Evans & Langford LLP

- Structural & Civil Engineers
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Land at Bell Farm, Church Road Harrietsham

Report on Phase 2 Intrusive Ground Investigation

	Name	Position	Signature	Date
Prepared by	Hannah Walters	Assistant Engineer		21 April 2015
Checked by	Colin Shackleford	Partner		21 April 2015

K E Monk & Son

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www.evanslangford.com

Partners: **S G Robertson / C P Shackleford / E G Stafford**
Associate: **T R Chainey**

Evans & Langford LLP, 91 King Street, Maidstone, Kent ME14 1BG
+44 (0)1622 690120 / mail@evanslangford.co.uk

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Report on Ground Investigation

1. Introduction

1.1 This report has been prepared on the instruction of K E Monk and Son. The instruction to proceed was conveyed by email dated 12 February 2015.

1.2 Terms of Reference It is proposed to construct a residential development on land at Bell Farm, Church Lane, in Harrietsham near Maidstone. An initial indicative layout shows the development to predominantly comprise semi-detached and detached properties with private gardens, a small number of apartments and terraced houses, totalling approximately 79 dwellings. Areas of open space are included as part of the development. This assessment has been undertaken as a second phase of investigation into the ground conditions and environmental constraints affecting the development. The report is based on the findings of intrusive ground investigation and subsequent laboratory testing. Evans & Langford LLP carried out a Phase 1 Preliminary Investigation for this site in September 2013, under project reference 12657X. Relevant information from that report is summarised herein but reference should be made to our previous report for full details.

1.3 Attention is drawn to the fact that, whilst every effort has been made to ensure the accuracy of the data contained herein and any analysis derived from it, the possibility remains that there may be a variation in the ground conditions around and between the discrete locations investigated. Evans & Langford LLP do not accept any responsibility for such variations. Furthermore, the recommendations contained in this report are specific to the project as proposed and should not be applied to any other project without prior reference to Evans & Langford LLP.

1.4 The ground investigation has been undertaken in accordance with the following British Standards:

- BS 5930:1999 (with amendment A2, 2010), “Code of Practice for Site Investigations”
- BS 10175:2011 (with amendment A1, 2013), “Code of Practice for the Investigation of Potentially Contaminated Sites”
- BS 1377, 1990, “Methods of test for Soils for Civil Engineering Purposes”

Reference is also made to relevant documents and reports published by:

- The Environment Agency and Defra
- Construction Industry Research and Information Association (CIRIA)
- Building Research Establishment (BRE)

2. The Site, Geology and Summary of Previous Reports

2.1 The site is located approximately 0.3km to the south east of the centre of the village of Harrietsham and 2.7km to the west of Lenham, as shown on Figure 1. The site is centred on approximate National Grid Reference 587115, 152560.

2.2 The site covers an area of approximately 3.7Ha and comprises two fields dived by Church Road, which runs approximately north east to south west. The site is used for agricultural purposes with an oast and other farm buildings adjacent to Church Road on the western field. The boundaries of the site are generally defined by trees, largely ash, or hedges, often with post and wire/mesh fences. A more detailed description of the site and surrounding area can be found in our Phase 1 report.

2.3 Reference to the topographical survey of the site shows that the highest point of the eastern field lies at 95.9mOD in the north eastern corner and slopes down to the south western corner, although the north eastern corner is relatively flat. There is a slightly higher ridge of land running approximately centrally through the site, in a north to south orientation and the low point is at the south eastern corner at 91.8mOD. The gate close to the south western corner of this field is at approximately 93.0mOD. The highest point of the western field lies at approximately 94.6mOD in the north east corner. The site slopes downwards to the south west with the lowest point in the south western corner at approximately 89.9mOD.

2.4 Evans & Langford LLP carried out a Phase 1 Preliminary Investigation of this site in September 2013. This investigation comprised a walkover survey of the site, a study of the site's history by reference to historic Ordnance Survey maps, a search of databases held by various bodies in order to assess the site's current environmental setting, and a review of published geological records for the area. The purpose of the Phase 1 Investigation was to identify environmental risks associated with the proposals, whether these were risks to the development, resulting from contamination of the site having occurred as a result of past or current usage of the site or adjacent land, or risks caused by the site or its development to neighbouring properties or the wider environment. Reference should be made to our report reference 12657X, dated September 2013, (hereon referred to as the E&L Phase 1 report) for full details of the investigation. A summary of the findings of this work is given below.

- The site is underlain by the Gault Formation. At the northern edge of the eastern half of the site, this is overlain by the West Melbury Marly Chalk Formation (the lowest part of the Lower Chalk). The Folkestone Formation, which underlies the Gault Formation, outcrops immediately to the south of the site and is locally, close to the site, mantled by superficial 4th River Terrace Deposits.

- The Gault Formation is classified as unproductive strata in terms of groundwater resources. The Chalk and the Folkestone Formation are classified as Principal Aquifers. The River Terrace deposits are classified as a Secondary A Aquifer.
- The southern half of the western field lies within a total catchment groundwater source protection zone (SPZ3), the remainder of the site lies outside of any SPZs.
- There are no water abstractions within 1km of the site; there is a public water supply borehole 1121m to the north west.
- Nearest surface water feature is a stream, a secondary river, 175m to the north west, flowing to the west. The site is not at risk of flooding from rivers or seas. A small pond is noted on site, close to the southern boundary of the western field, on some historic mapping.
- The earliest maps show the site to be on open rural land divided by Church Road, partly orchards for a short time with farm buildings in the eastern field close to Church Road. A building was shown on the eastern field between 1955 and 1993.
- Immediately to the west are works, believed to have been used for caravan sales from 1955 to the present day.
- There are no known significant or major pollution incidents within 500m.
- The closest waste related site lies 224m to the east.

2.5 The Phase 1 Report concluded that the following were possible sources of contamination:

- Farming/agricultural uses of the site e.g. spreading of manure or sludge (possible heavy metals), unrecorded burial of animals or waste, storage and use of pesticides/fuels etc, vehicle maintenance and refuelling, use of buildings for other commercial operations;
- Construction/development – elevated contaminants in fill brought to site during development and infilling of pond;
- Industrial/commercial uses – works immediately west and former garage to south east.

2.6 The Phase 1 Report concluded that possible pathways from the transmission of contaminants were:

- Lateral migration of contaminants through the Chalk below the extreme north of the site. Given the limited extent of the chalk outcrop on site, the potential impact of this was considered to be very low.
- Within the Folkestone Formation at depth, below the Gault Formation;
- Groundwater, deep below the site;
- Direct skin contact with, and inhalation and ingestion of soils/dusts/vapour by construction workers/future residents.

The Gault Formation was considered unlikely to provide a pathway by which contaminants could travel.

2.7 Possible receptors identified were:

- Future residents (most sensitive) and visitors;
- Construction workers;
- Principal Aquifers on/near the site;
- Foundations and underground services, and vegetation.

2.8 The identified potential source-pathway-receptor linkages were summarised in the Conceptual Site Model (CSM) in the Phase 1 report. The risk of these potential linkages resulting in actual health/environmental hazards was characterised qualitatively as 'Low' or 'Low to Moderate' in all cases. Further assessment, following intrusive investigation, was considered necessary. It was considered that a limited scope of intrusive investigation and further risk assessment were required, focused around the buildings with additional locations scattered across the entire site.

2.9 In addition to the Phase 1 report, two cable percussion boreholes were drilled on the site, one in each of the fields, near to their southernmost corners. Both found a thin (0.40m thick) layer of Topsoil/Fill over the Gault Formation, comprising an upper layer of gravelly CLAY, over stiff to very stiff CLAY. In the western field, in BH2, the Folkestone Formation comprising gravelly CLAY over SAND was encountered below 10.30m; this formation was not found in BH1 in the eastern field, drilled to 15.00m. The purpose of these boreholes was to assess the possibility of using soakaways on the site and to confirm soil conditions. It was concluded that due the very low permeability of the clay soils, the localised presence of perched water at shallow depth (BH1) and the sub-artesian groundwater table within the Folkestone Formation (BH2), surface water disposal via soakaways was not a viable option and that off-site disposal to existing sewers/ditches would have to be utilised. Full details of these findings are provided in Evans & Langford LLP letter reference 12657X/CPS dated 02 August 2013.

3. Fieldwork

3.1 The fieldwork was carried out on 02 and 03 March 2015 and comprised the following:

- 12 no. windowless sampler boreholes to a depth of 4m;
- 6 no. in-situ California Bearing Ratio (CBR) tests using the Perth Dynamic Cone Penetrometer.

3.2 The locations of the exploratory holes are shown on Figure 2. The borehole logs are included as Figures 3-14. Reference should be made to the logs for detailed information on the strata encountered, the type and depth of samples recovered, and the results of any in-situ tests carried out, a summary only being presented below.

Fill	All boreholes found Fill to depths between 0.40m in WS7 and 1.30m in WS5. The Fill typically comprised gravelly topsoil and reworked natural soils. Gravel was predominantly of flint and chalk. Fragments of brick were seen in WS3, 5, 11 and 12, and concrete in WS5.
West Melbury Marly Chalk Formation	This was seen only in WS8 and WS9, at the northern edge of the eastern field. In WS8 it was present between 0.60 and 1.40m, and in WS9, from 1.20m to the base of the borehole at 4.00m. In WS9, three discrete layers were found; comprising cream white gravelly CLAY, light cream unstructured CHALK, and light cream chalky CLAY. Gravel was of chalk. In WS8 this was seen as cream-orange gravelly CLAY; gravel again being of chalk.
Gault Formation	All positions found Gault Formation below the Fill or Chalk with the exception of WS9 where Gault was not encountered within the depth drilled. The Gault Formation typically comprised a number of layers. The upper layer(s) were typically of green grey, grey brown or orange brown gravelly fissured CLAY; the gravel being of flint and locally chalk. The lower layer was of firm to stiff/stiff grey/dark grey/green grey fissured CLAY.

3.3 There was no visual or olfactory evidence of contamination in any of the boreholes.

3.4 Groundwater was not encountered in any of the boreholes; all holes remained dry and stable whilst open. It should be noted that groundwater observations made during fieldwork are not necessarily indicative of the equilibrium groundwater level due to the

short time that the holes remained open. It should also be noted that groundwater levels can vary seasonally and in the long term.

3.5 In-situ Perth DCP CBR tests were carried out adjacent to WS1, 3, 5, 8, 10 and 12 to give general site-wide coverage. The CBR at typical formation depths was 2.9% or above. Full profiles are appended to this document.

4 Laboratory Testing

4.1 A programme of laboratory testing was undertaken upon completion of the fieldwork, to provide data on the geotechnical properties and chemical composition of the soils encountered. The tests carried out were as follows:

Geotechnical testing:

- 7 no. determinations of moisture content;
- 7 no. determinations of Atterberg limits.

Analytical testing:

- 18 no. suites of soil analysis for common metallic and inorganic contaminants;
- 18 no. speciated analyses for polyaromatic hydrocarbons;
- 20 no. speciated analyses for petroleum hydrocarbons;
- 18 no. analyses for water soluble sulfate content and pH;
- 18 no. analyses for organic content;
- 3 no. Asbestos identifications (with quantification where present);
- 3 no. analysis for organo-phosphorous pesticides;
- 3 no. analysis for organo-chlorine pesticides.

The results of the testing are presented in Appendices A and B.

5 Engineering Considerations

5.1 General

5.1.1 It is proposed to construct a residential development across the site. Initial, indicative proposals show predominantly detached and semi-detached properties with private gardens, open space, access roads and parking areas.

5.1.2 The investigation confirmed that the site was underlain by between 0.40m and 1.30m of Fill, typically comprising gravelly topsoil and reworked (i.e. ploughed) natural clay. The gravel content within the Fill was predominantly flint and chalk with brick and concrete being encountered locally. The Gault Formation was present in all boreholes except WS9, which remained in the West Melbury Marly Chalk Formation to its base at 4.00m. The Gault Formation was typically firm to stiff/stiff grey fissured CLAY, containing gravel of chalk and flint in the upper layers. The West Melbury Marly Chalk Formation comprised clayey chalk/chalky clay.

5.1.3 Where possible, the strength of the clay soils present was measured using a hand penetrometer. These tests typically indicated medium strength conditions at shallow depth, increasing to high/very high strength by the base of the boreholes.

5.1.4 The geotechnical laboratory testing demonstrated that the clay soils of the Gault Formation were of were of medium to very high plasticity and low to high volume change potential. The sample of the West Melbury Marly Chalk Formation tested was of medium plasticity and low volume change potential. It is recommended that high volume change potential be assumed for the majority of the site, where the Gault Formation is present from shallow depth. Low volume change potential conditions could be assumed for the area around WS9, where the West Melbury Marly Chalk was present to depth. Further investigation would be required to delineate the area where this material was present to sufficient depth; it may thus be simpler to assume high volume change potential for the whole site.

5.1.5 None of the boreholes encountered groundwater. The comments made in section 3.4 above should be borne in mind, with respect to seasonal/long term water levels.

5.2 Foundations

5.2.1 It is considered that the near surface soils will provide adequate support for conventional strip/trench fill or pad foundations. Foundations for the new structures should be constructed at a depth derived from whichever of the following criteria yields the greatest foundation depth:

- 0.30m below the base of any Fill;
- 0.30m below any softened or disturbed soil;
- For foundations outside the zone of influence of trees, a minimum depth of 1.00m would apply (for a clay soil of high volume change potential). In the area around WS9 this condition could reduce to 0.75m.
- For foundations within the zone of influence of trees, foundation depth derived from NHBC standards Chapter 4.2, "Building Near Trees" for a clay soil of high volume change potential (potentially, low volume change potential around WS9), based on existing tree heights for trees which are to be removed, and mature tree heights for trees which are to remain.
- 0.30m below the lowest root/rootlet encountered.

5.2.2 The soils at the minimum foundation depth stated above (i.e. 0.75/1.00m) are typically described as being of firm consistency, with hand penetrometer test results indicating medium to high strength. It is considered that an allowable bearing pressure of 100kN/m^2 may be adopted for design, provided that the depth to breadth ratio of the foundations is >1.0. If this is not possible then a lower figure, of 75kN/m^2, would apply. It may be beneficial to take foundations slightly deeper than the minimum depth, in order to allow the use of higher applied bearing pressures. By a depth of 1.50m, all boreholes had encountered clay of higher strength; an allowable bearing pressure of 150kN/m^2 could be utilised (if D/B>1.0; 125kN/m^2 if not) at this depth. Settlement at this degree of loading is not considered likely to be significant.

5.2.3 The higher allowable bearing pressure at 1.50m depth would apply to all areas except those around WS9; this borehole did encounter the higher strength clay (between 1.20m and 2.10m) but below this, between 2.10m and 3.00m, was a layer of chalk of uncertain strength (it is likely to have been disturbed by the drilling process), with softer clay also present below. In this area it would be prudent to limit the applied pressure to the lower figures stated above i.e. 100kN/m^2 for foundations with D/B>1.0.

5.2.4 Any steps in foundations, necessitated by the varying influence of trees across the site, should be detailed according to the guidance given in NHBC Chapter 4.4, "Strip and Trench Fill Foundations".

5.2.5 There is a potential for heave to occur in clay soils where foundation excavations sever roots from adjacent trees, isolating a block of clay within the foundations and allowing it to recover moisture over time. Heave can also occur where trees are removed to facilitate construction. It may therefore be necessary, locally, to provide compressible material to the inside faces of foundations, detailed in accordance with NHBC Chapter 4.2.

5.2.6 It is recommended that suspended floors be utilised throughout, given the presence of Fill, over clay soils of up to high volume change potential below, which may be subject to seasonal shrinkage and swelling, and the local potential for heave to occur within the zone of influence of trees. Floors should have a clear void beneath, detailed in accordance with NHBC Chapter 4.2.

5.2.7 The clay soils encountered will be susceptible to softening/disturbance during construction. Therefore, if concreting is not to take place immediately, the formation should be protected by blinding with a thin layer of concrete upon reaching the required depth, after any necessary inspections. Any softened material should be removed.

5.2.8 It is unlikely that groundwater will be encountered within the excavations necessary for foundation construction. However, the comments made previously should obviously be borne in mind, with respect to seasonal/long term variations in water level.

5.2.9 Excavations are considered likely to largely remain stable for the duration required. Small collapses may occur in the fill and any predominantly granular soils, or more gravelly clays. More significant collapses may occur if excavations in clay soils are left open for an extended period; collapse may occur without warning. A properly designed excavation support system will obviously be required where man-entry is required.

