	3.72	2.52
3.40	3	0.03	5.57	3.75
3.50	2	0.05	3.72	2.48
3.60	3	0.03	5.57	3.68
3.70	3	0.03	5.57	3.65
3.80	2	0.05	3.72	2.41
3.90	2	0.05	3.72	2.39
4.00	1	0.10	1.86	1.18
4.10	1	0.10	1.86	1.17
4.20	1	0.10	1.86	1.16
4.30	1	0.10	1.86	1.15
4.40	1	0.10	1.86	1.14
4.50	2	0.05	3.72	2.27
4.60	3	0.03	5.57	3.37
4.70	2	0.05	3.72	2.23
4.80	3	0.03	5.57	3.32
4.90	3	0.03	5.57	3.29
5.00	3	0.03	5.57	3.26



Notes:

Hammer Mass	63.5	kg
Fall Height	0.76	m
Cone Area	0.0019	m^2
E_{theor}	473	J
Energy Ratio	0.7457	
Anvil Mass	1	kg
Rod Mass	8.79	kg/m

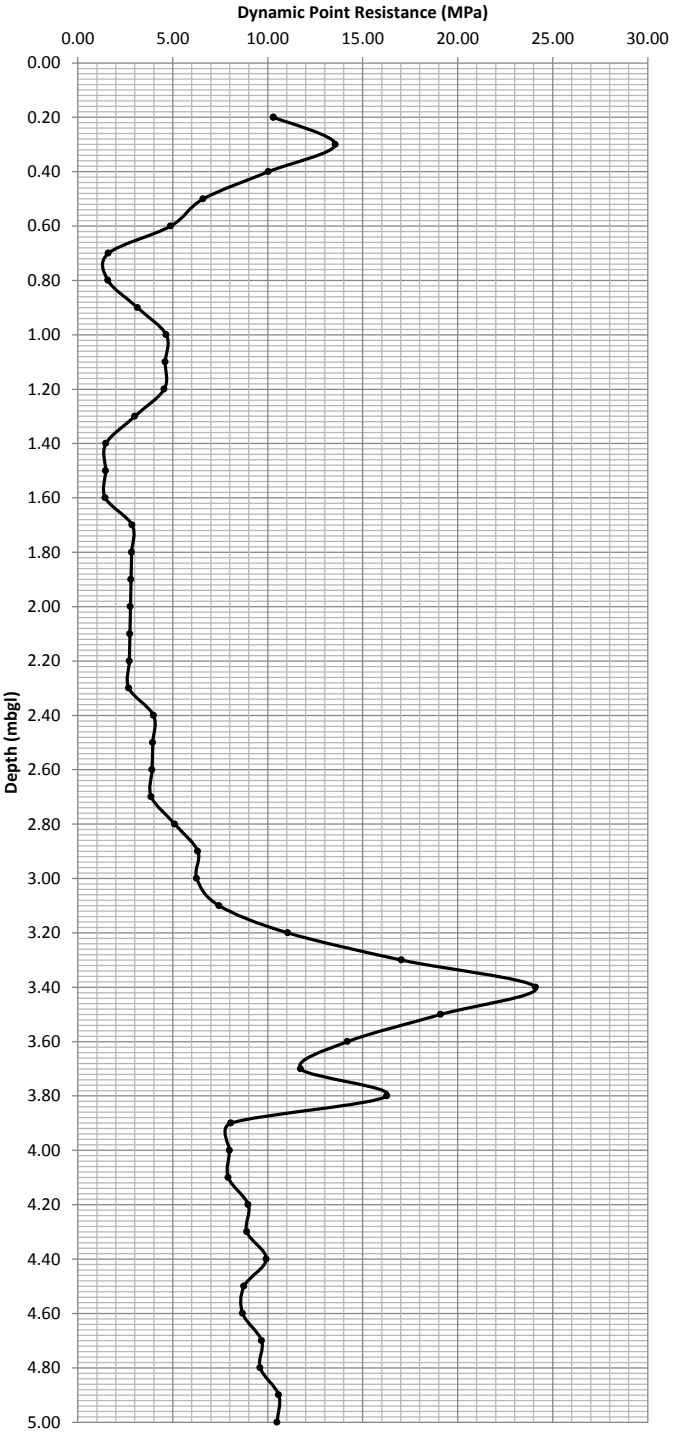
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Dynamic Probe Record

SITE Inland Revenue, Durrington Bridge House, Barrington Road, Worthing. **Report Ref.** LW26215

Test Location Reference	WS4

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10				
0.20	6	0.02	10.75	10.30
0.30	8	0.01	14.33	13.56
0.40	6	0.02	10.75	10.04
0.50	4	0.03	7.17	6.61
0.60	3	0.03	5.37	4.89
0.70	1	0.10	1.79	1.61
0.80	1	0.10	1.79	1.59
0.90	2	0.05	3.58	3.14
1.00	3	0.03	5.37	4.66
1.10	3	0.03	5.37	4.60
1.20	3	0.03	5.37	4.55
1.30	2	0.05	3.58	3.00
1.40	1	0.10	1.79	1.48
1.50	1	0.10	1.79	1.46
1.60	1	0.10	1.79	1.45
1.70	2	0.05	3.58	2.86
1.80	2	0.05	3.58	2.83
1.90	2	0.05	3.58	2.80
2.00	2	0.05	3.58	2.77
2.10	2	0.05	3.58	2.74
2.20	2	0.05	3.58	2.71
2.30	2	0.05	3.58	2.69
2.40	3	0.03	5.37	3.99
2.50	3	0.03	5.37	3.95
2.60	3	0.03	5.37	3.91
2.70	3	0.03	5.37	3.87
2.80	4	0.03	7.17	5.11
2.90	5	0.02	8.96	6.32
3.00	5	0.02	8.96	6.26
3.10	6	0.02	10.75	7.44
3.20	9	0.01	16.12	11.06
3.30	14	0.01	25.08	17.04
3.40	20	0.01	35.83	24.11
3.50	16	0.01	28.66	19.11
3.60	12	0.01	21.50	14.20
3.70	10	0.01	17.92	11.73
3.80	14	0.01	25.08	16.27
3.90	7	0.01	12.54	8.06
4.00	7	0.01	12.54	7.99
4.10	7	0.01	12.54	7.92
4.20	8	0.01	14.33	8.98
4.30	8	0.01	14.33	8.90
4.40	9	0.01	16.12	9.93
4.50	8	0.01	14.33	8.75
4.60	8	0.01	14.33	8.68
4.70	9	0.01	16.12	9.68
4.80	9	0.01	16.12	9.60
4.90	10	0.01	17.92	10.58
5.00	10	0.01	17.92	10.49



Notes:

Hammer Mass	63.5	kg
Fall Height	0.76	m
Cone Area	0.0019	m^2
E_{theor}	473	J
Energy Ratio	0.719	
Anvil Mass	1	kg
Rod Mass	8.79	kg/m

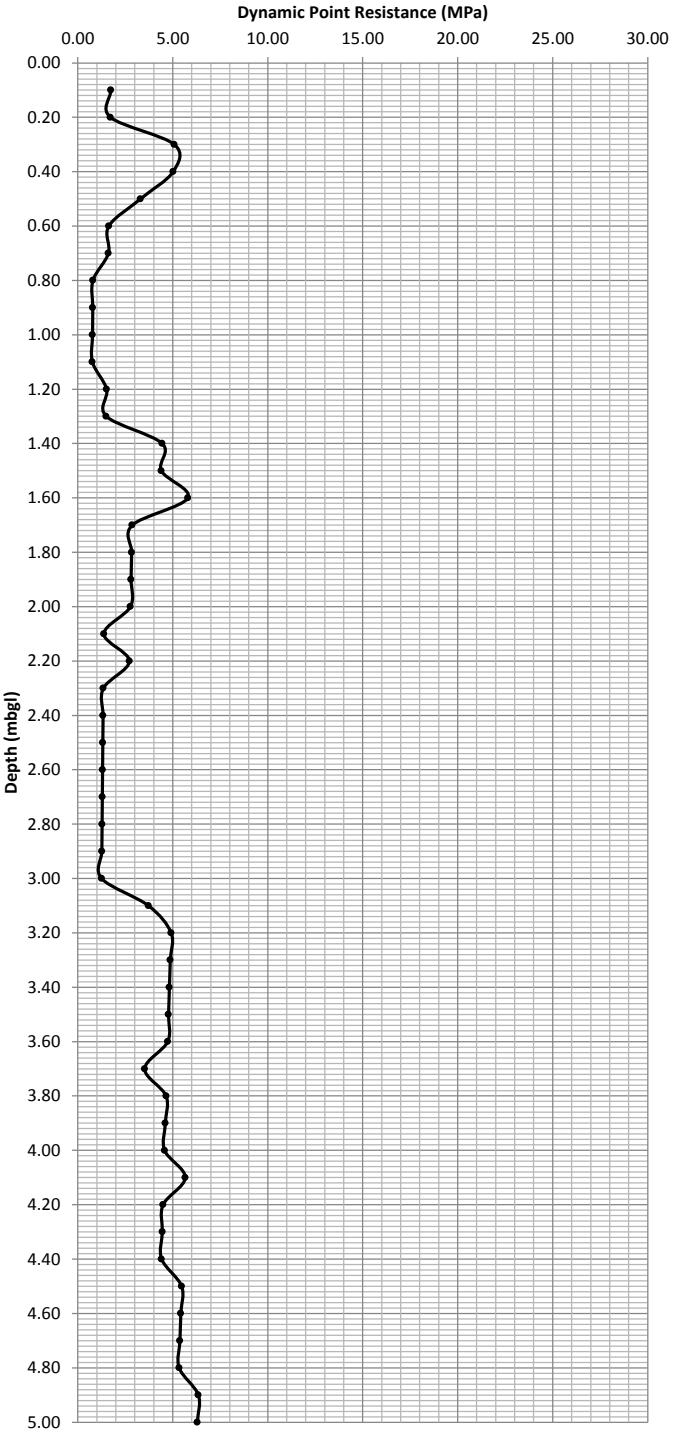
ASHDOWN SITE INVESTIGATION LTD

Dynamic Probe Record

SITE Inland Revenue, Durrington Bridge House, Barrington Road, Worthing. **Report Ref.** LW26215

Test Location Reference	WS5

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10	1	0.10	1.79	1.74
0.20	1	0.10	1.79	1.72
0.30	3	0.03	5.37	5.08
0.40	3	0.03	5.37	5.02
0.50	2	0.05	3.58	3.30
0.60	1	0.10	1.79	1.63
0.70	1	0.10	1.79	1.61
0.80	0.5	0.20	0.90	0.80
0.90	0.5	0.20	0.90	0.79
1.00	0.5	0.20	0.90	0.78
1.10	0.5	0.20	0.90	0.77
1.20	1	0.10	1.79	1.52
1.30	1	0.10	1.79	1.50
1.40	3	0.03	5.37	4.44
1.50	3	0.03	5.37	4.39
1.60	4	0.03	7.17	5.79
1.70	2	0.05	3.58	2.86
1.80	2	0.05	3.58	2.83
1.90	2	0.05	3.58	2.80
2.00	2	0.05	3.58	2.77
2.10	1	0.10	1.79	1.37
2.20	2	0.05	3.58	2.71
2.30	1	0.10	1.79	1.34
2.40	1	0.10	1.79	1.33
2.50	1	0.10	1.79	1.32
2.60	1	0.10	1.79	1.30
2.70	1	0.10	1.79	1.29
2.80	1	0.10	1.79	1.28
2.90	1	0.10	1.79	1.26
3.00	1	0.10	1.79	1.25
3.10	3	0.03	5.37	3.72
3.20	4	0.03	7.17	4.91
3.30	4	0.03	7.17	4.87
3.40	4	0.03	7.17	4.82
3.50	4	0.03	7.17	4.78
3.60	4	0.03	7.17	4.73
3.70	3	0.03	5.37	3.52
3.80	4	0.03	7.17	4.65
3.90	4	0.03	7.17	4.61
4.00	4	0.03	7.17	4.57
4.10	5	0.02	8.96	5.66
4.20	4	0.03	7.17	4.49
4.30	4	0.03	7.17	4.45
4.40	4	0.03	7.17	4.41
4.50	5	0.02	8.96	5.47
4.60	5	0.02	8.96	5.42
4.70	5	0.02	8.96	5.38
4.80	5	0.02	8.96	5.33
4.90	6	0.02	10.75	6.35
5.00	6	0.02	10.75	6.30



Notes:

Hammer Mass	63.5	kg
Fall Height	0.76	m
Cone Area	0.0019	m^2
E_{theor}	473	J
Energy Ratio	0.719	
Anvil Mass	1	kg
Rod Mass	8.79	kg/m

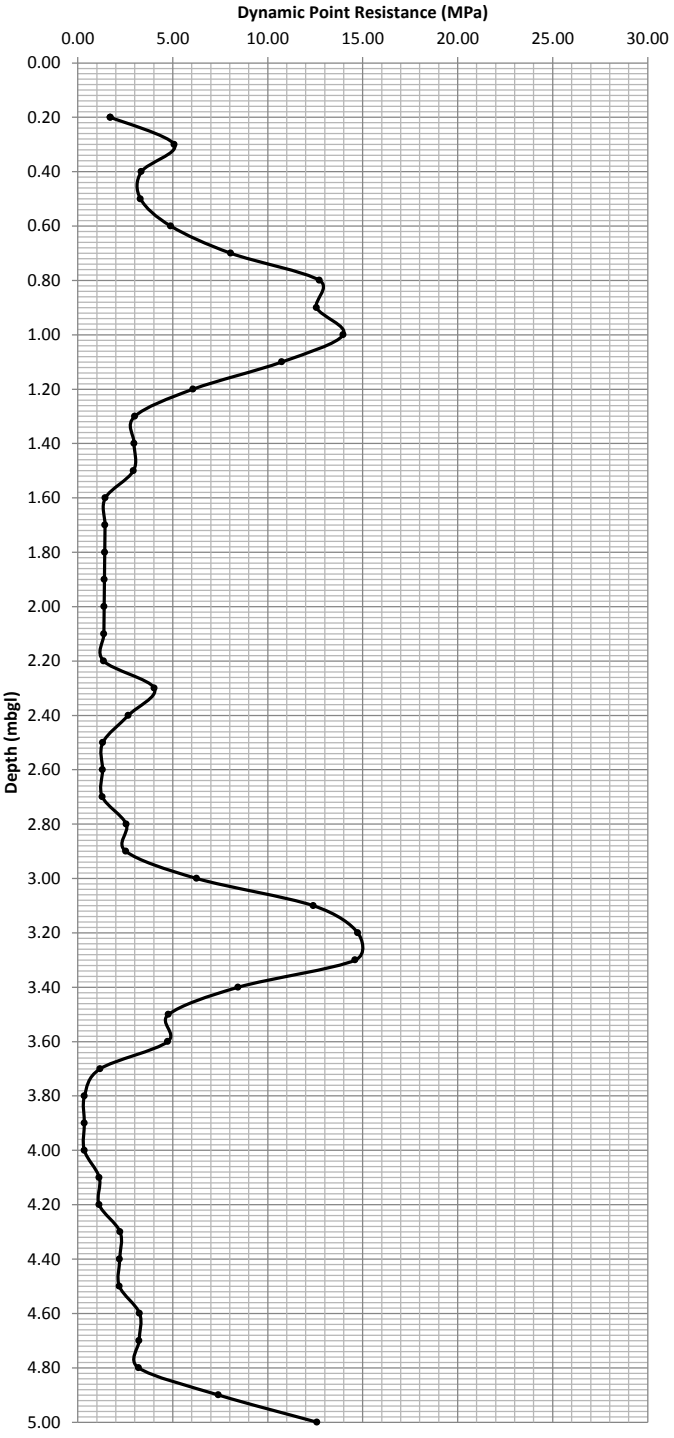
ASHDOWN SITE INVESTIGATION LTD

Dynamic Probe Record

SITE Inland Revenue, Durrington Bridge House, Barrington Road, Worthing. **Report Ref.** LW26215

Test Location Reference	WS6

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10				
0.20	1	0.10	1.79	1.72
0.30	3	0.03	5.37	5.08
0.40	2	0.05	3.58	3.35
0.50	2	0.05	3.58	3.30
0.60	3	0.03	5.37	4.89
0.70	5	0.02	8.96	8.05
0.80	8	0.01	14.33	12.72
0.90	8	0.01	14.33	12.57
1.00	9	0.01	16.12	13.97
1.10	7	0.01	12.54	10.74
1.20	4	0.03	7.17	6.06
1.30	2	0.05	3.58	3.00
1.40	2	0.05	3.58	2.96
1.50	2	0.05	3.58	2.93
1.60	1	0.10	1.79	1.45
1.70	1	0.10	1.79	1.43
1.80	1	0.10	1.79	1.42
1.90	1	0.10	1.79	1.40
2.00	1	0.10	1.79	1.39
2.10	1	0.10	1.79	1.37
2.20	1	0.10	1.79	1.36
2.30	3	0.03	5.37	4.03
2.40	2	0.05	3.58	2.66
2.50	1	0.10	1.79	1.32
2.60	1	0.10	1.79	1.30
2.70	1	0.10	1.79	1.29
2.80	2	0.05	3.58	2.55
2.90	2	0.05	3.58	2.53
3.00	5	0.02	8.96	6.26
3.10	10	0.01	17.92	12.40
3.20	12	0.01	21.50	14.74
3.30	12	0.01	21.50	14.60
3.40	7	0.01	12.54	8.44
3.50	4	0.03	7.17	4.78
3.60	4	0.03	7.17	4.73
3.70	1	0.10	1.79	1.17
3.80	0.3	0.33	0.54	0.35
3.90	0.3	0.33	0.54	0.35
4.00	0.3	0.33	0.54	0.34
4.10	1	0.10	1.79	1.13
4.20	1	0.10	1.79	1.12
4.30	2	0.05	3.58	2.22
4.40	2	0.05	3.58	2.21
4.50	2	0.05	3.58	2.19
4.60	3	0.03	5.37	3.25
4.70	3	0.03	5.37	3.23
4.80	3	0.03	5.37	3.20
4.90	7	0.01	12.54	7.40
5.00	12	0.01	21.50	12.59



Notes:

Hammer Mass	63.5	kg
Fall Height	0.76	m
Cone Area	0.0019	m^2
E_{theor}	473	J
Energy Ratio	0.719	
Anvil Mass	1	kg
Rod Mass	8.79	kg/m

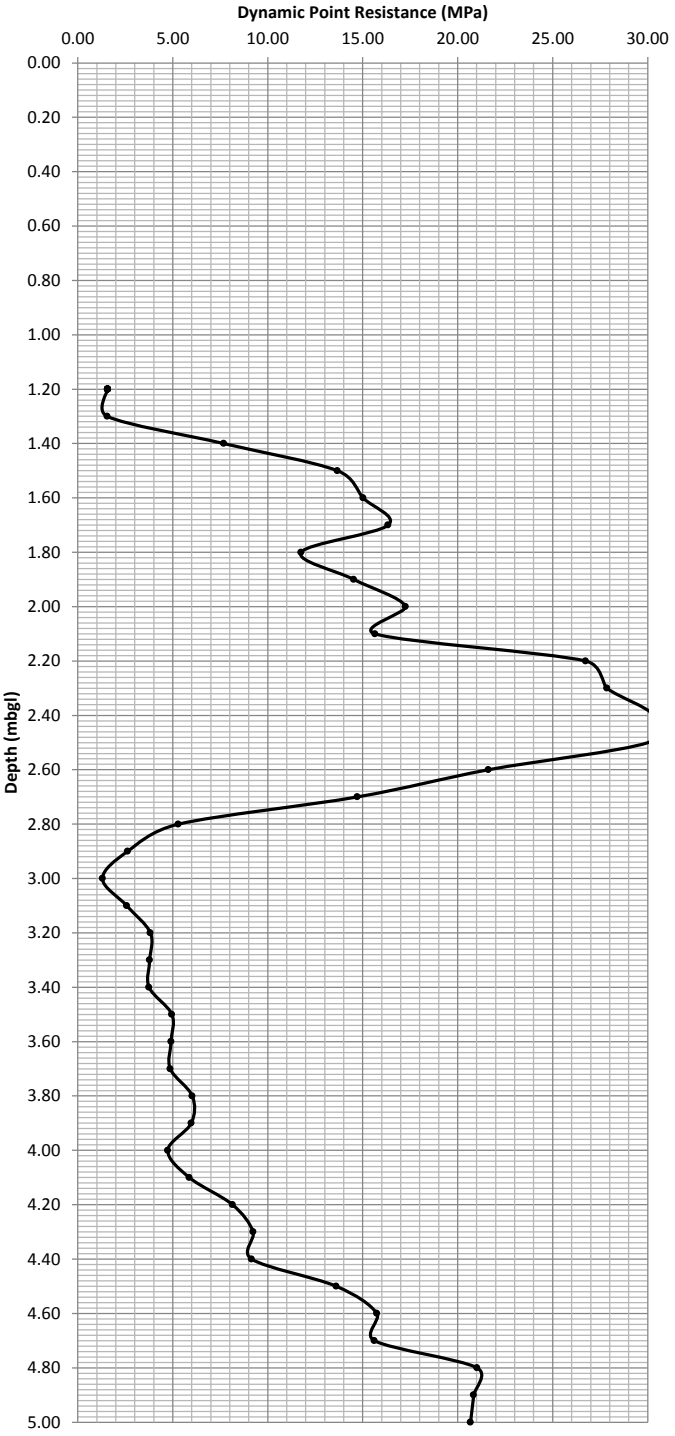
ASHDOWN SITE INVESTIGATION LTD

Dynamic Probe Record

SITE Inland Revenue, Durrington Bridge House, Barrington Road, Worthing. **Report Ref.** LW26215

Test Location Reference	WS9

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10				
0.20				
0.30				
0.40				
0.50				
0.60				
0.70				
0.80				
0.90				
1.00				
1.10				
1.20	1	0.10	1.86	1.57
1.30	1	0.10	1.86	1.55
1.40	5	0.02	9.29	7.68
1.50	9	0.01	16.72	13.67
1.60	10	0.01	18.58	15.02
1.70	11	0.01	20.44	16.34
1.80	8	0.01	14.86	11.75
1.90	10	0.01	18.58	14.53
2.00	12	0.01	22.30	17.25
2.10	11	0.01	20.44	15.65
2.20	19	0.01	35.30	26.74
2.30	20	0.01	37.16	27.86
2.40	22	0.00	40.88	30.33
2.50	22	0.00	40.88	30.02
2.60	16	0.01	29.73	21.61
2.70	11	0.01	20.44	14.71
2.80	4	0.03	7.43	5.30
2.90	2	0.05	3.72	2.62
3.00	1	0.10	1.86	1.30
3.10	2	0.05	3.72	2.57
3.20	3	0.03	5.57	3.82
3.30	3	0.03	5.57	3.79
3.40	3	0.03	5.57	3.75
3.50	4	0.03	7.43	4.96
3.60	4	0.03	7.43	4.91
3.70	4	0.03	7.43	4.87
3.80	5	0.02	9.29	6.03
3.90	5	0.02	9.29	5.97
4.00	4	0.03	7.43	4.74
4.10	5	0.02	9.29	5.87
4.20	7	0.01	13.01	8.15
4.30	8	0.01	14.86	9.23
4.40	8	0.01	14.86	9.15
4.50	12	0.01	22.30	13.61
4.60	14	0.01	26.01	15.75
4.70	14	0.01	26.01	15.61
4.80	19	0.01	35.30	21.02
4.90	19	0.01	35.30	20.84
5.00	19	0.01	35.30	20.68



