Phase I & II Geo-Environmental Assessment

Greenfield Avenue
Ickleford
North Hertfordshire
SG5 3XR

Prepared for:

North Hertfordshire Homes
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GREENFIELD AVENUE, ICKLEFORD

NON-TECHNICAL CLIENT SUMMARY

This report presents the findings of a combined Phase I Desk Study and Phase II Geo-Environmental assessment undertaken to determine ground conditions, establish if there are any environmental risks associated with the site and its development and provide a geotechnical appraisal. Pertinent findings and conclusions may be summarised as follows:

- The Phase I investigation (desk study) has shown that the site remained largely undeveloped until the 1970's when the current storage garages were constructed.
- Geological records indicate the ground conditions to consist of Glaciofluvial Deposits (sand and gravel) overlying Gault Formation. Although formal land use in the surrounding area has generally been limited to residential, potential risks were highlighted, mainly associated with the potential presence of contaminated shallow soils particularly in proposed areas of development.
- Intrusive investigations involved the drilling of five window sampler boreholes to 4.0m, which found ground conditions to comprise made ground / topsoil overlying sandy silty clay and flint gravel in a sandy silty matrix underlain by stiff sandy silty clay at depth.
- Laboratory testing has shown no levels of contamination that pose a risk to future site users therefore, no further environmental assessment is considered necessary. However, a number of precautionary control measures have been suggested including the adoption of standard health and safety practices for construction workers during redevelopment works.

ENGINEERING SUMMARY

- The ground conditions across the site are considered suitable for the use of conventional spread foundations bearing upon the Glaciofluvial Deposits adopting an allowable bearing pressure of 130kN/m^2 at around 1.0m, although the influence of groundwater will reduce bearing pressures.
- Infiltration testing of the underlying geology indicates 'very low' permeability conditions, which has most likely been influenced by shallow groundwater.
- A design sulphate class of DS-2 is considered suitable for shallow buried concrete, with an aggressive chemical environment for concrete (ACEC) of AC-2.

The above points represent a simplified summary of the findings of this assessment and should not form the basis for key decisions for the proposed development. A thorough review of the details is contained within the following report, or alternatively get in touch and we'll talk you through it.

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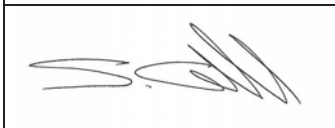	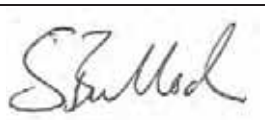	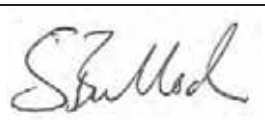
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Where ground investigations have been conducted, these have been limited to the level of detail required for the site in order to achieve the objectives of the investigation.

The report has been written, reviewed and authorised by the persons listed above. It has also undergone EPS' in house quality management inspection. Should you require any further assistance regarding the information provided within the report, please do not hesitate to contact us.

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1 INTRODUCTION

In January 2018, Environmental Protection Strategies Ltd (EPS) was commissioned by North Hertfordshire Homes to complete a Phase I & II Geo-Environmental Assessment at Greenfield Avenue, Ickleford, North Hertfordshire, SG5 3XR ('the site'); see Figure 1.

The work was commissioned in order to fulfil pre-planning requirements for the development of four residential flats with associated parking and communal areas.

This report presents the findings, conclusions, and recommendations of the Phase I Desk Study and subsequent Phase II Intrusive Investigation undertaken.

1.1 Objectives

The objectives of this investigation were as follows:

a) To compile a Phase I desk study and Conceptual Site Model (CSM) to evaluate the potential risks the site may pose to human and environmental receptors, both currently and in future.
b) To investigate potential contaminant linkages identified through the CSM by means of investigating shallow soils.
c) To determine the potential risks posed by the site and make recommendations for further work that may be required, to ensure safe development in accordance with the Model Procedures for the Management of Land Contamination - *Contaminated Land Report 11*.
d) To collect information on ground conditions and strength in order to make appropriate recommendations for geotechnical design.

1.2 Scope of Work

To perform an exploratory assessment of the site in accordance with the principles and requirements of DEFRAs '*Contaminated Land - Statutory Guidance'* (2012), BS10175 –'*Investigation of Potentially Contaminated Sites'*, BS 5930:2015 *'Code of Practice for Ground Investigations'* and BS EN 1997 '*Geotechnical Design*', the following tasks were undertaken:

<u>Desk Study:</u>

- Collection of site records.
- Study of existing geological, hydrogeological and historic maps of the area.
- Consultation of environmental databases, including records held by the local authority.
- Review of proposed development plans.
- Development of conceptual model and contaminant linkage assessment.

Intrusive Investigation:

- Site walkover, inspection of any visual evidence of contamination at the site, obtaining photographic records.
- Health and safety briefing / site supervision.
- Drilling of five window sampler boreholes, using a percussive drilling rig, to a maximum depth of 4.0m below ground level (bgl).
- Completion of falling head infiltration tests.
- Recording of ground conditions including inspection of samples for visual and olfactory contamination.

Reporting:

- Data collection and interpretation.
- Reporting.

The findings of these investigations and their conclusions are presented in the following sections.

1.3 Project Limitations and Constraints

The purpose of this report is to present the findings of a soil sampling investigation conducted at the location(s) specified. When examining the data collected from the investigations made during the assessment, Environmental Protection Strategies Ltd (EPS) makes the following statements:

No investigation method is capable of completely identifying all ground conditions that might be present in the soil or groundwater under a site. Where outlined in our report, we have examined the ground beneath a site by constructing a number of boreholes and / or trial pits to recover soil and / or groundwater samples. The locations of these excavations and sampling points are considered to be representative of the condition of the whole site subsurface however, ground conditions are naturally variable and it may be possible that the ground conditions encountered may differ to those encountered during the investigation.

No visible evidence of Japanese Knotweed was identified during the site walkover. However, this plant can be difficult to identify in the early stages of growth and therefore it is not always possible to identify its presence at certain times of the year. For this reason, EPS cannot confirm that Japanese Knotweed rhizomes do not exist and it is recommended that if it is suspected that this species, or other similarly invasive plants are present at the site, a specialist contractor should be commissioned to make a detailed assessment.

This report does not include specific investigation for the presence of Potential Asbestos Containing Material (PACM). Specialist contractors should be commissioned to make detailed assessments and recommendations if these materials are suspected.

The investigation was carried out to assess the significance of contamination resulting from the use of the site as identified in this report. Unless EPS has otherwise indicated, no assessment of potential impact of any other previous uses has been made.

2 GEO-ENVIRONMENTAL SETTING

The following section provides a summary of the information collected in relation to the site location and history.

2.1 Site Location and Description

Detail	Description
Location	The site is located to the south of Greenfield Avenue, situated roughly 0.2km west of the centre of Ickleford, North Hertfordshire.
National Grid Reference	517985, 231606
Topography	Approximately 59-60m above ordnance datum (AOD) and levels appear to be generally flat.
Description of Site	A walkover was undertaken on the 15th January 2018 and the site was noted to cover approximately 0.11 hectares in surface area. Access was gained off Greenfield Avenue in the north which ran into an asphalt surfaced area bordered by actively used storage garages to the north, south and west that were associated with surrounding residential properties. The main part of the site was roughly rectangular in shape and the aforementioned Greenfield Avenue bound the site to the north. Vegetation comprised grass surfacing along the north boundary with a mature tree and shrubs also present in this area.
Surrounding Land Use	Residential properties immediately surround the site in all directions with an electricity substation present adjacent to the south. In the larger area agricultural fields are seen to the north and west.

A plan showing the site location is provided as Figure 1, the current site layout is detailed on Figure 2 and an aerial photograph is included as Figure 3. Selected site photographs are included as Appendix A and the proposed development plan is included as Appendix B.

2.2 Environmental Setting

The following details are taken from the Envirocheck report.

<table>
<tr><th>Detail</th><th colspan="2">Description</th></tr>
<tr><td>Geology</td><td colspan="2">Geological mapping indicates the site to be underlain by Glaciofluvial Deposits (sand and gravel) overlying bedrock of the Gault Formation. Information on the site's geological context is included as Appendix C.