5.3 Buried Concrete

5.3.1 The results of the chemical tests (see Appendix B) carried out on soil samples indicate that Design Sulphate Class 1 conditions generally exist on this site, in accordance with BRE Special Digest 1:2005, “Concrete in Aggressive Ground”. The nature of the site (natural ground), pH (slightly acidic to slightly alkaline) and groundwater conditions (static) on site are commensurate with an Aggressive Chemical Environment for Concrete (ACEC) classification of AC-1s.

5.4 Roads and Hardstanding

5.4.1 As noted in section 3.5, the CBR value measured at typical formation depths was at least 2.9%. As such, a capping layer may be required beneath the proposed access road and parking areas. The required thickness of capping material may be reduced by incorporating a layer of geogrid reinforcement.

5.4.2 Upon completion of site stripping, the formation should be proof rolled and any soft spots removed and replaced with well compacted granular fill. A minimum construction thickness of 450mm should be adopted, to guard against frost attack.

5.4.3 The formation is likely to be susceptible to softening during wet weather, with the result that the CBR will reduce if the formation is not protected. Movement on site is likely to become difficult unless adequate precautions are taken, i.e., placement of geotextile and hardcore on heavily trafficked routes.

6 Contamination Assessment

6.1 Soil Appraisal Criteria

6.1.1 The results of the analytical testing have been appraised in the context of the 'Contaminated Land Exposure Assessment' (CLEA) reports published jointly by DEFRA and the Environment Agency in 2002, with later revisions. These set out the methodology behind the derivation of the Soil Guideline Values (SGVs), which are generic assessment criteria based on ensuring that risks to human health, caused by exposure to contaminants by a number of different pathways are kept to an acceptable level. If a SGV is exceeded for a particular contaminant, the implication is that there might, in specific cases, be an unacceptable risk to human health, and there is a need for further investigation and/or remediation. Soil Guideline Values do not address the risk to controlled waters.

6.1.2 The SGVs published in 2002 were withdrawn following the publication of the DEFRA document, "Outcome of the Way Forward Exercise on Soil Guideline Values" in July 2008. To date, revised values have been published only for Mercury, Selenium, Arsenic, Nickel, Cadmium, Phenols, the BTEX compounds and Dioxins, Furans and dioxin like PCBS, with others to follow. Therefore, reference has also been made to the ATRISK^{SOIL} Soil Screening Values, published by Atkins Consultants, which were derived using the EA published risk assessment package, CLEA (v.1.04 and v 1.06). These figures are used here under licence from Atkins. Further technical details are available on request but are not reproduced here due to copyright restrictions.

6.1.3 In 2014, DEFRA published the findings of their research project SP1010, "Development of Category 4 Screening Levels for assessment of land affected by contamination". The aim of this research project was to provide technical guidance to support Defra's revised Statutory Guidance (SG) for Part 2A of the Environmental Protection Act 1990 (Part 2A). Part 2A was originally introduced to ensure that the risks from land contamination to human health, property and the environment are managed appropriately, with the revised SG being designed to address concerns regarding its real-world application. The revised SG presented a new four category system for classifying land under Part 2A, ranging from Category 4, where the level of risk posed is acceptably low, to Category 1, where the level of risk is clearly unacceptable. Category 4 Screening Levels (C4SLs) were subsequently derived to provide a simple test for deciding that land is suitable for use and definitely not contaminated land. Subsequent guidance has determined that the C4SLs may be utilised within the planning regime i.e. as pragmatic screening values for use in the assessment of land for development.

6.1.4 Atkins' Soil Screening Values are currently available for a wide range of contaminants, for a range of end uses, as follows:

- Residential land use, with and without the consumption of home grown vegetables
- Commercial
- Parks
- Open spaces

6.1.5 The EA SGVs are available for residential (assuming consumption of some home grown produce), allotments, and commercial/industrial end uses.

6.1.6 The Defra C4SLs are currently available for Arsenic, Benzene, Benzo(a)Pyrene, Cadmium, Chromium (VI), and Lead.

6.1.7 For reference, the key features of the CLEA residential land use conceptual model are reproduced below:

- Critical receptor is a young female child (aged 0 to 6 years old);
- Exposure duration is 6 years;
- Exposure pathways include direct soil and indoor dust ingestion, consumption of home grown produce, consumption of soils adhering to home grown produce, skin contact with soils and indoor dusts, and inhalation of indoor and outdoor dust and vapours;
- Building type is a two-storey small terraced house

6.1.8 The above idealised land use model is broadly consistent with the proposed usage for the site although the housing type is yet to be confirmed. The relevant residential SGV/SSVs (with the consumption of home grown produce) will be used as a first tier of assessment. Any exceedances would be subject to further assessment (potentially by reference to the C4SLs, if a figure is available for the contaminant(s) of concern, and its use is appropriate) as opposed to indicating an immediate need for remediation.

6.1.9 The Atkins screening values have been used throughout, since the EA figures are based on a soil organic matter (SOM) content of 6%. Atkins also provides SSVs based on a soil organic matter content of 1%. The organic matter content of the samples tested on this site was between 0.4% and 9.5%, with an average of 3.6%. Therefore the Atkins figures for 1% organic matter have been used, these being the more conservative of the two sets of figures[1].

[1] The figures for Arsenic, Cadmium, Nickel, inorganic Mercury and Selenium are identical to the EA values, because SOM content does not have a significant effect on the CLEA model output for these contaminants.

6.2 Assessment of Results

6.2.1 An assessment of the results for this site, relative to the relevant assessment criteria, is presented below. The results have been compared to the Atkins SSVs for a residential land use scenario, with the consumption of home-grown produce, and assuming 1% soil organic matter, as published on 08 January 2015.

Contaminant	Unit	Mean Value[1]	Maximum Value	Screening Value[2,3]	Number exceeding screening value/ comments
Arsenic	(mg/kg)	8.52	14.80	32.0	0
Cadmium	(mg/kg)	0.50**	0.50	10.0	0; None above MDL
Total Chromium	(mg/kg)	22.79	33.30	N/A	-
Hexavalent Chromium	(mg/kg)	0.80**	0.80	14.2[6]	0; None above MDL
Lead	(mg/kg)	39.86	147.00	276[6]	0
Mercury	(mg/kg)	0.50**	0.50	0.0607 (elemental)	MDL> SSV; None above MDL
Nickel	(mg/kg)	24.31	45.60	130	0
Copper[4]	(mg/kg)	17.39	32.70	3,970	0
Zinc[4]	(mg/kg)	66.42	125.00	16,900	0
Selenium	(mg/kg)	1.04	1.40	350	0
pH value		7.58	6.40*	N/A	-
Water Soluble Sulfate[4]	(g/l SO_4)	0.03	0.07	-	See 5.3.1 above.
Total Cyanide	(mg/kg)	1.08	2.50	34	0
Free Cyanide	(mg/kg)	1.00**	1.00	-	0; None above MDL
Total Monohydric Phenols	(mg/kg)	6.00**	6.00	162	0; None above MDL
Soil Organic Matter	%	3.57	9.50	N/A	-
Asbestos	-	-	-	-	None identified
Polyaromatic Hydrocarbons					
Naphthalene	(mg/kg)	0.50**	0.50	0.585	0; None above MDL
Acenaphthylene	(mg/kg)	0.50**	0.50	-	See comments below; None above MDL
Acenaphthene	(mg/kg)	0.50**	0.50	588	0; None above MDL
Fluorene	(mg/kg)	0.50**	0.50	615	0; None above MDL
Phenanthrene	(mg/kg)	0.58	1.90	-	See comments below
Anthracene	(mg/kg)	0.50**	0.50	8270	0; None above MDL
Fluoranthene	(mg/kg)	0.82	5.50	822	0
Pyrene	(mg/kg)	0.77	4.80	563	0
Benzo(a)anthracene	(mg/kg)	0.64	3.00	4.52	0

Contaminant	Unit	Mean Value[1]	Maximum Value	Screening Value[2,3]	Number exceeding screening value/ comments
Chrysene	(mg/kg)	0.70	3.40	585	0
Benzo(b)fluoranthene	(mg/kg)	0.74	3.30	7.72	0
Benzo(k)fluoranthene	(mg/kg)	0.69	3.10	84.4	0
Benzo(a)pyrene	(mg/kg)	0.73	3.50	0.818	2 (WS1 at 0.20m & 11 at 0.50m)
Indeno(123-cd)pyrene	(mg/kg)	0.64	2.70	7.31	0
Dibenz(ah)anthracene	(mg/kg)	0.51	0.60	0.838	0
Benzo(ghi)perylene	(mg/kg)	0.61	2.40	96.2	0
Total PAH	(mg/kg)	4.89	35.00	-	-
Petroleum Hydrocarbons[5]					
$>C_8$-C_{10}	(mg/kg)	1.00**	1.00	9.79	0; None above MDL
$>C_{10}$-C_{12}	(mg/kg)	1.00**	1.00	57.3	0; None above MDL
$>C_{12}$-C_{16}	(mg/kg)	1.00**	1.00	142	0; None above MDL
$>C_{16}$-C_{21}	(mg/kg)	1.00**	1.00	272	0; None above MDL
$>C_{21}$-C_{35}	(mg/kg)	3.16	7.30	888	0
$>C_{35}$-C_{40}	(mg/kg)	1.00**	1.00	-	0; None above MDL
Total Petroleum Hydrocarbons ($>C_8$-C_{40})	(mg/kg)	3.16	7.30	-	0

Notes:

1 Test results below detection limit have been assumed to be equal to the detection limit for the purposes of calculating a mean value.
2 Screening values are Atkins' **AT**RISK[SOIL] SSVs for 'residential land' use with the consumption of home grown produce.
3 Soil Screening Value based on 1% Soil Organic Matter.
4 Not considered to be a risk to human health (but a risk to water/vegetation). Sulfate a risk to buried concrete.
5 Different SSVs exist for the aromatic and aliphatic fractions of TPH. However only a basic speciation was carried out; therefore, the lower of the two SSVs for each TPH fraction has been used for this screening exercise.
6 Atkins have withdrawn the SSV for Hexavalent Chromium and Lead following recent review of the toxicological data for these contaminants. The previously published (March 2011) values are presented in the table, for initial assessment purposes.

* pH is minimum value measured.
** Indicates contaminants that were not present above detection limits in any sample.

NA Not available.
MDL Method detection level.

6.2.2 Screening values are not currently available for a number of contaminants, as follows: Acenaphthylene, Phenanthrene: SSVs do not exist for these two PAHs. This issue has been addressed by the authors of the SSVs, as follows: *"The lack of SSVs for acenaphthylene and phenanthrene is related to the absence of specific toxicological*

information (based on our research to date). As a threshold contaminant it is not appropriate to use a TEF (toxic equivalency factor) approach based upon the toxicity of benzo(a)pyrene. We would have revisited this if these compounds had been particularly problematic on sites over the previous three years, however this has not been the case, and the other PAHs (14 total) are often accepted as suitable risk indicators."

Given this response, the concentrations of these two compounds present are not considered to be significant.

6.2.3 From the table in section 6.2.1, it can be seen that contaminant concentrations are generally low and are not of concern with respect to human health, in a residential setting (with the consumption of home grown produce).

6.2.4 The Soil Screening Values for mercury vary depending on the type present; for elemental mercury (the pure metal) the SSV is very low, at 0.067mg/kg. However, for inorganic mercury, which is the most common form in UK soils, the SSV is much higher, at 170mg/kg. The laboratory test determines the *total* mercury concentration (i.e. all types of mercury). Given that no sample contained a total concentration of more than 0.50mg/kg (the method detection limit), there is not considered to be a health risk as a result.

6.2.5 The notes accompanying the SSVs state that for the majority of polyaromatic hydrocarbons listed in the table in 6.2.1 above, the lower of the vapour or aqueous based saturation limits was exceeded in the calculation of screening criteria in the CLEA software. Atkins therefore present the 'combined assessment criterion' produced by the CLEA software as the SSV and suggest its use provided that free product is not observed. Use of the lower values should be considered if free product is observed; these are presented alongside the SSVs on the Atrisk website. No free product was observed on this site; therefore, it is considered appropriate to use the higher values.

6.2.6 No sample contained any concentration of petroleum hydrocarbon compounds above the relevant screening value. This was also the case for all polyaromatic hydrocarbon compounds with the exception of benzo(a)pyrene. Elevated concentrations of benzo(a)pyrene were recorded in WS1 at 0.20m (3.5mg/kg) and WS11 at 0.20m (1.60mg/kg), compared to the soil screening value of 0.82mg/kg. The DEFRA report referred to in 6.1.3 provides a Category 4 Screening Level for Benzo(a)pyrene, for residential land use (with consumption of home grown produce) of 5.0mg/kg. Given that this concentration is deemed to indicate an acceptable level of risk, the occurrence of two concentrations at significantly less than this value is not considered to indicate any need for remediation.

6.2.7 Three samples of the Fill were subjected to screening for asbestos fibres. Their presence was not detected in any sample.

6.2.8 Three samples were also analysed for a range of organo-chlorine and organo-phosphorus pesticides. The majority of the compounds were not present above the laboratory method detection limit. The exceptions to this were p,p DDE and p,p DDT, which recorded maximum values of 30µg/kg and 12µg/kg respectively. There are no published screening levels in the UK for these compounds. A document published by the European Commission (*European Commission (2007) EUR 22805 EN: Derivation Methods of Soil Screening Values in Europe. A Review and Evaluation of National Procedures towards Harmonisation*) compiles screening values for potentially unacceptable risk (residential use) used in European Countries. Finland, Poland and the Netherlands have screening values of 2.01mg/kg, 1.0mg/kg and 4.0mg/kg respectively for the sum of DDE and DDT and DDD compounds. On this site, the sums of these three compounds in the three samples tested were 51µg/kg, 32µg/kg, and 30µg/kg (*test results below detection limit have been assumed to be equal to the detection limit for the purposes of this comparison*). Given that the lowest screening value in the European Commission document referred to is 1000µg/kg (1mg/kg), the concentrations of these compounds measured on site are not considered to be of concern.

6.2.9 In light of the results of the analytical testing, risks to all potential receptors are considered to be **Low**. No remediation is considered to be necessary.

6.2.10 As mentioned previously the CLEA regime is concerned with the protection of human health and does not address risks to controlled waters. However, based on the low concentrations of contaminants generally measured, it is considered unlikely that the site could have had, or be having, any negative impact on the groundwater below the site, or on any other off-site receptor.

6.2.11 Conventional PPE, welfare facilities and working practices should be employed, as on any construction project.

6.2.12 Irrespective of the conditions encountered to date, the possibility remains that 'hot spots' of more significant contamination could exist elsewhere on the site, away from locations already investigated. The Contractor should seek advice if any unusual conditions are encountered, with respect to possible further investigation/analysis.

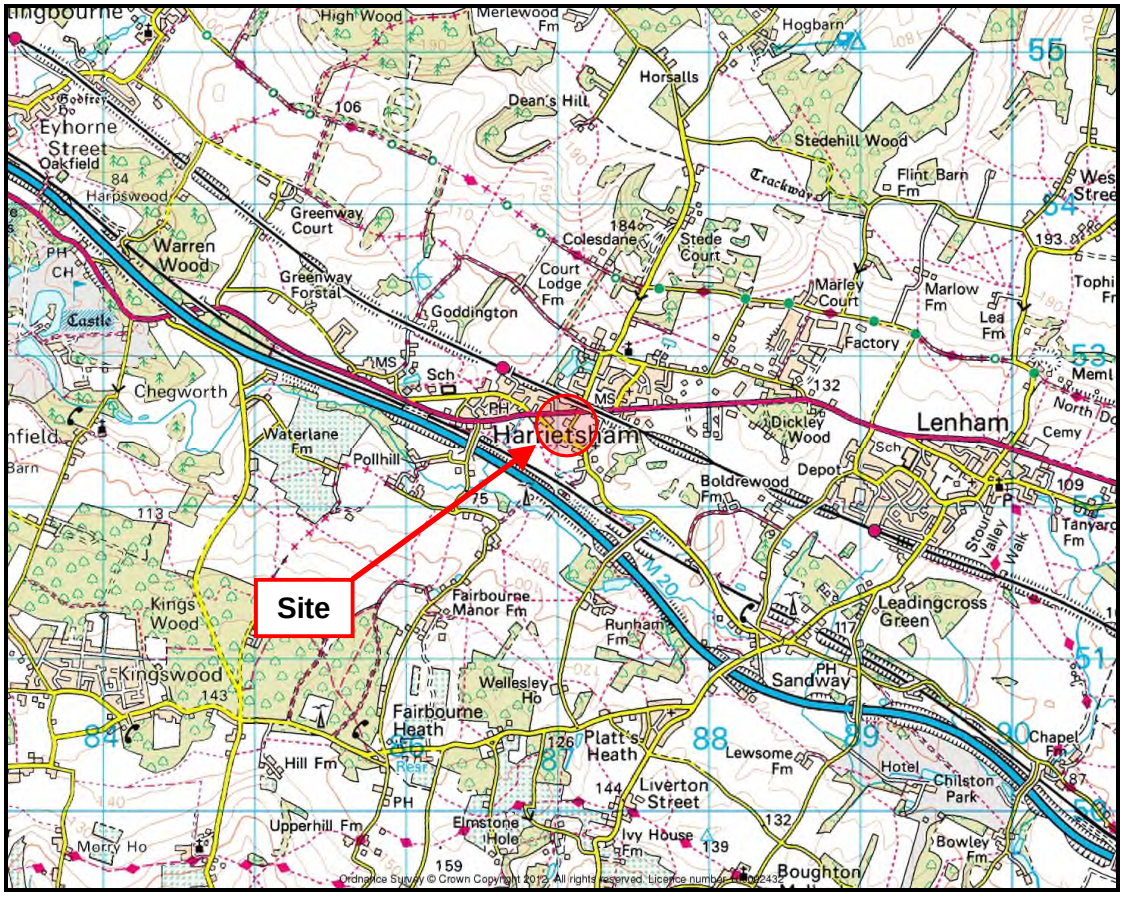
7 Waste Classification

7.1 Waste Acceptance Criteria (WAC) testing was beyond the scope of this investigation. The waste acceptance criteria are mainly based on the results of leaching tests, but there are certain parameters that are determined on the waste as sampled. These include PAH and mineral oil, both of which were determined on samples as part of the testing regime carried out for the investigation (mineral oil is classed as carbon range C_{10}-$C_{40,}$ which is approximately equivalent to the total petroleum hydrocarbon test). All levels of mineral oil/TPH fell below the inert acceptance criteria of 500mg/kg. Additionally all levels of PAH fell below the inert criteria of 100mg/kg.