Notes:

Hammer Mass	63.5	kg
Fall Height	0.76	m
Cone Area	0.0019	m^2
E_{theor}	473	J
Energy Ratio	0.7457	
Anvil Mass	1	kg
Rod Mass	8.79	kg/m

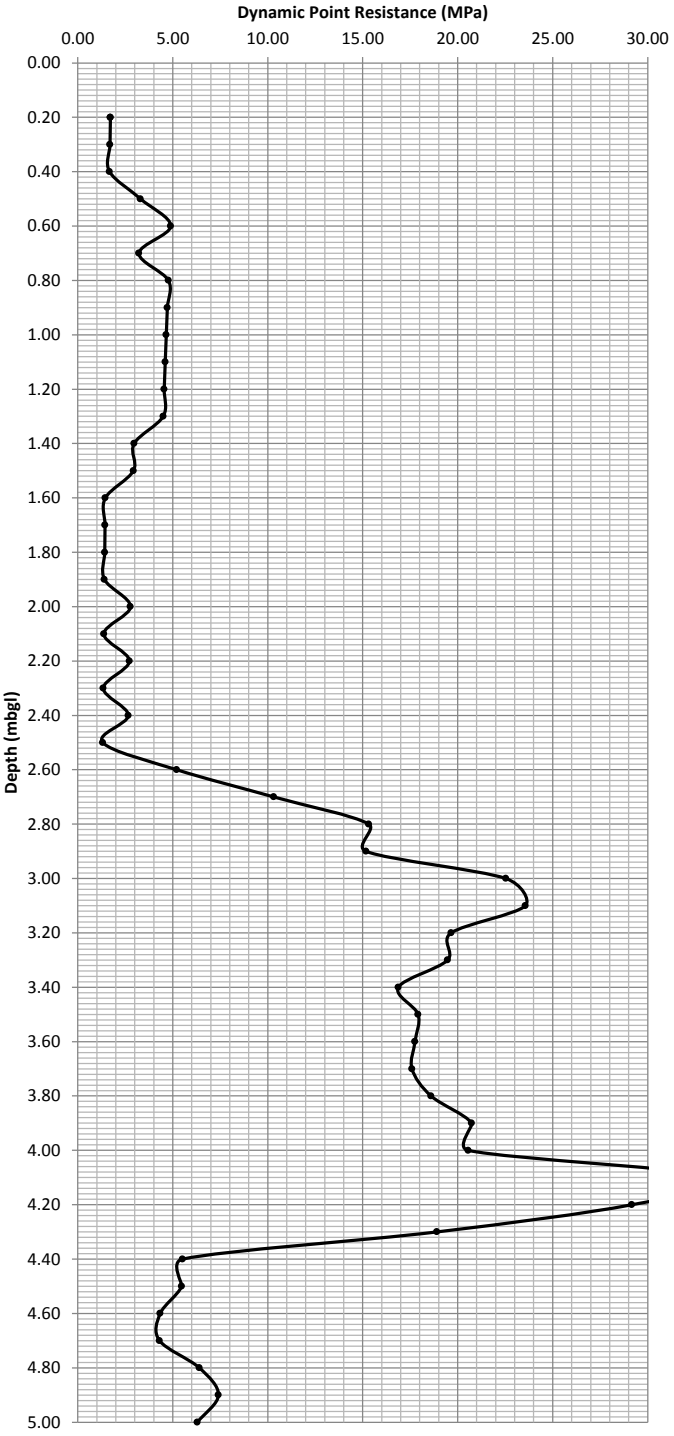
ASHDOWN SITE INVESTIGATION LTD

Dynamic Probe Record

SITE Inland Revenue, Durrington Bridge House, Barrington Road, Worthing. **Report Ref.** LW26215

Test Location Reference	WS10

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10				
0.20	1	0.10	1.79	1.72
0.30	1	0.10	1.79	1.69
0.40	1	0.10	1.79	1.67
0.50	2	0.05	3.58	3.30
0.60	3	0.03	5.37	4.89
0.70	2	0.05	3.58	3.22
0.80	3	0.03	5.37	4.77
0.90	3	0.03	5.37	4.71
1.00	3	0.03	5.37	4.66
1.10	3	0.03	5.37	4.60
1.20	3	0.03	5.37	4.55
1.30	3	0.03	5.37	4.50
1.40	2	0.05	3.58	2.96
1.50	2	0.05	3.58	2.93
1.60	1	0.10	1.79	1.45
1.70	1	0.10	1.79	1.43
1.80	1	0.10	1.79	1.42
1.90	1	0.10	1.79	1.40
2.00	2	0.05	3.58	2.77
2.10	1	0.10	1.79	1.37
2.20	2	0.05	3.58	2.71
2.30	1	0.10	1.79	1.34
2.40	2	0.05	3.58	2.66
2.50	1	0.10	1.79	1.32
2.60	4	0.03	7.17	5.21
2.70	8	0.01	14.33	10.32
2.80	12	0.01	21.50	15.32
2.90	12	0.01	21.50	15.17
3.00	18	0.01	32.25	22.54
3.10	19	0.01	34.04	23.56
3.20	16	0.01	28.66	19.65
3.30	16	0.01	28.66	19.47
3.40	14	0.01	25.08	16.88
3.50	15	0.01	26.87	17.92
3.60	15	0.01	26.87	17.75
3.70	15	0.01	26.87	17.59
3.80	16	0.01	28.66	18.60
3.90	18	0.01	32.25	20.73
4.00	18	0.01	32.25	20.55
4.10	30	0.00	53.75	33.95
4.20	26	0.00	46.58	29.17
4.30	17	0.01	30.46	18.91
4.40	5	0.02	8.96	5.51
4.50	5	0.02	8.96	5.47
4.60	4	0.03	7.17	4.34
4.70	4	0.03	7.17	4.30
4.80	6	0.02	10.75	6.40
4.90	7	0.01	12.54	7.40
5.00	6	0.02	10.75	6.30



Notes:

Hammer Mass	63.5	kg
Fall Height	0.76	m
Cone Area	0.0019	m^2
E_{theor}	473	J
Energy Ratio	0.719	
Anvil Mass	1	kg
Rod Mass	8.79	kg/m

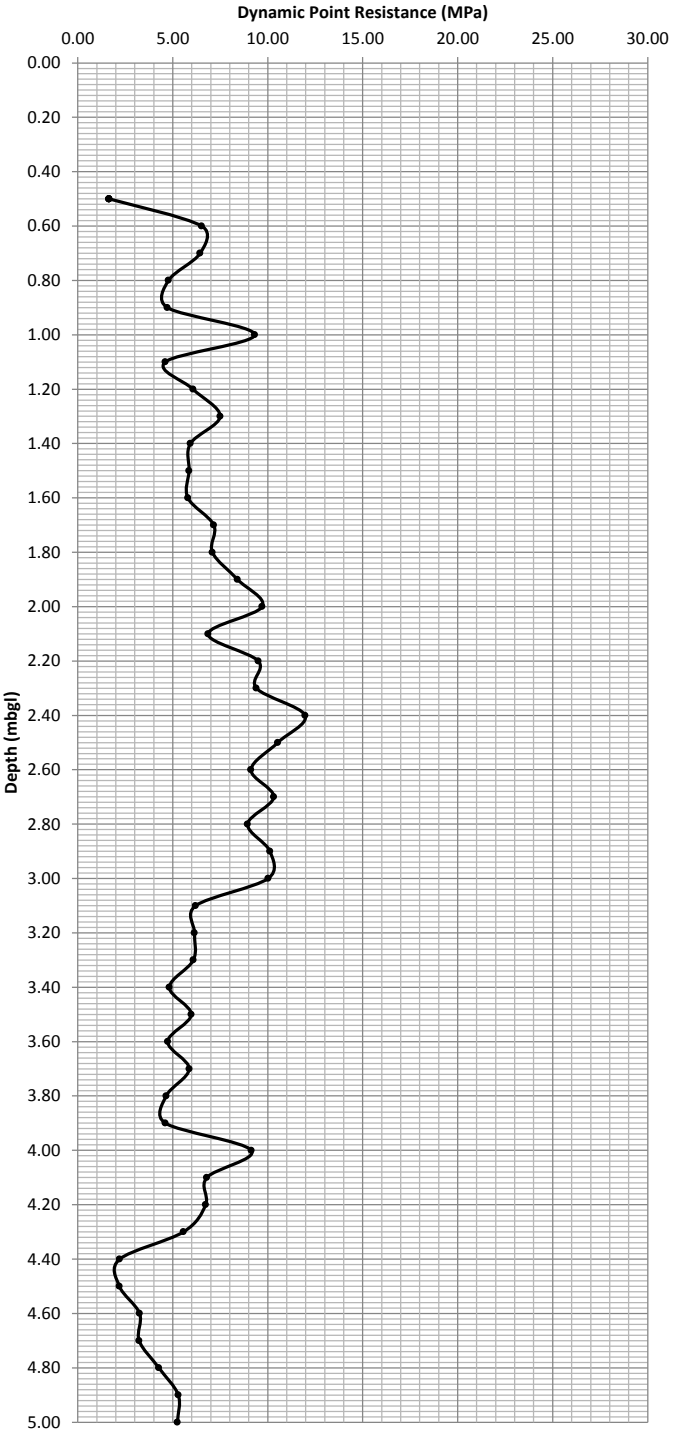
ASHDOWN SITE INVESTIGATION LTD

Dynamic Probe Record

SITE Inland Revenue, Durrington Bridge House, Barrington Road, Worthing. **Report Ref.** LW26215

Test Location Reference	WS11

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10				
0.20				
0.30				
0.40				
0.50	1	0.10	1.79	1.65
0.60	4	0.03	7.17	6.52
0.70	4	0.03	7.17	6.44
0.80	3	0.03	5.37	4.77
0.90	3	0.03	5.37	4.71
1.00	6	0.02	10.75	9.31
1.10	3	0.03	5.37	4.60
1.20	4	0.03	7.17	6.06
1.30	5	0.02	8.96	7.49
1.40	4	0.03	7.17	5.93
1.50	4	0.03	7.17	5.86
1.60	4	0.03	7.17	5.79
1.70	5	0.02	8.96	7.16
1.80	5	0.02	8.96	7.08
1.90	6	0.02	10.75	8.41
2.00	7	0.01	12.54	9.70
2.10	5	0.02	8.96	6.86
2.20	7	0.01	12.54	9.50
2.30	7	0.01	12.54	9.40
2.40	9	0.01	16.12	11.96
2.50	8	0.01	14.33	10.53
2.60	7	0.01	12.54	9.12
2.70	8	0.01	14.33	10.32
2.80	7	0.01	12.54	8.94
2.90	8	0.01	14.33	10.12
3.00	8	0.01	14.33	10.02
3.10	5	0.02	8.96	6.20
3.20	5	0.02	8.96	6.14
3.30	5	0.02	8.96	6.08
3.40	4	0.03	7.17	4.82
3.50	5	0.02	8.96	5.97
3.60	4	0.03	7.17	4.73
3.70	5	0.02	8.96	5.86
3.80	4	0.03	7.17	4.65
3.90	4	0.03	7.17	4.61
4.00	8	0.01	14.33	9.13
4.10	6	0.02	10.75	6.79
4.20	6	0.02	10.75	6.73
4.30	5	0.02	8.96	5.56
4.40	2	0.05	3.58	2.21
4.50	2	0.05	3.58	2.19
4.60	3	0.03	5.37	3.25
4.70	3	0.03	5.37	3.23
4.80	4	0.03	7.17	4.27
4.90	5	0.02	8.96	5.29
5.00	5	0.02	8.96	5.25



Notes:

Hammer Mass	63.5	kg
Fall Height	0.76	m
Cone Area	0.0019	m^2
E_{theor}	473	J
Energy Ratio	0.719	
Anvil Mass	1	kg
Rod Mass	8.79	kg/m

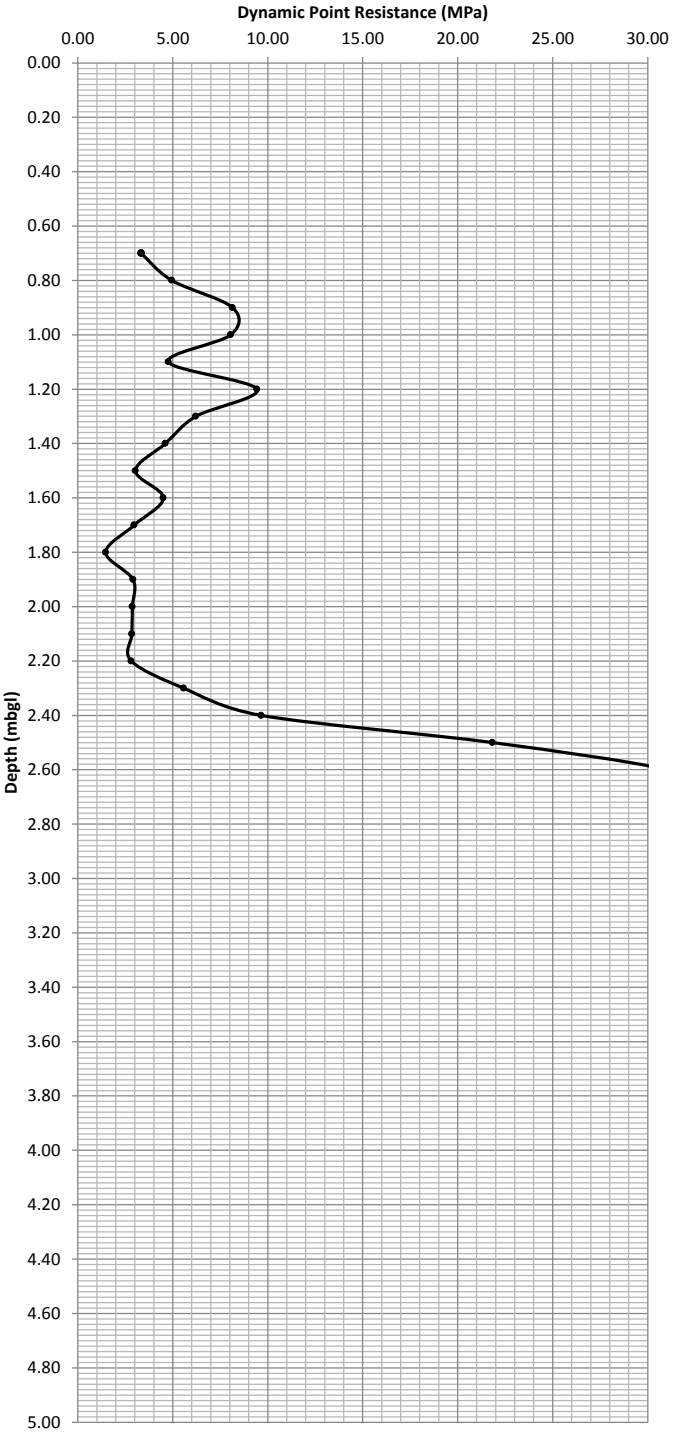
ASHDOWN SITE INVESTIGATION LTD

Dynamic Probe Record

SITE Inland Revenue, Durrington Bridge House, Barrington Road, Worthing. **Report Ref.** LW26215

Test Location Reference	WS12

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10				
0.20				
0.30				
0.40				
0.50				
0.60				
0.70	2	0.05	3.72	3.34
0.80	3	0.03	5.57	4.95
0.90	5	0.02	9.29	8.15
1.00	5	0.02	9.29	8.05
1.10	3	0.03	5.57	4.77
1.20	6	0.02	11.15	9.43
1.30	4	0.03	7.43	6.22
1.40	3	0.03	5.57	4.61
1.50	2	0.05	3.72	3.04
1.60	3	0.03	5.57	4.51
1.70	2	0.05	3.72	2.97
1.80	1	0.10	1.86	1.47
1.90	2	0.05	3.72	2.91
2.00	2	0.05	3.72	2.88
2.10	2	0.05	3.72	2.84
2.20	2	0.05	3.72	2.82
2.30	4	0.03	7.43	5.57
2.40	7	0.01	13.01	9.65
2.50	16	0.01	29.73	21.83
2.60	23	0.00	42.74	31.07
2.70	26	0.00	48.31	34.77
2.80	32	0.00	59.46	42.38
2.90	39	0.00	72.47	51.14
3.00				
3.10				
3.20				
3.30				
3.40				
3.50				
3.60				
3.70				
3.80				
3.90				
4.00				
4.10				
4.20				
4.30				
4.40				
4.50				
4.60				
4.70				
4.80				
4.90				
5.00				



Notes:
No further progress below 2.90m depth - hammer bouncing.

Hammer Mass	63.5	kg
Fall Height	0.76	m
Cone Area	0.0019	m^2
E_{theor}	473	J
Energy Ratio	0.7457	
Anvil Mass	1	kg
Rod Mass	8.79	kg/m

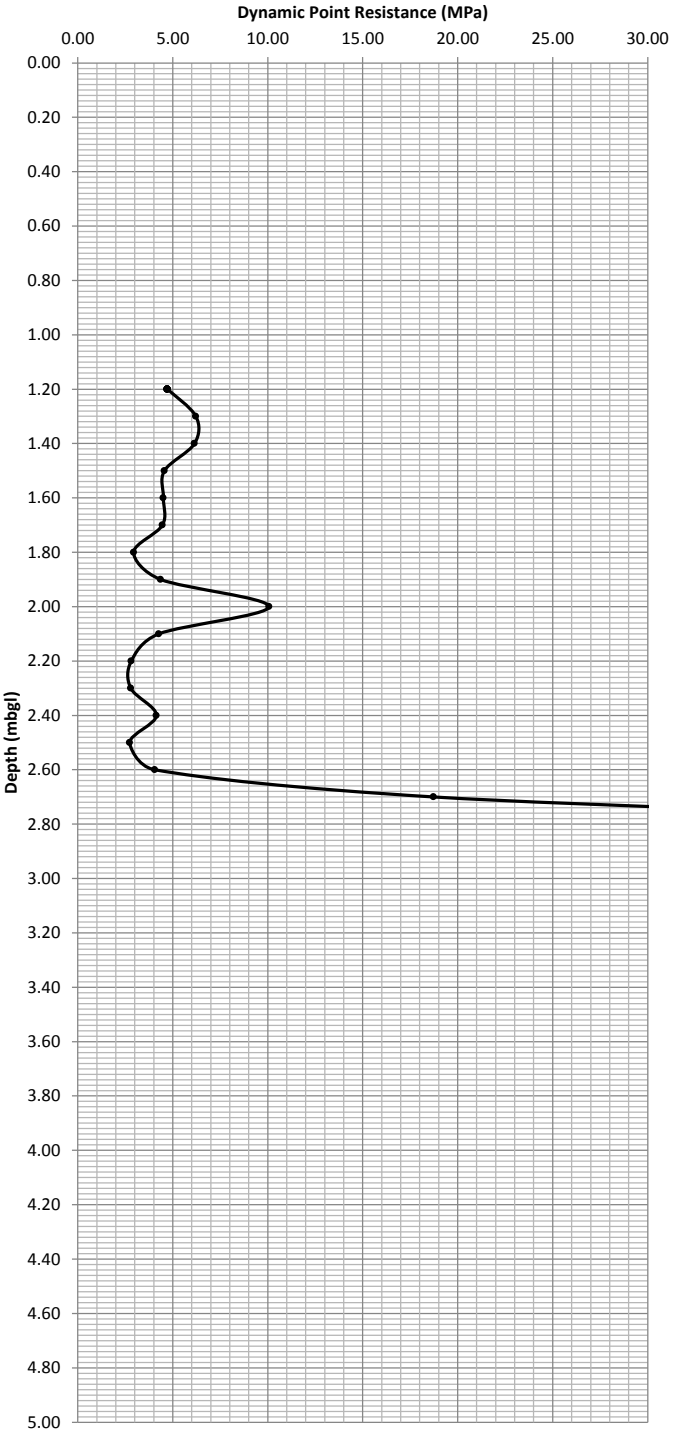
ASHDOWN SITE INVESTIGATION LTD

Dynamic Probe Record

SITE Inland Revenue, Durrington Bridge House, Barrington Road, Worthing. **Report Ref.** LW26215

Test Location Reference	WS13

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10				
0.20				
0.30				
0.40				
0.50				
0.60				
0.70				
0.80				
0.90				
1.00				
1.10				
1.20	3	0.03	5.57	4.72
1.30	4	0.03	7.43	6.22
1.40	4	0.03	7.43	6.15
1.50	3	0.03	5.57	4.56
1.60	3	0.03	5.57	4.51
1.70	3	0.03	5.57	4.46
1.80	2	0.05	3.72	2.94
1.90	3	0.03	5.57	4.36
2.00	7	0.01	13.01	10.06
2.10	3	0.03	5.57	4.27
2.20	2	0.05	3.72	2.82
2.30	2	0.05	3.72	2.79
2.40	3	0.03	5.57	4.14
2.50	2	0.05	3.72	2.73
2.60	3	0.03	5.57	4.05
2.70	14	0.01	26.01	18.72
2.80	38	0.00	70.61	50.32
2.90	35	0.00	65.03	45.90
3.00				
3.10				
3.20				
3.30				
3.40				
3.50				
3.60				
3.70				
3.80				
3.90				
4.00				
4.10				
4.20				
4.30				
4.40				
4.50				
4.60				
4.70				
4.80				
4.90				
5.00				



Notes:
No further progress below 2.90m depth - hammer bouncing.