An historic borehole log was acquired from the British Geological Survey (BGS) for a location approximately 247m northeast. The log reports topsoil extending to a depth of 0.6m overlying gravelly clay to 5.1m underlain by sand and gravel to 8.8m followed by clayey sand to 11.8m and sandy clay to 15.2m then finally boulder clay with chalk fragments to the maximum depth of the borehole at 44.5m. Groundwater was encountered at 22.8m. The historic borehole is also included in Appendix C.</td></tr>
<tr><td rowspan="9">Geological Hazards</td><td>Hazard</td><td>On Site Risk</td></tr>
<tr><td>Mining</td><td>Might not be affected</td></tr>
<tr><td>Collapsible Ground</td><td>Very Low</td></tr>
<tr><td>Compressible Ground</td><td>No Hazard</td></tr>
<tr><td>Ground Dissolution</td><td>No Hazard</td></tr>
<tr><td>Running Sand</td><td>Very Low</td></tr>
<tr><td>Landslide</td><td>Very Low</td></tr>
<tr><td>Shrinking/Swelling Clay</td><td>No Hazard</td></tr>
<tr><td colspan="2">The closest BGS mineral site is recorded 684m east for the quarrying of chalk.</td></tr>
<tr><td>Radon</td><td colspan="2">The BGS and Health Protection Agency (HPA) report entitled 'Indicative Atlas of Radon in England and Wales' (November 2007) shows the site to lie within a 1km grid section where the percentage of homes above the radon action level is between 0% and 1%. The joint Building Research Establishment Ltd (BRE) report entitled: 'Radon: Guidance on Protective Measures for New Buildings - 2007' reports that the site does not lie within an area where basic radon protection methods will need to be employed.</td></tr>
<tr><td>Hydrogeology</td><td colspan="2">Groundwater vulnerability maps for the area show that the underlying Glaciofluvial Deposits are classified by the EA as a Secondary A Aquifer with the underlying Gault Formation classified as Unproductive Strata. The site does not lie within a Source Protection Zone for local groundwater abstraction.

Two groundwater abstractions are listed within the Envirocheck Report with the closest of these recorded 922m west for general farming and domestic use. Groundwater vulnerability maps are included as Appendix D.</td></tr>
</table>

Detail	Description
Hydrology	The nearest surface water feature appears to be an unnamed river recorded 408m southeast. The nearest surface water abstraction is reported 566m east and relates to general agriculture: dust suppression. The nearest discharge consent is reported 570m northeast and relates to trade discharge – process water.
Flood Risk	Review of the EA flood zone map for the area indicates that the site lies within Flood Zone 1, which is defined within Table 1 of the technical guidance to the National Planning Policy Framework (NPPF) as '*the area with a low probability of flooding from rivers or the sea*'. It should be noted that the EA maps do not take into account flooding from other potential sources of floodwater, such as from poor drainage, or groundwater. An indicative flood zone map is included in Appendix D.

2.3 Landfill & Waste

The EA public database does not list any active or historic landfill sites within a 500m radius.

One licensed waste management facility is recorded within 1000m and is located 989m southeast.

There are no registered waste treatment, disposal or transfer sites listed within 1000m.

Three records of infilled ground are provided within 1000m, the nearest of which is located 412m east and refers to a water filled feature.

2.4 Industrial Land Use & Pollution

There is a total of 22 sites licensed for industrial activity within the surrounding 1000m, with only three of these being within 250m, the details of which are listed below.

Land Use	Approximate Distance (Direction)	Status
Commercial Cleaning Services	48m (NE)	Inactive
Coal & Smokeless Fuel Merchants & Distributors	70m (SE)	Inactive
Boilers – Servicing, Replacements & Repairs	163m (SE)	Inactive

One fuel station (obsolete) is recorded 606m northeast of the site.

There are no sites licensed by the local authority listed within 1000m radius.

2.5 Sensitive Land Use

The site is reported to be located within a Nitrate Vulnerable Zone where both groundwater and surface waters are considered to be susceptible to the leaching of nitrates from agricultural land.

An area of adopted green belt also lies 10m west.

2.6 Site History

A summary of historical map data from 1881 to 2018 is provided below and copies of relevant historic maps and any others examined during the investigation are included in this report as Appendix E.

- Early mapping from 1881 to 1901 showed the site as an undeveloped plot of land comprising part of a larger series of fields. Allotment gardens existed around 100m north and a number of properties associated with the village of Ickleford were found 250m east including several pubs, a school, St Katharine's Church and a smithy. In the larger area Ickleford House was located 240m southeast and Ickleford Roller Mills was mapped 310m southeast. A potential path or track (that would become the future Turnpike Lane) was seen 225m south with another (the future Bedford Road A600) 240m west.
- By 1922 the site was occupied by allotment gardens. In the surrounding area residential properties were built 195m northeast with several others constructed 185m southwest along the future Turnpike Lane. Three dwellings were also developed between 210m and 300m west of the site along the future Bedford Road.
- Between 1939 and 1950 a nursery and an orchard existed 165m west and a number of residential properties with associated allotment gardens were built 250m southwest.
- Sometime between 1978 and 1980 three rows of storage garages were constructed in the centre north, south and west of the site off Greenfield Avenue to the north. An electricity sub-station was immediately present in the southwest, with the site now entirely surrounded by residential properties associated with Ickleford that had expanded westbound.
- An aerial photograph from 1999 appeared to show the site in its current layout with three rows of storage garages likely associated with the surrounding residential properties located in the centre north, south and west. Along the north boundary grass surfacing was seen along with a mature tree and shrubs. In the larger area agricultural fields were seen 100m north and 80m west with playing fields seen further afield around 165m northeast.
- The site and surrounding area appeared to remain largely unchanged throughout the remainder of the historical period.

3 CONCEPTUAL MODEL AND PRELIMINARY RISK ASSESSMENT

The following section provides a review of the contaminant linkages that may be active at the site through examination of the potential sources that may be present as a result of historic and / or current site activities and where potential interaction between these sources and the identified human / environmental receptors may occur.

3.1 Source Characterisation

The following potential contaminant sources have been identified at the site and in the surrounding area:

Potential Source	Source Description	Principal Contaminants of Concern
Current / Historic Site Use	In-fill material of unknown origin (Made Ground) used to level areas beneath existing buildings and hardstanding.	PAH, Metals, ACM
	Historic use of the site for allotment gardens.	Herbicides, Metals & Pesticides
Current and Historic Surrounding Land Use	Current / historic commercial land use of the surrounding area including cleaning services and fuel merchants.	TPH, PAH, Metals, VOC, SVOC, ACM
	Electricity sub-station located adjacent to the site in the southwest.	TPH, PAH, PCB's

Notes:
PAH Polycyclic Aromatic Hydrocarbons
TPH Total Petroleum Hydrocarbons
SVOC Semi-Volatile Organic Compounds
ACM Asbestos Containing Materials
VOC Volatile Organic Compounds
PCB Polychlorinated biphenyl

3.2 Potential Receptors

A framework for the assessment of risks arising from the presence of contamination in soils has been produced by the Environment Agency and the Department for the Environment, Food and Rural Affairs (DEFRA) and is presented with the report: '*Using Science to Create A Better Place: Updated Technical Background to the CLEA Model* – Science Report SC050021/SR3'. This guidance document defines a series of standard land-uses, which form a basis for the development of an Environmental Conceptual Model.

Risks posed to all receptors have been considered in accordance with the Model Procedures for Management of Land Contamination (Contaminated Land Report 11). Risks posed to controlled waters have been considered in line with the Environment Agency's *Groundwater Protection: Principles and Practice* (referred to as GP3, 2013v1.1) and associated position statements.

The proposed development is understood to include four residential flats with associated parking and communal areas. Therefore, the land use has initially been considered as:

- Residential

In view of the environmental setting, current and potential future land use of the site and surrounding sites, the potential receptors for any contaminant impact are discussed below.

Receptor	Site Specific Description
Human	Future site users, site workers involved in the site redevelopment, and those working and living in the surrounding area have the potential to be at risk from exposure to potential contaminants of concern (CoCs).
Groundwater	The site is reported to be underlain by Glaciofluvial Deposits which are classified by the EA as a Secondary A Aquifer with the underlying Gault Formation classified as Unproductive Strata. Whilst the site does not lie within a SPZ for nearby groundwater abstraction, the underlying geology does have some resource potential and therefore groundwater should be considered as a potential receptor to site derived contaminants.
Surface Water	The nearest surface water feature appears to be an unnamed river located 408m southeast. Given the considerable distance of this watercourse from the site, it is considered highly unlikely that site derived contaminants could impact this receptor and on this basis surface waters have not been identified as a sensitive receptor to site derived contaminants.
Flora and Fauna	Proposed development plans for the site indicate that areas of communal garden, planting or landscaping will be present. Therefore, flora and fauna have been considered as a sensitive receptor to site-derived contaminants.
Buildings & Infrastructure	Subsurface structures are likely to be present at the site which may be adversely affected by the potential presence of the identified contaminants of concern. These include concrete used in building foundations, buried potable water supply pipes and other service lines and pipes.
Adjacent Land	Adjacent land/properties including private residential dwellings may be at risk from potential site-derived contaminants.