7.2 The results of the analytical testing have also been appraised using the online CAT-WASTE^{SOIL} waste assessment tool produced jointly by Atkins Consultants and the McArdle Group. The website output is included in Appendix B. The samples are all classified as non-hazardous (note – they may also be inert; the website only differentiates between hazardous and non-hazardous soils).

7.3 This assessment is of a preliminary nature and will need to be confirmed in due course by the waste disposal company/landfill site.

---End---



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- Structural & Civil Engineers
- Land & Building Surveyors
- Geo-Environmental Engineers
- Project Managers
- CDM Consultants
- Contract Administrators

Site: Land at Bell Farm, Church Road, Harrietsham

Job No.: 13298X	**Date:** April 2015	**Scale:** 1:50,000

Figure 1: Site Location Plan

Legend

- BH.1 Borehole (Aug 13)
- WS.1 Windowless Sampler Borehole (April 15)
- CBR.1 In-Situ California Bearing Ratio Test (April 15)

Evans & Langford LLP

- Structural & Civil Engineers
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Evans & Langford LLP, 91 King Street, Maidstone, Kent ME14 1BG

www.evanslangford.com Tel +44 (0) 1622 690120 mail@evanslangford.co.uk

Revisions	Checked	Date

Scale 1:1250 @ A3

Drawn CAS
Date April 15
Checked CPS
Date April 15
Approved CPS
Date April 15

Land at Bell Farm Harrietsham

Site Investigation Layout

13298X/Fig2

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Borehole Log

WS No.: 1
Sheet 1 of 1

Location: Bell Farm, Harrietsham

Job No.: 13298X | **Final Depth:** 4 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm		91.9	02/03/2015	02/03/2015

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.20	●						Dark brown friable topsoil over brown reworked gravelly clay. Gravel is angular to subrounded of flint and chalk.	
0.50	●					(0.60)	***(Fill)***	
0.70	●			91.30		0.60		
1.00	●						Firm, grey mottled orange and white very gravelly CLAY. Gravel is angular to subrounded of flint and chalk.	
1.50	●	pp=1.9				(0.90)	***(Gault Formation)***	
2.00	●	pp=2.6		90.40		1.50		
2.50	●	pp=2.0					Firm, high strength, dark grey fissured CLAY. Fissures are closely spaced.	
3.00	●					(1.50)	***(Gault Formation)***	
				88.90		3.00		
							No recovery between 3.0 and 4.0m.	
						(1.00)	*()*	
				87.90		4.00		

Remarks
Borehole remained dry and stable whilst open.

Chiselling Details

From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 3

Method: Tracked Window Sampler	Logged	ZB	Checked	HW	Approved	CPS

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Borehole Log

WS No.: 2
Sheet 1 of 1

Location: Bell Farm, Harrietsham

Job No.: 13298X | **Final Depth:** 4 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm		94.5	02/03/2015	02/03/2015

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.20	●						Soft dark brown topsoil over soft to firm reworked brown sandy gravelly clay. Gravel is angular to sub-angular of flint.	
						(0.70)	***(Fill)***	
0.50	●							
0.70	●			93.80		0.70		
							Firm light green grey gravelly fissured CLAY. Fissures are closely spaced. Gravel is angular to sub-rounded of flint and chalk.	
1.00	●					(0.50)	***(Gault Formation)***	
				93.30		1.20		
		pp=2.3					Firm to stiff, high strength, light green grey slightly gravelly fissured CLAY. Fissures are extremely closely spaced. Gravel is angular to subrounded of flint and chalk.	
1.50	●						***(Gault Formation)***	
		pp=2.0						
2.00	●					(1.80)		
2.50	●							
		pp=2.2						
3.00	●			91.50		3.00		
		pp=2.3					Stiff, high to very high strength, dark green grey fissured CLAY. Fissures are closely spaced.	
3.50	●					(1.00)	***(Gault Formation)***	
		pp=3.2						
4.00	●			90.50		4.00		
		pp=2.5						

Remarks
Borehole remained dry and stable whilst open.

Chiselling Details					
From	m	*To*	m	*Time*	
Water added	*From*	m	*To*	m	

Scale: 1:25

Figure No.: 4

Method: Tracked Window Sampler	Logged	ZB	Checked	HW	Approved	CPS

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Borehole Log

WS No.: 3
Sheet 1 of 1

Location: Bell Farm, Harrietsham

Job No.: 13298X | **Final Depth:** 4 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm		90.3	02/03/2015	02/03/2015

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.20	●					(0.50)	Dark brown topsoil overlying orange brown mottled green very gravelly reworked clay. Gravel is angular to subrounded of flint and brick fragments. ***(Fill)***	
0.50	●			89.80		0.50		
1.00	●					(1.50)	Firm brown grey mottled green and orange fissured gravelly CLAY. Fissures are closely spaced. Gravel is angular to subangular of flint and chalk. Very high strength at base. ***(Gault Formation)***	
1.50	●	pp=3.4						
2.00	●	pp=3.7		88.30		2.00		
2.50	●	pp=2.9				(1.00)	Stiff, high to very high strength, dark brown grey mottled orange fissured CLAY with occasional gravel of flint. Fissures are closely spaced. ***(Gault Formation)***	
3.00	●	pp=3.1		87.30		3.00		
3.50	●	pp=2.6				(1.00)	Stiff, high to very high strength, dark grey fissured CLAY. Fissures are closely spaced. ***(Gault Formation)***	
4.00	●	pp=3.0		86.30		4.00		

Remarks
Borehole remained dry and stable whilst open.

Chiselling Details

From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 5

Method: Tracked Window Sampler	Logged	ZB	Checked	HW	Approved	CPS

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Borehole Log

WS No.: 4
Sheet 1 of 1

Location: Bell Farm, Harrietsham

Job No.: 13298X | **Final Depth:** 4 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm		90.1	02/03/2015	02/03/2015

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.20	●						Dark brown topsoil overlying dark brown green mottled white reworked sandy gravelly clay. Gravel is angular to subrounded of flint and chalk.	
0.50	●			89.50		(0.60) 0.60	***(Fill)***	
0.70	●						Firm, medium to high strength, brown green fissured gravelly CLAY. Fissures are medium spaced. Gravel is angular to subrounded of flint.	
1.00	●	pp=1.3					***(Gault Formation)***	
1.50	●	pp=2.5		88.30		(1.20) 1.80		
2.00	●	pp=3.9					Firm, high to very high strength, dark green mottled orange and white fissured gravelly CLAY. Fissures are medium spaced. Gravel is angular to subrounded of flint and chalk.	
2.50	●	pp=2.9					***(Gault Formation)***	
3.00	●	pp=2.2		86.90		(1.40) 3.20		
3.50	●	pp=2.7					Firm to stiff, high to very high strength, dark green fissured CLAY with rare gravel of flint. Fissures are closely spaced. Gravel is angular to subrounded fine to medium of flint and chalk.	
4.00	●	pp=3.7		86.10		(0.80) 4.00	***(Gault Formation)***	

Remarks
Borehole remained dry and stable whilst open.

Chiselling Details					
From	m	*To*	m	*Time*	
Water added	*From*	m	*To*	m	

Scale: 1:25

Figure No.: 6

Method: Tracked Window Sampler	Logged	ZB	Checked	HW	Approved	CPS

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Borehole Log

WS No.: 5
Sheet 1 of 1

Location: Bell Farm, Harrietsham

Job No.: 13298X | **Final Depth:** 4 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm		92.8	02/03/2015	02/03/2015

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.20	●			92.50		(0.30) 0.30	Very dark brown sandy gravelly topsoil overlying gravel of brick and concrete. ***(Fill)***	
0.50	●						Firm, light brown green mottled orange gravelly reworked clay. Gravel is fine to medium subangular to subrounded of chalk and flint. ***(Fill)***	
0.70	●					(1.00)		
1.00	●			91.50		1.30		
1.50	●	pp=3.3					Firm to stiff, high to very high strength, light green grey mottled orange fissured CLAY. Fissures are closely spaced. ***(Gault Formation)***	
2.00	●	pp=2.9				(1.70)		
2.50	●	pp=3.3						
3.00	●	pp=4.3		89.80		3.00		
3.50	●	pp=4.9					Stiff, very high strength green grey mottled dark green fissured CLAY. Fissures are extremely closely spaced. ***(Gault Formation)***	
4.00	●	pp=5.5		88.80		(1.00) 4.00		

Remarks
Borehole remained dry and stable whilst open.

Chiselling Details

From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 7

Method: Tracked Window Sampler	Logged	ZB	Checked	HW	Approved	CPS

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Borehole Log

WS No.: 6
Sheet 1 of 1

Location: Bell Farm, Harrietsham

Job No.: 13298X | **Final Depth:** 4 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm		93.0	02/03/2015	02/03/2015

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
				92.80		(0.20) 0.20	Concrete over soft unstructured chalk and clay. ***(Fill)***	
0.30	●							
0.50	●			92.40		(0.40) 0.60	Firm light brown cream slightly gravelly clay. ***(Fill)***	
0.70	●							
1.00	●	pp=1.6		91.20		(1.20) 1.80	Firm, high strength, light green grey mottled orange gravelly CLAY. Gravel is angular to sub-angular medium to coarse of flint and chalk. ***(Gault Formation)***	
1.50	●	pp=2.0						
2.00	●	pp=2.4		89.00		(2.20) 4.00	Stiff, very high strength, light grey green fissured CLAY. Fissures are extremely closely spaced. ***(Gault Formation)***	
2.50	●							
3.00	●	pp=4.3						
3.50	●							
		pp=4.2						

Remarks
Borehole remained dry and stable whilst open.

Chiselling Details					
From	m	*To*	m	*Time*	
Water added	*From*	m	*To*	m	

Scale: 1:25

Figure No.: 8

Method: Tracked Window Sampler	Logged	ZB	Checked	HW	Approved	CPS

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Borehole Log

WS No.: 7
Sheet 1 of 1

Location: Bell Farm, Harrietsham

Job No.: 13298X | **Final Depth:** 4 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm		94.0	03/03/2015	03/03/2015

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.20	●			93.60		(0.40) 0.40	Soft light creamy white reworked unstructured chalk. ***(Fill)***	
0.50	●						Firm, high strength, light brown green mottled orange fissured gravelly CLAY. Fissures are closely spaced. Gravel is angular to subrounded of flint and chalk. ***(Gault Formation)***	
0.70	●							
1.00	●					(1.30)		
		pp=1.9						
1.50	●			92.30		1.70		
		pp=2.0					Firm to stiff, high to very high strength, light green grey mottled orange fissured CLAY. ***(Gault Formation)***	
2.00	●							
						(1.30)		
2.50	●							
		pp=3.1						
3.00	●			91.00		3.00		
		pp=3.1					Stiff, very high strength, dark grey with occasional dark blue veining fissured CLAY. ***(Gault Formation)***	
3.50	●							
		pp=3.3				(1.00)		
4.00	●			90.00		4.00		
		pp=3.9						

Remarks
Borehole remained dry and stable whilst open.

Chiselling Details					
From	m	*To*	m	*Time*	
Water added	*From*	m	*To*	m	

Scale: 1:25

Figure No.: 9

Method: Tracked Window Sampler	Logged	ZB	Checked	HW	Approved	CPS

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Borehole Log

WS No.: 8
Sheet 1 of 1

Location: Bell Farm, Harrietsham

Job No.: 13298X | **Final Depth:** 4 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm		95.1	03/03/2015	03/03/2015

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.20	●			94.50		(0.60) 0.60	Soft brown slightly gravelly topsoil, over soft to firm dark brown reworked gravelly clay. Gravel is angular to subrounded of flint and chalk. ***(Fill)***	
0.50	●							
0.70	●			93.70		(0.80) 1.40	Firm light creamy orange CLAY matrix with angular to subangular fine to medium clasts of chalk and occasional flint. ***(West Melbury Marly Chalk Formation)***	
1.00	●							
1.50	●	pp=2.4		92.60		(1.10) 2.50	Firm, high strength, light green grey mottled orange and white gravelly CLAY. Gravel is angular to subrounded fine of chalk with frequent chalk veining throughout. ***(Gault Formation)***	
2.00	●	pp=2.7						
2.50	●	pp=1.9		92.00		(0.60) 3.10	Firm to stiff, high to very high strength, light green grey mottled orange and white fissured slightly gravelly CLAY. Fissures are closely spaced. Gravel is fine of chalk. ***(Gault Formation)***	
3.00	●	pp=3.4		91.10		(0.90) 4.00	Firm to stiff, high to very high strength, blue grey fissured silty CLAY. Fissures are closely spaced. ***(Gault Formation)***	
3.50	●	pp=2.8						
4.00	●	pp=3.4						

Remarks
Borehole remained dry and stable whilst open.

Chiselling Details

From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 10

Method: Tracked Window Sampler	Logged	ZB	Checked	HW	Approved	CPS

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Borehole Log

WS No.: 9
Sheet 1 of 1

Location: Bell Farm, Harrietsham

Job No.: 13298X | **Final Depth:** 4 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm		95.6	03/03/2015	03/03/2015

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.20	●			95.40		(0.20) 0.20	Soft dark brown gravelly topsoil. Gravel is angular to subrounded of flint and chalk.	
							(Fill)	
0.50	●						Firm dark brown gravelly reworked clay. Gravel is angular to subrounded of flint and chalk.	
0.70	●						***(Fill)***	
		pp=1.9				(1.00)		
1.00	●			94.40		1.20		
1.50	●	pp=6+					Soft to firm, high strength, creamy white with light orange veining gravelly CLAY. Gravel is angular to subangular fine of chalk clasts in a soft chalky matrix.	
						(0.90)	Very stiff, extremely high strength between 1.4 and 1.8mbgl.	
2.00	●	pp=2.7		93.50		2.10	***(West Melbury Marly Chalk Formation)***	
2.50	●	pp=0.8					Light cream with occasional orange staining unstructured clayey CHALK.	
						(0.90)	***(West Melbury Marly Chalk Formation)***	
3.00	●	pp=1.3		92.60		3.00		
3.50	●	pp=2.9					Firm, high to very high strength, light grey cream fissured chalky CLAY. Fissures are closely spaced.	
						(1.00)	***(West Melbury Marly Chalk Formation)***	
4.00	●	pp=3.1		91.60		4.00		

Remarks
Borehole remained dry and stable whilst open.