Hammer Mass	63.5	kg
Fall Height	0.76	m
Cone Area	0.0019	m^2
E_{theor}	473	J
Energy Ratio	0.7457	
Anvil Mass	1	kg
Rod Mass	8.79	kg/m

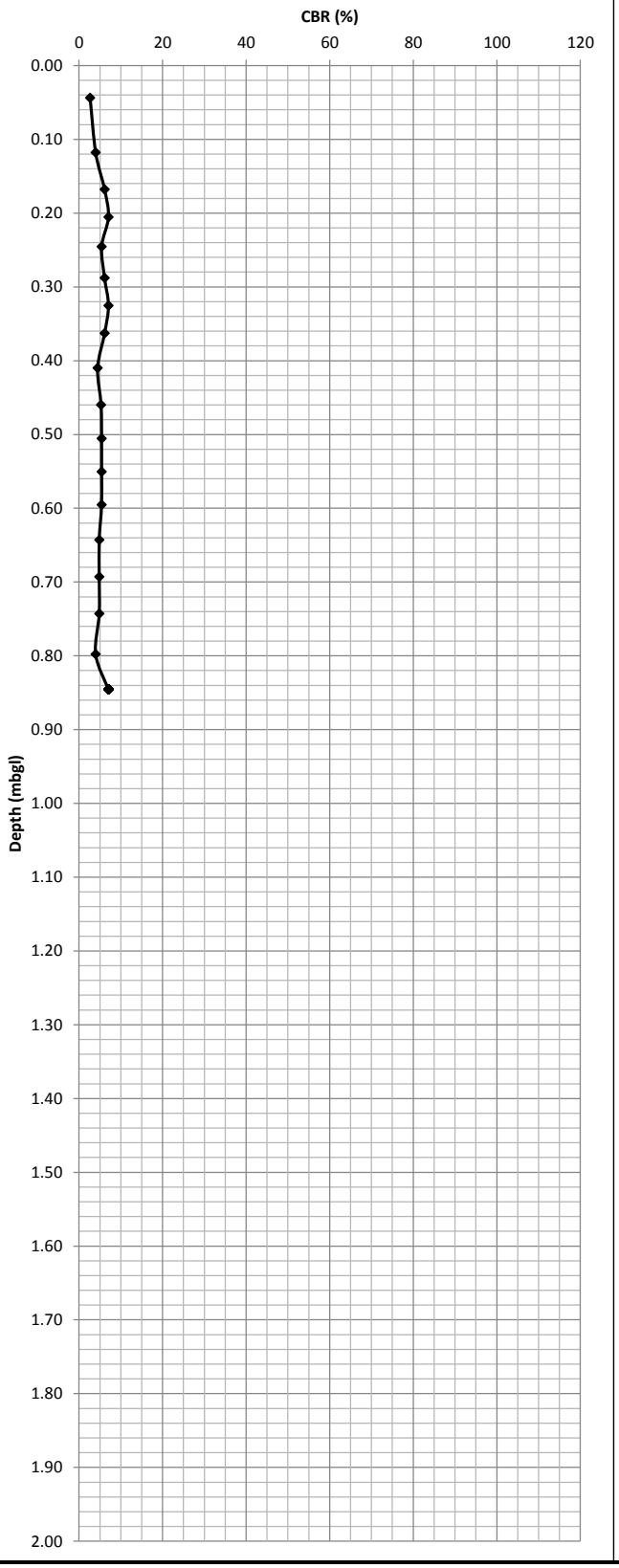
ASHDOWN SITE INVESTIGATION LTD

TRL Dynamic Cone Penetrometer Record

SITE Inland Revenue, Durrington Bridge House, Barrington Road, Worthing. **Report Ref.** LW26215

Test Location Reference	WS1
Depth of Start of Test (mbgl)	0.00

No. Blows	Total Blows	Reading (mm)	Depth (mbgl)	CBR%
DCP Zero Reading		72	0.00	
1	1	160	0.09	3
1	2	220	0.15	4
1	3	260	0.19	6
1	4	295	0.22	7
1	5	340	0.27	5
1	6	380	0.31	6
1	7	415	0.34	7
1	8	455	0.38	6
1	9	509	0.44	4
1	10	555	0.48	5
1	11	600	0.53	5
1	12	645	0.57	5
1	13	690	0.62	5
1	14	740	0.67	5
1	15	790	0.72	5
1	16	840	0.77	5
1	17	900	0.83	4
1	18	935	0.86	7



Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

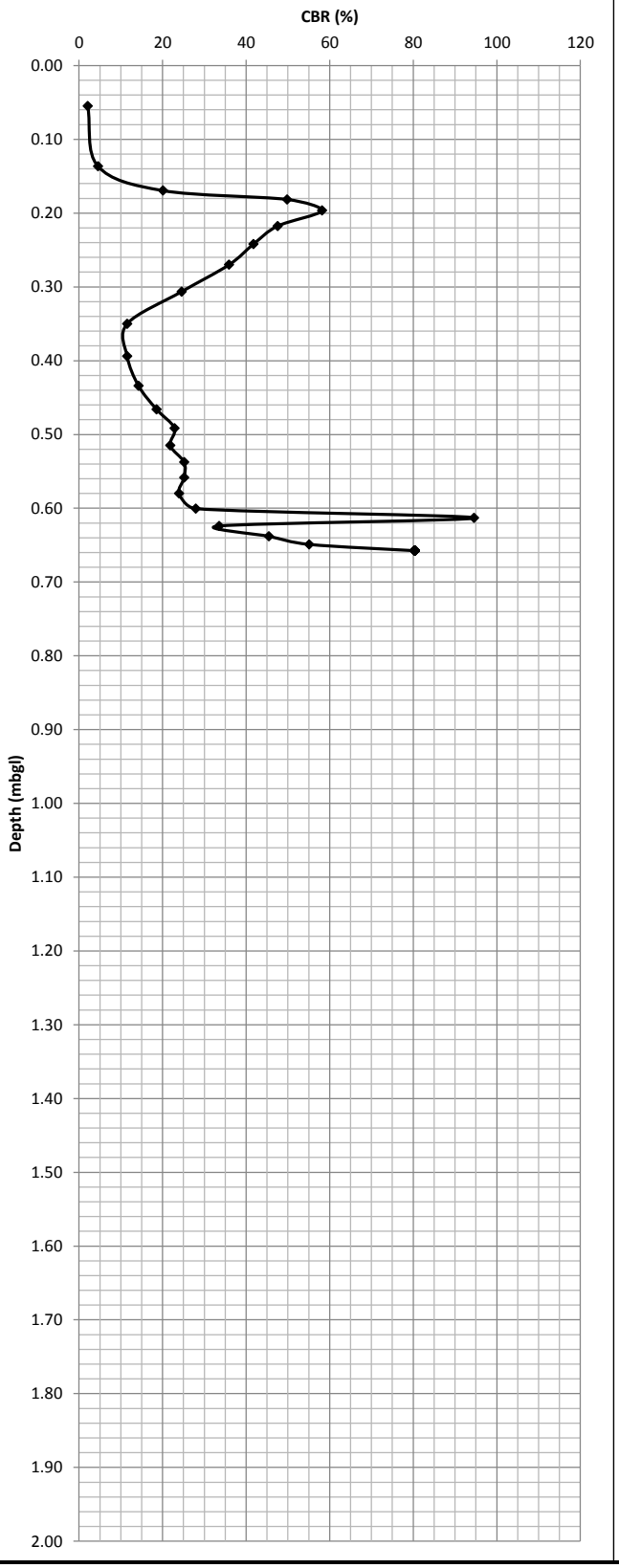
ASHDOWN SITE INVESTIGATION LTD

TRL Dynamic Cone Penetrometer Record

SITE Inland Revenue, Durrington Bridge House, Barrington Road, Worthing. **Report Ref.** LW26215

Test Location Reference	WS3
Depth of Start of Test (mbgl)	0.00

No. Blows	Total Blows	Reading (mm)	Depth (mbgl)	CBR%
DCP Zero Reading		75	0.00	
1	1	185	0.11	2
1	2	238	0.16	5
1	3	251	0.18	20
2	5	262	0.19	50
4	9	281	0.21	58
4	13	304	0.23	48
4	17	330	0.26	42
4	21	360	0.29	36
4	25	403	0.33	25
2	27	447	0.37	12
2	29	491	0.42	12
2	31	527	0.45	14
2	33	555	0.48	19
2	35	578	0.50	23
2	37	602	0.53	22
2	39	623	0.55	25
2	41	644	0.57	25
2	43	666	0.59	24
2	45	685	0.61	28
2	47	691	0.62	95
2	49	707	0.63	34
2	51	719	0.64	45
2	53	729	0.65	55
2	55	736	0.66	80



Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

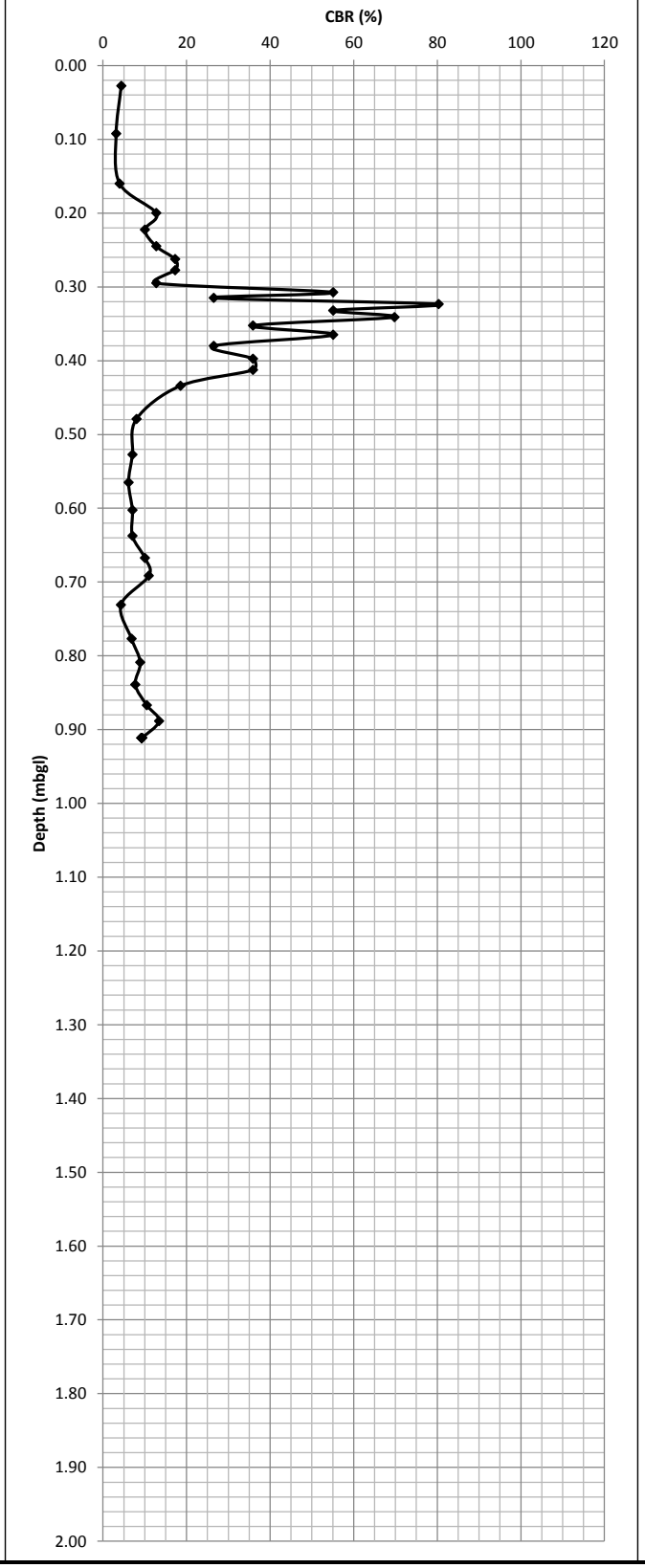
ASHDOWN SITE INVESTIGATION LTD

TRL Dynamic Cone Penetrometer Record

SITE Inland Revenue, Durrington Bridge House, Barrington Road, Worthing. **Report Ref.** LW26215

Test Location Reference	WS5
Depth of Start of Test (mbgl)	0.00

No. Blows	Total Blows	Reading (mm)	Depth (mbgl)	CBR%
DCP Zero Reading		5	0.00	
1	1	60	0.06	4
1	2	135	0.13	3
1	3	195	0.19	4
1	4	215	0.21	13
1	5	240	0.24	10
1	6	260	0.26	13
1	7	275	0.27	17
1	8	290	0.29	17
1	9	310	0.31	13
1	10	315	0.31	55
1	11	325	0.32	26
2	13	332	0.33	80
2	15	342	0.34	55
2	17	350	0.35	70
2	19	365	0.36	36
2	21	375	0.37	55
2	23	395	0.39	26
2	25	410	0.41	36
2	27	425	0.42	36
2	29	453	0.45	19
2	31	515	0.51	8
1	32	550	0.55	7
1	33	590	0.59	6
1	34	625	0.62	7
1	35	660	0.66	7
1	36	685	0.68	10
1	37	708	0.70	11
1	38	764	0.76	4
1	39	800	0.80	7
1	40	828	0.82	9
1	41	860	0.86	8
1	42	884	0.88	10
1	43	903	0.90	13
1	44	930	0.93	9



Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

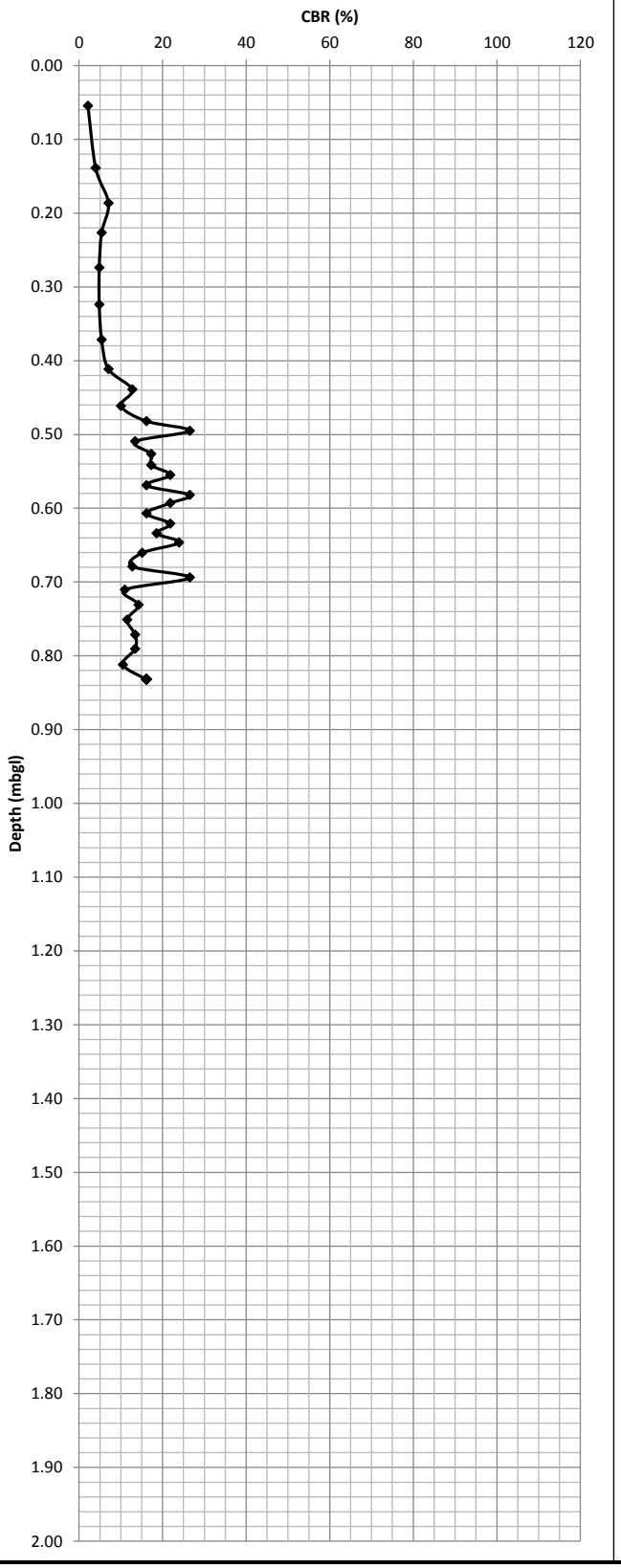
ASHDOWN SITE INVESTIGATION LTD

TRL Dynamic Cone Penetrometer Record

SITE Inland Revenue, Durrington Bridge House, Barrington Road, Worthing. **Report Ref.** LW26215

Test Location Reference	WS10
Depth of Start of Test (mbgl)	0.00

No. Blows	Total Blows	Reading (mm)	Depth (mbgl)	CBR%
DCP Zero Reading		81	0.00	
1	1	190	0.11	2
1	2	250	0.17	4
1	3	285	0.20	7
1	4	330	0.25	5
1	5	380	0.30	5
1	6	430	0.35	5
1	7	475	0.39	5
1	8	510	0.43	7
1	9	530	0.45	13
1	10	555	0.47	10
1	11	571	0.49	16
1	12	581	0.50	26
1	13	600	0.52	13
1	14	615	0.53	17
1	15	630	0.55	17
1	16	642	0.56	22
1	17	658	0.58	16
1	18	668	0.59	26
1	19	680	0.60	22
1	20	696	0.62	16
1	21	708	0.63	22
1	22	722	0.64	19
1	23	733	0.65	24
1	24	750	0.67	15
1	25	770	0.69	13
1	26	780	0.70	26
1	27	803	0.72	11
1	28	821	0.74	14
1	29	843	0.76	12
1	30	862	0.78	13
1	31	881	0.80	13
1	32	905	0.82	10
1	33	921	0.84	16



Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

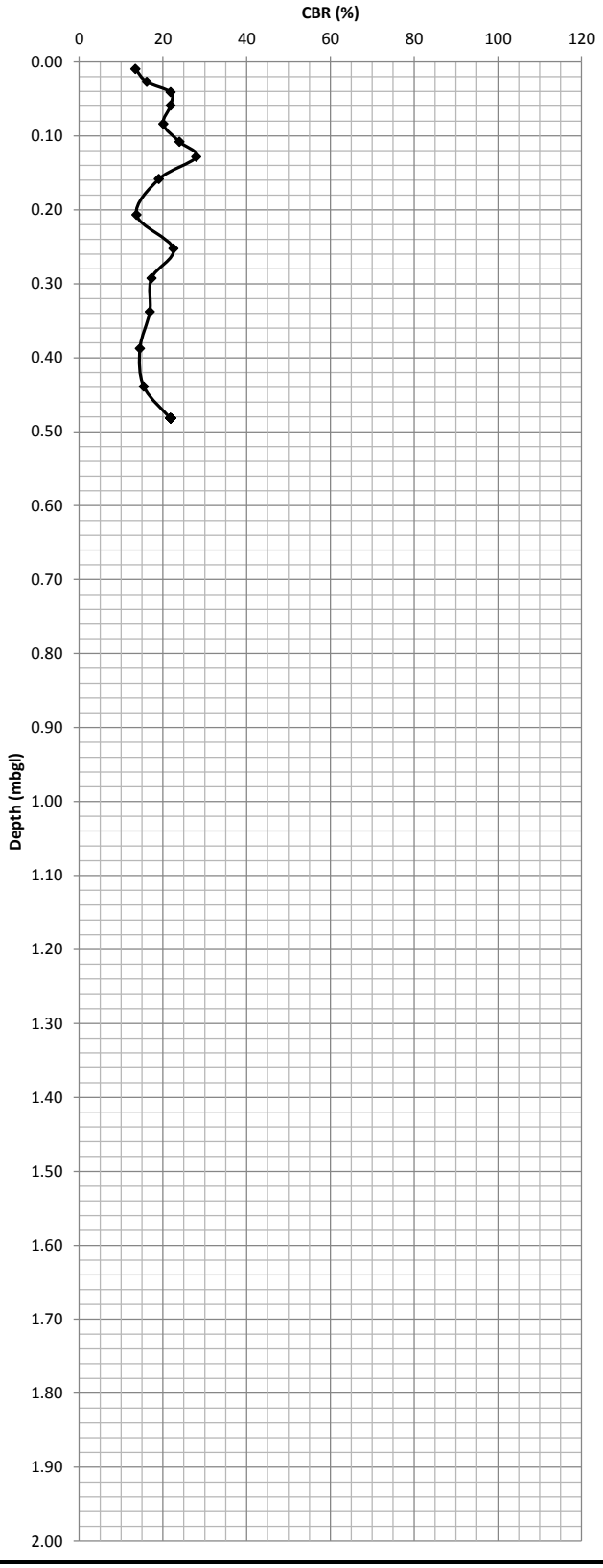
ASHDOWN SITE INVESTIGATION LTD

TRL Dynamic Cone Penetrometer Record

SITE Inland Revenue, Durrington Bridge House, Barrington Road, Worthing. **Report Ref.** LW26215

Test Location Reference	WS11
Depth of Start of Test (mbgl)	0.00

No. Blows	Total Blows	Reading (mm)	Depth (mbgl)	CBR%
DCP Zero Reading		404	0.00	
1	1	423	0.02	13
1	2	439	0.04	16
1	3	451	0.05	22
2	5	475	0.07	22
2	7	501	0.10	20
2	9	523	0.12	24
2	11	542	0.14	28
3	14	583	0.18	19
3	17	639	0.24	14
3	20	674	0.27	23
3	23	719	0.32	17
3	26	765	0.36	17
3	29	818	0.41	15
3	32	868	0.46	15
3	35	904	0.50	22



Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

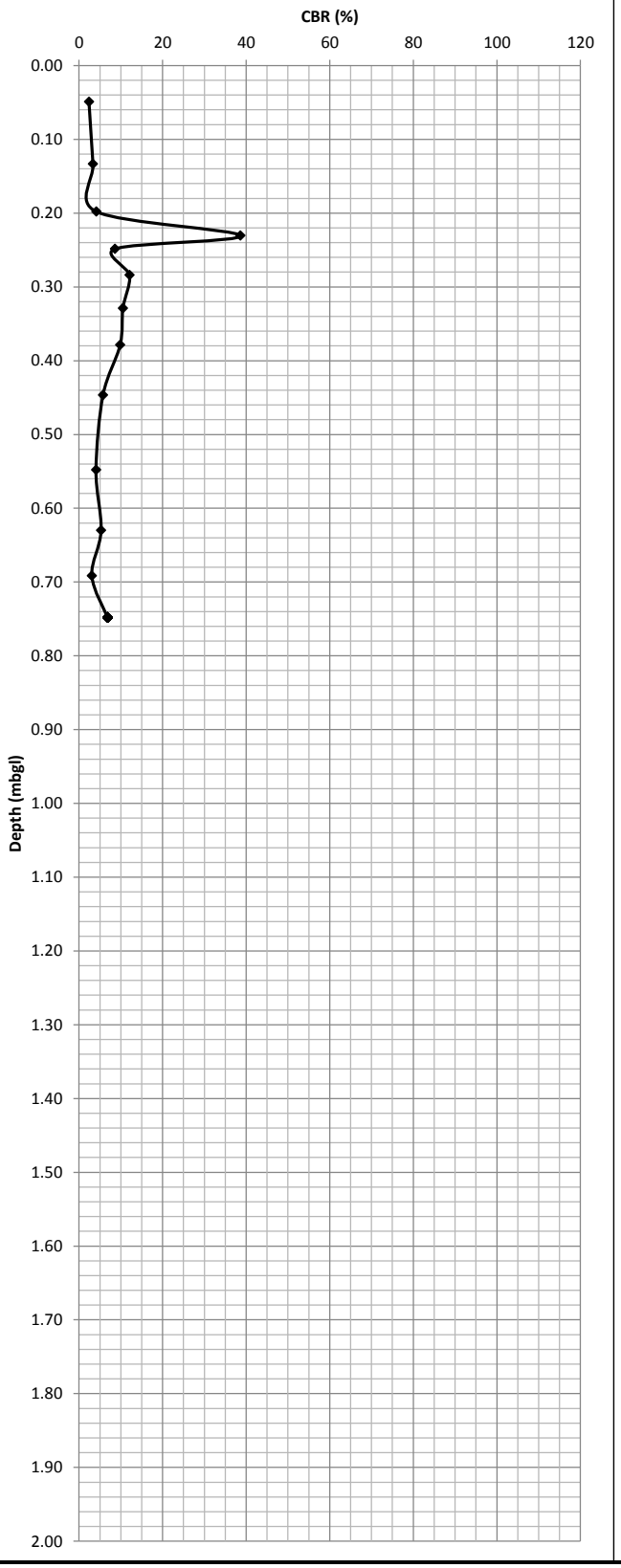
ASHDOWN SITE INVESTIGATION LTD

TRL Dynamic Cone Penetrometer Record

SITE Inland Revenue, Durrington Bridge House, Barrington Road, Worthing. **Report Ref.** LW26215

Test Location Reference	WS13
Depth of Start of Test (mbgl)	0.00

No. Blows	Total Blows	Reading (mm)	Depth (mbgl)	CBR%
DCP Zero Reading		168	0.00	
1	1	266	0.10	2
1	2	337	0.17	3
1	3	395	0.23	4
1	4	402	0.23	39
1	5	431	0.26	9
2	7	473	0.31	12
2	9	521	0.35	10
2	11	572	0.40	10
2	13	657	0.49	6
2	15	775	0.61	4
1	16	821	0.65	5
1	17	898	0.73	3
1	18	934	0.77	7



Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

ASHDOWN SITE INVESTIGATION LIMITED

Site: Durrington Bridge House, Barrington Road, Worthing, West Sussex.	Report No.: LW26215 Sheet No.: 1 of 2

SUMMARY OF BOREHOLE FALLING HEAD SOAKAGE TEST RESULTS

Borehole **WS2**	
Time (mins)	Depth to water (m bgl)
0	0.03
1	0.12
2	0.25
4	0.42
8	0.55
16	0.63
30	0.75
Borehole Depth (m bgl)	2.00
Casing Depth (m bgl)	1.00
Borehole Diameter (mm)	92.00
Casing Diameter (mm)	105.00

Borehole **WS4**	
Time (mins)	Depth to water (m bgl)
0	0.00
1	0.00
2	0.00
5	0.00
10	0.02
20	0.02
40	0.03
60	0.03
Borehole Depth (m bgl)	3.00
Casing Depth (m bgl)	2.00
Borehole Diameter (mm)	92.00
Casing Diameter (mm)	105.00

Notes: bgl – below ground level.