3.3 Potential Pathways

Where contaminants may be present in soil, there are a number of potential pathways that enable human receptors to come into contact with or be exposed to them. The most direct pathways, considered under current UK legislation, can be summarised as follows:

- Direct ingestion of contaminated soil
- Ingestion of household dust
- Ingestion of contaminated vegetables
- Ingestion of soil attached to vegetables
- Dermal contact with contaminated soil
- Dermal contact with household dust
- Inhalation of fugitive soil dust
- Inhalation of fugitive household dust
- Inhalation of vapours outdoors
- Inhalation of vapours indoors

Clearly, not all of these potential pathways apply for every standard land-use; the simplest example for exclusions being a commercial / industrial site which is covered by concrete hardstanding. The concrete precludes the direct exposure of humans working at the site to any contaminated soils.

However, in addition to direct exposure pathways, a number of physical transport mechanisms / pathways may also exist at a site that allow remote or less accessible contaminants in soil or groundwater to reach human or environmental receptors both at a site and beyond the site boundary. These include the following:

- Downward and lateral movement of contaminants in soil either by gravity or through being 'leached' by percolating rainwater.
- Lateral migration of contaminants dissolved in groundwater.
- Direct seepage or leaching of contaminants from soil into subsurface drains or supply pipework.
- Volatilisation of contaminants from groundwater or unsaturated soils into buildings or outdoor air.

Through examination of the standard land use and environmental setting at each site, the presence of pathways and transport mechanisms described above must be considered when assessing whether a contaminant linkage may plausibly be active, and therefore be included in the conceptual site model.

3.4 Summary of Contaminant Linkages

Considering the site use and environmental setting, and the proposed land use; the plausible contaminant linkages that require further investigation are summarised in the following table:

Source	Pathway	Receptor
Contaminated soil	Direct contact and inadvertent ingestion by eating or smoking with dirty hands	Construction workers during redevelopment & site users
	Inhalation of fugitive dusts	Site users
	Ingress / diffusion through permeable potable water supply pipes	
	Volatilisation of organic compounds to indoor and outdoor air.	
	Direct uptake via root systems	Plants

The following comments are made with respect to contaminant linkages which have been considered through development of the conceptual model, but have not been concluded as 'plausible' – i.e. through which a significant possibility of significant harm could occur to an identified receptor:

- PAHs and metals have been identified as contaminants of concern associated with the historic onsite made ground, however these contaminants are considered to be relatively immobile in the environment by virtue of their very low solubility and volatility. On this basis, plausible pathways by which these potential contaminants could pose a significant risk to the underlying groundwater (or nearby surface watercourses) are not considered to be active.
- Agri-chemicals utilised for historical on-site horticultural activities, including allotments, have been identified as potential sources of contamination. However, given the time elapsed since these land uses were last active and the quantities in which they are likely to have been applied, it is considered highly unlikely that significant pesticide contamination or any semi-volatile organic contaminants associated with this source would still be present in shallow soils within concentrations capable of posing a risk to future site users.
- A number of commercial and industrial land uses are located in the surrounding area. However, given the distance and status of these land uses and limited mobility of associated contaminants of concern in the environment, these sources are not considered to pose a significant risk to the proposed development.
- Whilst the majority of relatively modern electrical transformers do not contain insulation oils containing PCBs, the historic electricity sub-stations identified adjacent to the site may represent a potential source that could contain PCBs. However, given the limited environmental mobility of PCBs and as this sub-station is understood to be still in use and maintained by EDF, this source is not considered to pose a plausible risk to future site users.

The following diagram provides an illustration of the plausible contaminant linkages that may be active at the site and which may need further investigation or control to ensure safe development:

Greenfield Avenue, Ickleford – Illustrative Conceptual Site Model

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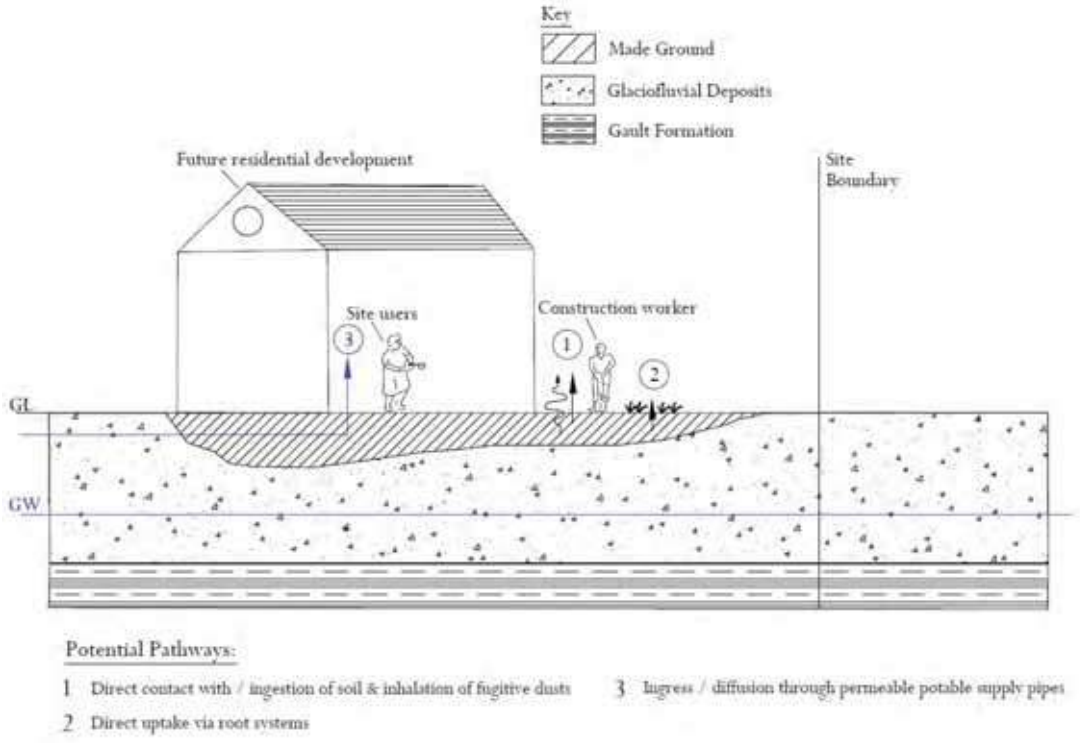

4 SUMMARY OF INTRUSIVE INVESTIGATIONS

Intrusive ground investigations were undertaken on the 15th January 2018 in accordance with EPS standard operating procedures, copies of which will be made available on request. A summary of all site activities is presented in the following sections:

4.1 Exploratory Hole Locations

Exploratory hole locations were selected through consideration of the proposed development layout, the location of below ground utilities as well as operational and health & safety considerations.

A total of five window sampler boreholes (BH1-BH5) were drilled to depths of up to 4.0m using a track mounted window sampling drilling rig.

The table below provides the rationale behind the exploratory hole locations.

Location	Rationale
BH1 – BH5	To provide general site coverage regarding the nature of the ground conditions and the quality of shallow soils.
BH1 – BH2	To facilitate falling head permeability tests.

The exploratory holes were undertaken in accordance with standard EPS methodologies, and subcontractors were supervised by an EPS engineer.

A detailed layout plan showing the locations of the boreholes formed during the investigation is presented as Figure 4.

4.2 Soil Sampling

Each borehole was logged for ground conditions encountered and inspected for any physical evidence of contamination, such as soil staining, odour and the presence of separate phase liquids, on a precautionary basis.

Soil samples were recovered from each location at regular intervals for record purposes and laboratory testing. Selection of samples for laboratory analysis from these positions focused on providing an assessment of the geotechnical properties of the soils encountered as well as the quality of shallow subsurface soils present across the site, particularly those areas to be converted as communal gardens.

Where potentially volatile organic compounds are suspected, EPS carries a Photoionisation Detector (PID), which can be used to measure the relative concentrations of vapour associated with soil samples collected from different depths and locations at the site. In this case, no physical evidence of volatile organic compounds was encountered (such as soil staining or odour), therefore the PID was not used.

Cone penetration tests (CPT's) were carried out in granular materials using an automatic trip hammer. The number of blows required to advance a solid 60° nose cone over the final 300mm of a 450mm total drive was recorded, and is shown on the borehole records at the penetration resistance ("N" value).