Chiselling Details

From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 11

Method: Tracked Window Sampler	Logged	ZB	Checked	HW	Approved	CPS

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Borehole Log

WS No.: 10
Sheet 1 of 1

Location: Bell Farm, Harrietsham

Job No.: 13298X | **Final Depth:** 4 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm		95.7	03/03/2015	03/03/2015

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.20	●					(0.40)	Soft dark brown slightly gravelly topsoil. ***(Fill)***	
				95.30		0.40		
0.50	●					(0.20)	Soft to firm brown reworked gravelly clay. Gravel is angular to subrounded of flint and chalk.	
				95.10		0.60	***(Fill)***	
0.70	●	pp=1.0					Firm, medium strength, light green grey mottled orange fissured gravelly CLAY. Fissures are closely spaced. Gravel is angular to subangular of flint and chalk.	
1.00	●					(0.70)	***(Gault Formation)***	
				94.40		1.30		
1.50	●	pp=2.3					Firm, high to very high strength, light green grey mottled orange fissured gravelly CLAY. Fissures are closely spaced. Gravel is angular to subangular of flint and chalk.	
2.00	●	pp=3.2					***(Gault Formation)***	
2.50	●	pp=3.2				(2.20)		
3.00	●	pp=3.1						
3.50	●	pp=2.6		92.20		3.50		
							Firm to stiff, high to very high strength, dark blue fissured silty CLAY. Fissures are closely spaced.	
						(0.50)	***(Gault Formation)***	
4.00	●	pp=4.0		91.70		4.00		

Remarks
Borehole remained dry and stable whilst open.

Chiselling Details

From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 12

Method: Tracked Window Sampler	Logged	ZB	Checked	HW	Approved	CPS

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Borehole Log

WS No.: 11
Sheet 1 of 1

Location: Bell Farm, Harrietsham

Job No.: 13298X | **Final Depth:** 4 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm		95.5	03/03/2015	03/03/2015

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.20	●			95.10		(0.40) 0.40	Soft dark brown gravelly topsoil. ***(Fill)***	
0.50	●						Soft green grey gravelly reworked clay. Gravel is angular to subrounded of brick, flint and chalk.	
0.70	●					(0.80)	***(Fill)***	
1.00	●			94.30		1.20		
		pp=1.8					Soft to firm, high strength, green grey mottled yellow and orange gravelly CLAY. Gravel is angular to subangular of flint.	
1.50	●						***(Gault Formation)***	
		pp=2.0				(1.20)		
2.00	●	pp=2.3		93.10		2.40		
2.50	●	pp=2.6					Firm, high strength, blue grey fissured CLAY. Fissures are medium spaced.	
						(0.60)	***(Gault Formation)***	
3.00	●	pp=3.1		92.50		3.00		
							Stiff, very high strength, blue grey fissured silty CLAY. Fissures are closely spaced.	
		pp=3.4				(1.00)	***(Gault Formation)***	
4.00	●	pp=5.1		91.50		4.00		

Remarks
Borehole remained dry and stable whilst open.

Chiselling Details					
From	m	*To*	m	*Time*	
Water added	*From*	m	*To*	m	

Scale: 1:25

Figure No.: 13

Method: Tracked Window Sampler	Logged	ZB	Checked	HW	Approved	CPS

Evans & Langford LLP

Borehole Log

WS No.: 12
Sheet 1 of 1

Location: Bell Farm, Harrietsham

Job No.: 13298X | **Final Depth:** 4 m

Diameter	Casing	GL (mOD)	Start	Finish
90mm		93.1	03/03/2015	03/03/2015

Samples & insitu tests			Water	STRATA DETAILS				Installation/ Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth/ Thickness	Description	
0.20	●			92.90		(0.20) 0.20	Soft dark brown gravelly topsoil. ***(Fill)***	
0.50	●			92.60		(0.30) 0.50	Firm brown gravelly reworked clay. Gravel is angular to subrounded of flint, chalk and occasional brick fragments. ***(Fill)***	
0.70	●						Firm light green grey gravelly CLAY. Gravel is angular to subrounded of flint and chalk. ***(Gault Formation)***	
1.00	●	pp=3.6				(1.00)		
1.50	●	pp=2.3		91.60		1.50		
2.00	●	pp=2.6				(1.10)	Firm to stiff green grey mottled white and orange gravelly CLAY. Gravel is rounded to subrounded fine to medium of chalk. ***(Gault Formation)***	
2.50	●	pp=2.1		90.50		2.60		
3.00	●	pp=1.6				(1.00)	Firm green grey mottled orange fissured CLAY. Fissures are medium spaced. ***(Gault Formation)***	
3.50	●	pp=2.0		89.50		3.60		
4.00	●			89.10		(0.40) 4.00	Firm dark blue fissured silty CLAY. Fissures are closely spaced. ***(Gault Formation)***	

Remarks
Borehole remained dry and stable whilst open.

Chiselling Details

From	m	*To*	m	*Time*	
Water added		*From*	m	*To*	m

Scale: 1:25

Figure No.: 14

Method: Tracked Window Sampler	Logged	ZB	Checked	HW	Approved	CPS

Dynamic Cone CBR Test

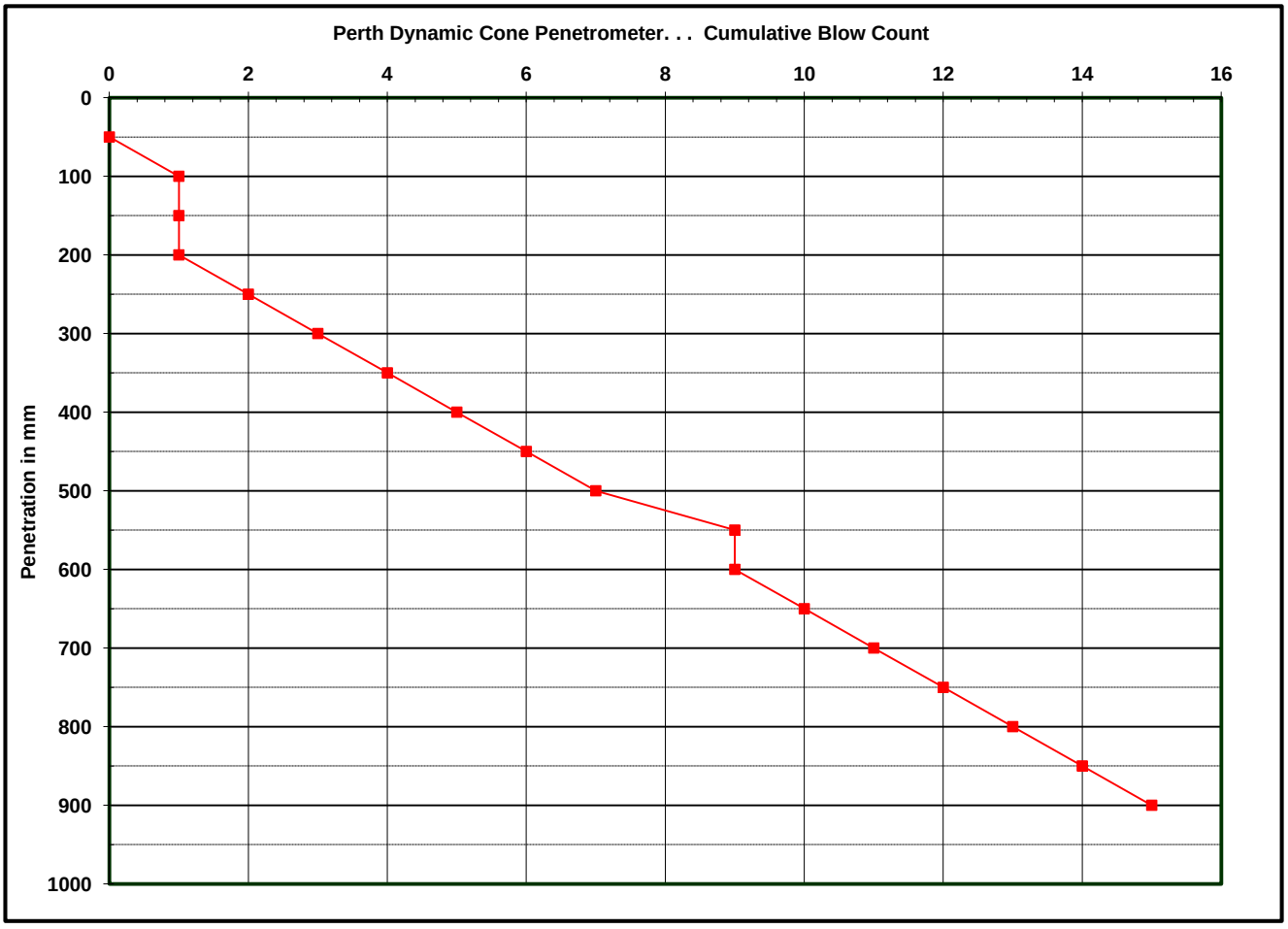
OAKLAND site investigation

Job Nr 13298X Date 02.03.2015

Nr Blows	S Blows	Penetration mm	S Pen. mm
0	0	50	50
1	1	50	100
0	1	50	150
0	1	50	200
1	2	50	250
1	3	50	300
1	4	50	350
1	5	50	400
1	6	50	450
1	7	50	500
2	9	50	550
0	9	50	600
1	10	50	650
1	11	50	700
1	12	50	750
1	13	50	800
1	14	50	850
1	15	50	900

CBR VALUE CALCULATIONS

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
100	250	1	2	150.0	1.5	0.7	**0.7**
250	500	2	7	50.0	4.8	2.9	**2.9**
500	750	7	12	50.0	4.8	2.9	**2.9**
750	900	12	15	50.0	4.8	2.9	**2.9**
			0				
			0				
			0				



Tested by	DB	Checked	TC	Approved	

Site: Church Road, Harrietsham	**Client:** Evans and Langford	**Date:** 02.03.2015
	Job No: 13298X	**Test No:** CBR 1

Dynamic Cone CBR Test

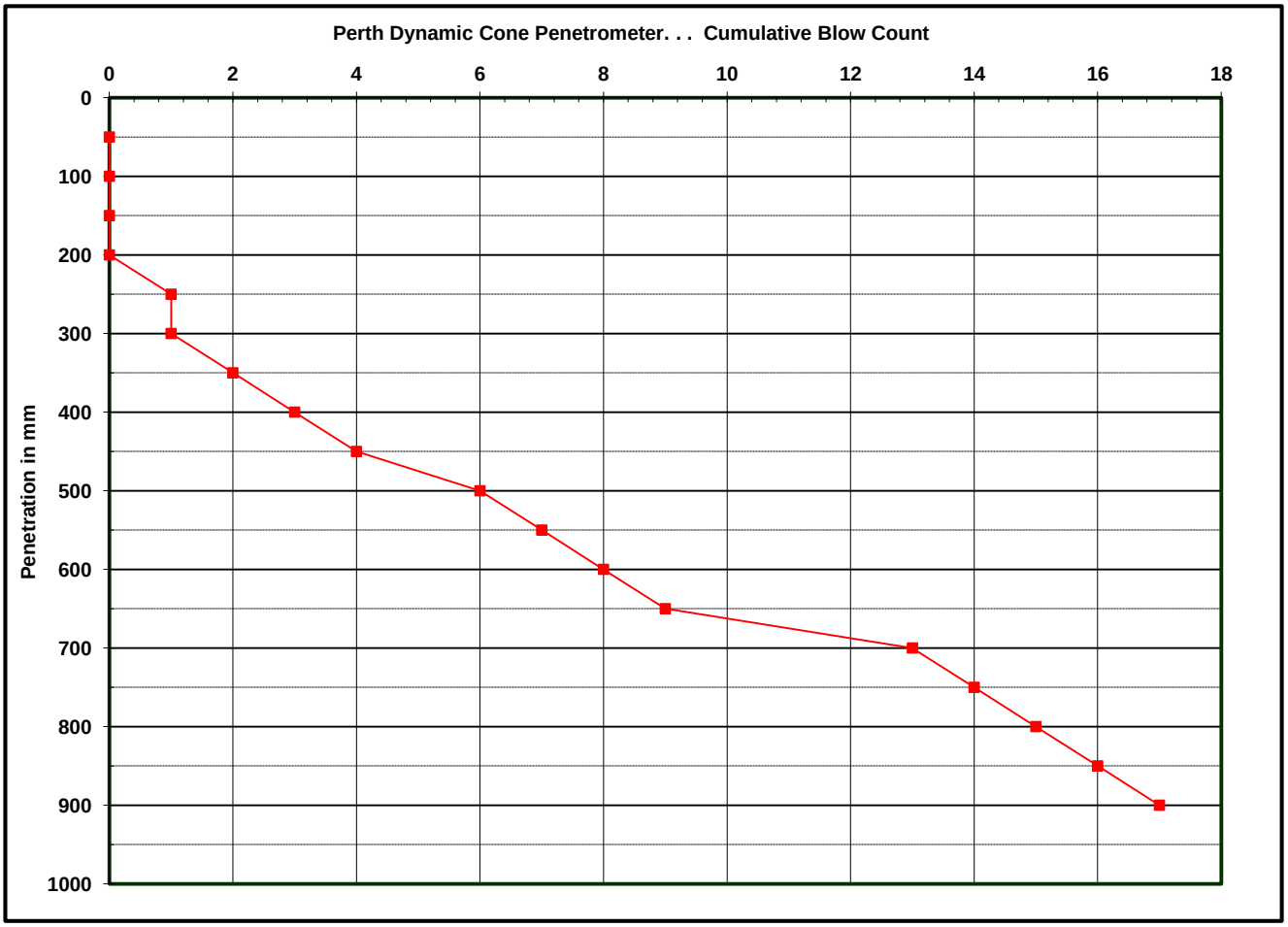
OAKLAND site investigation

Nr Blows	S Blows	Penetration mm	S Pen. mm
0	0	50	50
0	0	50	100
0	0	50	150
0	0	50	200
1	1	50	250
0	1	50	300
1	2	50	350
1	3	50	400
1	4	50	450
2	6	50	500
1	7	50	550
1	8	50	600
1	9	50	650
4	13	50	700
1	14	50	750
1	15	50	800
1	16	50	850
1	17	50	900

Job Nr 13298X Date 02.03.2015

CBR VALUE CALCULATIONS

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
250	350	1	2	100.0	2.3	1.2	**1.2**
250	500	1	6	50.0	4.8	2.9	**2.9**
500	750	6	14	31.3	7.9	5.2	**5.2**
750	900	14	17	50.0	4.8	2.9	**2.9**
			0				
			0				
			0				



Tested by	DB	Checked	TC	Approved	

Site: Church Road, Harrietsham	**Client:** Evans and Langford	**Date:** 02.03.2015
	Job No: 13298X	**Test No:** CBR 3

Dynamic Cone CBR Test

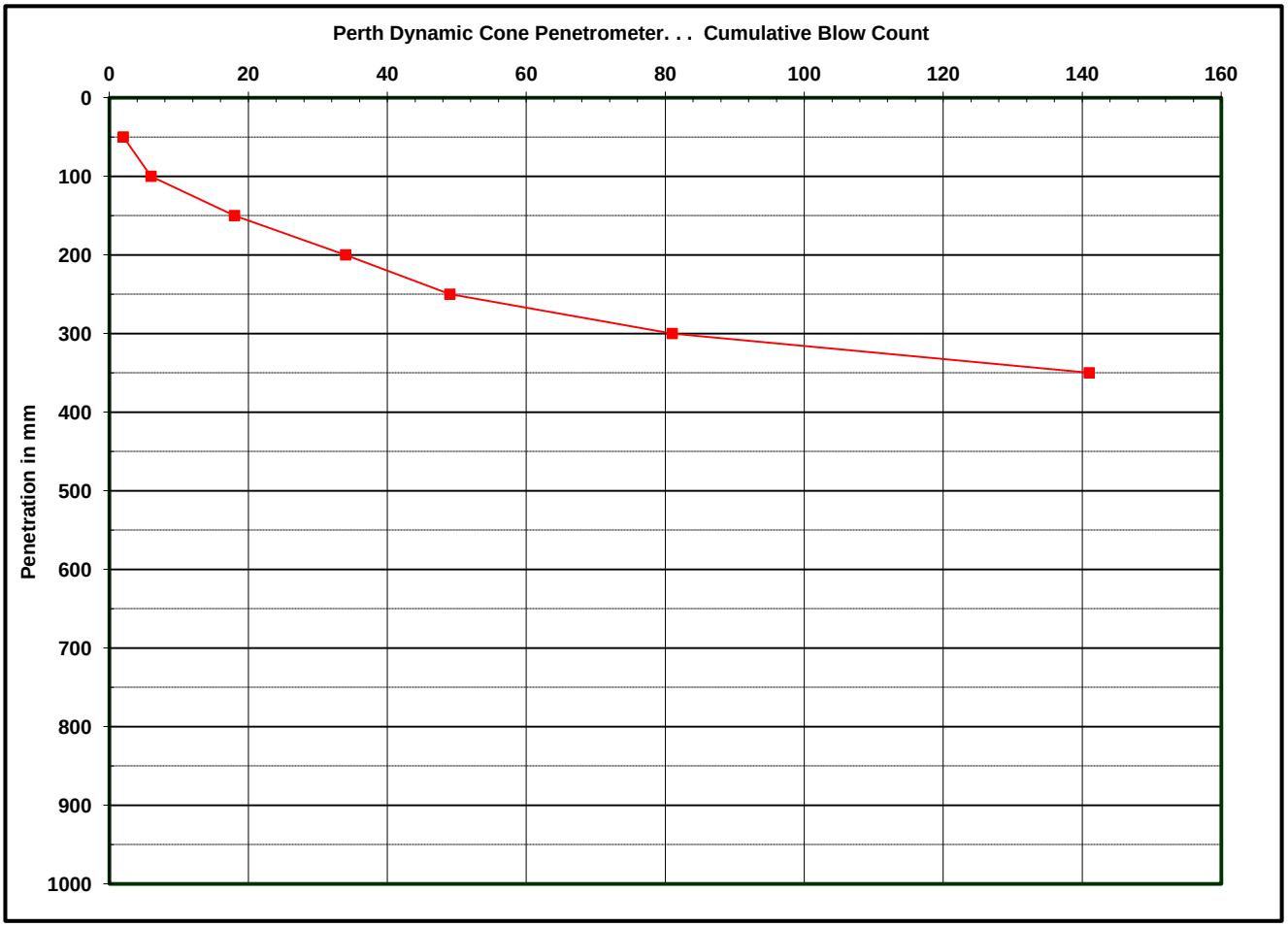
OAKLAND site investigation

Nr Blows	S Blows	Penetration mm	S Pen. mm
2	2	50	50
4	6	50	100
12	18	50	150
16	34	50	200
15	49	50	250
32	81	50	300
60	141	50	350
		50	400
		50	450
		50	500
		50	550
		50	600
		50	650
		50	700
		50	750
		50	800
		50	850
		50	900