ASHDOWN SITE INVESTIGATION LIMITED

Site: Durrington Bridge House, Barrington Road, Worthing, West Sussex.	Report No.: LW26215 Sheet No.: 2 of 2

SUMMARY OF BOREHOLE FALLING HEAD SOAKAGE TEST RESULTS

Borehole **WS10 Test 1**	
Time (mins)	Depth to water (m bgl)
0	0.40
1	1.10
2	1.60
3	1.90
4	2.30
5	Dry
Borehole Depth (m bgl)	3.00
Casing Depth (m bgl)	2.00
Borehole Diameter (mm)	92.00
Casing Diameter (mm)	105.00

Borehole **WS10 Test 2**	
Time (mins)	Depth to water (m bgl)
0	0.25
1	0.50
2	0.65
3	0.75
6	0.90
8	1.05
13	1.25
19	1.43
24	1.55
29	1.65
34	1.76
40	1.84
53	2.02
Borehole Depth (m bgl)	3.00
Casing Depth (m bgl)	2.00
Borehole Diameter (mm)	92.00
Casing Diameter (mm)	105.00

Borehole **WS13**	
Time (mins)	Depth to water (m bgl)
0	0.00
1	0.15
2	0.27
4	0.36
6	0.48
16	0.72
30	0.95
Borehole Depth (m bgl)	2.70
Casing Depth (m bgl)	2.00
Borehole Diameter (mm)	92.00
Casing Diameter (mm)	105.00

Notes: bgl – below ground level.

APPENDIX B

Geotechnical Laboratory Testing Notes
Geotechnical Test Results
Contamination Test Results

GEOTECHNICAL LABORATORY TESTING NOTES

1 Soil Description

Description and classification of soils has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of soil, Part 1 Identification and description (BS EN ISO 14688-1:2002) and Part 2 Principles of classification (BS EN 14688-2:2004) as well as the BS5930:1990 + A2:2010 code of Practice for Site Investigations.

2 Index Tests

Index (Atterberg Limit) tests are undertaken on samples of fine grained soils provide the primary information for the classification of fine grained soils.

Fine grained soil is tested to determine its liquid and plastic limits, which are moisture contents that define boundaries between material consistency states. These tests are used to evaluate indices used for soil identification and to help determine the shrinkage and swelling characteristics of the soil under conditions of changing moisture content. The tests are carried out in accordance with BS1377: Part 2: 1990 + A1:1996 Classification tests.

The consistency index is derived from the Index Tests and is summarized in the following table. These divisions may be approximate, particularly for low plasticity soils. The consistency recorded on the soil classification summary is derived from the consistency index.

Consistency	Consistency Index
Very Soft	<0.25
Soft	0.25 to 0.50
Firm	0.50 to 0.75
Stiff	0.75 to 1.00
Very Stiff	>1.00

Based on BN EN ISO 14688-2:2004

3 Particle Size Distribution Tests

Sieve analyses are carried out soil samples to establish their particle size distribution that can assist in the assessment of the permeability and classification of granular soils.

The tests are carried out in accordance with BS1377: Part 2: 1990 + A1:1996 Classification tests.

4 Natural Moisture/ Saturated Moisture Content Determination of Chalk

The results of natural moisture or saturated moisture content tests of disturbed samples of chalk are used to assist in the classification of the chalk to determine key geotechnical parameters of strength, density and crushing properties.

The tests are carried out in accordance with BS1377: Part 2: 1990 + A1:1996 Classification tests.

5 Soil Suction Testing

Soil suction tests are undertaken for the determination of the state of desiccation in clay soils.

The testing is carried out in accordance with the Building Research Establishment Information Paper IP4/93, dated February 1993.

6 Triaxial Compression Tests

Undrained triaxial compression tests are carried out on undisturbed samples of cohesive soil in order to assist in the determination of the undrained shear strength of the soil. The results of moisture content and density determinations are also included.

The tests are carried out in accordance with BS1377: Part 7: 1990 + A1:1994 Shear strength tests (total stress).

7 Shear Vane and Hand Penetrometer Testing

Undisturbed samples are tested in the laboratory using a Geonor Hand Shear Vane for the determination of their undrained shear strength.

The vane tests are carried out in general accordance with BS1377: Part 7: 1990 + A1:1994 Shear strength tests (total stress).

8 One Dimensional Consolidation Tests

One-dimensional consolidation tests are performed on undisturbed soil samples to ascertain their settlement characteristics.

The tests are carried out in accordance with BS1377: Part 5: 1990 + A1:1994 Compressibility, Permeability and Durability tests.

9 Dry Density / Moisture Content Relationship (Compaction) Testing

Compaction testing for the determination of the dry density / moisture content relationship is carried out on using either a 2.5kg, 4.5kg hammer or a vibrating hammer.

The tests are carried out in accordance with the British Standard BS1377: Part 4: 1990 + A1 & A2:2002 Compaction-related tests.

10 California Bearing Ratio

The soil is usually compacted at the as dug “natural” moisture content and often at moisture contents around the natural moisture content.

The California bearing ratio is determined in accordance with the British Standard BS1377: Part 4: 1990 + A1 & A2:2002 Compaction related tests.

11 Chemical Testing

Soil samples are tested for their concentration of water soluble sulphate and pH for use in concrete mix design.

Water samples are tested for total sulphate concentration and pH value.

Where a water soluble sulphate content in soils or a total sulphate content in groundwater exceeds 3000mg/l SO_4 the magnesium sulphate content of the samples is required to be determined (BRE Special Digest 1:2005).

Swanborough Farm Swanborough Lewes, East Sussex BN73PF	**ASHDOWN SITE INVESTIGATION LTD** **Geotechnical and Geoenvironmental Engineers**	ASHDOWN SITE INVESTIGATION L·I·M·I·T·E·D

Site:	Inland Revenue, Durrington Bridge House, Barrington Road, Worthing, West Sussex	Job No: Sheet No:	LW26215 1

SOIL CLASSIFICATION SUMMARY

BH/TP No.	Depth (m)	Nat. Moist. Cont. (w %)	Equiv. Moist. Cont. (w_a %)	Atterberg Limits			Class'n	Cons. Index (I_c)	% passing 425 µm sieve	Visual Description of Sample
				W_l %	W_p %	I_p %				
WS1	1.60	19		44	15	29	CI	0.86*	99	Stiff brown slightly gravelly slightly sandy CLAY. Gravel is fine flint.
WS10	2.30	18		34	15	19	CL	0.84*	100	Stiff grey slightly sandy CLAY with occasional orange brown staining.
WS11	1.10	15		47	20	27	CI	1.19*	100	Very stiff orange brown sandy CLAY.
WS13	2.10	13		31	15	16	CL	1.13*	97	Very stiff orange brown slightly gravelly sandy CLAY with occasional roots <1mm. Gravel is fine to medium flint.
WS2	0.95	20		41	19	22	CI	0.95*	98	Stiff orange brown slightly gravelly CLAY. Gravel is fine to medium flint.
WS3	1.00	19		42	20	22	CI	1.05*	99	Very stiff brown slightly gravelly slightly sandy CLAY. Gravel is fine to medium flint.
WS4	1.30	23		22	14	8	CL	-0.13*	100	Very soft brown and light brown mottled slightly sandy CLAY.
WS6	3.00	12		30	14	16	CL	1.13*	66	Very stiff light grey slightly gravelly slightly sandy CLAY. Gravel is fine to coarse flint.

Test Method: Classification Tests BS1377: Part 2: 1990: Method 4.4, 5.3 and 5.4

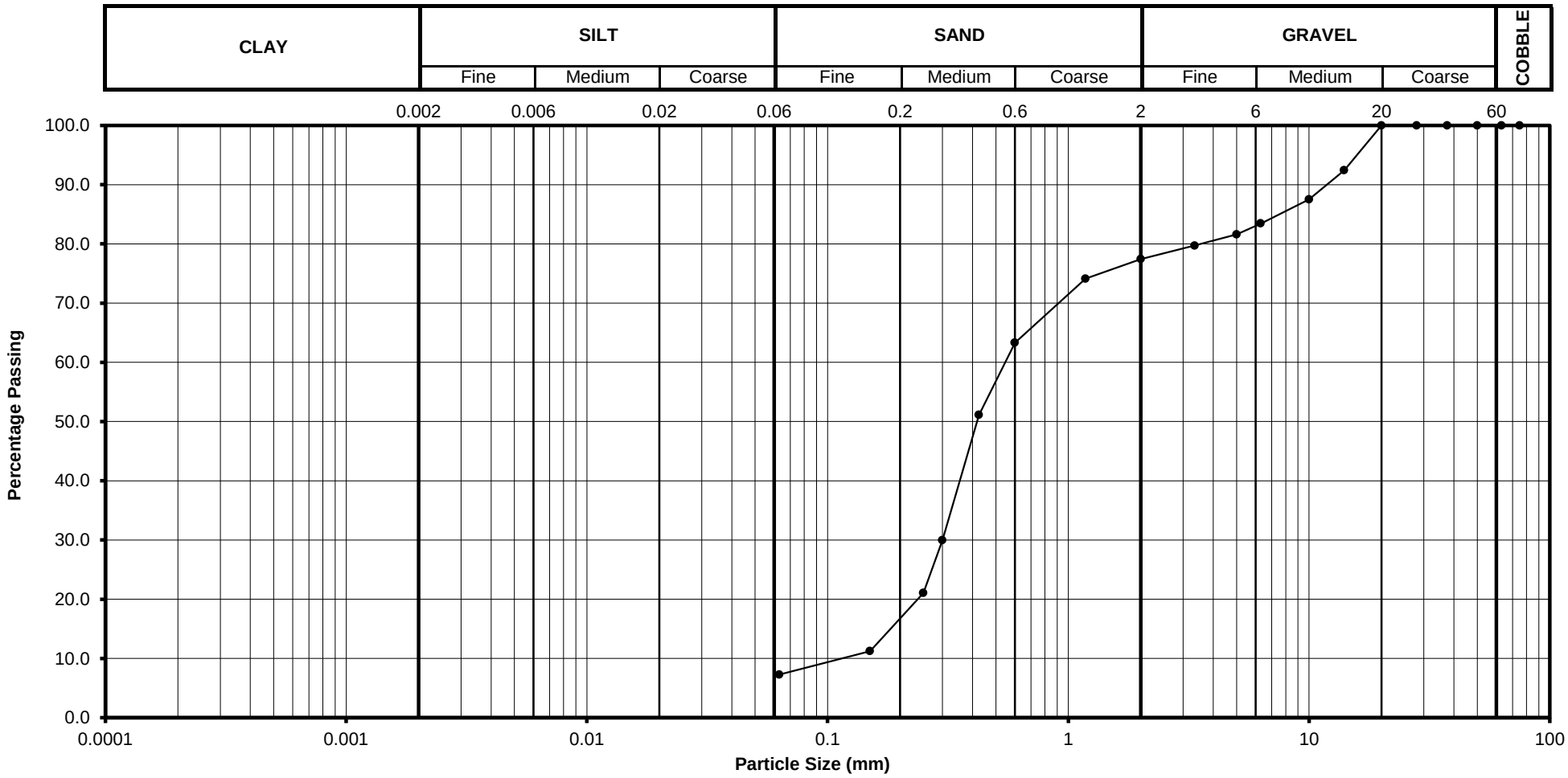
* Consistency index based on natural moisture content and not the equivalent moisture content.

Swanborough Farm
Swanborough
Lewes, East Sussex
BN73PF

ASHDOWN SITE INVESTIGATION LTD
Geotechnical and Geoenvironmental Engineers

ASHDOWN SITE INVESTIGATION LIMITED

Particle Size Distribution by Wet Sieve; BS1377: Part 2 1990



Job Name	Inland Revenue, Durrington Bridge House, Barrington Road, Worthing, West Sussex	**BH/ TP No.**	WS9	**Sample Description**	Very gravelly clayey SAND.
Job No.	LW26215	**Sample Depth (m)**	1.80		

Unit A2
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Ponswood Industrial Estate
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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	15-03225
Issue:	1
Date of Issue:	11/08/2015
Contact:	David Harris
Customer Details:	Ashdown Site Investigation Ltd The Old Dairy Swanborough Farm Lewes East Sussex
Quotation No:	Q15-00267
Order No:	2577
Customer Reference:	LW26215
Date Received:	05/08/2015
Date Approved:	11/08/2015
Details:	IRO Durrington Bridge House, Barrington Road, Worthing
Approved by:	[redacted]

Naomi Williams, Customer services officer

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

Sample Summary

Report No.: 15-03225

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
35903	WS2 D 1.20	05/08/2015	05/08/2015	Silty clayey loam	
35904	WS12 D 0.50	05/08/2015	05/08/2015	Sandy silty loam	

Results Summary

Report No.: 15-03225

ELAB Reference	35903	35904
Customer Reference	D	D
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	WS2	WS12
Sample Depth (m)	1.20	0.50
Sampling Date	05/08/2015	05/08/2015

Determinand	Codes	Units	LOD		
Anions					
Water Soluble Sulphate	M	g/l	0.02	< 0.02	0.05
Miscellaneous					
pH	M	units	0.1	7.4	8.3

Method Summary

Report No.: 15-03225

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
pH	M	Air dried sample	10/08/2015	113	Electromeric
Water soluble anions	M	Air dried sample	07/08/2015	172	Ion Chromatography

Report Information

Report No.: 15-03225

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis
Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

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Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY
Telephone: (01424) 718618
Facsimile: (01424) 729911
info@elab-uk.co.uk

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	15-03550
Issue:	1
Date of Issue:	07/09/2015
Contact:	David Harris
Customer Details:	Ashdown Site Investigation Ltd The Old Dairy Swanborough Farm Lewes East Sussex
Quotation No:	Q15-00267
Order No:	2687
Customer Reference:	LW26215
Date Received:	01/09/2015
Date Approved:	07/09/2015
Details:	IRO, Durrington Bridge House, Barrington Road, Worthing
Approved by:	[redacted]

Naomi Williams, Customer services officer

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

Sample Summary

Report No.: 15-03550

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
38224	WS1 3.00	28/08/2015	01/09/2015	Loamy sand	
38225	WS5 1.30	28/08/2015	01/09/2015	Silty clayey loam	
38226	WS6 1.80	28/08/2015	01/09/2015	Clayey loam	
38227	WS9 0.80	28/08/2015	01/09/2015	Silty clayey loam	
38228	WS10 2.30	28/08/2015	01/09/2015	Silty clayey loam	

Results Summary

Report No.: 15-03550

			ELAB Reference	38224	38225	38226	38227	38228
			Customer Reference					
			Sample ID					
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS1	WS5	WS6	WS9	WS10
			Sample Depth (m)	3.00	1.30	1.80	0.80	2.30
			Sampling Date	28/08/2015	28/08/2015	28/08/2015	28/08/2015	28/08/2015
Determinand	**Codes**	**Units**	**LOD**					
Anions								
Water Soluble Sulphate	M	g/l	0.02	0.02	0.02	0.02	0.06	< 0.02
Miscellaneous								
pH	M	units	0.1	8.1	8.0	7.9	7.7	7.5

Method Summary

Report No.: 15-03550

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
pH	M	Air dried sample	04/09/2015	113	Electromeric
Water soluble anions	M	Air dried sample	04/09/2015	172	Ion Chromatography

Report Information

Report No.: 15-03550

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
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Soil sample results are expressed on an air dried basis
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Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
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2683

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	15-03161
Issue:	1
Date of Issue:	06/08/2015
Contact:	David Harris
Customer Details:	Ashdown Site Investigation Ltd The Old Dairy Swanborough Farm Lewes East Sussex
Quotation No:	Q15-00267
Order No:	2565
Customer Reference:	LW26215
Date Received:	31/07/2015
Date Approved:	06/08/2015
Details:	Inland revenue, Durrington Bridge House, Barrington Road
Approved by:	[redacted]

John Wilson, Operations Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

Sample Summary

Report No.: 15-03161

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
35454	WS2 0.15	27/07/2015	31/07/2015	Silty loam	
35455	WS11 0.70	27/07/2015	31/07/2015	Silty loam	
35456	WS12 0.30	27/07/2015	31/07/2015	Sandy loam	
35457	WS13 0.35	27/07/2015	31/07/2015	Loamy sand	

Results Summary

Report No.: 15-03161

			ELAB Reference	35454	35455	35456	35457
			Customer Reference				
			Sample ID				
			Sample Type	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS2	WS11	WS12	WS13
			Sample Depth (m)	0.15	0.70	0.30	0.35
			Sampling Date	27/07/2015	27/07/2015	27/07/2015	27/07/2015
Determinand	**Codes**	**Units**	**LOD**				
Metals							
Arsenic	M	mg/kg	1	13.0	16.6	11.6	9.9
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	26.0	35.6	19.5	19.2
Copper	M	mg/kg	5	27.3	23.4	12.9	12.6
Lead	M	mg/kg	5	60.0	24.0	14.5	11.2
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	19.2	27.1	22.2	21.2
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	M	mg/kg	45	98.4	71.7	< 45.0	< 45.0
Inorganics							
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	n/t	< 1.0	n/t	< 1.0
Acid Soluble Sulphate (SO4)	U	%SO4	0.02	n/t	n/t	0.09	n/t
Water Soluble Boron	N	mg/kg	0.5	0.6	< 0.5	< 0.5	< 0.5
Miscellaneous							
Moisture Content	N	%	0.1	n/t	n/t	15.9	n/t
pH	M	units	0.1	7.6	7.3	8.5	8.3
Soil Organic Matter	U	%	0.1	2.3	1.5	0.6	1.3
Organics							
>C8-C10 BCB	N	mg/kg	1	n/t	< 1.0	< 1.0	< 1.0
>C10-C12 BCB	N	mg/kg	1	n/t	< 1.0	< 1.0	< 1.0
>C12-C16 BCB	N	mg/kg	1	n/t	< 1.0	< 1.0	< 1.0
>C16-C21 BCB	N	mg/kg	1	n/t	< 1.0	< 1.0	< 1.0
>C21-C35 BCB	N	mg/kg	1	n/t	2.3	< 1.0	3.0
>C35-C40 BCB	N	mg/kg	1	n/t	< 1.0	< 1.0	< 1.0
Total (>C8-C40) BCB	N	mg/kg	1	n/t	2.3	< 1.0	3.0
Phenols							
Phenol	M	mg/kg	1	n/t	< 1	n/t	< 1
M,P-Cresol	N	mg/kg	1	n/t	< 1	n/t	< 1
O-Cresol	N	mg/kg	1	n/t	< 1	n/t	< 1
3,4-Dimethylphenol	N	mg/kg	1	n/t	< 1	n/t	< 1
2,3-Dimethylphenol	M	mg/kg	1	n/t	< 1	n/t	< 1
Trimethylphenol	M	mg/kg	1	n/t	< 1	n/t	< 1
Total Monohydric Phenols	N	mg/kg	5	n/t	< 5	n/t	< 5

Results Summary

Report No.: 15-03161

			ELAB Reference	35454	35455	35456	35457
			Customer Reference				
			Sample ID				
			Sample Type	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS2	WS11	WS12	WS13
			Sample Depth (m)	0.15	0.70	0.30	0.35
			Sampling Date	27/07/2015	27/07/2015	27/07/2015	27/07/2015
Determinand	**Codes**	**Units**	**LOD**				
Polyaromatic hydrocarbons							
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	0.2	0.1	< 0.1	0.1
Pyrene	M	mg/kg	0.1	0.1	0.1	< 0.1	< 0.1
Benzo (a) anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1	0.2	< 0.1	0.2	0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	0.3	0.2	0.4	0.2
Benzo (k) fluoranthene	M	mg/kg	0.1	0.1	0.1	0.2	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1	0.1	< 0.1	0.2	0.2
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	0.2	0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	0.2	0.1	< 0.1	< 0.1
Benzo(ghi)perylene	M	mg/kg	0.1	0.2	0.2	0.2	0.1
Total PAH(16)	M	mg/kg	0.4	1.7	0.8	1.4	0.7
BTEX							
Benzene	M	ug/kg	10	n/t	n/t	< 10.0	n/t
Toluene	M	ug/kg	10	n/t	n/t	< 10.0	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	< 10.0	n/t
Xylenes	M	ug/kg	10	n/t	n/t	< 10.0	n/t

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Results Summary

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Asbestos Qualitative Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #)
in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Result
35455	0.70	WS11	Silty loam	No asbestos detected
35457	0.35	WS13	Loamy sand	No asbestos detected

Method Summary

Report No.: 15-03161

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Hexavalent chromium	N	As submitted sample	04/08/2015	110	Colorimetry
pH	M	Air dried sample	05/08/2015	113	Electromeric
Acid Soluble Sulphate	U	Air dried sample	05/08/2015	115	Ion Chromatography
Aqua regia extractable metals	M	Air dried sample	05/08/2015	118	ICPMS
Phenols in solids	M	As submitted sample	04/08/2015	121	HPLC
Polyaromatic hydrocarbons (GC-FID)	M	As submitted sample	03/08/2015	133	GC-FID
BTEX in solids	M	As submitted sample	04/08/2015	181	GC-MS
Water soluble boron	N	Air dried sample	04/08/2015	202	Colorimetry
Total cyanide	M	As submitted sample	05/08/2015	204	Colorimetry
Basic carbon banding in soil	N	As submitted sample	03/08/2015	218	GC-FID
Soil organic matter	U	Air dried sample	04/08/2015	BS1377:P3	Titrimetry
Asbestos identification	U	As submitted sample	04/08/2015	PMAN	Microscopy

Tests marked N are not UKAS accredited

Report Information

Report No.: 15-03161

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis
Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	15-03551
Issue:	1
Date of Issue:	08/09/2015
Contact:	David Harris
Customer Details:	Ashdown Site Investigation Ltd The Old Dairy Swanborough Farm Lewes East Sussex BN7 3PF
Quotation No:	Q15-00267
Order No:	2678
Customer Reference:	LW26215
Date Received:	01/09/2015
Date Approved:	08/09/2015
Details:	IRO Durrington Bridge House, Barrington Road, Worthing
Approved by:	[redacted]