A laboratory testing schedule is included as Table 1.

4.3 Environmental Laboratory Analysis

All samples obtained for analysis of identified contaminants of concern were submitted to Jones Environmental of Flintshire, who hold appropriate UKAS / MCERT accreditation for the required testing. Samples were transported in laboratory supplied containers and delivered to the laboratory by approved courier. Furthermore, laboratory testing detailing all samples submitted for laboratory analysis is included within Table 1.

4.4 Geotechnical Laboratory Testing

Geotechnical testing was undertaken by Soil Property Testing, Huntingdon, a UKAS accredited laboratory.

Copies of chain of custody documentation are held by EPS and will be made available on request. Furthermore, laboratory testing detailing all samples submitted for laboratory analysis is also included within Table 1.

5 FINDINGS OF THE INVESTIGATION

This section of the report provides a summary of the findings of the various aspects of the ground investigation.

5.1 Ground Conditions

A total of five boreholes were formed at the site and the ground conditions encountered during the site drilling work are briefly summarised as follows:

- Made Ground / Topsoil
- Glaciofluvial Deposits
- Glacial Till

Site specific borehole records are included as Appendix F and give descriptions and depths of strata encountered. A summary of the strata encountered across the site is provided below.

Geological Strata	Maximum Depth to Base of Strata (m bgl)	Range of Strata Thickness (m)
Made Ground / Topsoil	0.6	0.5-0.6
Glaciofluvial Deposits	3.0	2.4-2.6
Glacial Till	>4.0	Not Proven

5.1.1 Made Ground / Topsoil

Made ground comprising a brown and grey very gravelly sandy soil with cobble and concrete fragments was encountered beneath the asphalt (0.2m thick) in BH1-BH3.

A dark brown slightly clayey gravelly sandy silty topsoil with common rootlets was recorded at the surface in BH4 and BH5 to a maximum depth of 0.6m.

5.1.2 Glaciofluvial Deposits

Soils interpreted to represent Glaciofluvial Deposits were noted beneath the made ground / topsoil in all of the boreholes. These soils generally comprised layers of firm yellowish brown gravelly sandy silty clay and medium dense brown black and white fine to coarse angular to subrounded flint gravel in a soft yellowish brown sandy silty matrix.

5.1.3 Glacial Till

Directly beneath the Glaciofluvial Deposits were soils considered to be representative of Glacial Till. These soils were typically described as stiff light olive brown gravelly sandy silty clay with subrounded chalk and rare flint fragments.

5.2 Groundwater

Groundwater was encountered within all of the boreholes. Strikes were recorded at 1.2m in BH1, 1.1m in BH2, 2.0m rising to 1.0m in BH3, 2.0m rising to 1.4m in BH4 and 2.0m rising to 0.6m in BH5.

5.3 Physical Evidence of Contamination

No palpable evidence of contamination was encountered in any of the exploratory locations formed during the ground investigation. The soils did not include any notable evidence of waste or putrefiable material, with hydrocarbon staining / odours also absent. Although isolated evidence of suspected cobble and concrete fragments was encountered within shallow soils present within top 0.6m profile, this is anticipated to be more indicative of 'low risk' construction debris, which had been mixed with shallow natural soils during original development phase.

5.4 Laboratory Analysis

5.4.1 Chemical Analysis-Soils

A laboratory analysis testing schedule is presented as Table 1 and all environmental sample results obtained from the laboratory are included as Appendix G.

The key results of laboratory testing on environmental soil samples are summarised as follows:

Contaminant	No. of Samples	No of Detections	Range of Detections (mg/kg)		Highest Location & Depth (m bgl)
			Min	Max	
Arsenic	8	8	9.9	37.5	BH3 (0.5-1.5)
Cadmium	8	2	0.2		BH5 (0.1-0.6) BH3 (2.2-2.4)
Chromium III	8	8	46.9	96.8	BH3 (0.5-1.5)
Chromium VI	8	0	-		
Copper	8	8	2	25	BH5 (0.1-0.6)
Mercury	8	0	-		
Nickel	8	8	11.5	35.4	BH3 (0.5-1.5)
Lead	8	7	7	58	BH5 (0.1-0.6)
Selenium	8	1	1		BH5 (0.1-0.6)
Zinc	8	8	19	116	BH5 (0.1-0.6)
Benzo(a)pyrene	8	2	0.10	0.28	BH4 (0.1-0.4)
Dibenzo(ah)anthracene	8	1	0.06		BH4 (0.1-0.4)
Napthalene	8	0	-		
PAH (Total of 16)	8	2	1.2	2.9	BH4 (0.1-0.4)
Total TPH	3	0	-		
BTEX	3	0	-		
PCB's	3	0	-		
ACM (mass %)	8	0	-		

Notes:	-	Contaminant not identified above MDL.
	ACM	Asbestos Containing Material
	BTEX	Benzene, Toluene, Ethylbenzene & Xylenes
	PAH	Polycyclic Aromatic Hydrocarbons
	PCB	Polychlorinated biphenyl
	TPH	Total Petroleum Hydrocarbons

- Limited concentrations of the majority of heavy metals were identified within shallow soils samples recovered.
- Individual PAH compounds were rarely detected above the minimum detection limit (MDL) within the majority of the samples submitted for laboratory analysis, with the combined concentration (total of 16 compounds) also falling below MDL.
- Individual BTEX compounds were not identified above MDL within any of the soils submitted for laboratory analysis.
- No trace of Asbestos Containing Materials (ACM) was identified within any samples submitted for laboratory analysis to a MDL of 0.001% by sample weight.

5.5 Waste Classification

Waste analysis has been carried out on three samples, representative of the underlying natural strata (Glaciofluvial Deposits and Glacial Till) at the site. These materials were considered as most likely 'waste streams' to be created due to future groundworks.

Waste Acceptance Criteria (WAC) analysis was completed in order to provide information on the most appropriate method of disposal for these materials. This information is summarised within the table below and the results of environmental laboratory analysis, (including WAC tests) are included as Appendix G.

Waste classification (i.e. hazardous or non-hazardous) was also undertaken using computer software provided by HazWaste OnlineTM. The results of this analysis are also summarised within the table below and the output from the HazWaste Online™ software is included as Appendix H.

Location	Depth (m bgl)	Description	Is it Hazardous?	Waste Acceptance Criteria	Waste Classification
BH3	0.5-1.5	Medium dense brown black and white flint GRAVEL in a soft yellowish brown sandy silty matrix	No	Passed Criteria for Inert Landfill	INERT
BH3	1.5-2.2	Medium dense brown black and white very sandy silty flint GRAVEL with occasional chalk fragments	No	Passed Criteria for Inert Landfill	INERT

Location	Depth (m bgl)	Description	Is it Hazardous?	Waste Acceptance Criteria	Waste Classification
BH3	2.2-4.0	Firm to stiff brown gravelly sandy silty CLAY with chalk and flint fragments	No	Passed Criteria for Inert Landfill	INERT

On this basis, material representative of underlying Glaciofluvial Deposits and Glacial Till at the site should be classified as Inert for the purposes of offsite disposal.

5.6 Geotechnical Testing

5.6.1 Laboratory Geotechnical Testing

The results of geotechnical laboratory testing are summarised in the table below.

Strata	Range of Parameters							
	Moisture Content (%)		Plastic Limit (%)		Plasticity Index (%)		CBR Value (%)	
	Min	Max	Min	Max	Min	Max	Min	Max
Glaciofluvial Deposits	10.4	16.6	14	19	9 (3.3)	25 (21)	20	54
Glacial Till	17.7		16		23 (19.5)		-	

() indicates plasticity index modified for granular content

The natural moisture content was established for five samples of cohesive soil in accordance with BS1377 Part 1:7.3 and BS1377: Part 2:3.2.

Atterberg limit tests were undertaken on five samples of cohesive soils in accordance with BS1377: Part 1:7.4 and BS1377: Part 2:3.2&4.2.

Particle Size Distribution (PSD) was carried out on three samples prepared in accordance with BS:1377 Part 1:7.3 & &:4.5 and the reported value is the percentage passing through a wet sieve at 425μm in accordance with the test BS1377: Part 2:.9.2.

California Bearing Ratio (CBR) tests were scheduled for two samples of shallow soils in accordance with BS 1377: Part1, 4:1990:7.4.

Sulphate contents and pH values determinations were also carried out by the chemical laboratory for natural soils, the results of which are summarised in section 9.5 below.