Job Nr 13298X Date 02.03.2015

CBR VALUE CALCULATIONS

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
50	150	2	18	6.3	43.5	41.0	**41.0**
150	250	18	49	3.2	87.6	95.7	**87.6**
250	350	49	141	1.1	276.5	385.2	**276.5**
			0				
			0				
			0				
			0				



Tested by	DB	Checked	TC	Approved	

Site: Church Road, Harrietsham	**Client:** Evans and Langford	**Date:** 02.03.2015
	Job No: 13298X	**Test No:** CBR 5

Dynamic Cone CBR Test

OAKLAND site investigation

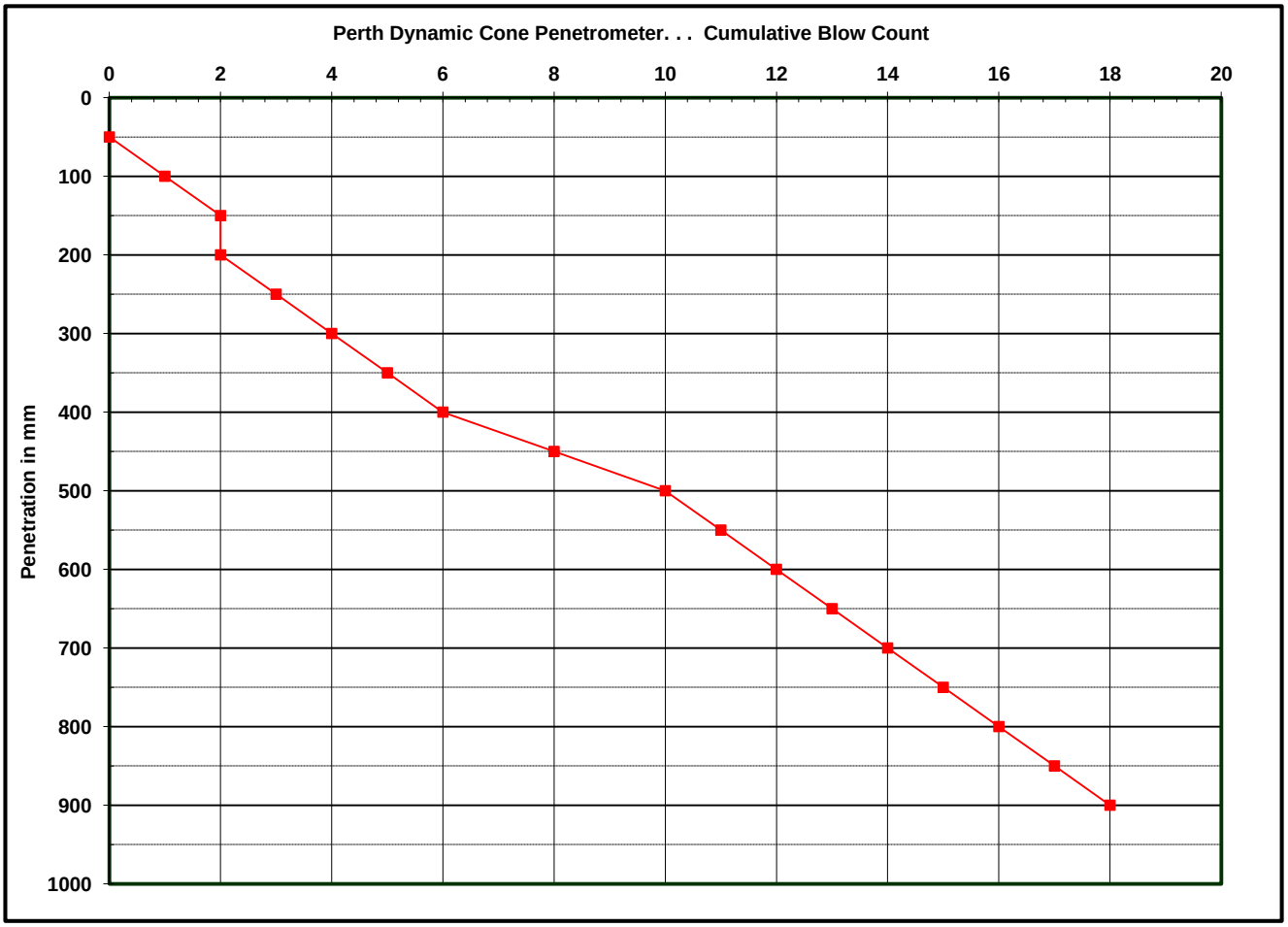
Nr Blows	S Blows	Penetration mm	S Pen. mm
0	0	50	50
1	1	50	100
1	2	50	150
0	2	50	200
1	3	50	250
1	4	50	300
1	5	50	350
1	6	50	400
2	8	50	450
2	10	50	500
1	11	50	550
1	12	50	600
1	13	50	650
1	14	50	700
1	15	50	750
1	16	50	800
1	17	50	850
1	18	50	900

Job Nr 13298X Date 02.03.2015

0

CBR VALUE CALCULATIONS

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
100	250	1	3	75.0	3.1	1.7	**1.7**
250	500	3	10	35.7	6.9	4.4	**4.4**
500	750	10	15	50.0	4.8	2.9	**2.9**
750	900	15	18	50.0	4.8	2.9	**2.9**
			0				
			0				
			0				



Tested by	DB	Checked	TC	Approved	

Site: Church Road, Harrietsham	**Client:** Evans and Langford	**Date:** 02.03.2015
	Job No: 13298X	**Test No:** CBR 8

Dynamic Cone CBR Test

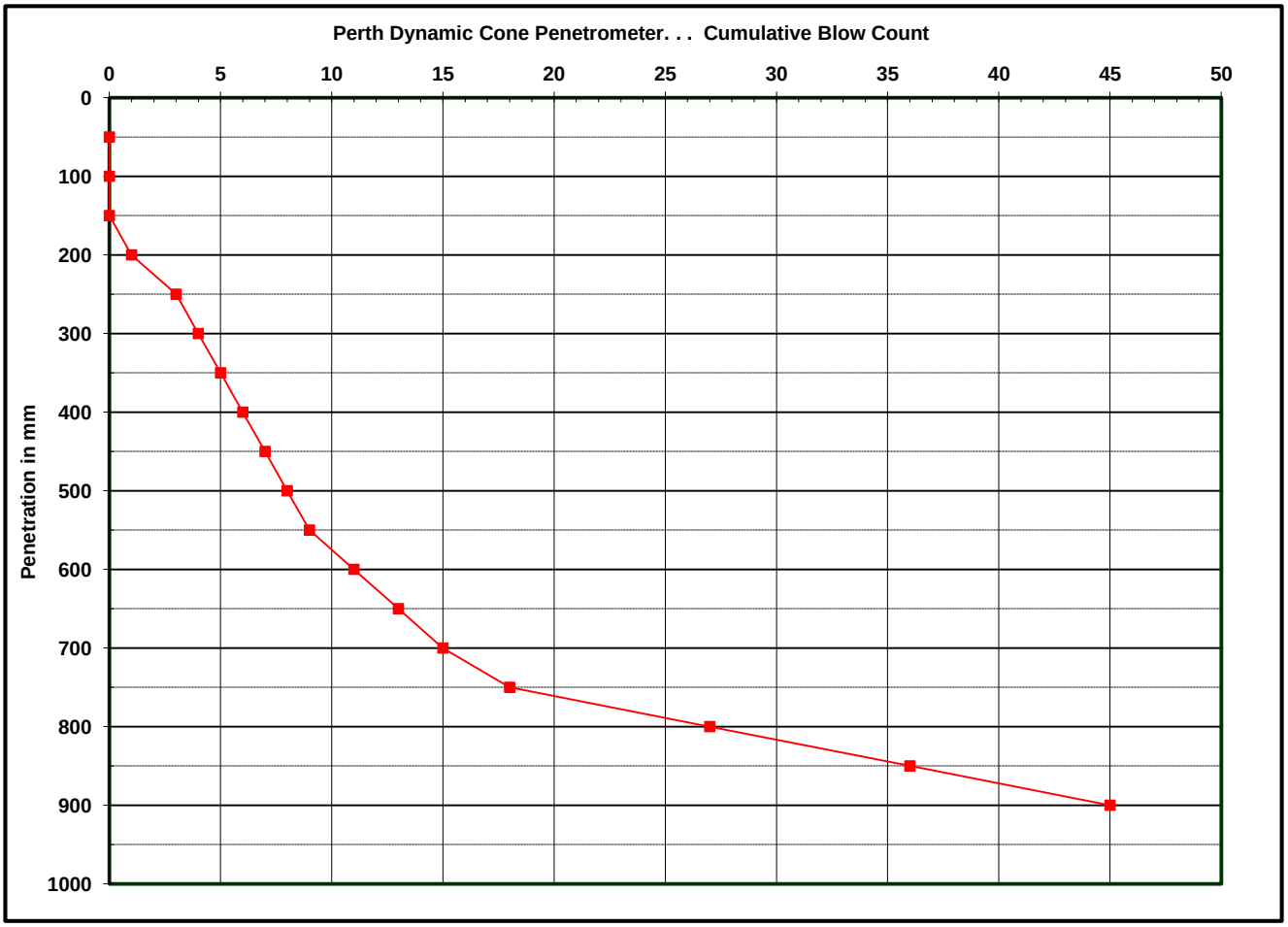
OAKLAND site investigation

Nr Blows	S Blows	Penetration mm	S Pen. mm
0	0	50	50
0	0	50	100
0	0	50	150
1	1	50	200
2	3	50	250
1	4	50	300
1	5	50	350
1	6	50	400
1	7	50	450
1	8	50	500
1	9	50	550
2	11	50	600
2	13	50	650
2	15	50	700
3	18	50	750
9	27	50	800
9	36	50	850
9	45	50	900

Job Nr 13298X Date 02.03.2015

CBR VALUE CALCULATIONS

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
200	350	1	5	37.5	6.6	4.1	**4.1**
250	500	3	8	50.0	4.8	2.9	**2.9**
500	750	8	18	25.0	10.1	7.0	**7.0**
750	900	18	45	5.6	49.3	47.7	**47.7**
			0				
			0				
			0				



Tested by	DB	Checked	TC	Approved	

Site: Church Road, Harrietsham	**Client:** Evans and Langford	**Date:** 02.03.2015
	Job No: 13298X	**Test No:** CBR 10

Dynamic Cone CBR Test

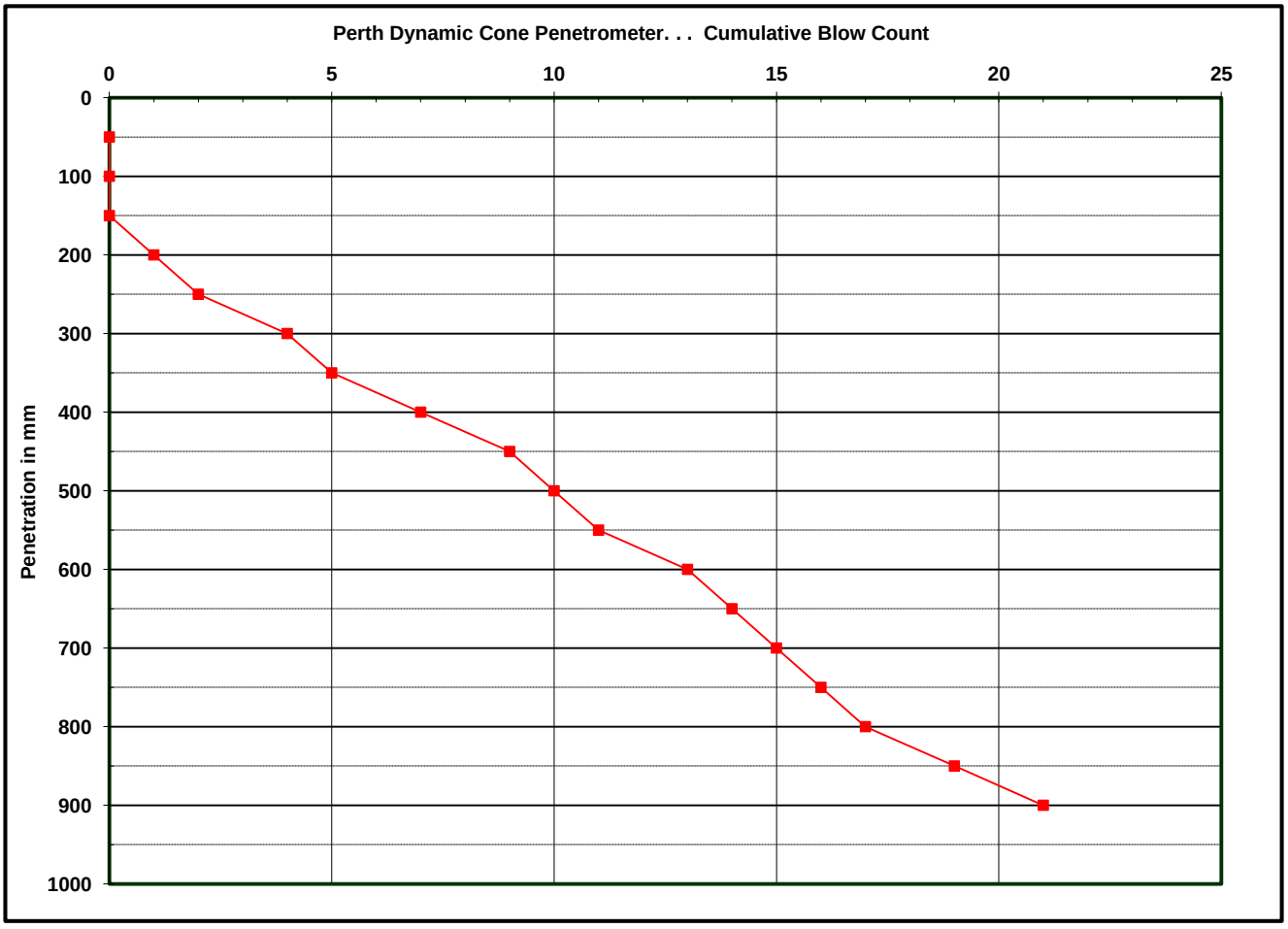
OAKLAND site investigation

Job Nr 13298X Date 02.03.2015

Nr Blows	S Blows	Penetration mm	S Pen. mm
0	0	50	50
0	0	50	100
0	0	50	150
1	1	50	200
1	2	50	250
2	4	50	300
1	5	50	350
2	7	50	400
2	9	50	450
1	10	50	500
1	11	50	550
2	13	50	600
1	14	50	650
1	15	50	700
1	16	50	750
1	17	50	800
2	19	50	850
2	21	50	900

CBR VALUE CALCULATIONS

Initial S Pen mm	Final S Pen mm	Initial S Blows	Final S Blows	Pen/Blow mm	CBR TRRL	CBR KVH	CBR Value (%)
200	350	1	5	37.5	6.6	4.1	**4.1**
250	500	2	10	31.3	7.9	5.2	**5.2**
500	750	10	16	41.7	5.9	3.6	**3.6**
750	900	16	21	30.0	8.3	5.5	**5.5**
			0				
			0				
			0				



Tested by	DB	Checked	TC	Approved	

Site: Church Road, Harrietsham	**Client:** Evans and Langford	**Date:** 02.03.2015
	Job No: 13298X	**Test No:** CBR 12

Appendix A
Geotechnical Testing Report

Soiltec Laboratories Limited
Soiltec House, Langley Park
Sutton Road, Langley,
Maidstone, Kent ME17 3NQ

Telephone: (01622) 862138
(01622) 862904
E-mail: info@soiltec.net
Web: www.soiltec.net

LABORATORY REPORT

Date : 25th March 2015

Report No : 06531/21

Client : Evans & Langford LLP
91 King Street
Maidstone
Kent
ME14 1BG

Client Ref : 13298X

Site : Bell Farm
Church Road
Harrietsham

This report details the results of laboratory tests on samples recovered from the above site and submitted for test on 6th March 2015.