John Wilson, Operations Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

Sample Summary

Report No.: 15-03551

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
38229	WS1 0.30	28/08/2015	01/09/2015	Silty loam	
38230	WS1 0.60	28/08/2015	01/09/2015	Silty loam	
38231	WS3 0.50	28/08/2015	01/09/2015	Silty loam	
38232	WS8 0.40	28/08/2015	01/09/2015	Silty loam	
38233	WS9 0.30	28/08/2015	01/09/2015	Loamy sand	
38234	WS9 0.60	28/08/2015	01/09/2015	Silty loam	
38235	WS9 0.80	28/08/2015	01/09/2015	Silty loam	
38236	WS9 2.10	28/08/2015	01/09/2015	Sand	
38237	WS10 0.30	28/08/2015	01/09/2015	Silty loam	
38238	WS10 1.20	28/08/2015	01/09/2015	Silty clayey loam	
38239	WS10 2.20	28/08/2015	01/09/2015	Silty clayey loam	
38240	WS10 3.00	28/08/2015	01/09/2015	Sand	
38241	WS4 0.20	28/08/2015	01/09/2015	Sandy silty loam	
38242	WS5 0.50	28/08/2015	01/09/2015	Sandy silty loam	
38243	WS6 0.20	28/08/2015	01/09/2015	Silty loam	
38244	WS6 1.00	28/08/2015	01/09/2015	Silty loam	

Results Summary

Report No.: 15-03551

			ELAB Reference	38229	38230	38231	38232	38233	38234
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS1	WS1	WS3	WS8	WS9	WS9
			Sample Depth (m)	0.30	0.60	0.50	0.40	0.30	0.60
			Sampling Date	28/08/2015	28/08/2015	28/08/2015	28/08/2015	28/08/2015	28/08/2015
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	10.6	n/t	8.8	10.0	11.6	n/t
Cadmium	M	mg/kg	0.5	< 0.5	n/t	< 0.5	< 0.5	< 0.5	n/t
Chromium	M	mg/kg	5	29.0	n/t	21.7	19.4	16.2	n/t
Copper	M	mg/kg	5	17.4	n/t	16.4	23.3	19.0	n/t
Lead	M	mg/kg	5	11.4	n/t	16.7	18.4	504	n/t
Mercury	M	mg/kg	0.5	< 0.5	n/t	< 0.5	< 0.5	< 0.5	n/t
Nickel	M	mg/kg	5	19.5	n/t	15.6	15.4	12.2	n/t
Selenium	M	mg/kg	1	< 1.0	n/t	< 1.0	1.0	< 1.0	n/t
Zinc	M	mg/kg	45	53.2	n/t	48.7	57.6	< 45.0	n/t
Inorganics									
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	n/t	< 0.8	< 0.8	< 0.8	n/t
Acid Soluble Sulphate (SO4)	U	%SO4	0.02	n/t	n/t	0.02	n/t	0.15	n/t
Water Soluble Boron	N	mg/kg	0.5	0.7	n/t	0.6	0.8	0.6	n/t
Miscellaneous									
Acid Neutralisation Capacity	N	mol/kg	0.1	n/t	n/t	< 0.1	n/t	n/t	n/t
Loss On Ignition (450°C)	M	%	0.01	n/t	n/t	2.17	n/t	n/t	n/t
Moisture Content	N	%	0.1	n/t	n/t	11.4	n/t	15.8	n/t
pH	M	units	0.1	8.2	n/t	7.8	9.4	11.2	n/t
Soil Organic Matter	U	%	0.1	0.5	n/t	1.1	2.3	0.7	n/t
Total Organic Carbon	N	%	0.01	n/t	n/t	0.38	n/t	n/t	n/t
Organics									
>C8-C10 BCB	N	mg/kg	1	< 1.0	n/t	< 1.0	< 1.0	< 1.0	n/t
>C10-C12 BCB	N	mg/kg	1	< 1.0	n/t	< 1.0	< 1.0	< 1.0	n/t
>C12-C16 BCB	N	mg/kg	1	< 1.0	n/t	< 1.0	1.6	2.0	n/t
>C16-C21 BCB	N	mg/kg	1	< 1.0	n/t	< 1.0	4.9	5.9	n/t
>C21-C35 BCB	N	mg/kg	1	3.4	n/t	1.5	75.1	86.3	n/t
>C35-C40 BCB	N	mg/kg	1	< 1.0	n/t	< 1.0	24.7	45.7	n/t
Total (>C8-C40) BCB	N	mg/kg	1	3.4	n/t	1.5	106	140	n/t
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	n/t	< 0.1	0.2	0.1	n/t
Acenaphthylene	M	mg/kg	0.1	< 0.1	n/t	< 0.1	0.3	< 0.1	n/t
Acenaphthene	M	mg/kg	0.1	< 0.1	n/t	< 0.1	0.1	0.1	n/t
Fluorene	M	mg/kg	0.1	< 0.1	n/t	< 0.1	< 0.1	0.1	n/t
Phenanthrene	M	mg/kg	0.1	< 0.1	n/t	< 0.1	1.2	0.5	n/t
Anthracene	M	mg/kg	0.1	< 0.1	n/t	< 0.1	0.4	0.1	n/t
Fluoranthene	M	mg/kg	0.1	< 0.1	n/t	0.1	2.6	0.6	n/t
Pyrene	M	mg/kg	0.1	< 0.1	n/t	0.1	2.2	0.5	n/t
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	n/t	< 0.1	1.1	0.2	n/t
Chrysene	M	mg/kg	0.1	0.1	n/t	0.2	1.7	0.5	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	n/t	0.2	1.3	0.2	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	n/t	< 0.1	1.4	< 0.1	n/t
Benzo (a) pyrene	M	mg/kg	0.1	0.2	n/t	< 0.1	1.4	0.3	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	n/t	0.2	1.0	< 0.1	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	n/t	< 0.1	0.4	< 0.1	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	n/t	< 0.1	0.7	< 0.1	n/t
Total PAH(16)	M	mg/kg	0.4	< 0.4	n/t	0.7	16.1	3.2	n/t
Total PAH (Including Coronene)	N	mg/kg	2	n/t	n/t	< 2	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 15-03551

				ELAB Reference	38229	38230	38231	38232	38233	38234
				Customer Reference						
				Sample ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	WS1	WS1	WS3	WS8	WS9	WS9
				Sample Depth (m)	0.30	0.60	0.50	0.40	0.30	0.60
				Sampling Date	28/08/2015	28/08/2015	28/08/2015	28/08/2015	28/08/2015	28/08/2015
Determinand	**Codes**	**Units**	**LOD**							
BTEX										
Benzene	M	ug/kg	10	n/t	n/t	< 10.0	n/t	n/t	n/t
Toluene	M	ug/kg	10	n/t	n/t	< 10.0	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	n/t	n/t	< 10.0	n/t	n/t	n/t
Xylenes	M	ug/kg	10	n/t	n/t	< 10.0	n/t	n/t	n/t
Total BTEX	M	mg/kg	0.01	n/t	n/t	< 0.01	n/t	n/t	n/t
Total Petroleum Hydrocarbons										
Mineral Oil	U	mg/kg	5	n/t	n/t	< 5	n/t	n/t	n/t
PCB (ICES 7 congeners)										
PCB 28	M	mg/kg	0.01	n/t	< 0.01	n/t	< 0.01	n/t	< 0.01
PCB 52	M	mg/kg	0.01	n/t	< 0.01	n/t	< 0.01	n/t	< 0.01
PCB 101	M	mg/kg	0.01	n/t	< 0.01	n/t	< 0.01	n/t	< 0.01
PCB 118	M	mg/kg	0.01	n/t	< 0.01	n/t	< 0.01	n/t	< 0.01
PCB 153	M	mg/kg	0.01	n/t	< 0.01	n/t	< 0.01	n/t	< 0.01
PCB 138	M	mg/kg	0.01	n/t	< 0.01	n/t	< 0.01	n/t	< 0.01
PCB 180	M	mg/kg	0.01	n/t	< 0.01	n/t	< 0.01	n/t	< 0.01
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	< 0.03	< 0.03	< 0.03	n/t	< 0.03

Results Summary

Report No.: 15-03551

			ELAB Reference	38235	38236	38237	38238	38239
			Customer Reference					
			Sample ID					
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS9	WS9	WS10	WS10	WS10
			Sample Depth (m)	0.80	2.10	0.30	1.20	2.20
			Sampling Date	28/08/2015	28/08/2015	28/08/2015	28/08/2015	28/08/2015
Determinand	**Codes**	**Units**	**LOD**					
Metals								
Arsenic	M	mg/kg	1	n/t	n/t	9.2	n/t	n/t
Cadmium	M	mg/kg	0.5	n/t	n/t	< 0.5	n/t	n/t
Chromium	M	mg/kg	5	n/t	n/t	22.7	n/t	n/t
Copper	M	mg/kg	5	n/t	n/t	16.1	n/t	n/t
Lead	M	mg/kg	5	n/t	n/t	26.3	n/t	n/t
Mercury	M	mg/kg	0.5	n/t	n/t	< 0.5	n/t	n/t
Nickel	M	mg/kg	5	n/t	n/t	16.8	n/t	n/t
Selenium	M	mg/kg	1	n/t	n/t	< 1.0	n/t	n/t
Zinc	M	mg/kg	45	n/t	n/t	49.5	n/t	n/t
Inorganics								
Hexavalent Chromium	N	mg/kg	0.8	n/t	n/t	< 0.8	n/t	n/t
Acid Soluble Sulphate (SO4)	U	%SO4	0.02	n/t	n/t	< 0.02	n/t	n/t
Water Soluble Boron	N	mg/kg	0.5	n/t	n/t	0.8	n/t	n/t
Miscellaneous								
Acid Neutralisation Capacity	N	mol/kg	0.1	n/t	n/t	< 0.1	n/t	n/t
Loss On Ignition (450°C)	M	%	0.01	n/t	n/t	1.82	n/t	n/t
Moisture Content	N	%	0.1	n/t	n/t	17.1	n/t	n/t
pH	M	units	0.1	n/t	n/t	8.1	n/t	n/t
Soil Organic Matter	U	%	0.1	n/t	n/t	1.0	n/t	n/t
Total Organic Carbon	N	%	0.01	n/t	n/t	0.51	n/t	n/t
Organics								
>C8-C10 BCB	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 BCB	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 BCB	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 BCB	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 BCB	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 BCB	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C8-C40) BCB	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Polyaromatic hydrocarbons								
Naphthalene	M	mg/kg	0.1	n/t	n/t	< 0.1	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	n/t	n/t	< 0.1	n/t	n/t
Acenaphthene	M	mg/kg	0.1	n/t	n/t	< 0.1	n/t	n/t
Fluorene	M	mg/kg	0.1	n/t	n/t	< 0.1	n/t	n/t
Phenanthrene	M	mg/kg	0.1	n/t	n/t	< 0.1	n/t	n/t
Anthracene	M	mg/kg	0.1	n/t	n/t	< 0.1	n/t	n/t
Fluoranthene	M	mg/kg	0.1	n/t	n/t	< 0.1	n/t	n/t
Pyrene	M	mg/kg	0.1	n/t	n/t	< 0.1	n/t	n/t
Benzo(a)anthracene	M	mg/kg	0.1	n/t	n/t	< 0.1	n/t	n/t
Chrysene	M	mg/kg	0.1	n/t	n/t	< 0.1	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	n/t	n/t	0.3	n/t	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	n/t	< 0.1	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	n/t	n/t	0.4	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	n/t	n/t	< 0.1	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	n/t	< 0.1	n/t	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	n/t	< 0.1	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	n/t	n/t	0.7	n/t	n/t
Total PAH (Including Coronene)	N	mg/kg	2	n/t	n/t	< 2	n/t	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 15-03551

				ELAB Reference	38235	38236	38237	38238	38239
				Customer Reference					
				Sample ID					
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	WS9	WS9	WS10	WS10	WS10
				Sample Depth (m)	0.80	2.10	0.30	1.20	2.20
				Sampling Date	28/08/2015	28/08/2015	28/08/2015	28/08/2015	28/08/2015
Determinand	**Codes**	**Units**	**LOD**						
BTEX									
Benzene	M	ug/kg	10		< 10.0	n/t	< 10.0	< 10.0	n/t
Toluene	M	ug/kg	10		< 10.0	n/t	< 10.0	< 10.0	n/t
Ethylbenzene	M	ug/kg	10		< 10.0	n/t	< 10.0	< 10.0	n/t
Xylenes	M	ug/kg	10		< 10.0	n/t	< 10.0	< 10.0	n/t
Total BTEX	M	mg/kg	0.01		n/t	n/t	< 0.01	n/t	n/t
Total Petroleum Hydrocarbons									
Mineral Oil	U	mg/kg	5		n/t	n/t	< 5	n/t	n/t
PCB (ICES 7 congeners)									
PCB 28	M	mg/kg	0.01		n/t	n/t	n/t	n/t	n/t
PCB 52	M	mg/kg	0.01		n/t	n/t	n/t	n/t	n/t
PCB 101	M	mg/kg	0.01		n/t	n/t	n/t	n/t	n/t
PCB 118	M	mg/kg	0.01		n/t	n/t	n/t	n/t	n/t
PCB 153	M	mg/kg	0.01		n/t	n/t	n/t	n/t	n/t
PCB 138	M	mg/kg	0.01		n/t	n/t	n/t	n/t	n/t
PCB 180	M	mg/kg	0.01		n/t	n/t	n/t	n/t	n/t
PCB (Total of 7 Congeners)	M	mg/kg	0.03		n/t	n/t	< 0.03	n/t	n/t

Results Summary

Report No.: 15-03551

	ELAB Reference	38240	38241	38242	38243	38244
	Customer Reference					
	Sample ID					
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	WS10	WS4	WS5	WS6	WS6
	Sample Depth (m)	3.00	0.20	0.50	0.20	1.00
	Sampling Date	28/08/2015	28/08/2015	28/08/2015	28/08/2015	28/08/2015
Determinand	**Codes** / **Units** / **LOD**					
Metals						
Arsenic	M / mg/kg / 1	n/t	107	25.0	10.7	14.7
Cadmium	M / mg/kg / 0.5	n/t	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M / mg/kg / 5	n/t	77.2	33.3	25.5	28.3
Copper	M / mg/kg / 5	n/t	26.6	26.9	31.2	30.0
Lead	M / mg/kg / 5	n/t	105	55.8	28.0	45.7
Mercury	M / mg/kg / 0.5	n/t	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	n/t	19.2	18.0	20.4	22.6
Selenium	M / mg/kg / 1	n/t	1.3	3.2	< 1.0	< 1.0
Zinc	M / mg/kg / 45	n/t	60.1	64.0	72.2	83.6
Inorganics						
Hexavalent Chromium	N / mg/kg / 0.8	n/t	< 0.8	< 0.8	< 0.8	< 0.8
Acid Soluble Sulphate (SO4)	U / %SO4 / 0.02	n/t	n/t	n/t	0.10	n/t
Water Soluble Boron	N / mg/kg / 0.5	n/t	0.5	0.6	0.5	1.4
Miscellaneous						
Acid Neutralisation Capacity	N / mol/kg / 0.1	n/t	n/t	n/t	< 0.1	n/t
Loss On Ignition (450°C)	M / % / 0.01	n/t	n/t	n/t	4.38	n/t
Moisture Content	N / % / 0.1	n/t	n/t	n/t	14.7	n/t
pH	M / units / 0.1	n/t	8.4	10.6	9.4	7.5
Soil Organic Matter	U / % / 0.1	n/t	0.5	10	1.6	2.2
Total Organic Carbon	N / % / 0.01	n/t	n/t	n/t	0.80	n/t
Organics						
>C8-C10 BCB	N / mg/kg / 1	< 1.0	n/t	n/t	< 1.0	n/t
>C10-C12 BCB	N / mg/kg / 1	< 1.0	n/t	n/t	< 1.0	n/t
>C12-C16 BCB	N / mg/kg / 1	< 1.0	n/t	n/t	< 1.0	n/t
>C16-C21 BCB	N / mg/kg / 1	< 1.0	n/t	n/t	1.4	n/t
>C21-C35 BCB	N / mg/kg / 1	< 1.0	n/t	n/t	12.2	n/t
>C35-C40 BCB	N / mg/kg / 1	< 1.0	n/t	n/t	2.9	n/t
Total (>C8-C40) BCB	N / mg/kg / 1	< 1.0	n/t	n/t	16.4	n/t
Polyaromatic hydrocarbons						
Naphthalene	M / mg/kg / 0.1	n/t	0.1	0.1	< 0.1	< 0.1
Acenaphthylene	M / mg/kg / 0.1	n/t	0.4	1.1	0.3	< 0.1
Acenaphthene	M / mg/kg / 0.1	n/t	< 0.1	0.3	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	n/t	< 0.1	0.2	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	n/t	1.0	0.6	0.5	0.4
Anthracene	M / mg/kg / 0.1	n/t	0.4	1.0	0.3	< 0.1
Fluoranthene	M / mg/kg / 0.1	n/t	2.9	1.8	2.3	0.6
Pyrene	M / mg/kg / 0.1	n/t	2.7	3.3	2.3	0.5
Benzo(a)anthracene	M / mg/kg / 0.1	n/t	1.7	1.0	1.8	0.2
Chrysene	M / mg/kg / 0.1	n/t	1.9	1.5	1.9	0.3
Benzo (b) fluoranthene	M / mg/kg / 0.1	n/t	2.2	2.0	2.8	0.3
Benzo(k)fluoranthene	M / mg/kg / 0.1	n/t	2.1	1.5	2.3	0.3
Benzo (a) pyrene	M / mg/kg / 0.1	n/t	2.4	1.8	2.8	0.2
Indeno (1,2,3-cd) pyrene	M / mg/kg / 0.1	n/t	2.0	2.6	2.1	< 0.1
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	n/t	0.4	1.2	0.5	< 0.1
Benzo[g,h,i]perylene	M / mg/kg / 0.1	n/t	2.2	2.1	2.1	< 0.1
Total PAH(16)	M / mg/kg / 0.4	n/t	22.7	21.9	22.3	3.0
Total PAH (Including Coronene)	N / mg/kg / 2	n/t	n/t	n/t	23	n/t

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 15-03551

			ELAB Reference	38240	38241	38242	38243	38244
			Customer Reference					
			Sample ID					
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS10	WS4	WS5	WS6	WS6
			Sample Depth (m)	3.00	0.20	0.50	0.20	1.00
			Sampling Date	28/08/2015	28/08/2015	28/08/2015	28/08/2015	28/08/2015
Determinand	**Codes**	**Units**	**LOD**					
BTEX								
Benzene	M	ug/kg	10	< 10.0	n/t	n/t	< 10.0	n/t
Toluene	M	ug/kg	10	< 10.0	n/t	n/t	< 10.0	n/t
Ethylbenzene	M	ug/kg	10	< 10.0	n/t	n/t	< 10.0	n/t
Xylenes	M	ug/kg	10	< 10.0	n/t	n/t	< 10.0	n/t
Total BTEX	M	mg/kg	0.01	n/t	n/t	n/t	< 0.01	n/t
Total Petroleum Hydrocarbons								
Mineral Oil	U	mg/kg	5	n/t	n/t	n/t	7	n/t
PCB (ICES 7 congeners)								
PCB 28	M	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t
PCB 52	M	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t
PCB 101	M	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t
PCB 118	M	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t
PCB 153	M	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t
PCB 138	M	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t
PCB 180	M	mg/kg	0.01	n/t	n/t	n/t	n/t	n/t
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	n/t	< 0.03	n/t

Results Summary

Report No.: 15-03551

ELAB Reference	38232	38233
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	WS8	WS9
Sample Depth (m)	0.40	0.30
Sampling Date	28/08/2015	28/08/2015

Determinand	Codes	Units	LOD		
VOC					
Heptane	N	ug/kg	10	< 10.0	< 10.0
Octane	N	ug/kg	10	< 10.0	< 10.0
Nonane	N	ug/kg	10	< 10.0	< 10.0
Benzene	M	ug/kg	10	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0
m+p-xylene	M	ug/kg	10	< 10.0	< 10.0
o-xylene	M	ug/kg	10	< 10.0	< 10.0
cis-1,2-dichloroethene	M	ug/kg	10	< 10.0	< 10.0
1,1-Dichloroethane	M	ug/kg	10	< 10.0	< 10.0
Chloroform	M	ug/kg	10	< 10.0	< 10.0
Tetrachloromethane	M	ug/kg	10	< 10.0	< 10.0
1,1,1-Trichloroethane	M	ug/kg	10	< 10.0	< 10.0
Trichloroethylene	M	ug/kg	10	< 10.0	< 10.0
Tetrachloroethylene	M	ug/kg	10	< 10.0	< 10.0
1,1,1,2-Tetrachloroethane	M	ug/kg	10	< 10.0	< 10.0
1,1,2,2-Tetrachloroetha	M	ug/kg	10	< 10.0	< 10.0
Chlorobenzene	M	ug/kg	10	< 10.0	< 10.0
Bromobenzene	M	ug/kg	10	< 10.0	< 10.0
Bromodichloromethane	M	ug/kg	10	< 10.0	< 10.0
Methylethylbenzene	M	ug/kg	10	< 10.0	< 10.0
1,1-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0
Trans - 1-2 -dichloroethylene	N	ug/kg	10	< 10.0	< 10.0
2,2-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0
Bromochloromethane	N	ug/kg	10	< 10.0	< 10.0
1,2-Dichloroethane	N	ug/kg	10	< 10.0	< 10.0
Dibromomethane	M	ug/kg	10	< 10.0	< 10.0
1,2-Dichloropropane	M	ug/kg	10	< 10.0	< 10.0
cis-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0
trans-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0
1,1,2-Trichloroethane	N	ug/kg	10	< 10.0	< 10.0
Dibromochloromethane	N	ug/kg	10	< 10.0	< 10.0
1,3-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0
Dibromoethane	M	ug/kg	10	< 10.0	< 10.0
Styrene	N	ug/kg	10	< 10.0	< 10.0
Propylbenzene	N	ug/kg	10	< 10.0	< 10.0
2-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0
1,2,4-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0
4-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0
t-butylbenzene	N	ug/kg	10	< 10.0	< 10.0
1,3,5-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0
1-methylpropylbenzene	N	ug/kg	10	< 10.0	< 10.0
o-cymene	N	ug/kg	10	< 10.0	< 10.0
1,3-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Butylbenzene	N	ug/kg	10	< 10.0	< 10.0
1,2-Dibromo-3-chloropropane	N	ug/kg	10	< 10.0	< 10.0
Hexachlorobutadiene	N	ug/kg	10	< 10.0	< 10.0
1,2,3-Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Naphthalene	N	ug/kg	10	< 10.0	< 10.0
1,2,4-Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
1,4-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
1,2-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Bromoform	N	ug/kg	10	< 10.0	< 10.0

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 15-03551

WAC Analysis								
Elab Ref:	38243					**Landfill Waste Acceptance Criteria Limits**		
Sample Date:	28/08/2015					**Inert Waste Landfill**	**Stable Non-reactive Hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	WS6							
Depth:	0.2							
Site:	IRO Durrington Bridge House, Barrington Road, Worthing							
Determinand		**Code**	**Units**					
Total Organic Carbon		N	%		0.80	3	5	6
Loss on Ignition		M	%		4.4	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		7	500	--	--
Total (of 17) PAHs		N	mg/kg		23.0	100	--	--
pH		M			9.4	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		< 0.1	--	To evaluate	To evaluate
Eluate Analysis			**2:1**	**8:1**	**10:1**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
			mg/l	**mg/l**	**mg/kg**			
Arsenic		N	0.009	0.011	0.10	0.5	2	25
Barium		N	0.016	0.009	0.10	20	100	300
Cadmium		N	< 0.001	< 0.001	< 0.01	0.04	1	5
Chromium		N	0.008	< 0.005	< 0.05	0.5	10	70
Copper		N	0.017	0.006	0.07	2	50	100
Mercury		N	< 0.005	< 0.005	< 0.01	0.01	0.2	2
Molybdenum		N	0.009	< 0.005	< 0.05	0.5	10	30
Nickel		N	0.003	0.001	< 0.05	0.4	10	40
Lead		N	< 0.001	0.001	< 0.05	0.5	10	50
Antimony		N	< 0.005	< 0.005	< 0.05	0.06	0.7	5
Selenium		N	< 0.005	< 0.005	< 0.05	0.1	0.5	7
Zinc		N	0.023	0.027	0.26	4	50	200
Chloride		N	24.000	9.000	107.00	800	15000	25000
Fluoride		N	< 1	< 1	< 10	10	150	500
Sulphate		N	76.000	20.000	269.00	1000	20000	50000
Total Dissolved Solids		N	240.000	120.000	1360.00	4000	60000	100000
Phenol Index		N	< 0.01	< 0.01	< 0.10	1	-	-
Dissolved Organic Carbon		N	9.670	7.760	80.00	500	800	1000
Leach Test Information								
Eluent Volume (ml)		N	163	1000				
pH		N	8	9				
Conductivity (uS/cm)		N	347	171				
Temperature (°C)		N	21	18				
Solid Information								
Dry mass of test portion (g)			126					
Moisture (%)			17					