A laboratory analysis testing schedule is presented as Table 1 and all geotechnical sample results obtained from the laboratory are included as Appendix I.

6 GEOTECHNICAL APPRAISAL

The ground conditions have been found to comprise made ground / topsoil overlying Glaciofluvial Deposits (clays and gravels) overlying Glacial Till (clay).

6.1 Structural Foundations

6.1.1 Spread Foundations

The site and ground conditions are considered suitable for the use of conventional spread foundations, bearing upon the granular Glaciofluvial Deposits and providing that any layers of shallow cohesive soil are fully penetrated.

An allowable bearing capacity of 130kN/m^2 is considered suitable at a depth of around 1.0m in granular soils. Groundwater has been recorded at relatively shallow depths across the site and this will lead to a reduction in allowable bearing capacity if foundations are constructed below groundwater level due to loosening effects in the granular soils. Whilst it is recommended that foundations aren't constructed below groundwater, due to difficulties with groundwater control and excavation stability, an allowable bearing capacity of only 75kN/m^2 would be applicable if this unavoidable. The allowable bearing capacity is the permissible increase in vertical stress at the level of the underside of the foundation, above existing overburden pressure, which may be calculated on the basis of a soil density of 19kN/m^3.

At the above allowable bearing capacity, settlements are considered unlikely to exceed 15mm. Settlements in any cohesive soils will likely comprise a small amount of immediate settlement and a larger proportion of consolidation settlement which will occur over a long period of time, whilst in granular soils will occur rapidly as loadings increase.

Where foundations cross a change in strata, from cohesive to granular, it would be prudent to incorporate nominal reinforcement to control the effects of differential settlements.

A minimum foundation depth of 0.75m, is considered suitable for the site, below existing or proposed ground level, subject to the following provisos:

a) All foundations should fully penetrate any Made Ground or disturbed ground arising from removal of existing structures, and extend a minimum of 150mm into undisturbed natural strata.

b) Any bands of cohesive soils within the Glaciofluvial Deposits and at depth will be subject to volume change, (subsidence and / or heave) due to the presence of trees. Foundation design will therefore need to take into account the presence of trees, both those to remain and those to be planted as well as to be removed from site. The cohesive soils should be considered as having a medium volume change potential in accordance with NHBC Standards Chapter 4.2 *'Building Near Trees'*.

   A mature tree has been noted along the north boundary. It is recommended that a full tree survey is undertaken so that full impact of this feature can be accounted for.

6.2 Ground Floor Construction

Given the presence of variable low strength made ground and shrinkable soils encountered, suspended ground floor construction is recommended the incorporation of a suitable sub-floor void.

6.3 External Works

6.3.1 Pavement Design

Ground conditions at pavement subgrade level are likely to consist of either Made Ground or Glaciofluvial Deposits, depending upon final levels.

Laboratory CBR testing was undertaken on two shallow samples representative of sub-grade in predetermined locations and gave varied CBR values between 20% and 54% for the natural granular soils encountered, and as such it is suggested that a CBR value of 20% is suitable for the natural granular soils. The results of these tests are included within Appendix I.

Where Made Ground is encountered at subgrade level, a CBR value of only 2% to 3% would be appropriate, given the variable nature of this material.

Once the formation level for the new pavement has been achieved, proof rolling should be carried out using a heavy roller, and any soft or loose areas revealed should be excavated and a greater depth of sub-base provided.

Exposed subgrades will likely deteriorate rapidly on exposure to wet weather and should be shaped to shed water. Sub-base should be placed as soon as possible to minimise the exposure of the subgrade to adverse weather conditions.

6.3.2 Drainage

Falling head permeability tests were undertaken in two borehole positions (BH1 & BH2) to give an initial indication of infiltration characteristics of the underlying soils, the results of which are highlighted in the table below:

Falling Head Test Location	Depth (m bgl)	Test 1 Infiltration Rate (m/s)	Test 2 Infiltration Rate (m/s)
BH1	2.0	$1.94E^{-07}$	$1.93E^{-07}$
BH2	2.0	$5.66E^{-07}$	$5.64E^{-07}$

Each test was conducted for at least 1 hour, with very limited change in depth of water column over this period. This is considered to be indicative of very low permeability conditions, and it should be noted that shallow groundwater may have influenced the observed rates.

It is recommended that full soakaway testing, in conjunction with BRE365, is completed if this method of surface water disposal is to be pursued; although given the presence of shallow groundwater and cohesive soils, ground conditions may prove to be unsuitable in this instance.

It is also considered unlikely that the use of deep bored soakaways would be suitable as the bedrock in the area comprises Gault Clay and this appears to be mantled by low permeability Glacial Till.

6.4 Groundworks

The unsupported stability of the shallow Made Ground and Glaciofluvial Deposits should not be relied upon and significant instability is anticipated below groundwater.

Heavy plant and stockpiles of materials should not be permitted close to the edges of unsupported excavations.

Further reference may be made to CIRIA Report No. 97 '*Trenching Practice*' 1992.

Groundwater was encountered within all of the boreholes. Strikes were recorded at 1.2m in BH1, 1.1m in BH2, 2.0m rising to 1.0m in BH3, 2.0m rising to 1.4m in BH4 and 2.0m rising to 0.6m in BH5.

6.5 Concrete Grade

Sulphate contents and pH values determinations were carried out by the chemical laboratory, the results of which are also included within Appendix G. Results for concrete grade testing are summarised within the following table:

Strata	Water soluble Sulphate ($g/l\ SO_4$)		pH	
	Min	Max	Min	Max
Glaciofluvial Deposits	0.089	0.787	7.53	8.89
Glacial Till	0.319		8.26	

In accordance with Part 1 of the BRE Special Digest 1 '*Concrete in Aggressive Ground*' 2005, a design sulphate class of DS-2 is considered suitable for shallow buried concrete, with an aggressive chemical environment for concrete (ACEC) of AC-2.

7 ENVIRONMENTAL APPRAISAL

The following section outlines the approach applied to assessing the risks posed to human health and controlled waters through a Generic Quantitative Risk Assessment, then identifies any sample results found by this investigation which warrant further consideration.

7.1 Human Health

7.1.1 Land Use Setting & Generic Screening

It is understood that the site will be redeveloped for residential use in the form of four residential flats with associated parking and communal areas. In order to screen laboratory data for concentrations of contaminant in soil with potential to cause harm to human health at a residential setting (with plant uptake), relevant generic screening values have been used. These values are all based on suitable for use criteria for contaminants in soil. The technical framework used to derive the screening values and the documents in which they are published are summarised as follows:

- *EA Science Reports* (SC050021/SR2, SC050021/SR3, and SC050021/SR7)
- *EA Soil Guideline Value Science Reports*
- *Suitable for Use Levels (S4ULs) for Human Health Risk Assessment* – LQM and CIEH (2015)
- *Soil Generic Assessment Criteria for Human Health Risk Assessment* - EIC/AGS/CL: AIRE (2010)
- *Development of Category 4 Screening Levels for assessment of land affected by contamination - SP1010* – DEFRA (2013)

A summary of the screening criteria and the methodology used to derive them is included in Appendix J.

7.1.2 Assessment of Results

The results of the screening process for on-site human receptors showed that screening criteria representative of minimal / low risk to future site users were not exceeded for any contaminant at any location.

7.2 Controlled Waters

7.2.1 Generic Screening

In addition to screening the concentrations of contaminants in soil for risks to human health, EPS has also screened the concentrations for potential to cause harm to water resources. The criteria used for this process were derived by EPS using the following technical guidance:

- *Environment Agency Remedial Targets Methodology: Hydrogeological Risk Assessment for Land Contamination.*

Resource Sensitivity of Area	Basis of Tier 1 Criteria
High Groundwater Resource Potential (HGwRP) - Principal aquifers	UK Drinking Water Standards (UKDWS)
Low Groundwater Resource Potential (LGwRP) - Secondary aquifers not being abstracted and Un-productive groundwater strata	UK Environmental Quality Standards (EQS)

Screening criteria for Low Groundwater Resource Potential (LGwRP) have been adopted for this site due to the underlying bedrock (clay) being classified as unproductive strata.

7.2.2 Assessment of Soil Results – Controlled Waters

The results of the screening process for controlled waters show that the screening values for Low Groundwater Resource Potential (LGwRP) were not exceeded in any of the samples analysed.

7.3 Conclusions

Laboratory analysis of shallow soils sampled from across the site has indicated that available generic screening criteria have not been exceeded for any contaminant at any location therefore the shallow soil currently in place across the site is considered suitable for its proposed end use.