Tests as follows:

7 Nr. Liquid & Plastic Limits

7 Nr. Moisture Contents

2 Nr. Sample Preparation (Wash over 425micron sieve)

All tests have been carried out in accordance with BS 1377 : 1990

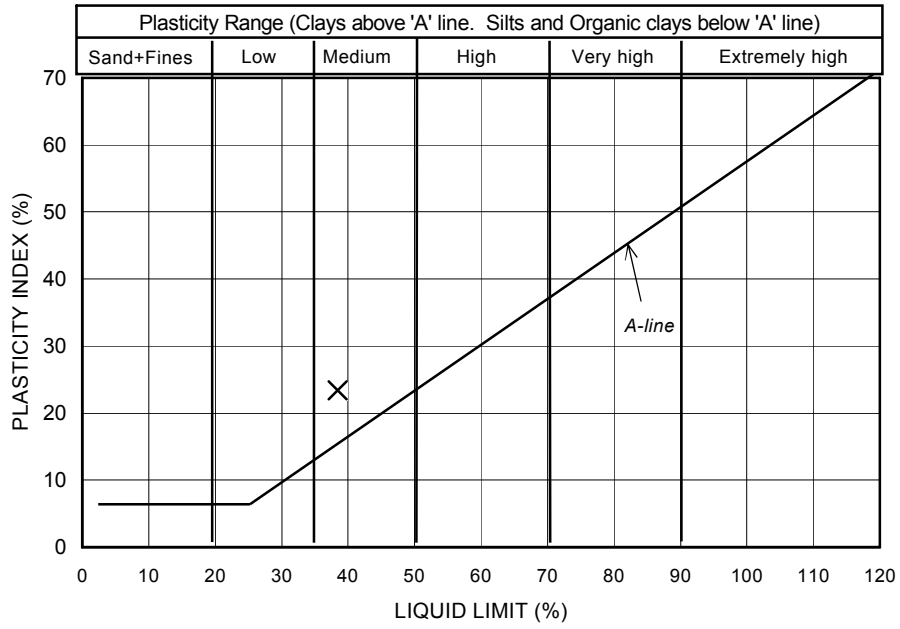
For and on behalf of
Soiltec Laboratories Limited

PLASTICITY INDEX

Client :	Evans & Langford	Rep No:	06531/21
Site:	Bell Farm, Church Road, Harrietsham	Borehole/Trial Pit :	WS1
		Sample No:	1
		Sample Depth (m)	1.50
		Date:	25/03/15

Sample description	:	0
Test Method	:	BS1377:Part2:1990:4.4 Single point method
Sample preparation	:	washed on 425 micron sieve
Material passing 425µm	:	49.27 %
Natural Water Content	**:**	**18.6 %**
Liquid Limit	**:**	**38 %**
Plastic Limit	**:**	**15 %**
Plasticity Index	**:**	**23 %**
Liquidity Index	**:**	**0.15**
Modified Plasticity Index	**:**	**12 %** Ref : N.H.B.C. 4.2

CASAGRANDE PLASTICITY CHART



Operator	VK
Checked	MK
Approved	M K

PLASTICITY INDEX

Client :	Evans & Langford	Rep No:	06531/21
Site:	Bell Farm, Church Road, Harrietsham	Borehole/Trial Pit :	WS3
		Sample No:	1
		Sample Depth (m)	1.00
		Date:	25/03/15

Sample description : 0

Test Method : BS1377:Part2:1990:4.4 Single point method

Sample preparation : washed on 425 micron sieve

Material passing 425µm : 85.84 %

Natural Water Content : 21.3 %

Liquid Limit : 50 %

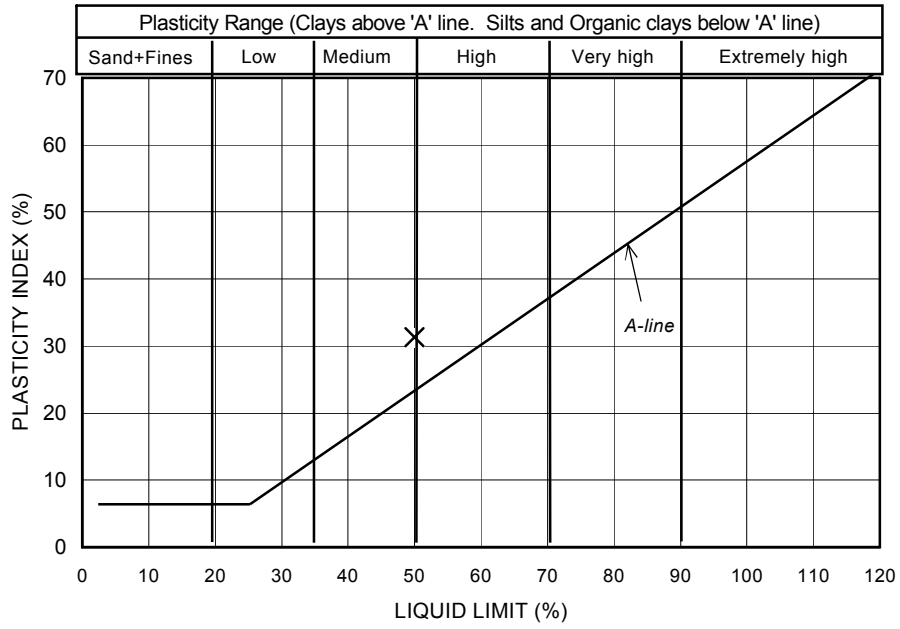
Plastic Limit : 19 %

Plasticity Index : 31 %

Liquidity Index : 0.09

Modified Plasticity Index : 27 % Ref : N.H.B.C. 4.2

CASAGRANDE PLASTICITY CHART



Operator	VK
Checked	MK
Approved	M K

PLASTICITY INDEX

Client :	Evans & Langford	Rep No:	06531/21
Site:	Bell Farm, Church Road, Harrietsham	Borehole/Trial Pit :	WS5
		Sample No:	1
		Sample Depth (m)	3.50
		Date:	25/03/15

Sample description : 0

Test Method : BS1377:Part2:1990:4.4 Single point method

Sample preparation : as received

Material passing 425µm : 100.00 %

Natural Water Content : 25.6 %

Liquid Limit : 63 %

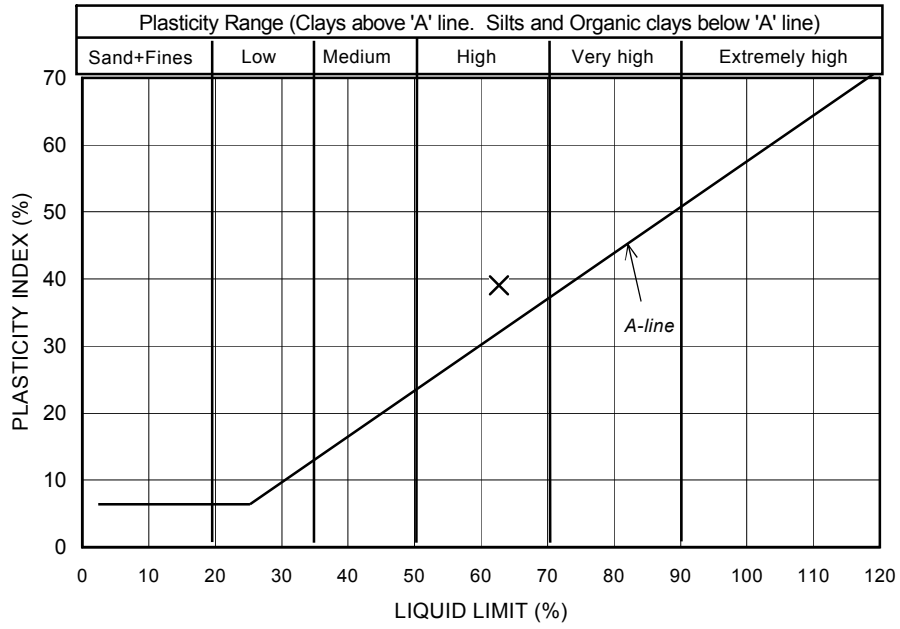
Plastic Limit : 24 %

Plasticity Index : 39 %

Liquidity Index : 0.05

Modified Plasticity Index : 39 % Ref : N.H.B.C. 4.2

CASAGRANDE PLASTICITY CHART



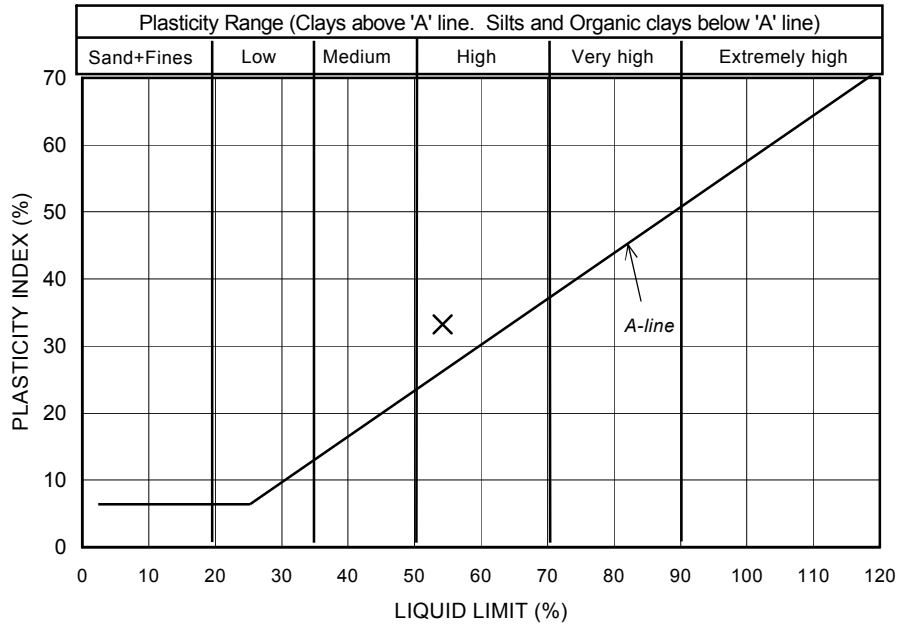
Operator	VK
Checked	MK
Approved	M K

PLASTICITY INDEX

Client :	Evans & Langford	Rep No:	06531/21
Site:	Bell Farm, Church Road, Harrietsham	Borehole/Trial Pit :	WS8
		Sample No:	1
		Sample Depth (m)	0.70
		Date:	25/03/15

Sample description	:	0
Test Method	:	BS1377:Part2:1990:4.4 Single point method
Sample preparation	:	as received
Material passing 425µm	:	100.00 %
Natural Water Content	**:**	**20.4 %**
Liquid Limit	**:**	**54 %**
Plastic Limit	**:**	**21 %**
Plasticity Index	**:**	**33 %**
Liquidity Index	**:**	**-0.02**
Modified Plasticity Index	**:**	**33 %** Ref : N.H.B.C. 4.2

CASAGRANDE PLASTICITY CHART



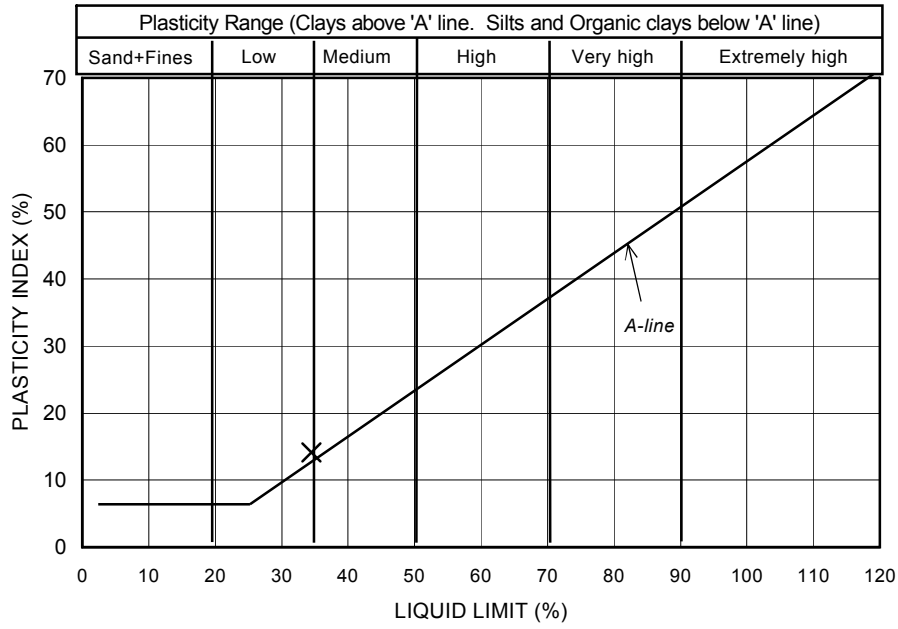
Operator	VK
Checked	MK
Approved	M K

PLASTICITY INDEX

Client :	Evans & Langford	Rep No:	06531/21
Site:	Bell Farm, Church Road, Harrietsham	Borehole/Trial Pit :	WS9
		Sample No:	1
		Sample Depth (m)	1.50
		Date:	25/03/15

Sample description	:	0	
Test Method	:	BS1377:Part2:1990:4.4 Single point method	
Sample preparation	:	as received	
Material passing 425µm	:	100.00 %	
Natural Water Content	**:**	**21.0 %**	
Liquid Limit	**:**	**35 %**	
Plastic Limit	**:**	**20 %**	
Plasticity Index	**:**	**14 %**	
Liquidity Index	**:**	**0.05**	
Modified Plasticity Index	**:**	**14 %**	Ref : N.H.B.C. 4.2

CASAGRANDE PLASTICITY CHART



Operator	VK
Checked	MK
Approved	M K

PLASTICITY INDEX

Client :	Evans & Langford	Rep No:	06531/21
Site:	Bell Farm, Church Road, Harrietsham	Borehole/Trial Pit :	WS10
		Sample No:	1
		Sample Depth (m)	1.50
		Date:	25/03/15

Sample description : 0

Test Method : BS1377:Part2:1990:4.4 Single point method

Sample preparation : as received

Material passing 425µm : 100.00 %

Natural Water Content : 31.4 %

Liquid Limit : 87 %

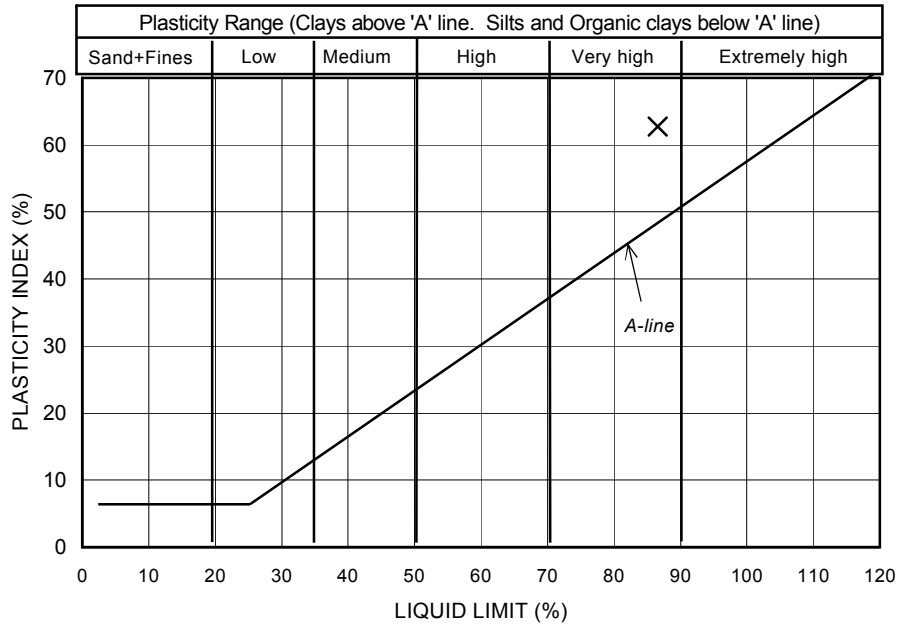
Plastic Limit : 24 %

Plasticity Index : 63 %

Liquidity Index : 0.12

Modified Plasticity Index : 63 % Ref : N.H.B.C. 4.2

CASAGRANDE PLASTICITY CHART



Operator	VK
Checked	MK
Approved	M K

PLASTICITY INDEX

Client :	Evans & Langford	Rep No:	06531/21
Site:	Bell Farm, Church Road, Harrietsham	Borehole/Trial Pit :	WS12
		Sample No:	1
		Sample Depth (m)	2.00
		Date:	25/03/15