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ELAB cannot be held responsible for any discrepencies with current legislation

Results Summary

Report No.: 15-03551

WAC Analysis								
Elab Ref:	38237					**Landfill Waste Acceptance Criteria Limits**		
Sample Date:	28/08/2015					**Inert Waste Landfill**	**Stable Non-reactive Hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	WS10							
Depth:	0.3							
Site:	IRO Durrington Bridge House, Barrington Road, Worthing							
Determinand		**Code**	**Units**					
Total Organic Carbon		N	%		0.51	3	5	6
Loss on Ignition		M	%		1.8	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		< 5	500	--	--
Total (of 17) PAHs		N	mg/kg		< 2	100	--	--
pH		M			8.1	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		< 0.1	--	To evaluate	To evaluate
Eluate Analysis			**2:1**	**8:1**	**10:1**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
			mg/l	**mg/l**	**mg/kg**			
Arsenic		N	< 0.005	< 0.005	< 0.05	0.5	2	25
Barium		N	0.008	< 0.005	< 0.05	20	100	300
Cadmium		N	< 0.001	< 0.001	< 0.01	0.04	1	5
Chromium		N	< 0.005	< 0.005	< 0.05	0.5	10	70
Copper		N	< 0.005	< 0.005	< 0.05	2	50	100
Mercury		N	< 0.005	< 0.005	< 0.01	0.01	0.2	2
Molybdenum		N	0.005	< 0.005	< 0.05	0.5	10	30
Nickel		N	< 0.001	< 0.001	< 0.05	0.4	10	40
Lead		N	< 0.001	< 0.001	< 0.05	0.5	10	50
Antimony		N	< 0.005	< 0.005	< 0.05	0.06	0.7	5
Selenium		N	< 0.005	< 0.005	< 0.05	0.1	0.5	7
Zinc		N	0.040	0.067	0.65	4	50	200
Chloride		N	7.000	< 5	< 50	800	15000	25000
Fluoride		N	< 1	< 1	< 10	10	150	500
Sulphate		N	5.000	2.000	24.40	1000	20000	50000
Total Dissolved Solids		N	190.000	< 10	153.00	4000	60000	100000
Phenol Index		N	< 0.01	< 0.01	< 0.10	1	-	-
Dissolved Organic Carbon		N	16.400	9.200	98.00	500	800	1000
Leach Test Information								
Eluent Volume (ml)		N	132	1270				
pH		N	8.4	7.9				
Conductivity (uS/cm)		N	231	78				
Temperature (°C)		N	20	19				
Solid Information								
Dry mass of test portion (g)			164					
Moisture (%)			16.3					

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ELAB cannot be held responsible for any discrepencies with current legislation

Results Summary

Report No.: 15-03551

WAC Analysis								
Elab Ref:	38231					**Landfill Waste Acceptance Criteria Limits**		
Sample Date:	28/08/2015					**Inert Waste Landfill**	**Stable Non-reactive Hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:	WS3							
Depth:	0.5							
Site:	IRO Durrington Bridge House, Barrington Road, Worthing							
Determinand		**Code**	**Units**					
Total Organic Carbon		N	%		0.38	3	5	6
Loss on Ignition		M	%		2.2	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		< 5	500	--	--
Total (of 17) PAHs		N	mg/kg		< 2	100	--	--
pH		M			7.8	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		< 0.1	--	To evaluate	To evaluate
Eluate Analysis			**2:1**	**8:1**	**10:1**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
			mg/l	**mg/l**	**mg/kg**			
Arsenic		N	< 0.005	< 0.005	< 0.05	0.5	2	25
Barium		N	0.007	< 0.005	< 0.05	20	100	300
Cadmium		N	< 0.001	< 0.001	< 0.01	0.04	1	5
Chromium		N	< 0.005	< 0.005	< 0.05	0.5	10	70
Copper		N	< 0.005	< 0.005	< 0.05	2	50	100
Mercury		N	< 0.005	< 0.005	< 0.01	0.01	0.2	2
Molybdenum		N	< 0.005	< 0.005	< 0.05	0.5	10	30
Nickel		N	0.001	< 0.001	< 0.05	0.4	10	40
Lead		N	< 0.001	< 0.001	< 0.05	0.5	10	50
Antimony		N	< 0.005	< 0.005	< 0.05	0.06	0.7	5
Selenium		N	< 0.005	< 0.005	< 0.05	0.1	0.5	7
Zinc		N	0.045	0.086	0.81	4	50	200
Chloride		N	9.000	< 5	< 50	800	15000	25000
Fluoride		N	< 1	< 1	< 10	10	150	500
Sulphate		N	5.000	2.000	26.80	1000	20000	50000
Total Dissolved Solids		N	< 10	< 10	< 100	4000	60000	100000
Phenol Index		N	< 0.01	< 0.01	< 0.10	1	-	-
Dissolved Organic Carbon		N	10.400	8.040	83.00	500	800	1000
Leach Test Information								
Eluent Volume (ml)		N	203	1380				
pH		N	8.4	7.9				
Conductivity (uS/cm)		N	214	105				
Temperature (°C)		N	20	18				
Solid Information								
Dry mass of test portion (g)			176					
Moisture (%)			11.6					

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ELAB cannot be held responsible for any discrepencies with current legislation

2683

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY
Tel: +44 (0)1424 718618, Email: info@elab-uk.co.uk, Web: www.elab-uk.co.uk

Results Summary

Report No.: 15-03551

Asbestos Qualitative Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #)
in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Result
38229	0.30	WS1	Silty loam	No asbestos detected
38231	0.50	WS3	Silty loam	No asbestos detected
38232	0.40	WS8	Silty loam	Chrysotile Amosite
38233	0.30	WS9	Loamy sand	No asbestos detected
38237	0.30	WS10	Silty loam	No asbestos detected
38241	0.20	WS4	Sandy silty loam	No asbestos detected
38242	0.50	WS5	Sandy silty loam	No asbestos detected
38243	0.20	WS6	Silty loam	No asbestos detected
38244	1.00	WS6	Silty loam	No asbestos detected

Method Summary

Report No.: 15-03551

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Anions in 2:1 WAC	N		08/09/2015		
DOC in 2:1 WAC	N		08/09/2015		
Metals by ICP in 2:1 WAC	N		08/09/2015		
Phenols in 2:1 WAC	N		08/09/2015		
Polyaromatic hydrocarbons in solids	N	As submitted sample	03/09/2015		GC-FID
Hexavalent chromium	N	As submitted sample	02/09/2015	110	Colorimetry
pH	M	Air dried sample	04/09/2015	113	Electromeric
Acid Soluble Sulphate	U	Air dried sample	07/09/2015	115	Ion Chromatography
Total Petroleum Hydrocarbons in solids	U	As submitted sample	02/09/2015	117	GC-FID
Aqua regia extractable metals	M	Air dried sample	04/09/2015	118	ICPMS
PCB (ICES 7 congeners)	M	Air dried sample	04/09/2015	120	GC-MS
Loss on ignition at 450 deg C	M	Air dried sample	04/09/2015	129	Gravimetry
Polyaromatic hydrocarbons (GC-FID)	M	As submitted sample	02/09/2015	133	GC-FID
BTEX in solids	M	As submitted sample	03/09/2015	181	GC-MS
VOC in solids	M	As submitted sample	02/09/2015	181	GC-MS
Water soluble boron	N	Air dried sample	04/09/2015	202	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	04/09/2015	210	IR
Basic carbon banding in soil	N	As submitted sample	02/09/2015	218	GC-FID
Soil organic matter	U	Air dried sample	04/09/2015	BS1377:P3	Titrimetry
Acid neutralisation capacity	N	Air dried sample	04/09/2015	737	
Asbestos identification	U	As submitted sample	03/09/2015	PMAN	Microscopy

Leachate

Tests marked N are not UKAS accredited

Report Information

Report No.: 15-03551

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis
Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

APPENDIX C

Guidance on Comparing Soil Contamination Data with a Critical Concentration Statistical Analysis Summary Sheets

ASHDOWN SITE INVESTIGATION LIMITED

Notes on the "Guidance on Comparing Soil Contamination Data with a Critical Concentration" (CIEH & CL: AIRE, May 2008)

The Chartered Institute of Environmental Health & CL:AIRE, have published updated guidance on the statistical assessment of contaminated land data, "*Guidance on Comparing Soil Contamination Data with a Critical Concentration" (May 2008).* This is an update to previous guidance published within Contaminated Land Report CLR7 (Defra, 2002).

The CIEH/CL:AIRE guidance forms part of a package of proposed improved UK guidance highlighted in the Defra discussion paper, "*Assessing risks from land contamination –a proportionate approach. Soil guideline values: The Way Forward (CLAN 06/2006)". This discussion paper discussed* the role and use of SGVs for managing the risks associated with soil contamination.

The guidance states that its overall aim is to "increase understanding amongst stakeholders of the role that statistics can play in quantifying the uncertainty attached to estimates of the mean concentration of contaminants in soil, thereby creating a more informed basis for regulatory decision-making".

The initial question, on which the guidance is based, is whether the Site under consideration is to be assessed under the Planning System or under Part 2A of the Environmental Protection Act 1990. The key questions asked when considering contaminant concentrations vary depending on the scenario under consideration. The key questions will generally be:

- **Planning Scenario** – "can we confidently say that the level of contamination on this land is low relative to some appropriate measure of risk?" or "that the level of contamination is lower than the critical concentration" (alternative hypothesis).

- **Part 2A Scenario** – "can we confidently say that the level of contamination on this land is high relative to some appropriate measure of risk?" or "that the level of contamination is higher than the critical concentration" (alternative hypothesis).

Within the guidance, to 'answer' the relevant question above, a null hypothesis has been outlined for each scenario, which, if rejected with a high degree of confidence, means that the alternative hypothesis can be accepted. The null hypothesis for a planning scenario is that the soils contain levels of contamination above the critical concentration (i.e. the soils are assumed to be unsuitable for use until proven otherwise). Under the Part 2A scenario, the null hypothesis is that the soils contain levels of contamination below the critical concentration (i.e. the land is assumed not to fall within Part 2A legislation until proved otherwise).

For the planning scenario the null hypothesis may be rejected if it is considered that the 95th percentile of the normally distributed population as a whole lies below the critical concentration i.e. there is a 95% probability that your true population mean lies below the critical concentration. A lower probability of the true mean lying below the critical concentration may be used, but deviation from the standard 95% requires justification.

For the Part 2A scenario the null hypothesis may be rejected if it can be shown that the lower 95th percentile lies above the critical concentration. If the lower 95th percentile lies below the critical concentration but the true population mean lies above the critical concentration further assessment should be undertaken before the Site can be classified under Part 2A.

Guidance on the treatment of outliers (results that are not representative of a sample population), is also provided in the report. The guidance confirms that outliers should only be excluded from the dataset where they are either demonstrably the result of an error that can be identified and explained, or clearly indicate that more than one soil population exists within the dataset.

Where an individual result is recognised as a 'statistical outlier' or 'contamination hot-spot' within the data set (and where the critical concentration for that contaminant is exceeded), remediation work and or further investigation may be required.

Client/client ref:
Project ref: LW26215
Site ref: Inland Revenue, Durrington Bridge House, Worthing
Data description: Made Ground
Contaminant(s): Arsenic, Cadmium, Chromium, Lead, Mercury, Nickel, Copper, Zinc, Selenium, Boron.
Test scenario: Planning

	Arsenic (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Zinc (mg/kg)	Hexavalent Chromium (mg/kg)	Water Soluble Boron (mg/kg)
Critical concentration, C_c	**37**	**11**	**910**	**2400**	**200**	**40**	**180**	**250**	**3700**	**6**	**290**
Notes	S4UL Residential with Homegrown Produce	S4UL Residential with Homegrown Produce	S4UL Residential with Homegrown Produce	S4UL Residential with Homegrown Produce	C4SL Residential with Homegrown Produce	S4UL Residential with Homegrown Produce	S4UL Residential with Homegrown Produce	S4UL Residential with Homegrown Produce	S4UL Residential with Homegrown Produce	S4UL Residential with Homegrown Produce	S4UL Residential with Homegrown Produce
Sample size, n	12	12	12	12	12	12	12	12	12	12	12
Sample mean, $\bar{X}$	20.725	0.25	29.5166667	21.65	75.2166667	0.25	19.5	0.79166667	55.7416667	0.4	0.5875
Standard deviation, s	27.5291622	0	16.0876482	6.67348893	137.757625	0	3.77286966	0.79253143	24.5293686	5.798E-17	0.31270448
Number of non-detects	0	**12**	0	0	0	**12**	0	**10**	**3**	**12**	**3**
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Outliers?	Yes	No	Yes	No	Yes	No	No	Yes	No	No	Yes
Distribution	Non-normal	Single value	Non-normal	Normal	Non-normal	Single value	Normal	Non-normal	Normal	Non-normal	Non-normal
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: One-sample t	Auto: Chebychev	Auto: Chebychev	Auto: One-sample t	Auto: Chebychev	Auto: One-sample t	Auto: Chebychev	Auto: Chebychev

Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?				**Evidence level required:**		**95%**	Use Normal distribution to test for outliers			
t statistic, t_0 (or k_0)	-2.047946586	N/A	-189.5916483	-1234.563533	-3.137845513	N/A	-147.3648336	-1089.272882	-514.6516969	-3.34583E+17	-3206.075952
Upper confidence limit (on true mean concentration, μ)	55.3651028	0.25	49.7598467	25.1097188	248.557877	0.25	21.4559586	1.78891351	68.4583608	0.4	0.98097784
Evidence level	**81%**	**100%**	**100%**	**100%**	**91%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level
Result	**μ ≈≥ Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ ≈≥ Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**

Client/client ref:
Project ref: LW26215
Site ref: Inland Revenue, Durrington Bridge House, Worthing
Data description: Made Ground
Contaminant(s): Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene. Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene

	Naphthalene (mg/kg)	Acenaphthylene (mg/kg)	Acenaphthene (mg/kg)	Fluorene (mg/kg)	Phenanthrene (mg/kg)	Anthracene (mg/kg)	Fluoranthene (mg/kg)	Pyrene (mg/kg)
Critical concentration, C_c	**2.3**	**170**	**210**	**170**	**95**	**2400**	**280**	**620**
Notes	S4UL Residential With Homegrown Produce (1% SOM)	S4UL Residential With Homegrown Produce (1% SOM)	S4UL Residential With Homegrown Produce (1% SOM)	S4UL Residential With Homegrown Produce (1% SOM)	S4UL Residential With Homegrown Produce (1% SOM)	S4UL Residential With Homegrown Produce (1% SOM)	S4UL Residential With Homegrown Produce (1% SOM)	S4UL Residential With Homegrown Produce (1% SOM)
Sample size, n	12	12	12	12	12	12	12	12
Sample mean, $\overline{X}$	0.0625	0.1875	0.075	0.06666667	0.27916667	0.18333333	0.7375	0.81666667
Standard deviation, s	0.02261335	0.31051643	0.07229988	0.04438127	0.316557	0.28230652	1.00952847	1.20629661
Number of non-detects	**9**	**9**	**10**	**10**	**7**	**8**	**3**	**4**
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Outliers?	No	Yes	Yes	Yes	No	Yes	No	No
Distribution	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev

Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?				**Evidence level required:**		**95%**	Use Normal distribut
t statistic, t_0 (or k_0)	-342.7589046	-1894.417476	-10058.12909	-13263.84662	-1036.535579	-29447.45616	-958.2629001	-1778.098325
Upper confidence limit (on true mean concentration, μ)	0.09095451	0.57822461	0.16597535	0.12251187	0.67749215	0.53856124	2.00779546	2.33455662
Evidence level	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**

Client/client ref:
Project ref: LW26215
Site ref: Inland Revenue, Durrington Bridge House, Worthing
Data description: Made Ground
Contaminant(s): Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene. Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene

	Benz(a)anthracene (mg/kg)	Chrysene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Benzo(a)pyrene (mg/kg)	Indeno(123-cd)pyrene (mg/kg)	Dibenz(ah)anthracene (mg/kg)	Benzo(ghi)perylene (mg/kg)
Critical concentration, C_c	**7.2**	**15**	**2.6**	**77**	**2.2**	**27**	**0.24**	**320**
Notes	S4UL Residential With Homegrown Produce (1% SOM)	S4UL Residential With Homegrown Produce (1% SOM)	S4UL Residential With Homegrown Produce (1% SOM)	S4UL Residential With Homegrown Produce (1% SOM)	S4UL Residential With Homegrown Produce (1% SOM)	S4UL Residential With Homegrown Produce (1% SOM)	S4UL Residential With Homegrown Produce (1% SOM)	S4UL Residential With Homegrown Produce (1% SOM)
Sample size, n	12	12	12	12	12	12	12	12
Sample mean, $\overline{X}$	0.4375	0.58333333	0.7625	0.57083333	0.725	0.625	0.22916667	0.6125
Standard deviation, s	0.66950626	0.73060788	0.96745331	0.86351774	0.99806631	0.98107084	0.34209138	0.91951692
Number of non-detects	**7**	**2**	**1**	**5**	**2**	**6**	**7**	**5**
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Outliers?	No	No	No	No	No	No	Yes	No
Distribution	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev

Test scenario:	tion to test for outliers							
t statistic, t_0 (or k_0)	-34.98994477	-68.355132	-6.579425224	-306.6044725	-5.119449299	-93.12852451	-0.109701002	-1203.230449
Upper confidence limit (on true mean concentration, μ)	1.27994357	1.50266143	1.97985205	1.65740266	1.98087257	1.85948707	0.65962222	1.76953342
Evidence level	**100%**	**100%**	**98%**	**100%**	**96%**	**100%**	**1%**	**100%**
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ ≥ Cc**	**μ < Cc**

APPENDIX D

Classification of Probability, Consequence and Risk

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

Consequence of risk being realised		
Classification	Category	Definition
Severe	Human Health	Short term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA.
	Controlled Waters	Short term risk of pollution (note: Water Resources Act contains no scope for considering significance of pollution) of sensitive water resource.
	Property	Catastrophic damage to buildings/property.
	Ecological Systems	A short term risk to a particular ecosystem or organisation forming part of such ecosystem.
Moderate	Human Health	Chronic damage to Human Health.
	Controlled Waters	Pollution of sensitive water resources (note: Water Resources Act contains no scope for considering significance of pollution).
	Ecological System	A significant change in a particular ecosystem or organism forming part of such ecosystem.
Minor	Controlled Waters	Pollution of non-sensitive water resources.
	Property	Significant damage to crops, buildings, structures and services.
	Ecological Systems	Damage to sensitive buildings/structures/services or the environment.
Very Minor	Human Health	Non-permanent health effects to human health (easily prevented by means such as personal protective clothing, etc).
	Property	Easily repairable effects of damage to buildings, structures and services.
	Project	Harm, although not necessarily significant harm, which may result in a financial loss or expenditure to resolve.

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

APPENDIX E

HAzWaste Online Output Sheet

Waste Classification Report

RHQMA-DCUXN-HR7RG

Job name

LW26215 - IRO Durrington Bridge House, Barrington Road, Worthing

Waste Stream

ASI Enhanced WM3 v1

Comments

Project

Site

Classified by

Name:
Card, Stuart
Date:
21/09/2015 16:53 UTC
Telephone:
01273 483119

Company:
Ashdown Site Investigation Limited
The Old Dairy
Swanborough Farm, Swanborough
Lewes
BN7 3PF

Report

Created by: Card, Stuart
Created date: 21/09/2015 16:53 UTC

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazardous properties	Page
1	WS2	0.15	Non Hazardous		2
2	WS11	0.7	Non Hazardous		4
3	WS12	0.3	Non Hazardous		6
4	WS13	0.35	Non Hazardous		8
5	WS1	0.3	Non Hazardous		10
6	WS3	0.5	Non Hazardous		12
7	WS8	0.4	Non Hazardous		14
8	WS9	0.3	Non Hazardous		17
9	WS10	0.3	Non Hazardous		19
10	WS4	0.2	Non Hazardous		21
11	WS5	0.5	Non Hazardous		23
12	WS6	0.2	Non Hazardous		25
13	WS6[1]	1	Non Hazardous		27

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	29
Appendix B: Notes	31
Appendix C: Version	32

Classification of sample: WS2

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

Sample details

Sample Name:
WS2
Sample Depth:
0.15 m
Moisture content: **0%**
(no correction)

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

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
arsenic trioxide: (Cation conc. entered: 13 mg/kg, converted to compound conc.:17.164 mg/kg or 0.00172%)
benzo[a]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
benzo[b]fluoranthene: (Whole conc. entered as: 0.3 mg/kg or 0.00003%)
benzo[ghi]perylene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
benzo[k]fluoranthene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
boron tribromide/trichloride/trifluoride (combined): (Cation conc. entered: 0.6 mg/kg, converted to compound conc.:8.058 mg/kg or 0.000806%)
cadmium sulfide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.643 mg/kg or <0.0000643%, Note 1 conc.: <0.00005%) IGNORED Because: "<LOD"
chromium(III) oxide: (Cation conc. entered: 26 mg/kg, converted to compound conc.:38 mg/kg or 0.0038%)
chromium(VI) oxide: (Cation conc. entered: <0.8 mg/kg, converted to compound conc.:<1.538 mg/kg or <0.000154%) IGNORED Because: "<LOD"
chrysene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
copper (I) oxide: (Cation conc. entered: 27.3 mg/kg, converted to compound conc.:30.737 mg/kg or 0.00307%)
dibenz[a,h]anthracene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
fluoranthene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
indeno[123-cd]pyrene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 60 mg/kg, converted to compound conc.:90.6 mg/kg or 0.00906%, Note 1 conc.: 0.006%)
mercury dichloride: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.677 mg/kg or <0.0000677%) IGNORED Because: "<LOD"
naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
nickel dihydroxide: (Cation conc. entered: 19.2 mg/kg, converted to compound conc.:30.326 mg/kg or 0.00303%)
pH: (Whole conc. entered as: 7.6 pH, converted to conc.:7.6 pH or 7.6 pH)
phenanthrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
pyrene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) IGNORED Because: "<LOD"
zinc chloride: (Cation conc. entered: 98.4 mg/kg, converted to compound conc.:205.117 mg/kg or 0.0205%)

Notes utilised in assessment

C14: Step 5
"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "arsenic trioxide"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "benzo[b]fluoranthene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "benzo[ghi]perylene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "benzo[k]fluoranthene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "chromium(III) oxide"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "chrysene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "copper (I) oxide"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "dibenz[a,h]anthracene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "fluoranthene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "nickel dihydroxide"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "pyrene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "zinc chloride"