Waste Acceptance Criteria testing has indicated that underlying natural soils representative of Glaciofluvial Deposits and Glacial Till should be classified as INERT for the purpose of off-site disposal.

Whilst on the basis of the findings of the investigation the likelihood of encountering significant contamination is considered unlikely, additional precautionary measures to reduce the risk of exposure to contamination, should it be encountered are detailed below: -

a) All construction workers operating at the site should be advised of the potential for exposure to and contact with made ground in the subsurface of the site. Appropriate health and safety precautions should also be adopted during any excavation works to avoid exposure to soils. Reference should be made to the following HSE document: *Protection of Workers and the General Public during Development of Contaminated Land*.

b) Should any palpable evidence of unexpected contamination be encountered during the redevelopment work, it should be reported to EPS so that an inspection can be made and appropriate sampling and assessment work carried out. A method statement for encountering any unexpected contamination is included as Appendix K of this report.

In accordance with the *Model Procedures for Management of Land Contamination (Contaminated Land Report 11*), the risks identified by this work will not require further assessment. A summary of the approach outlined in CLR11, marking the work already completed under the risk assessment phase, is presented as a flow diagram in Figure 5 of this report.

It is also recommended that a copy of this report be provided to the Environmental Health Department of North Hertfordshire District Council for inclusion in their land quality records.

FIGURES



Approximate Site Location

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Title:	Site Location Plan		
Project:	Greenfield Avenue, Ickleford, North Hertfordshire, SG5 3XR	Scale:	NTS
		Drawn By: SC	Approved By: WE
Fig No:	1	Job No:	UK18.2974
		Dwg No:	NorthHerts/0218/01
		Date:	February 2018



Approximate Site Boundary

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Title:	Current Site Layout
Project:	Greenfield Avenue, Ickleford, North Hertfordshire, SG5 3XR
Fig No:	2
Scale:	NTS
Drawn By:	SC
Approved By:	WE
Job No:	UK18.2974
Dwg No:	NorthHerts/0218/02
Date:	February 2018

N



Approximate Site Boundary

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Title: Aerial Photograph

Project: Greenfield Avenue, Ickleford, North Hertfordshire, SG5 3XR

Fig No: 3

Scale:	NTS
Drawn By:	SC
Approved By:	WE
Job No:	UK18.2974
Dwg No:	NorthHerts/0218/03
Date:	February 2018



Approximate Site Boundary

Approximate Borehole Location

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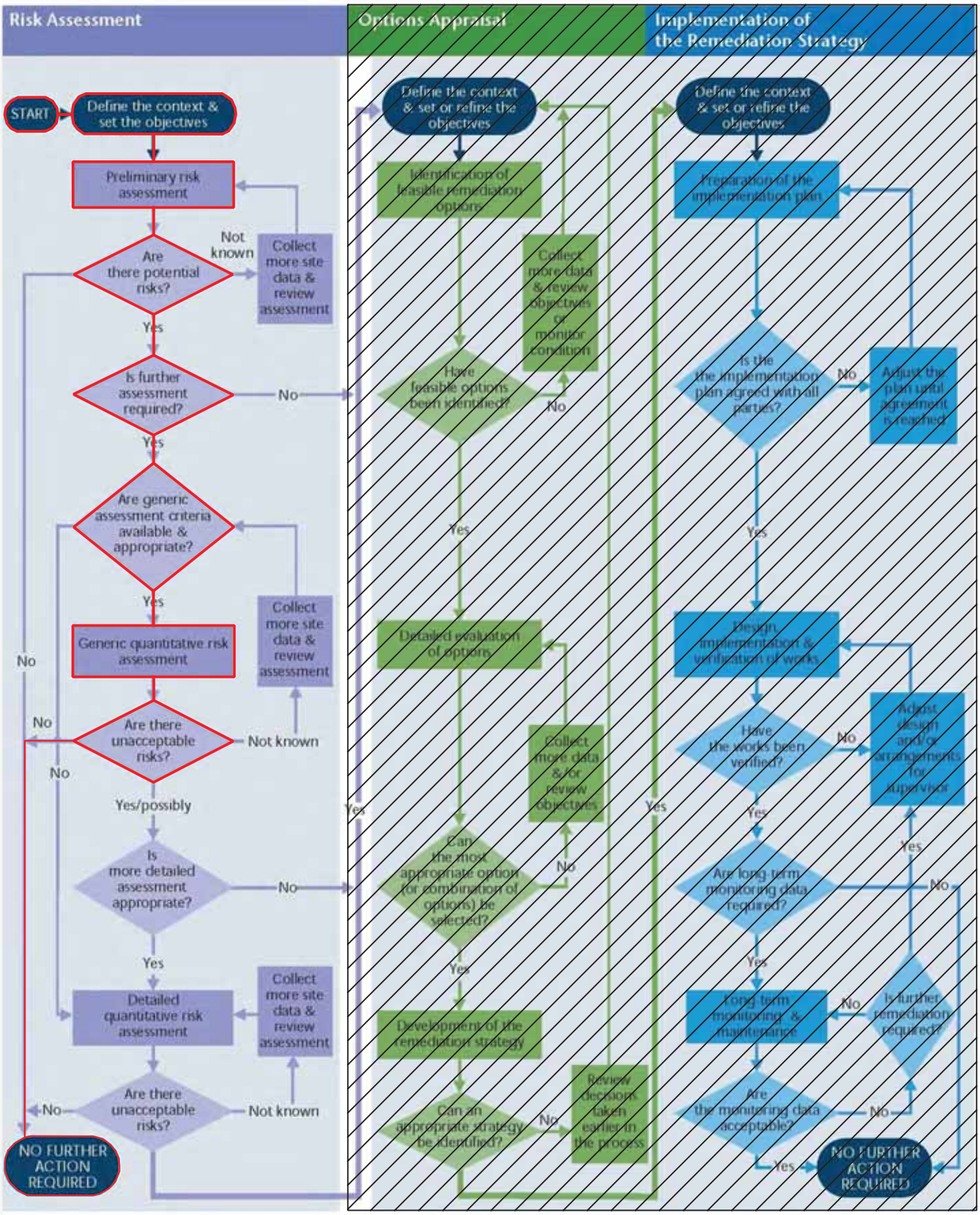
Title:	Borehole Location Plan		
Project:	Greenfield Avenue, Ickleford, SG5 3XR	Scale:	NTS
		Drawn By: SC	Approved By: WE
Fig No:	4	Job No:	UK18.2974
		Dwg No:	NorthHerts/0118/04
		Date:	January 2018



Assessment Pathway for Site

Title:	Site Context - CLR11		
Project:	Greenfield Avenue, Ickleford, North Hertfordshire, SG5 3XR	Scale:	n/a
		Drawn By: SC	Approved By: SB
Fig No:	5	Job No:	UK18.2974
		Dwg No:	NorthHerts/0218/05
		Date:	February 2018

TABLES

Table 1 – Laboratory Testing Schedule

Sample ID	Sample Depth (m bgl)	EPS Mini Suite	EPS Waste Suite	PH & Sulphates	Moisture Content	Atterberg Limits	CBR	PSD
BH1	0.3-1.3	-	-	-	1	1	1	-
BH1	1.8-2.0	-	-	-	-	-	-	1
BH2	0.3-1.3	-	-	-	1	1	1	-
BH2	1.3-1.5	-	-	-	-	-	-	1
BH3	0.5-1.5	-	1	-	-	-	-	-
BH3	0.6-0.8	-	-	-	1	1	-	-
BH3	0.8-1.0	1	-	1	-	-	-	-
BH3	1.3-1.5	-	-	1	-	-	-	-
BH3	1.5-2.2	-	1	-	-	-	-	-
BH3	2.3-2.5	-	-	-	1	1	-	-
BH3	2.2-4.0	-	1	-	-	-	-	-
BH4	0.1-0.4	1	-	-	-	-	-	-
BH4	1.0-1.2	-	-	-	-	-	-	1
BH4	2.7-2.9	-	-	1	-	-	-	-
BH4	3.8-4.0	-	-	1	1	1	-	-
BH5	0.1-0.6	1	-	-	-	-	-	-
BH5	0.6-0.8	1	-	-	-	-	-	-
BH5	1.0-1.5	1	-	-	-	-	-	-