Sample description : 0

Test Method : BS1377:Part2:1990:4.4 Single point method

Sample preparation : as received

Material passing 425µm : 100.00 %

Natural Water Content : 28.4 %

Liquid Limit : 78 %

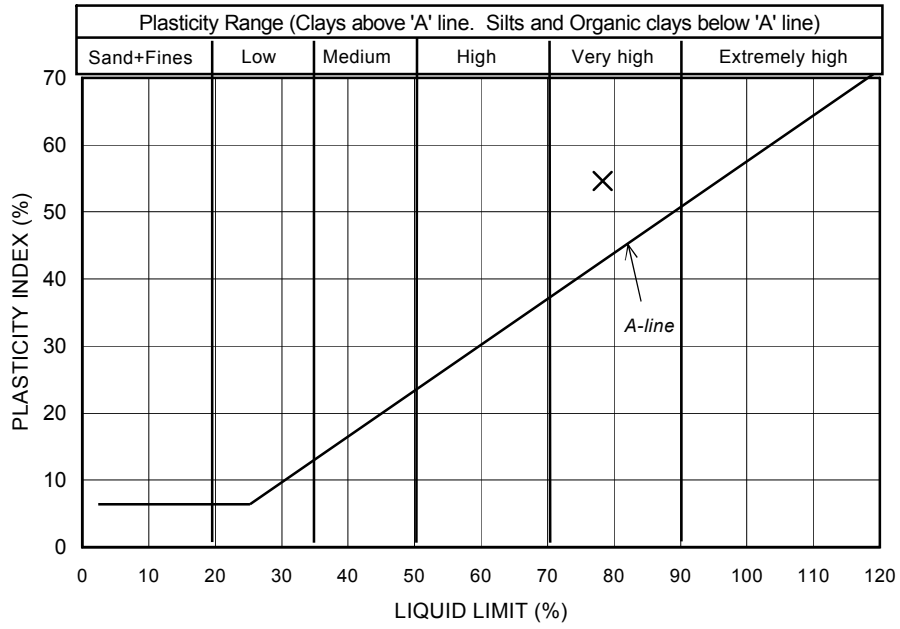
Plastic Limit : 24 %

Plasticity Index : 55 %

Liquidity Index : 0.09

Modified Plasticity Index : 55 % Ref : N.H.B.C. 4.2

CASAGRANDE PLASTICITY CHART



Operator	VK
Checked	MK
Approved	M K

Appendix B
Analytical Testing Report

Unit A2
Windmill Road
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:	15-00884
Issue:	1
Date of Issue:	20/03/2015
Contact:	Colin Shackleford
Customer Details:	Evans & Langford 91 Kings Street Maidstone Kent
Quotation No:	Q14-00059
Order No:	13298X
Customer Reference:	13298X
Date Received:	06/03/2015
Date Approved:	20/03/2015
Details:	Bell Farm, Church Road, Harrietsham
Approved by:	

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.: 15-00884

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
18672	WS1 0.20	02/03/2015	06/03/2015	Silty loam	
18673	WS1 0.50	02/03/2015	06/03/2015	Silty loam	
18674	WS2 0.50	02/03/2015	06/03/2015	Silty clayey loam	
18675	WS3 0.20	02/03/2015	06/03/2015	Silty loam	
18676	WS4 0.20	02/03/2015	06/03/2015	Silty loam	
18677	WS5 0.50	02/03/2015	06/03/2015	Silty clayey loam	
18678	WS5 1.00	02/03/2015	06/03/2015	Silty clayey loam	
18679	WS6 0.50	02/03/2015	06/03/2015	Silty loam	
18680	WS6 1.00	02/03/2015	06/03/2015	Silty clayey loam	
18681	WS6 2.00	02/03/2015	06/03/2015	Silty clayey loam	
18682	WS7 0.20	02/03/2015	06/03/2015	Silty clayey loam	
18683	WS7 1.00	02/03/2015	06/03/2015	Silty clayey loam	
18684	WS8 0.20	02/03/2015	06/03/2015	Silty loam	
18685	WS8 0.50	02/03/2015	06/03/2015	Silty loam	
18686	WS9 0.50	02/03/2015	06/03/2015	Silty loam	
18687	WS10 0.20	02/03/2015	06/03/2015	Silty loam	
18688	WS11 0.50	02/03/2015	06/03/2015	Silty clayey loam	
18689	WS12 0.20	02/03/2015	06/03/2015	Silty loam	
18690	WS12 0.50	02/03/2015	06/03/2015	Silty loam	
18691	WS6 3.00	02/03/2015	06/03/2015	Clay	

Results Summary

Report No.: 15-00884

			ELAB Reference	18672	18673	18674	18675	18676	18677
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS1	WS1	WS2	WS3	WS4	WS5
			Sample Depth (m)	0.20	0.50	0.50	0.20	0.20	0.50
			Sampling Date	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	14.8	9.7	4.4	13.5	11.3	5.2
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	33.3	29.8	16.4	32.2	32.8	16.3
Copper	M	mg/kg	5	30.5	14.4	12.1	24.9	21.7	8.8
Lead	M	mg/kg	5	83.8	29.7	14.8	46.8	108	15.1
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	24.7	25.7	19.9	27.9	21.8	18.4
Selenium	M	mg/kg	1	1.4	< 1.0	< 1.0	1.1	1.1	< 1.0
Zinc	M	mg/kg	45	125	60.6	< 45.0	95.9	89.7	< 45.0
Anions									
Water Soluble Sulphate	M	g/l	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.02
Inorganics									
Free Cyanide	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Miscellaneous									
pH	M	units	0.1	7.6	7.6	8.0	6.8	6.4	8.1
Soil Organic Matter	U	%	0.1	4.7	3.3	0.8	6.1	6.9	1.9

Results Summary

Report No.: 15-00884

			ELAB Reference	18672	18673	18674	18675	18676	18677
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS1	WS1	WS2	WS3	WS4	WS5
			Sample Depth (m)	0.20	0.50	0.50	0.20	0.20	0.50
			Sampling Date	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015
Determinand	**Codes**	**Units**	**LOD**						
Organics									
>C8-C10 BCB	N	mg/kg	1	< 1.0	< 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	< 1.0
>C12-C16 BCB	N	mg/kg	1	< 1.0	< 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	< 1.0
>C21-C35 BCB	N	mg/kg	1	7.3	2.5	4.0	3.6	4.8	2.6
>C35-C40 BCB	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C8-C40) BCB	N	mg/kg	1	7.3	2.5	4.0	3.6	4.8	2.6
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	M	mg/kg	0.5	1.9	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	M	mg/kg	0.5	5.5	< 0.5	< 0.5	1.0	< 0.5	< 0.5
Pyrene	M	mg/kg	0.5	4.8	< 0.5	< 0.5	0.9	< 0.5	< 0.5
Benzo (a) anthracene	M	mg/kg	0.5	3.0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	M	mg/kg	0.5	3.4	< 0.5	< 0.5	0.6	< 0.5	< 0.5
Benzo (b) fluoranthene	M	mg/kg	0.5	3.3	< 0.5	< 0.5	0.6	0.6	< 0.5
Benzo (k) fluoranthene	M	mg/kg	0.5	3.1	< 0.5	< 0.5	0.6	0.6	< 0.5
Benzo (a) pyrene	M	mg/kg	0.5	3.5	< 0.5	< 0.5	0.5	< 0.5	< 0.5
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.5	2.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenzo(a,h)anthracene	M	mg/kg	0.5	0.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(ghi)perylene	M	mg/kg	0.5	2.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH(16)	M	mg/kg	2	35	2	< 2	6	4	< 2

Results Summary

Report No.: 15-00884

			ELAB Reference	18672	18673	18674	18675	18676	18677
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS1	WS1	WS2	WS3	WS4	WS5
			Sample Depth (m)	0.20	0.50	0.50	0.20	0.20	0.50
			Sampling Date	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015
Determinand	**Codes**	**Units**	**LOD**						
OrganoChlorine Pesticides									
alpha-HCH	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t	n/t
beta_HCH	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t	n/t
gamma-HCH	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t	n/t
delta-HCH	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t	n/t
Heptachlor	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t	n/t
Aldrin	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t	n/t
Heptachlor expoxide	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t	n/t
trans-Chlordane	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t	n/t
alpha cis-Chlordane	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t	n/t
p,p-DDE	M	ug/kg	10	n/t	n/t	n/t	30	n/t	n/t
Dieldrin	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t	n/t
Endrin	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t	n/t
p,p-DDD	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t	n/t
Endosulfan II	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t	n/t
Endrin aldehyde	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t	n/t
p,p-DDT	M	ug/kg	10	n/t	n/t	n/t	11	n/t	n/t
Endosulphan sulphate	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t	n/t
Methoxychlor	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t	n/t
Endrin ketone	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t	n/t
OrganoPhosphorus Pesticides									
Acephate	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t	n/t
Aziniphos-methyl	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t	n/t
Chlorpyrifos	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t	n/t
Demeton-s-methyl	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t	n/t
Dichlorvos	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t	n/t
Dimethoate	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t	n/t
Ethion	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t	n/t
Malathion	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t	n/t
Mathidathion	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t	n/t
Methamidophos	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t	n/t
Omethoate	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t	n/t
Pirimifos-methyl	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t	n/t
Profenofos	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t	n/t
Pyrazophos	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t	n/t
Tokuthion	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t	n/t
Tolclofos-methyl	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t	n/t

Results Summary

Report No.: 15-00884

			ELAB Reference	18678	18679	18680	18681	18682	18683
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS5	WS6	WS6	WS6	WS7	WS7
			Sample Depth (m)	1.00	0.50	1.00	2.00	0.20	1.00
			Sampling Date	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	9.8	3.8	5.4	n/t	4.8	5.2
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Chromium	M	mg/kg	5	28.7	7.9	18.3	n/t	10.8	9.9
Copper	M	mg/kg	5	14.1	8.6	13.4	n/t	10.8	11.7
Lead	M	mg/kg	5	17.9	7.1	16.8	n/t	10.7	11.4
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Nickel	M	mg/kg	5	34.0	11.4	32.4	n/t	13.5	21.9
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	n/t	< 1.0	< 1.0
Zinc	M	mg/kg	45	< 45.0	< 45.0	< 45.0	n/t	< 45.0	< 45.0
Anions									
Water Soluble Sulphate	M	g/l	0.02	0.03	0.03	0.05	n/t	0.07	< 0.02
Inorganics									
Free Cyanide	N	mg/kg	1	< 1.0	< 1.0	< 1.0	n/t	< 1.0	< 1.0
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	n/t	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	n/t	< 1.0	< 1.0
Miscellaneous									
pH	M	units	0.1	8.3	8.2	8.2	n/t	8.0	8.2
Soil Organic Matter	U	%	0.1	0.6	0.9	0.4	n/t	1.1	0.6

Results Summary

Report No.: 15-00884

			ELAB Reference	18678	18679	18680	18681	18682	18683
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS5	WS6	WS6	WS6	WS7	WS7
			Sample Depth (m)	1.00	0.50	1.00	2.00	0.20	1.00
			Sampling Date	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015
Determinand	**Codes**	**Units**	**LOD**						
Organics									
>C8-C10 BCB	N	mg/kg	1	< 1.0	< 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	< 1.0
>C12-C16 BCB	N	mg/kg	1	< 1.0	< 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	< 1.0
>C21-C35 BCB	N	mg/kg	1	< 1.0	3.5	1.5	1.3	< 1.0	1.3
>C35-C40 BCB	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C8-C40) BCB	N	mg/kg	1	< 1.0	3.5	1.5	1.3	< 1.0	1.3
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	n/t	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Acenaphthylene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Acenaphthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Fluorene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Phenanthrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Fluoranthene	M	mg/kg	0.5	< 0.5	0.6	< 0.5	n/t	< 0.5	< 0.5
Pyrene	M	mg/kg	0.5	< 0.5	0.6	< 0.5	n/t	< 0.5	< 0.5
Benzo (a) anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Chrysene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Benzo (b) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Benzo (k) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Benzo (a) pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Dibenzo(a,h)anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Benzo(ghi)perylene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Total PAH(16)	M	mg/kg	2	< 2	4	< 2	n/t	< 2	< 2

Results Summary

Report No.: 15-00884

			ELAB Reference	18678	18679	18680	18681	18682	18683
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS5	WS6	WS6	WS6	WS7	WS7
			Sample Depth (m)	1.00	0.50	1.00	2.00	0.20	1.00
			Sampling Date	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015
Determinand	**Codes**	**Units**	**LOD**						
OrganoChlorine Pesticides									
alpha-HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
beta_HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
gamma-HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
delta-HCH	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Heptachlor	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Aldrin	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Heptachlor expoxide	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
trans-Chlordane	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
alpha cis-Chlordane	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
p,p-DDE	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Dieldrin	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Endrin	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
p,p-DDD	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Endosulfan II	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Endrin aldehyde	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
p,p-DDT	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Endosulphan sulphate	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Methoxychlor	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Endrin ketone	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
OrganoPhosphorus Pesticides									
Acephate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	n/t
Aziniphos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	n/t
Chlorpyrifos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	n/t
Demeton-s-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	n/t
Dichlorvos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	n/t
Dimethoate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	n/t
Ethion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	n/t
Malathion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	n/t
Mathidathion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	n/t
Methamidophos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	n/t
Omethoate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	n/t
Pirimifos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	n/t
Profenofos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	n/t
Pyrazophos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	n/t
Tokuthion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	n/t
Tolclofos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	n/t

Results Summary

Report No.: 15-00884

			ELAB Reference	18684	18685	18686	18687	18688	18689
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS8	WS8	WS9	WS10	WS11	WS12
			Sample Depth (m)	0.20	0.50	0.50	0.20	0.50	0.20
			Sampling Date	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	12.8	11.4	10.7	6.2	8.4	6.5
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	26.1	31.0	26.3	15.9	28.1	19.1
Copper	M	mg/kg	5	32.7	21.2	20.9	17.1	13.0	17.3
Lead	M	mg/kg	5	147	39.9	50.5	37.1	17.5	31.3
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	23.4	24.5	27.7	15.9	45.6	19.5
Selenium	M	mg/kg	1	1.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	M	mg/kg	45	93.6	72.3	74.9	73.9	< 45.0	85.8
Anions									
Water Soluble Sulphate	M	g/l	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Inorganics									
Free Cyanide	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Miscellaneous									
pH	M	units	0.1	6.8	7.1	7.3	7.3	8.0	7.0
Soil Organic Matter	U	%	0.1	6.2	3.8	4.5	8.5	0.7	9.5

Results Summary

Report No.: 15-00884

			ELAB Reference	18684	18685	18686	18687	18688	18689
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS8	WS8	WS9	WS10	WS11	WS12
			Sample Depth (m)	0.20	0.50	0.50	0.20	0.50	0.20
			Sampling Date	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015
Determinand	**Codes**	**Units**	**LOD**						
Organics									
>C8-C10 BCB	N	mg/kg	1	< 1.0	< 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	< 1.0
>C12-C16 BCB	N	mg/kg	1	< 1.0	< 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	< 1.0
>C21-C35 BCB	N	mg/kg	1	1.6	1.4	2.0	4.3	6.7	3.5
>C35-C40 BCB	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C8-C40) BCB	N	mg/kg	1	1.6	1.4	2.0	4.3	6.7	3.5
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	M	mg/kg	0.5	0.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (a) anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.1	< 0.5
Benzo (b) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	0.6	< 0.5	1.8	< 0.5
Benzo (k) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.2	< 0.5
Benzo (a) pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.6	< 0.5
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.8	< 0.5
Dibenzo(a,h)anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(ghi)perylene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.6	< 0.5
Total PAH(16)	M	mg/kg	2	4	3	4	< 2	8	2