Determinand notes

Note 1 , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Note A , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Classification of sample: WS11

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

Sample details

Sample Name:
WS11
Sample Depth:
0.7 m
Moisture content: **0%**
(no correction)

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

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
arsenic trioxide: (Cation conc. entered: 16.6 mg/kg, converted to compound conc.:21.917 mg/kg or 0.00219%)
benzo[a]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
benzo[b]fluoranthene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
benzo[ghi]perylene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
benzo[k]fluoranthene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
boron tribromide/trichloride/trifluoride (combined): (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<6.715 mg/kg or <0.000672%) IGNORED Because: "<LOD"
cadmium sulfide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.643 mg/kg or <0.0000643%, Note 1 conc.: <0.00005%) IGNORED Because: "<LOD"
chromium(III) oxide: (Cation conc. entered: 35.6 mg/kg, converted to compound conc.:52.031 mg/kg or 0.0052%)
chromium(VI) oxide: (Cation conc. entered: <0.8 mg/kg, converted to compound conc.:<1.538 mg/kg or <0.000154%) IGNORED Because: "<LOD"
chrysene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
copper (I) oxide: (Cation conc. entered: 23.4 mg/kg, converted to compound conc.:26.346 mg/kg or 0.00263%)
dibenz[a,h]anthracene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
fluoranthene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
indeno[123-cd]pyrene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 24 mg/kg, converted to compound conc.:36.24 mg/kg or 0.00362%, Note 1 conc.: 0.0024%)
mercury dichloride: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.677 mg/kg or <0.0000677%) IGNORED Because: "<LOD"
naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
nickel dihydroxide: (Cation conc. entered: 27.1 mg/kg, converted to compound conc.:42.804 mg/kg or 0.00428%)
pH: (Whole conc. entered as: 7.3 pH, converted to conc.:7.3 pH or 7.3 pH)
phenanthrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
pyrene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) IGNORED Because: "<LOD"
TPH (C6 to C40) petroleum group: (Whole conc. entered as: 2.3 mg/kg or 0.00023%)
zinc chloride: (Cation conc. entered: 71.7 mg/kg, converted to compound conc.:149.46 mg/kg or 0.0149%)

Test Settings

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: Force this test to non hazardous because: "TPH unlikely to be flammable at concentrations <500mg/kg, no free product identified in boreholes"

Notes utilised in assessment

C14: Step 5
"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "arsenic trioxide"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "benzo[b]fluoranthene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "benzo[ghi]perylene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "benzo[k]fluoranthene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "chromium(III) oxide"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "copper (I) oxide"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "dibenz[a,h]anthracene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "fluoranthene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "nickel dihydroxide"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "pyrene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "zinc chloride"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "TPH (C6 to C40) petroleum group"

Note 1 , used on:

Test: "HP 5 on STOT SE 2; H371, STOT RE 2; H373" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 6 on Acute Tox. 4; H302" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 6 on Acute Tox. 4; H332" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 7 on Carc. 2; H351" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 10 on Repr. 1A; H360, Repr. 1B; H360, Repr. 1B; H360F, Repr. 1A; H360F, Repr. 1A; H360D, Repr. 1B; H360D, Repr. 1B; H360FD, Repr. 1A; H360FD, Repr. 1A; H360Fd, Repr. 1B; H360Fd, Repr. 1B; H360Df, Repr. 1A; H360Df" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 10 on Repr. 2; H361, Repr. 2; H361f, Repr. 2; H361d, Repr. 2; H361fd" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Determinand notes

Note 1 , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Note A , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

WM3: Unknown oil , used on:

determinand: "TPH (C6 to C40) petroleum group"

Classification of sample: WS12

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

Sample details

Sample Name:
WS12
Sample Depth:
0.3 m
Moisture content: **0%**
(no correction)

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

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
arsenic trioxide: (Cation conc. entered: 11.6 mg/kg, converted to compound conc.:15.316 mg/kg or 0.00153%)
benzo[a]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
benzo[b]fluoranthene: (Whole conc. entered as: 0.4 mg/kg or 0.00004%)
benzo[ghi]perylene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
benzo[k]fluoranthene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
boron tribromide/trichloride/trifluoride (combined): (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<6.715 mg/kg or <0.000672%) IGNORED Because: "<LOD"
cadmium sulfide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.643 mg/kg or <0.0000643%, Note 1 conc.: <0.00005%) IGNORED Because: "<LOD"
chromium(III) oxide: (Cation conc. entered: 19.5 mg/kg, converted to compound conc.:28.5 mg/kg or 0.00285%)
chromium(VI) oxide: (Cation conc. entered: <0.8 mg/kg, converted to compound conc.:<1.538 mg/kg or <0.000154%) IGNORED Because: "<LOD"
chrysene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
copper (I) oxide: (Cation conc. entered: 12.9 mg/kg, converted to compound conc.:14.524 mg/kg or 0.00145%)
dibenz[a,h]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
indeno[123-cd]pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 14.5 mg/kg, converted to compound conc.:21.895 mg/kg or 0.00219%, Note 1 conc.: 0.00145%)
mercury dichloride: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.677 mg/kg or <0.0000677%) IGNORED Because: "<LOD"
naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
nickel dihydroxide: (Cation conc. entered: 22.2 mg/kg, converted to compound conc.:35.065 mg/kg or 0.00351%)
pH: (Whole conc. entered as: 8.5 pH, converted to conc.:8.5 pH or 8.5 pH)
phenanthrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) IGNORED Because: "<LOD"
TPH (C6 to C40) petroleum group: (Whole conc. entered as: <1 mg/kg or <0.0001%) IGNORED Because: "<LOD"
zinc chloride: (Cation conc. entered: <45 mg/kg, converted to compound conc.:<93.803 mg/kg or <0.00938%) IGNORED Because: "<LOD"

benzene: (Whole conc. entered as: <0.01 mg/kg or <0.000001%) IGNORED Because: "<LOD"
toluene: (Whole conc. entered as: <0.01 mg/kg or <0.000001%) IGNORED Because: "<LOD"
ethylbenzene: (Whole conc. entered as: <0.01 mg/kg or <0.000001%) IGNORED Because: "<LOD"
xylene: (Whole conc. entered as: <0.01 mg/kg or <0.000001%) IGNORED Because: "<LOD"

Notes utilised in assessment

C14: Step 5
"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "arsenic trioxide"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "benzo[b]fluoranthene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "benzo[ghi]perylene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "benzo[k]fluoranthene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "chromium(III) oxide"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "chrysene"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "copper (I) oxide"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "nickel dihydroxide"

Determinand notes

Note 1 , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Note A , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Classification of sample: WS13

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

Sample details

Sample Name:
WS13
Sample Depth:
0.35 m
Moisture content: **0%**
(no correction)

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

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
arsenic trioxide: (Cation conc. entered: 9.9 mg/kg, converted to compound conc.:13.071 mg/kg or 0.00131%)
benzo[a]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
benzo[b]fluoranthene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
benzo[ghi]perylene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
benzo[k]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
boron tribromide/trichloride/trifluoride (combined): (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<6.715 mg/kg or <0.000672%) IGNORED Because: "<LOD"
cadmium sulfide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.643 mg/kg or <0.0000643%, Note 1 conc.: <0.00005%) IGNORED Because: "<LOD"
chromium(III) oxide: (Cation conc. entered: 19.2 mg/kg, converted to compound conc.:28.062 mg/kg or 0.00281%)
chromium(VI) oxide: (Cation conc. entered: <0.8 mg/kg, converted to compound conc.:<1.538 mg/kg or <0.000154%) IGNORED Because: "<LOD"
chrysene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
copper (I) oxide: (Cation conc. entered: 12.6 mg/kg, converted to compound conc.:14.186 mg/kg or 0.00142%)
dibenz[a,h]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
fluoranthene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
indeno[123-cd]pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 11.2 mg/kg, converted to compound conc.:16.912 mg/kg or 0.00169%, Note 1 conc.: 0.00112%)
mercury dichloride: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.677 mg/kg or <0.0000677%) IGNORED Because: "<LOD"
naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
nickel dihydroxide: (Cation conc. entered: 21.2 mg/kg, converted to compound conc.:33.485 mg/kg or 0.00335%)
pH: (Whole conc. entered as: 8.3 pH, converted to conc.:8.3 pH or 8.3 pH)
phenanthrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) IGNORED Because: "<LOD"
TPH (C6 to C40) petroleum group: (Whole conc. entered as: 3 mg/kg or 0.0003%)
zinc chloride: (Cation conc. entered: <45 mg/kg, converted to compound conc.:<93.803 mg/kg or <0.00938%) IGNORED Because: "<LOD"

Test Settings

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: Force this test to non hazardous because: "TPH unlikely to be flammable at concentrations <500mg/kg, no free product identified in boreholes"

Notes utilised in assessment

C14: Step 5
"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "arsenic trioxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[b]fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[ghi]perylene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chromium(III) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "copper (I) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "nickel dihydroxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "TPH (C6 to C40) petroleum group"

Determinand notes

Note 1 , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Note A , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

WM3: Unknown oil , used on:

determinand: "TPH (C6 to C40) petroleum group"

Classification of sample: WS1

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

Sample details

Sample Name:
WS1
Sample Depth:
0.3 m
Moisture content: **0%**
(no correction)

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

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
arsenic trioxide: (Cation conc. entered: 10.6 mg/kg, converted to compound conc.:13.995 mg/kg or 0.0014%)
benzo[a]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
benzo[b]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
benzo[ghi]perylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
benzo[k]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
boron tribromide/trichloride/trifluoride (combined): (Cation conc. entered: 0.7 mg/kg, converted to compound conc.:9.401 mg/kg or 0.00094%)
cadmium sulfide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.643 mg/kg or <0.0000643%, Note 1 conc.: <0.00005%) IGNORED Because: "<LOD"
chromium(III) oxide: (Cation conc. entered: 29 mg/kg, converted to compound conc.:42.385 mg/kg or 0.00424%)
chromium(VI) oxide: (Cation conc. entered: <0.8 mg/kg, converted to compound conc.:<1.538 mg/kg or <0.000154%) IGNORED Because: "<LOD"
chrysene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
copper (I) oxide: (Cation conc. entered: 17.4 mg/kg, converted to compound conc.:19.59 mg/kg or 0.00196%)
dibenz[a,h]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
indeno[123-cd]pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 11.4 mg/kg, converted to compound conc.:17.214 mg/kg or 0.00172%, Note 1 conc.: 0.00114%)
mercury dichloride: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.677 mg/kg or <0.0000677%) IGNORED Because: "<LOD"
naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
nickel dihydroxide: (Cation conc. entered: 19.5 mg/kg, converted to compound conc.:30.8 mg/kg or 0.00308%)
pH: (Whole conc. entered as: 8.2 pH, converted to conc.:8.2 pH or 8.2 pH)
phenanthrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) IGNORED Because: "<LOD"
TPH (C6 to C40) petroleum group: (Whole conc. entered as: 3 mg/kg or 0.0003%)
zinc chloride: (Cation conc. entered: 53.2 mg/kg, converted to compound conc.:110.897 mg/kg or 0.0111%)
benzene: (Whole conc. entered as: <0.01 mg/kg or <0.000001%) IGNORED Because: "<LOD"

toluene: (Whole conc. entered as: <0.01 mg/kg or <0.000001%) IGNORED Because: "<LOD"
ethylbenzene: (Whole conc. entered as: <0.01 mg/kg or <0.000001%) IGNORED Because: "<LOD"
xylene: (Whole conc. entered as: <0.01 mg/kg or <0.000001%) IGNORED Because: "<LOD"

Test Settings

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: Force this test to non hazardous because: "TPH unlikely to be flammable at concentrations <500mg/kg, no free product identified in boreholes"

Notes utilised in assessment

C14: Step 5
"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "arsenic trioxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chromium(III) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "copper (I) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "nickel dihydroxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "zinc chloride"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "TPH (C6 to C40) petroleum group"

Note 1 , used on:

Test: "HP 5 on STOT SE 2; H371, STOT RE 2; H373" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 6 on Acute Tox. 4; H302" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 6 on Acute Tox. 4; H332" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 7 on Carc. 2; H351" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 10 on Repr. 1A; H360, Repr. 1A; H360F, Repr. 1A; H360D, Repr. 1A; H360FD, Repr. 1A; H360Fd, Repr. 1A; H360Df, Repr. 1B; H360, Repr. 1B; H360F, Repr. 1B; H360D, Repr. 1B; H360FD, Repr. 1B; H360Fd, Repr. 1B; H360Df" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 10 on Repr. 2; H361, Repr. 2; H361f, Repr. 2; H361d, Repr. 2; H361fd" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Determinand notes

Note 1 , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Note A , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

WM3: Unknown oil , used on:

determinand: "TPH (C6 to C40) petroleum group"

Classification of sample: WS3

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

Sample details

Sample Name:
WS3
Sample Depth:
0.5 m
Moisture content: **0%**
(no correction)

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

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
arsenic trioxide: (Cation conc. entered: 8.8 mg/kg, converted to compound conc.:11.619 mg/kg or 0.00116%)
benzo[a]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
benzo[b]fluoranthene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
benzo[ghi]perylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
benzo[k]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
boron tribromide/trichloride/trifluoride (combined): (Cation conc. entered: 0.6 mg/kg, converted to compound conc.:8.058 mg/kg or 0.000806%)
cadmium sulfide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.643 mg/kg or <0.0000643%, Note 1 conc.: <0.00005%) IGNORED Because: "<LOD"
chromium(III) oxide: (Cation conc. entered: 21.7 mg/kg, converted to compound conc.:31.716 mg/kg or 0.00317%)
chromium(VI) oxide: (Cation conc. entered: <0.8 mg/kg, converted to compound conc.:<1.538 mg/kg or <0.000154%) IGNORED Because: "<LOD"
chrysene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
copper (I) oxide: (Cation conc. entered: 16.4 mg/kg, converted to compound conc.:18.465 mg/kg or 0.00185%)
dibenz[a,h]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
fluoranthene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
indeno[123-cd]pyrene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 16.7 mg/kg, converted to compound conc.:25.217 mg/kg or 0.00252%, Note 1 conc.: 0.00167%)
mercury dichloride: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.677 mg/kg or <0.0000677%) IGNORED Because: "<LOD"
naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
nickel dihydroxide: (Cation conc. entered: 15.6 mg/kg, converted to compound conc.:24.64 mg/kg or 0.00246%)
pH: (Whole conc. entered as: 7.8 pH, converted to conc.:7.8 pH or 7.8 pH)
phenanthrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
pyrene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) IGNORED Because: "<LOD"
TPH (C6 to C40) petroleum group: (Whole conc. entered as: 2 mg/kg or 0.0002%)
zinc chloride: (Cation conc. entered: 48.7 mg/kg, converted to compound conc.:101.516 mg/kg or 0.0102%)

Test Settings

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: Force this test to non hazardous because: "TPH unlikely to be flammable at concentrations <500mg/kg, no free product identified in boreholes"

Notes utilised in assessment

C14: Step 5
"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "arsenic trioxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[b]fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chromium(III) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "copper (I) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "nickel dihydroxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "pyrene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "zinc chloride"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "TPH (C6 to C40) petroleum group"

Determinand notes

Note 1 , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Note A , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

WM3: Unknown oil , used on:

determinand: "TPH (C6 to C40) petroleum group"

Classification of sample: WS8

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

Sample details

Sample Name:
WS8
Sample Depth:
0.4 m
Moisture content: **0%**
(no correction)

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

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
acenaphthylene: (Whole conc. entered as: 0.3 mg/kg or 0.00003%)
anthracene: (Whole conc. entered as: 0.4 mg/kg or 0.00004%)
arsenic trioxide: (Cation conc. entered: 10 mg/kg, converted to compound conc.:13.203 mg/kg or 0.00132%)
benzo[a]anthracene: (Whole conc. entered as: 1.1 mg/kg or 0.00011%)
benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 1.4 mg/kg or 0.00014%)
benzo[b]fluoranthene: (Whole conc. entered as: 1.3 mg/kg or 0.00013%)
benzo[ghi]perylene: (Whole conc. entered as: 0.7 mg/kg or 0.00007%)
benzo[k]fluoranthene: (Whole conc. entered as: 1.4 mg/kg or 0.00014%)
boron tribromide/trichloride/trifluoride (combined): (Cation conc. entered: 0.8 mg/kg, converted to compound conc.:10.744 mg/kg or 0.00107%)
cadmium sulfide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.643 mg/kg or <0.0000643%, Note 1 conc.: <0.00005%) IGNORED Because: "<LOD"
chromium(III) oxide: (Cation conc. entered: 19.4 mg/kg, converted to compound conc.:28.354 mg/kg or 0.00284%)
chromium(VI) oxide: (Cation conc. entered: <0.8 mg/kg, converted to compound conc.:<1.538 mg/kg or <0.000154%) IGNORED Because: "<LOD"
chrysene: (Whole conc. entered as: 1.7 mg/kg or 0.00017%)
copper (I) oxide: (Cation conc. entered: 23.3 mg/kg, converted to compound conc.:26.233 mg/kg or 0.00262%)
dibenz[a,h]anthracene: (Whole conc. entered as: 0.4 mg/kg or 0.00004%)
fluoranthene: (Whole conc. entered as: 2.6 mg/kg or 0.00026%)
fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
indeno[123-cd]pyrene: (Whole conc. entered as: 1 mg/kg or 0.0001%)
lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 18.4 mg/kg, converted to compound conc.:27.784 mg/kg or 0.00278%, Note 1 conc.: 0.00184%)
mercury dichloride: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.677 mg/kg or <0.0000677%) IGNORED Because: "<LOD"
naphthalene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
nickel dihydroxide: (Cation conc. entered: 15.4 mg/kg, converted to compound conc.:24.324 mg/kg or 0.00243%)
pH: (Whole conc. entered as: 9.4 pH, converted to conc.:9.4 pH or 9.4 pH)
phenanthrene: (Whole conc. entered as: 1.2 mg/kg or 0.00012%)
pyrene: (Whole conc. entered as: 2.2 mg/kg or 0.00022%)
selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite): (Cation conc. entered: 1 mg/kg, converted to compound conc.:1.5 mg/kg or 0.00015%)
TPH (C6 to C40) petroleum group: (Whole conc. entered as: 106 mg/kg or 0.0106%)
zinc chloride: (Cation conc. entered: 57.6 mg/kg, converted to compound conc.:120.068 mg/kg or 0.012%)

Test Settings

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: Force this test to non hazardous because: "TPH unlikely to be flammable at concentrations <500mg/kg, no free product identified in boreholes"

Notes utilised in assessment

C14: Step 5
"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "acenaphthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "anthracene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "arsenic trioxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[a]anthracene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[b]fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[ghi]perylene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[k]fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chromium(III) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "copper (I) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "dibenz[a,h]anthracene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "naphthalene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "nickel dihydroxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "phenanthrene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "pyrene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "zinc chloride"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "TPH (C6 to C40) petroleum group"

Note 1 , used on:

Test: "HP 5 on STOT SE 2; H371, STOT RE 2; H373" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 6 on Acute Tox. 4; H302" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 6 on Acute Tox. 4; H332" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 7 on Carc. 2; H351" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 10 on Repr. 1A; H360, Repr. 1A; H360F, Repr. 1A; H360D, Repr. 1A; H360FD, Repr. 1A; H360Fd, Repr. 1A; H360Df, Repr. 1B; H360, Repr. 1B; H360F, Repr. 1B; H360D, Repr. 1B; H360FD, Repr. 1B; H360Fd, Repr. 1B; H360Df" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 10 on Repr. 2; H361, Repr. 2; H361f, Repr. 2; H361d, Repr. 2; H361fd" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Determinand notes

Note 1 , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Note A , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"
determinand: "selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite)"

WM3: Unknown oil , used on:

determinand: "TPH (C6 to C40) petroleum group"

Classification of sample: WS9

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

Sample details

Sample Name:
WS9
Sample Depth:
0.3 m
Moisture content: **0%**
(no correction)

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

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
anthracene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
arsenic trioxide: (Cation conc. entered: 11.6 mg/kg, converted to compound conc.:15.316 mg/kg or 0.00153%)
benzo[a]anthracene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 0.3 mg/kg or 0.00003%)
benzo[b]fluoranthene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
benzo[ghi]perylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
benzo[k]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
boron tribromide/trichloride/trifluoride (combined): (Cation conc. entered: 0.6 mg/kg, converted to compound conc.:8.058 mg/kg or 0.000806%)
cadmium sulfide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.643 mg/kg or <0.0000643%, Note 1 conc.: <0.00005%) IGNORED Because: "<LOD"
chromium(III) oxide: (Cation conc. entered: 16.2 mg/kg, converted to compound conc.:23.677 mg/kg or 0.00237%)
chromium(VI) oxide: (Cation conc. entered: <0.8 mg/kg, converted to compound conc.:<1.538 mg/kg or <0.000154%) IGNORED Because: "<LOD"
chrysene: (Whole conc. entered as: 0.5 mg/kg or 0.00005%)
copper (I) oxide: (Cation conc. entered: 19 mg/kg, converted to compound conc.:21.392 mg/kg or 0.00214%)
dibenz[a,h]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
fluoranthene: (Whole conc. entered as: 0.6 mg/kg or 0.00006%)
fluorene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
indeno[123-cd]pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 504 mg/kg, converted to compound conc.:761.04 mg/kg or 0.0761%, Note 1 conc.: 0.0504%)
mercury dichloride: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.677 mg/kg or <0.0000677%) IGNORED Because: "<LOD"
naphthalene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
nickel dihydroxide: (Cation conc. entered: 12.2 mg/kg, converted to compound conc.:19.27 mg/kg or 0.00193%)
pH: (Whole conc. entered as: 11.2 pH, converted to conc.:11.2 pH or 11.2 pH)
phenanthrene: (Whole conc. entered as: 0.5 mg/kg or 0.00005%)
pyrene: (Whole conc. entered as: 0.5 mg/kg or 0.00005%)
selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) IGNORED Because: "<LOD"
TPH (C6 to C40) petroleum group: (Whole conc. entered as: 140 mg/kg or 0.014%)
zinc chloride: (Cation conc. entered: <45 mg/kg, converted to compound conc.:<93.803 mg/kg or <0.00938%) IGNORED Because: "<LOD"

benzene: (Whole conc. entered as: <0.01 mg/kg or <0.000001%) IGNORED Because: "<LOD"
toluene: (Whole conc. entered as: <0.01 mg/kg or <0.000001%) IGNORED Because: "<LOD"
ethylbenzene: (Whole conc. entered as: <0.01 mg/kg or <0.000001%) IGNORED Because: "<LOD"
xylene: (Whole conc. entered as: <0.01 mg/kg or <0.000001%) IGNORED Because: "<LOD"

Test Settings

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: Force this test to non hazardous because: "TPH unlikely to be flammable at concentrations <500mg/kg, no free product identified in boreholes"

Notes utilised in assessment

C14: Step 5

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

Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "acenaphthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "anthracene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "arsenic trioxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[a]anthracene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[b]fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chromium(III) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "copper (I) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "fluorene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "naphthalene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "nickel dihydroxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "phenanthrene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "pyrene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "TPH (C6 to C40) petroleum group"

Determinand notes

Note 1 , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Note A , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

WM3: Unknown oil , used on:

determinand: "TPH (C6 to C40) petroleum group"

Classification of sample: WS10

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

Sample details

Sample Name:
WS10
Sample Depth:
0.3 m
Moisture content: **0%**
(no correction)