APPENDICES

APPENDIX A

Selected Site Photographs



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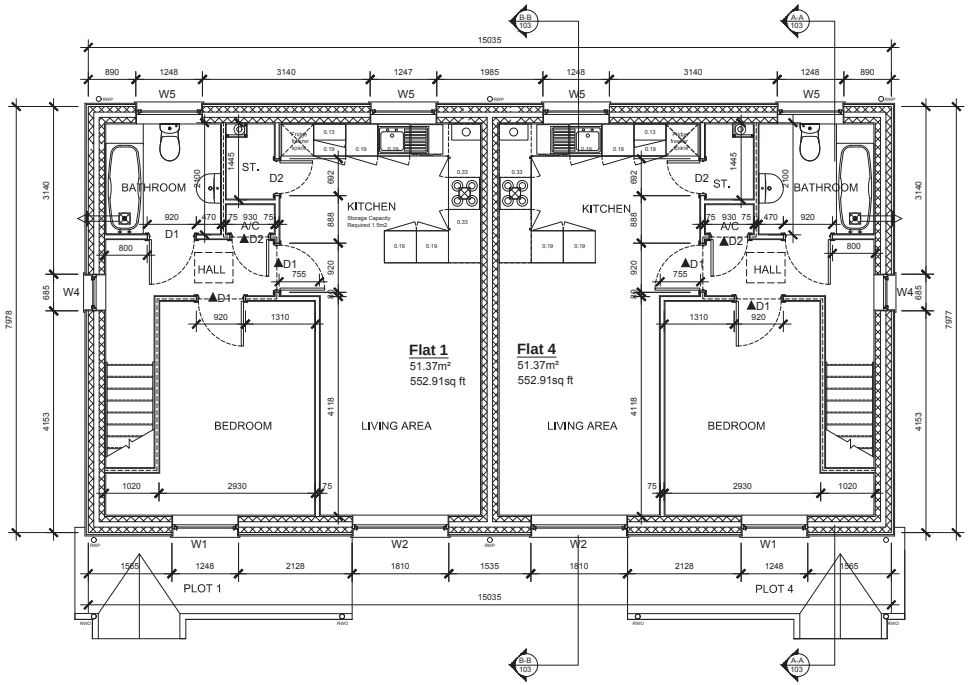
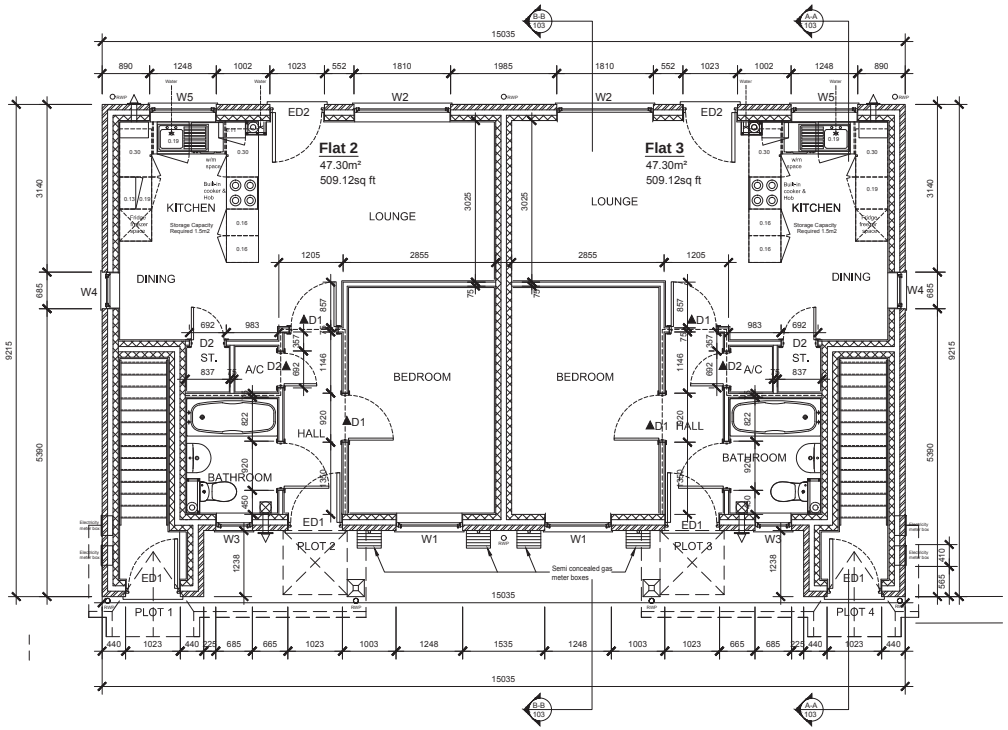
Title:	Photo Location Plan		
Project:	Greenfield Avenue, Ickleford, North Hertfordshire, SG5 3XR	Scale:	NTS
		Drawn By: SC	Approved By: WE
Appendix: A		Job No:	UK18.2974
		Dwg No:	NorthHerts/0218/A
		Date:	February 2018

Photo 1: Site entrance off Greenfield Avenue facing southeast	Photo 2: Mature tree present along north boundary
	
Photo 3: Storage garages present on site	Photo 4: Facing southwest
	
Photo 5: Electricity sub-station adjacent to the site in the southwest	Photo 6: BH3
	

APPENDIX B

Proposed Development Plan





KEY

Greenwood unity CV2 continuous extract system. Extract from vent to proprietary roof tile or similar

Boiler position with flue through adjacent external wall. Make sure that all boiler flue outlet positions are a min. 2.1m above adjacent ground level

Carbon monoxide detector. Locate a minimum 1000mm away from boiler.

Denotes mains operated, interlinked smoke detector. Locate a minimum 300mm from any wall.

75mm timber studs fully sound insulated with an absorbent layer of unfaced mineral wool batts or quilt (Min. thk. 25mm, min. density 10kg/m^3) 12.5mm Gyproc Wallboard Ten finish min. density 10kg/m^2. Skim finish.

Wall spec. as above to hall to achieve a 30 minute fire rating to form a protected shaft. Please follow Manufacturers installation guidelines and seal all gaps.

Ground floor external wall with Ibstock Surrey Russet Red facing bricks with 100mm cavity filled Knauf Dri -therm 32 insulation, 100mm Plasmor Stranlite block inner leaf and 12.5mm plasterboard on dot and dabs.

First floor external wall with Marley Cedral weatherboard cladding, 100mm Plasmor Stranlite block, 100mm cavity filled Knauf Dri -therm 32 insulation, 100mm Plasmor Stranlite block inner leaf and 12.5mm plasterboard on dot and dabs.

Fire Doors

FD30
30 minute fire resistant door with intumescent seals rebated in frame.

FD60S & S/C
60 minute fire resistant door with combined intumescent fire and brush smoke seal rebated in frame. Door fitted with overhead closer sized to suit door weight.

Insulated loft hatch location shown is indicative. Actual position to be shown on roof truss manufacturers layouts. Loft hatches in communal areas to comply with the guidance set out in Secured by Design New Homes 2014 guide Section 35.

Windows
Background ventilation Each window & door over 900mm wide to be provided with a min. 8000mm² & each rooflight with 2600mm²

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Rev.	Date	Description	By

Levitt Partnership Limited
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Tel.: 01767 312808
Fax: 01767 313400

Architects
Building Surveyors
Project Managers
Principal Designers
Land Agents

Client
North Hertfordshire Homes

Project
PROPOSED RESIDENTIAL DEVELOPMENT AT GREENFIELD AVENUE, ICKLEFORD, HERTFORDSHIRE, SG4 0NU

Drawing Title
GA Plans

Job No.	12568	Scale	1:50@A1
Drawing No.	100	Date	OCT 2017
Rev.		Drawn	TC
		Checked	DAT

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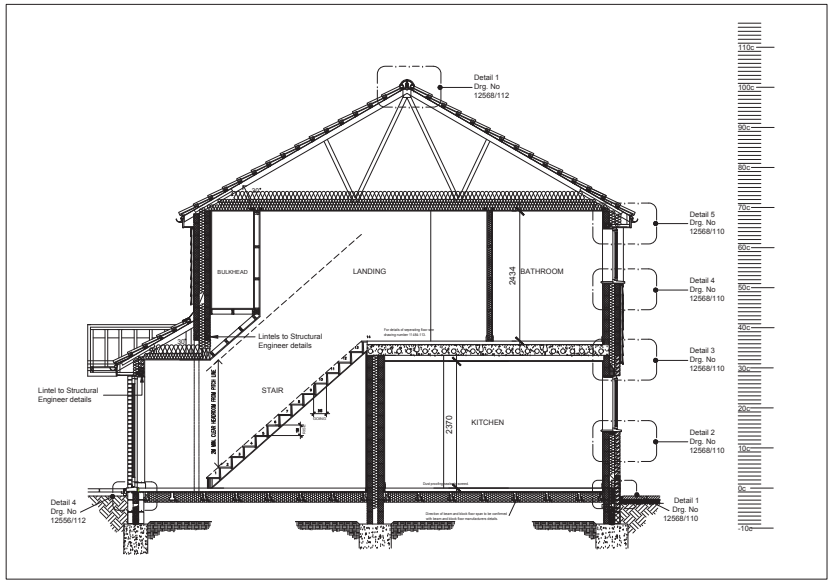