Results Summary

Report No.: 15-00884

			ELAB Reference	18684	18685	18686	18687	18688	18689
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS8	WS8	WS9	WS10	WS11	WS12
			Sample Depth (m)	0.20	0.50	0.50	0.20	0.50	0.20
			Sampling Date	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015	02/03/2015
Determinand	**Codes**	**Units**	**LOD**						
OrganoChlorine Pesticides									
alpha-HCH	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
beta_HCH	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
gamma-HCH	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
delta-HCH	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
Heptachlor	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
Aldrin	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
Heptachlor expoxide	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
trans-Chlordane	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
alpha cis-Chlordane	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
p,p-DDE	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
Dieldrin	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
Endrin	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
p,p-DDD	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
Endosulfan II	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
Endrin aldehyde	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
p,p-DDT	M	ug/kg	10	n/t	n/t	12	n/t	n/t	< 10
Endosulphan sulphate	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
Methoxychlor	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
Endrin ketone	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	< 10
OrganoPhosphorus Pesticides									
Acephate	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t	< 100
Aziniphos-methyl	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t	< 100
Chlorpyrifos	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t	< 100
Demeton-s-methyl	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t	< 100
Dichlorvos	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t	< 100
Dimethoate	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t	< 100
Ethion	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t	< 100
Malathion	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t	< 100
Mathidathion	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t	< 100
Methamidophos	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t	< 100
Omethoate	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t	< 100
Pirimifos-methyl	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t	< 100
Profenofos	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t	< 100
Pyrazophos	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t	< 100
Tokuthion	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t	< 100
Tolclofos-methyl	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t	< 100

Results Summary

Report No.: 15-00884

			ELAB Reference	18690	18691
			Customer Reference		
			Sample ID		
			Sample Type	SOIL	SOIL
			Sample Location	WS12	WS6
			Sample Depth (m)	0.50	3.00
			Sampling Date	02/03/2015	02/03/2015
Determinand	**Codes**	**Units**	**LOD**		
Metals					
Arsenic	M	mg/kg	1	9.4	n/t
Cadmium	M	mg/kg	0.5	< 0.5	n/t
Chromium	M	mg/kg	5	27.3	n/t
Copper	M	mg/kg	5	19.9	n/t
Lead	M	mg/kg	5	32.1	n/t
Mercury	M	mg/kg	0.5	< 0.5	n/t
Nickel	M	mg/kg	5	29.4	n/t
Selenium	M	mg/kg	1	< 1.0	n/t
Zinc	M	mg/kg	45	63.9	n/t
Anions					
Water Soluble Sulphate	M	g/l	0.02	< 0.02	n/t
Inorganics					
Free Cyanide	N	mg/kg	1	< 1.0	n/t
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	n/t
Total Cyanide	M	mg/kg	1	2.5	n/t
Miscellaneous					
pH	M	units	0.1	7.6	n/t
Soil Organic Matter	U	%	0.1	3.7	n/t

Results Summary

Report No.: 15-00884

ELAB Reference	18690	18691
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	WS12	WS6
Sample Depth (m)	0.50	3.00
Sampling Date	02/03/2015	02/03/2015

Determinand	Codes	Units	LOD		
Organics					
>C8-C10 BCB	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 BCB	N	mg/kg	1	< 1.0	< 1.0
>C12-C16 BCB	N	mg/kg	1	< 1.0	< 1.0
>C16-C21 BCB	N	mg/kg	1	< 1.0	< 1.0
>C21-C35 BCB	N	mg/kg	1	3.6	5.6
>C35-C40 BCB	N	mg/kg	1	< 1.0	< 1.0
Total (>C8-C40) BCB	N	mg/kg	1	3.6	5.6
Phenols					
Total Phenols	N	mg/kg	6	< 6	n/t
Polyaromatic hydrocarbons					
Naphthalene	M	mg/kg	0.5	< 0.5	n/t
Acenaphthylene	M	mg/kg	0.5	< 0.5	n/t
Acenaphthene	M	mg/kg	0.5	< 0.5	n/t
Fluorene	M	mg/kg	0.5	< 0.5	n/t
Phenanthrene	M	mg/kg	0.5	< 0.5	n/t
Anthracene	M	mg/kg	0.5	< 0.5	n/t
Fluoranthene	M	mg/kg	0.5	< 0.5	n/t
Pyrene	M	mg/kg	0.5	< 0.5	n/t
Benzo (a) anthracene	M	mg/kg	0.5	< 0.5	n/t
Chrysene	M	mg/kg	0.5	< 0.5	n/t
Benzo (b) fluoranthene	M	mg/kg	0.5	0.5	n/t
Benzo (k) fluoranthene	M	mg/kg	0.5	< 0.5	n/t
Benzo (a) pyrene	M	mg/kg	0.5	< 0.5	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.5	< 0.5	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.5	< 0.5	n/t
Benzo(ghi)perylene	M	mg/kg	0.5	< 0.5	n/t
Total PAH(16)	M	mg/kg	2	< 2	n/t

Results Summary

Report No.: 15-00884

			ELAB Reference	18690	18691
			Customer Reference		
			Sample ID		
			Sample Type	SOIL	SOIL
			Sample Location	WS12	WS6
			Sample Depth (m)	0.50	3.00
			Sampling Date	02/03/2015	02/03/2015
Determinand	**Codes**	**Units**	**LOD**		
OrganoChlorine Pesticides					
alpha-HCH	M	ug/kg	10	n/t	n/t
beta_HCH	M	ug/kg	10	n/t	n/t
gamma-HCH	M	ug/kg	10	n/t	n/t
delta-HCH	N	ug/kg	10	n/t	n/t
Heptachlor	N	ug/kg	10	n/t	n/t
Aldrin	M	ug/kg	10	n/t	n/t
Heptachlor expoxide	N	ug/kg	10	n/t	n/t
trans-Chlordane	N	ug/kg	10	n/t	n/t
alpha cis-Chlordane	N	ug/kg	10	n/t	n/t
p,p-DDE	M	ug/kg	10	n/t	n/t
Dieldrin	M	ug/kg	10	n/t	n/t
Endrin	N	ug/kg	10	n/t	n/t
p,p-DDD	M	ug/kg	10	n/t	n/t
Endosulfan II	N	ug/kg	10	n/t	n/t
Endrin aldehyde	N	ug/kg	10	n/t	n/t
p,p-DDT	M	ug/kg	10	n/t	n/t
Endosulphan sulphate	M	ug/kg	10	n/t	n/t
Methoxychlor	N	ug/kg	10	n/t	n/t
Endrin ketone	N	ug/kg	10	n/t	n/t
OrganoPhosphorus Pesticides					
Acephate	N	ug/kg	100	n/t	n/t
Aziniphos-methyl	N	ug/kg	100	n/t	n/t
Chlorpyrifos	N	ug/kg	100	n/t	n/t
Demeton-s-methyl	N	ug/kg	100	n/t	n/t
Dichlorvos	N	ug/kg	100	n/t	n/t
Dimethoate	N	ug/kg	100	n/t	n/t
Ethion	N	ug/kg	100	n/t	n/t
Malathion	N	ug/kg	100	n/t	n/t
Mathidathion	N	ug/kg	100	n/t	n/t
Methamidophos	N	ug/kg	100	n/t	n/t
Omethoate	N	ug/kg	100	n/t	n/t
Pirimifos-methyl	N	ug/kg	100	n/t	n/t
Profenofos	N	ug/kg	100	n/t	n/t
Pyrazophos	N	ug/kg	100	n/t	n/t
Tokuthion	N	ug/kg	100	n/t	n/t
Tolclofos-methyl	N	ug/kg	100	n/t	n/t

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.: 15-00884

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
18679	0.50	WS6	Silty loam	No asbestos detected
18683	1.00	WS7	Silty clayey loam	No asbestos detected
18687	0.20	WS10	Silty loam	No asbestos detected

Method Summary

Report No.: 15-00884

Parameter	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil				
Free cyanide	As submitted sample	12/03/2015	107	Colorimetry
Hexavalent chromium	As submitted sample	10/03/2015	110	Colorimetry
pH	Air dried sample	13/03/2015	113	Electromeric
Aqua regia extractable metals	Air dried sample	13/03/2015	118	ICPMS
Phenols in solids	As submitted sample	10/03/2015	121	HPLC
Polyaromatic hydrocarbons (GC-FID)	As submitted sample	10/03/2015	133	GC-FID
Water soluble anions	Air dried sample	13/03/2015	172	Ion Chromatography
Organochlorine Pesticides in solids	As submitted sample	12/03/2015	173	GC-MS
Organophosphorus Pesticides in solids	As submitted sample	12/03/2015	173	GC-MS
Total cyanide	As submitted sample	11/03/2015	204	Colorimetry
Basic carbon banding in soil	As submitted sample	10/03/2015	218	GC-FID
Soil organic matter	Air dried sample	13/03/2015	BS1377:P3	Titrimetry
Asbestos identification	As submitted sample	20/03/2015	PMAN	Microscopy

Report Information

Report No.: 15-00884

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

CAT-WASTE SOIL

Classification Assessment Tool of Soil Wastes - Hazard Summary Sheet

McArdle ATKINS

Site Name	Bell Farm, Harrietsham
Location	
Site ID	13298X
Job Number	
Date	4/20/2015 10:37:57 AM
User Name	Hannah.walters@evanslangford.co.uk
Company Name	Evans & Langford LLP

Hole ID	Sample Depth	Hazardous Waste Y/N	H1	H2	H3A	H3B	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15
WS1	0.2m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS1	0.5m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS2	0.5m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS3	0.2m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS4	0.2m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS5	0.5m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS5	1.0m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS6	0.5m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS6	1.0m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS6	2.0m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS7	0.2m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS7	1.0m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS8	0.2m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS8	0.5m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS9	0.5m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS10	0.2m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS11	0.5m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS12	0.2m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS12	0.5m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
WS6	3.0m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

CAT-WASTE SOIL

Classification Assessment Tool of Soil Wastes - Individual Compound Information

McArdle ATKINS

Site Name	Bell Farm, Harrietsham
Location	
Site ID	13298X
Job Number	
Date	4/20/2015 10:37:57 AM
User Name	Hannah.walters@evanslangford.co.uk
Company Name	Evans & Langford LLP

Hole ID	Sample Depth	Contaminant	Contaminant Concentration (%)	Hazardous Waste Y/N	Hazard Class	Risk Phrases Exceeded	Additive Risk Phrases Exceeded	H14 Risk Phrases Exceeded	Additional Risk Phrases (see notes section)
WS1	0.2m	Chromium (Total)	0.0048	N					R9 test/calculation
WS1	0.2m	Free Cyanide	0.0001	N					R12 test
WS1	0.5m	Chromium (Total)	0.0042	N					R9 test/calculation
WS1	0.5m	Free Cyanide	0.0001	N					R12 test
WS2	0.5m	Chromium (Total)	0.0023	N					R9 test/calculation
WS2	0.5m	Free Cyanide	0.0001	N					R12 test
WS3	0.2m	Chromium (Total)	0.0046	N					R9 test/calculation
WS3	0.2m	Free Cyanide	0.0001	N					R12 test
WS4	0.2m	Chromium (Total)	0.0047	N					R9 test/calculation
WS4	0.2m	Free Cyanide	0.0001	N					R12 test
WS5	0.5m	Chromium (Total)	0.0023	N					R9 test/calculation
WS5	0.5m	Free Cyanide	0.0001	N					R12 test
WS5	1.0m	Chromium (Total)	0.0041	N					R9 test/calculation
WS5	1.0m	Free Cyanide	0.0001	N					R12 test
WS6	0.5m	Chromium (Total)	0.0010	N					R9 test/calculation
WS6	0.5m	Free Cyanide	0.0001	N					R12 test
WS6	1.0m	Chromium (Total)	0.0026	N					R9 test/calculation
WS6	1.0m	Free Cyanide	0.0001	N					R12 test
WS7	0.2m	Chromium (Total)	0.0015	N					R9 test/calculation
WS7	0.2m	Free Cyanide	0.0001	N					R12 test
WS7	1.0m	Chromium (Total)	0.0013	N					R9 test/calculation
WS7	1.0m	Free Cyanide	0.0001	N					R12 test
WS8	0.2m	Chromium (Total)	0.0037	N					R9 test/calculation
WS8	0.2m	Free Cyanide	0.0001	N					R12 test

CAT-WASTE SOIL

Classification Assessment Tool of Soil Wastes - Individual Compound Information

McArdle ATKINS

Site Name	Bell Farm, Harrietsham
Location	
Site ID	13298X
Job Number	
Date	4/20/2015 10:37:57 AM
User Name	Hannah.walters@evanslangford.co.uk
Company Name	Evans & Langford LLP

Hole ID	Sample Depth	Contaminant	Contaminant Concentration (%)	Hazardous Waste Y/N	Hazard Class	Risk Phrases Exceeded	Additive Risk Phrases Exceeded	H14 Risk Phrases Exceeded	Additional Risk Phrases (see notes section)
WS8	0.5m	Chromium (Total)	0.0044	N					R9 test/calculation
WS8	0.5m	Free Cyanide	0.0001	N					R12 test
WS9	0.5m	Chromium (Total)	0.0037	N					R9 test/calculation
WS9	0.5m	Free Cyanide	0.0001	N					R12 test
WS10	0.2m	Chromium (Total)	0.0022	N					R9 test/calculation
WS10	0.2m	Free Cyanide	0.0001	N					R12 test
WS11	0.5m	Chromium (Total)	0.0040	N					R9 test/calculation
WS11	0.5m	Free Cyanide	0.0001	N					R12 test
WS12	0.2m	Chromium (Total)	0.0027	N					R9 test/calculation
WS12	0.2m	Free Cyanide	0.0001	N					R12 test
WS12	0.5m	Chromium (Total)	0.0039	N					R9 test/calculation
WS12	0.5m	Free Cyanide	0.0001	N					R12 test

CAT-WASTE SOIL

McArdle ATKINS

Notes - Additional Information on Risk Phrases

R1 to R6	Explosive - See comment	Associated with H15, where the hazard (H15) will apply if the waste contains substances that degrade to form, or react with, other wastes or substances (or produce on combustion) other substances with any of the properties H1 to H14, at or above the appropriate threshold.
R7, R8 and R9	Test/calculation for oxides	Applicable to solid compounds that are not explosive, highly flammable, organic peroxides or combustible. A test for the compounds oxidising properties as described in Directive 92/69/EEC, Test Method A17. For organic peroxides calculate the available oxygen content (%). For liquids and oxidising materials not covered by those previously listed no testing available.
R10	R10 test flash point	Flashpoint test as per Directive 92/62/EEC, Test Method A9
R11	R11 test flash point	For liquid substances, undertake the flashpoint test as per Directive 92/62/EEC, Test Method A9. For solid substances undertake flammability test as per directive 92/62/EEC, Test Method A10
R12	R12 test flammability	Flammability of gasses test as per Directive 92/62/EEC Test Method A11.
R15	R15 test flammability	To test the flammability of a substance when in contact with water test as per Directive 92/62/EEC, Test Method A12.
R16	R16 test for explosives	See comment above
R17	R17 pyrophoric test	To test the pyrophoric properties of solids and liquids test as per Directive 92/62/EEC, Test Method A13.
R18	R18 test for flammable explosive vapour air mixture	See comment above
R19	R19 test for flammable explosive peroxides	See comment above
R29	R29 test or calculation	Undertake test as per Directive 92/62/EEC, Test Method A12.
R31	R31 test or calculation	Undertake testing as per Directive 92/62/EEC, Test Method A12 modified to replace water with an acid which will not cause a displacement reaction to occur. Method to measure SO2 evolved when a waste is in contact with an acid (see Environment Agency SWEN 068).
R32	R32 test or calculation	Undertake testing as per Directive 92/62/EEC, Test Method A12 modified to replace water with an acid which will not cause a displacement reaction to occur).
R44	R44 test for explosives	See comment above
R54 to R58	see comment	Classification of waste as ecotoxic (on the basis of terrestrial non-aquatic toxicity) is not applicable due to the lack of detailed information. Until more data becomes available R54 to R58 should not be considered when assessing the ecotoxic hazard of wastes and classifications should be based upon aquatic toxicity data. Where there is reason to believe that a waste contains substances that only have effects on the terrestrial environment, guidance on the approapriate test method should be obtained from the Environment Agency.

Notes:

Testing of compounds which would be classified under H14 should only be undertaken where the hazards cannot be adequately identified. (i.e. where the waste contains a substance/s for which there is no aquatic toxicity data and/or where the waste is an uncharacterised mixture and/or there is the potential that the waste may contain unknown substances or breakdown products.
Aquatic toxicity testing should be undertaken in accordance with the Environmental Health and Safety Publication, series on Testing and Assessment No. 23 ENV/JM/MONO(2000) 6 June 2000