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

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
arsenic trioxide: (Cation conc. entered: 9.2 mg/kg, converted to compound conc.:12.147 mg/kg or 0.00121%)
benzo[a]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 0.4 mg/kg or 0.00004%)
benzo[b]fluoranthene: (Whole conc. entered as: 0.3 mg/kg or 0.00003%)
benzo[ghi]perylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
benzo[k]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
boron tribromide/trichloride/trifluoride (combined): (Cation conc. entered: 0.8 mg/kg, converted to compound conc.:10.744 mg/kg or 0.00107%)
cadmium sulfide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.643 mg/kg or <0.0000643%, Note 1 conc.: <0.00005%) IGNORED Because: "<LOD"
chromium(III) oxide: (Cation conc. entered: 22.7 mg/kg, converted to compound conc.:33.177 mg/kg or 0.00332%)
chromium(VI) oxide: (Cation conc. entered: <0.8 mg/kg, converted to compound conc.:<1.538 mg/kg or <0.000154%) IGNORED Because: "<LOD"
chrysene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
copper (I) oxide: (Cation conc. entered: 16.1 mg/kg, converted to compound conc.:18.127 mg/kg or 0.00181%)
dibenz[a,h]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
indeno[123-cd]pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 26.3 mg/kg, converted to compound conc.:39.713 mg/kg or 0.00397%, Note 1 conc.: 0.00263%)
mercury dichloride: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.677 mg/kg or <0.0000677%) IGNORED Because: "<LOD"
naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
nickel dihydroxide: (Cation conc. entered: 16.8 mg/kg, converted to compound conc.:26.536 mg/kg or 0.00265%)
pH: (Whole conc. entered as: 8.1 pH, converted to conc.:8.1 pH or 8.1 pH)
phenanthrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) IGNORED Because: "<LOD"
TPH (C6 to C40) petroleum group: (Whole conc. entered as: <1 mg/kg or <0.0001%) IGNORED Because: "<LOD"
zinc chloride: (Cation conc. entered: 49.5 mg/kg, converted to compound conc.:103.184 mg/kg or 0.0103%)

Notes utilised in assessment

C14: Step 5
"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "arsenic trioxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[b]fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chromium(III) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "copper (I) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "nickel dihydroxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "zinc chloride"

Note 1 , used on:

Test: "HP 5 on STOT SE 2; H371, STOT RE 2; H373" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 6 on Acute Tox. 4; H302" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 6 on Acute Tox. 4; H332" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 7 on Carc. 2; H351" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 10 on Repr. 1A; H360, Repr. 1A; H360F, Repr. 1A; H360D, Repr. 1A; H360FD, Repr. 1A; H360Fd, Repr. 1A; H360Df, Repr. 1B; H360, Repr. 1B; H360F, Repr. 1B; H360D, Repr. 1B; H360FD, Repr. 1B; H360Fd, Repr. 1B; H360Df" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 10 on Repr. 2; H361, Repr. 2; H361f, Repr. 2; H361d, Repr. 2; H361fd" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Determinand notes

Note 1 , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Note A , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Classification of sample: WS4

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

Sample details

Sample Name:
WS4
Sample Depth:
0.2 m
Moisture content: **0%**
(no correction)

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

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
acenaphthylene: (Whole conc. entered as: 0.4 mg/kg or 0.00004%)
anthracene: (Whole conc. entered as: 0.4 mg/kg or 0.00004%)
arsenic trioxide: (Cation conc. entered: 107 mg/kg, converted to compound conc.:141.275 mg/kg or 0.0141%)
benzo[a]anthracene: (Whole conc. entered as: 1.7 mg/kg or 0.00017%)
benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 2.4 mg/kg or 0.00024%)
benzo[b]fluoranthene: (Whole conc. entered as: 2.2 mg/kg or 0.00022%)
benzo[ghi]perylene: (Whole conc. entered as: 2.2 mg/kg or 0.00022%)
benzo[k]fluoranthene: (Whole conc. entered as: 2.1 mg/kg or 0.00021%)
boron tribromide/trichloride/trifluoride (combined): (Cation conc. entered: 0.5 mg/kg, converted to compound conc.:6.715 mg/kg or 0.000672%)
cadmium sulfide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.643 mg/kg or <0.0000643%, Note 1 conc.: <0.00005%) IGNORED Because: "<LOD"
chromium(III) oxide: (Cation conc. entered: 77.2 mg/kg, converted to compound conc.:112.832 mg/kg or 0.0113%)
chromium(VI) oxide: (Cation conc. entered: <0.8 mg/kg, converted to compound conc.:<1.538 mg/kg or <0.000154%) IGNORED Because: "<LOD"
chrysene: (Whole conc. entered as: 1.9 mg/kg or 0.00019%)
copper (I) oxide: (Cation conc. entered: 26.6 mg/kg, converted to compound conc.:29.949 mg/kg or 0.00299%)
dibenz[a,h]anthracene: (Whole conc. entered as: 0.4 mg/kg or 0.00004%)
fluoranthene: (Whole conc. entered as: 2.9 mg/kg or 0.00029%)
fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
indeno[123-cd]pyrene: (Whole conc. entered as: 2 mg/kg or 0.0002%)
lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 105 mg/kg, converted to compound conc.:158.55 mg/kg or 0.0159%, Note 1 conc.: 0.0105%)
mercury dichloride: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.677 mg/kg or <0.0000677%) IGNORED Because: "<LOD"
naphthalene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
nickel dihydroxide: (Cation conc. entered: 19.2 mg/kg, converted to compound conc.:30.326 mg/kg or 0.00303%)
pH: (Whole conc. entered as: 8.4 pH, converted to conc.:8.4 pH or 8.4 pH)
phenanthrene: (Whole conc. entered as: 1 mg/kg or 0.0001%)
pyrene: (Whole conc. entered as: 2.7 mg/kg or 0.00027%)
selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite): (Cation conc. entered: 1.3 mg/kg, converted to compound conc.:1.95 mg/kg or 0.000195%)
zinc chloride: (Cation conc. entered: 60.1 mg/kg, converted to compound conc.:125.28 mg/kg or 0.0125%)

Notes utilised in assessment

C14: Step 5
"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "anthracene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "arsenic trioxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[a]anthracene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[b]fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[ghi]perylene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[k]fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chromium(III) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "copper (I) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "dibenz[a,h]anthracene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "naphthalene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "nickel dihydroxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "phenanthrene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "pyrene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "zinc chloride"

Note 1 , used on:

Test: "HP 5 on STOT SE 2; H371, STOT RE 2; H373" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 6 on Acute Tox. 4; H302" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 6 on Acute Tox. 4; H332" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 7 on Carc. 2; H351" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 10 on Repr. 1A; H360, Repr. 1A; H360F, Repr. 1A; H360D, Repr. 1A; H360FD, Repr. 1A; H360Fd, Repr. 1A; H360Df, Repr. 1B; H360, Repr. 1B; H360F, Repr. 1B; H360D, Repr. 1B; H360FD, Repr. 1B; H360Fd, Repr. 1B; H360Df" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 10 on Repr. 2; H361, Repr. 2; H361f, Repr. 2; H361d, Repr. 2; H361fd" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Determinand notes

Note 1 , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Note A , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"
determinand: "selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite)"

Classification of sample: WS5

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

Sample details

Sample Name:
WS5
Sample Depth:
0.5 m
Moisture content: **0%**
(no correction)

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

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: 0.3 mg/kg or 0.00003%)
acenaphthylene: (Whole conc. entered as: 1.1 mg/kg or 0.00011%)
anthracene: (Whole conc. entered as: 1 mg/kg or 0.0001%)
arsenic trioxide: (Cation conc. entered: 25 mg/kg, converted to compound conc.:33.008 mg/kg or 0.0033%)
benzo[a]anthracene: (Whole conc. entered as: 1 mg/kg or 0.0001%)
benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 1.8 mg/kg or 0.00018%)
benzo[b]fluoranthene: (Whole conc. entered as: 2 mg/kg or 0.0002%)
benzo[ghi]perylene: (Whole conc. entered as: 2.1 mg/kg or 0.00021%)
benzo[k]fluoranthene: (Whole conc. entered as: 1.5 mg/kg or 0.00015%)
boron tribromide/trichloride/trifluoride (combined): (Cation conc. entered: 0.6 mg/kg, converted to compound conc.:8.058 mg/kg or 0.000806%)
cadmium sulfide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.643 mg/kg or <0.0000643%, Note 1 conc.: <0.00005%) IGNORED Because: "<LOD"
chromium(III) oxide: (Cation conc. entered: 33.3 mg/kg, converted to compound conc.:48.67 mg/kg or 0.00487%)
chromium(VI) oxide: (Cation conc. entered: <0.8 mg/kg, converted to compound conc.:<1.538 mg/kg or <0.000154%) IGNORED Because: "<LOD"
chrysene: (Whole conc. entered as: 1.5 mg/kg or 0.00015%)
copper (I) oxide: (Cation conc. entered: 26.9 mg/kg, converted to compound conc.:30.286 mg/kg or 0.00303%)
dibenz[a,h]anthracene: (Whole conc. entered as: 1.2 mg/kg or 0.00012%)
fluoranthene: (Whole conc. entered as: 1.8 mg/kg or 0.00018%)
fluorene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
indeno[123-cd]pyrene: (Whole conc. entered as: 2.6 mg/kg or 0.00026%)
lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 55.8 mg/kg, converted to compound conc.:84.258 mg/kg or 0.00843%, Note 1 conc.: 0.00558%)
mercury dichloride: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.677 mg/kg or <0.0000677%) IGNORED Because: "<LOD"
naphthalene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
nickel dihydroxide: (Cation conc. entered: 18 mg/kg, converted to compound conc.:28.431 mg/kg or 0.00284%)
pH: (Whole conc. entered as: 10.6 pH, converted to conc.:10.6 pH or 10.6 pH)
phenanthrene: (Whole conc. entered as: 0.6 mg/kg or 0.00006%)
pyrene: (Whole conc. entered as: 3.3 mg/kg or 0.00033%)
selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite): (Cation conc. entered: 3.2 mg/kg, converted to compound conc.:4.8 mg/kg or 0.00048%)
zinc chloride: (Cation conc. entered: 64 mg/kg, converted to compound conc.:133.409 mg/kg or 0.0133%)
benzene: (Whole conc. entered as: <0.01 mg/kg or <0.000001%) IGNORED Because: "<LOD"
toluene: (Whole conc. entered as: <0.01 mg/kg or <0.000001%) IGNORED Because: "<LOD"

ethylbenzene: (Whole conc. entered as: <0.01 mg/kg or <0.000001%) IGNORED Because: "<LOD"
xylene: (Whole conc. entered as: <0.01 mg/kg or <0.000001%) IGNORED Because: "<LOD"

Notes utilised in assessment

C14: Step 5
"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "acenaphthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "anthracene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "arsenic trioxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[a]anthracene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[b]fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[ghi]perylene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[k]fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chromium(III) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "copper (I) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "dibenz[a,h]anthracene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "fluorene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "naphthalene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "nickel dihydroxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "phenanthrene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "pyrene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "zinc chloride"

Determinand notes

Note 1 , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Note A , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"
determinand: "selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite)"

Classification of sample: WS6

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

Sample details

Sample Name:
WS6
Sample Depth:
0.2 m
Moisture content: **0%**
(no correction)

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

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
acenaphthylene: (Whole conc. entered as: 0.3 mg/kg or 0.00003%)
anthracene: (Whole conc. entered as: 0.3 mg/kg or 0.00003%)
arsenic trioxide: (Cation conc. entered: 10.7 mg/kg, converted to compound conc.:14.127 mg/kg or 0.00141%)
benzo[a]anthracene: (Whole conc. entered as: 1.8 mg/kg or 0.00018%)
benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 2.8 mg/kg or 0.00028%)
benzo[b]fluoranthene: (Whole conc. entered as: 2.8 mg/kg or 0.00028%)
benzo[ghi]perylene: (Whole conc. entered as: 2.1 mg/kg or 0.00021%)
benzo[k]fluoranthene: (Whole conc. entered as: 2.3 mg/kg or 0.00023%)
boron tribromide/trichloride/trifluoride (combined): (Cation conc. entered: 0.5 mg/kg, converted to compound conc.:6.715 mg/kg or 0.000672%)
cadmium sulfide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.643 mg/kg or <0.0000643%, Note 1 conc.: <0.00005%) IGNORED Because: "<LOD"
chromium(III) oxide: (Cation conc. entered: 25.5 mg/kg, converted to compound conc.:37.27 mg/kg or 0.00373%)
chromium(VI) oxide: (Cation conc. entered: <0.8 mg/kg, converted to compound conc.:<1.538 mg/kg or <0.000154%) IGNORED Because: "<LOD"
chrysene: (Whole conc. entered as: 1.9 mg/kg or 0.00019%)
copper (I) oxide: (Cation conc. entered: 31.2 mg/kg, converted to compound conc.:35.128 mg/kg or 0.00351%)
dibenz[a,h]anthracene: (Whole conc. entered as: 0.5 mg/kg or 0.00005%)
fluoranthene: (Whole conc. entered as: 2.3 mg/kg or 0.00023%)
fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
indeno[123-cd]pyrene: (Whole conc. entered as: 2.1 mg/kg or 0.00021%)
lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 28 mg/kg, converted to compound conc.:42.28 mg/kg or 0.00423%, Note 1 conc.: 0.0028%)
mercury dichloride: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.677 mg/kg or <0.0000677%) IGNORED Because: "<LOD"
naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
nickel dihydroxide: (Cation conc. entered: 20.4 mg/kg, converted to compound conc.:32.222 mg/kg or 0.00322%)
pH: (Whole conc. entered as: 9.4 pH, converted to conc.:9.4 pH or 9.4 pH)
phenanthrene: (Whole conc. entered as: 0.5 mg/kg or 0.00005%)
pyrene: (Whole conc. entered as: 2.3 mg/kg or 0.00023%)
selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) IGNORED Because: "<LOD"
TPH (C6 to C40) petroleum group: (Whole conc. entered as: 16 mg/kg or 0.0016%)
zinc chloride: (Cation conc. entered: 72.2 mg/kg, converted to compound conc.:150.502 mg/kg or 0.0151%)

Test Settings

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: Force this test to non hazardous because: "TPH unlikely to be flammable at concentrations <500mg/kg, no free product identified in boreholes"

Notes utilised in assessment

C14: Step 5

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

Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "anthracene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "arsenic trioxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[a]anthracene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[b]fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[ghi]perylene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[k]fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chromium(III) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "copper (I) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "dibenz[a,h]anthracene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "nickel dihydroxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "phenanthrene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "pyrene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "zinc chloride"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "TPH (C6 to C40) petroleum group"

Note 1 , used on:

Test: "HP 5 on STOT SE 2; H371, STOT RE 2; H373" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 6 on Acute Tox. 4; H302" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 6 on Acute Tox. 4; H332" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 7 on Carc. 2; H351" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 10 on Repr. 1A; H360, Repr. 1A; H360F, Repr. 1A; H360D, Repr. 1A; H360FD, Repr. 1A; H360Fd, Repr. 1A; H360Df, Repr. 1B; H360, Repr. 1B; H360F, Repr. 1B; H360D, Repr. 1B; H360FD, Repr. 1B; H360Fd, Repr. 1B; H360Df" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 10 on Repr. 2; H361, Repr. 2; H361f, Repr. 2; H361d, Repr. 2; H361fd" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Determinand notes

Note 1 , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Note A , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

WM3: Unknown oil , used on:

determinand: "TPH (C6 to C40) petroleum group"

Classification of sample: WS6[1]

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

Sample details

Sample Name:
WS6[1]
Sample Depth:
1 m
Moisture content: **0%**
(no correction)

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

Hazard properties

None identified

Determinands (Moisture content: 0%, no correction)

acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
arsenic trioxide: (Cation conc. entered: 14.7 mg/kg, converted to compound conc.:19.409 mg/kg or 0.00194%)
benzo[a]anthracene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 0.2 mg/kg or 0.00002%)
benzo[b]fluoranthene: (Whole conc. entered as: 0.3 mg/kg or 0.00003%)
benzo[ghi]perylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
benzo[k]fluoranthene: (Whole conc. entered as: 0.3 mg/kg or 0.00003%)
boron tribromide/trichloride/trifluoride (combined): (Cation conc. entered: 1.4 mg/kg, converted to compound conc.:18.802 mg/kg or 0.00188%)
cadmium sulfide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.643 mg/kg or <0.0000643%, Note 1 conc.: <0.00005%) IGNORED Because: "<LOD"
chromium(III) oxide: (Cation conc. entered: 28.3 mg/kg, converted to compound conc.:41.362 mg/kg or 0.00414%)
chromium(VI) oxide: (Cation conc. entered: <0.8 mg/kg, converted to compound conc.:<1.538 mg/kg or <0.000154%) IGNORED Because: "<LOD"
chrysene: (Whole conc. entered as: 0.3 mg/kg or 0.00003%)
copper (I) oxide: (Cation conc. entered: 30 mg/kg, converted to compound conc.:33.777 mg/kg or 0.00338%)
dibenz[a,h]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
fluoranthene: (Whole conc. entered as: 0.6 mg/kg or 0.00006%)
fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
indeno[123-cd]pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 45.7 mg/kg, converted to compound conc.:69.007 mg/kg or 0.0069%, Note 1 conc.: 0.00457%)
mercury dichloride: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.677 mg/kg or <0.0000677%) IGNORED Because: "<LOD"
naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) IGNORED Because: "<LOD"
nickel dihydroxide: (Cation conc. entered: 22.6 mg/kg, converted to compound conc.:35.697 mg/kg or 0.00357%)
pH: (Whole conc. entered as: 7.5 pH, converted to conc.:7.5 pH or 7.5 pH)
phenanthrene: (Whole conc. entered as: 0.4 mg/kg or 0.00004%)
pyrene: (Whole conc. entered as: 0.5 mg/kg or 0.00005%)
selenium compounds (with the exception of cadmium sulfoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) IGNORED Because: "<LOD"
zinc chloride: (Cation conc. entered: 83.6 mg/kg, converted to compound conc.:174.266 mg/kg or 0.0174%)

Notes utilised in assessment

C14: Step 5
"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "arsenic trioxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[a]anthracene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[b]fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "benzo[k]fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chromium(III) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "chrysene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "copper (I) oxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "fluoranthene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "nickel dihydroxide"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "phenanthrene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "pyrene"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "zinc chloride"

Note 1 , used on:

Test: "HP 5 on STOT SE 2; H371, STOT RE 2; H373" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 6 on Acute Tox. 4; H302" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 6 on Acute Tox. 4; H332" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 7 on Carc. 2; H351" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 10 on Repr. 1A; H360, Repr. 1A; H360F, Repr. 1A; H360D, Repr. 1A; H360FD, Repr. 1A; H360Fd, Repr. 1A; H360Df, Repr. 1B; H360, Repr. 1B; H360F, Repr. 1B; H360D, Repr. 1B; H360FD, Repr. 1B; H360Fd, Repr. 1B; H360Df" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 10 on Repr. 2; H361, Repr. 2; H361f, Repr. 2; H361d, Repr. 2; H361fd" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"
Test: "HP 14 on R50, R52, R50/53, R51/53, R53, R52/53" for determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Determinand notes

Note 1 , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Note A , used on:

determinand: "lead compounds (with the exception of those listed separately in this Annex)"

Appendix A: Classifier defined and non CLP determinands

acenaphthene (CAS Number: 83-32-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=133563&HarmOnly=no
Data source date: 16/07/2012
Risk Phrases: R36, R37, R38, N; R50/53, N; R51/53
Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Aquatic Chronic 2; H411

acenaphthylene (CAS Number: 208-96-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=59285&HarmOnly=no
Data source date: 16/07/2012
Risk Phrases: R22, R26, R27, R36, R37, R38
Hazard Statements: Acute Tox. 4; H302, Acute Tox. 1; H330, Acute Tox. 1; H310, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315

anthracene (CAS Number: 120-12-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=101102&HarmOnly=no
Data source date: 08/03/2013
Risk Phrases: R36, R37, R38, R43, N; R50/53
Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

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

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=15793&HarmOnly=no
Data source date: 16/07/2012
Risk Phrases: N; R50/53
Hazard Statements: Aquatic Acute 1; H400, Aquatic Chronic 1; H410

boron tribromide/trichloride/trifluoride (combined)

Comments: Combines the risk phrases and the average of the conversion factors for Boron tribromide, Boron trichloride and Boron trifluoride
Data source: N/A
Data source date: 10/01/2011
Risk Phrases: R14, T+; R26/28, C; R34, C; R35
Hazard Statements: EUH014, Acute Tox. 2; H330, Acute Tox. 2; H300, Skin Corr. 1A; H314, Skin Corr. 1B; H314

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

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en
Data source date: 26/11/2012
Risk Phrases: R20, R22, R36, R37, R38, R42, R43, R50/53, R60, R61
Hazard Statements: Acute Tox. 4; H332, Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Resp. Sens. 1; H334, Skin Sens. 1; H317, Repr. 1B; H360FD, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

fluoranthene (CAS Number: 206-44-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=56375&HarmOnly=no
Data source date: 16/07/2012
Risk Phrases: R20, R22, R36, N; R50/53
Hazard Statements: Acute Tox. 4; H302, Acute Tox. 4; H332, Eye Irrit. 2; H319, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

fluorene (CAS Number: 86-73-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=81845&HarmOnly=no
Data source date: 16/07/2012
Risk Phrases: N; R50/53, R53
Hazard Statements: Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Aquatic Chronic 4; H413

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

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=128806&HarmOnly=no
Data source date: 08/03/2013
Risk Phrases: R40
Hazard Statements: Carc. 2; H351

lead compounds (with the exception of those listed separately in this Annex)

CLP index number: 082-001-00-6
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Risk Phrases: None.
Additional Hazard Statements: Carc. 2; H351
Reason:
03/06/2015 - Carc. 2; H351 hazard statement sourced from: Larsen et al., 2014; Survey of lead and lead compounds, Environmental Project No. 1539, The Danish Environmental Protection Agency

pH

Comments: Appendix C, C4.5
Data source: WM2 - Interpretation of the definition and classification of hazardous waste (Second Edition, version2.2), Environment Agency
Data source date: 30/05/2008
Risk Phrases: None.
Hazard Statements: None.

phenanthrene (CAS Number: 85-01-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=109754&HarmOnly=no
Data source date: 16/07/2012
Risk Phrases: R22, R36, R37, R38, R40, R43, N; R50/53
Hazard Statements: Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Carc. 2; H351, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Skin Irrit. 2; H315

pyrene (CAS Number: 129-00-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=87484&HarmOnly=no
Data source date: 16/07/2012
Risk Phrases: R23, N; R50/53
Hazard Statements: Acute Tox. 3; H331, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

TPH (C6 to C40) petroleum group

Comments: Risk phrase data given on page A41
Data source: WM2 3rd edition, 2013
Data source date: 01/08/2013
Risk Phrases: R10, R45, R46, R51/53, R63, R65
Hazard Statements: Flam. Liq. 3; H226, Asp. Tox. 1; H304, STOT RE 2; H373, Muta. 1B; H340, Carc. 1B; H350, Repr. 2; H361d, Aquatic Chronic 2; H411

ethylbenzene (CAS Number: 100-41-4)

CLP index number: 601-023-00-4
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
Additional Risk Phrases: None.
Additional Hazard Statements: Carc. 2; H351
Reason:
03/06/2015 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

Appendix B: Notes

C14: Step 5

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

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

Note 1

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

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

Note A

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

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

WM3: Unknown oil

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

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

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

"