Section A-A
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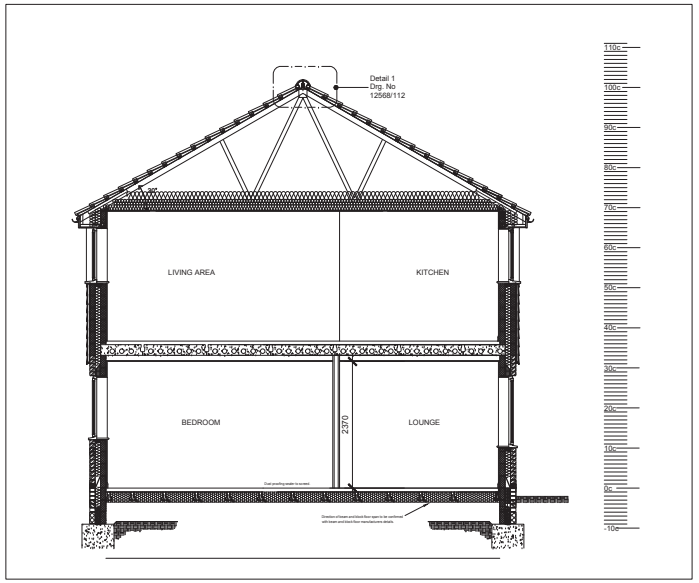

Section B-B
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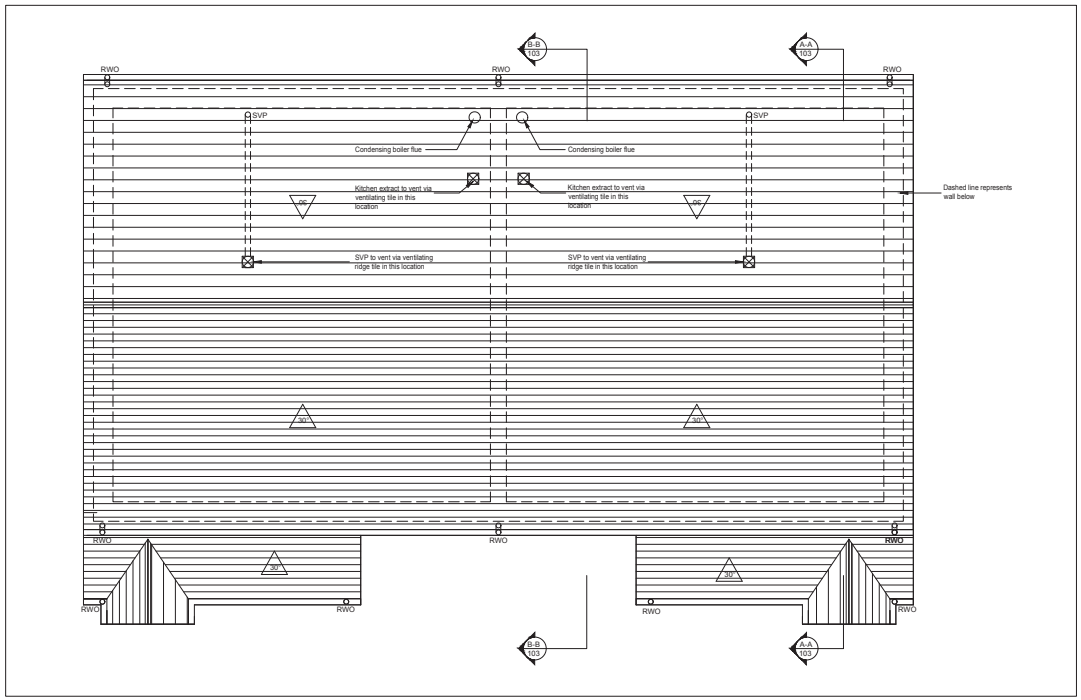

Roof Plan
Scale 1:50 @ A1

Rev.	Date	Description	By

Architects
Building Surveyors
Project Managers
Principal Designers
Land Agents

Levitt Partnership Limited
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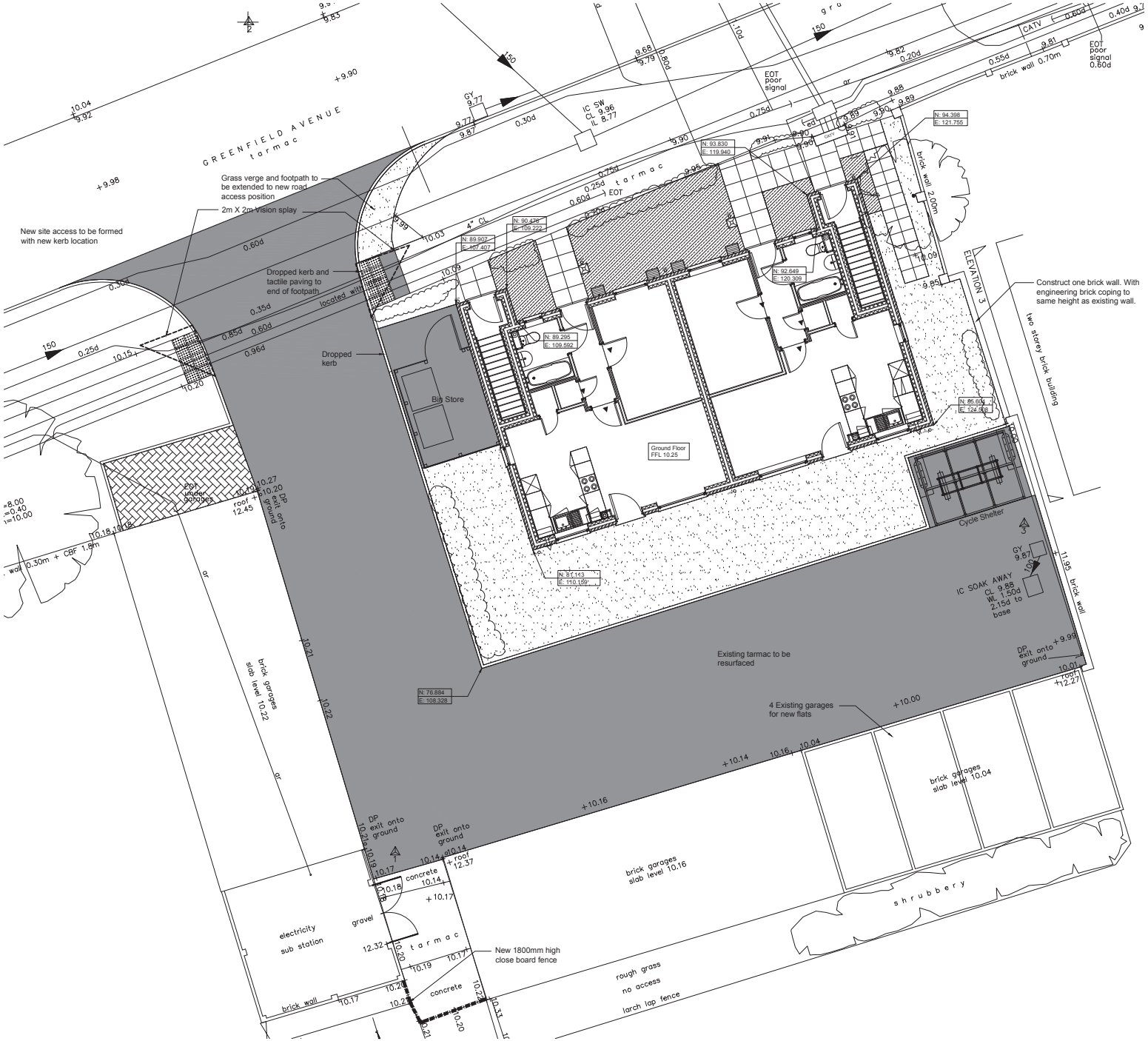
Fax: 01767 313400

Client
North Hertfordshire Homes

Project
PROPOSED RESIDENTIAL DEVELOPMENT AT GREENFIELD AVENUE, ICKLEFORD, HERTFORDSHIRE, SG4 0NU

Drawing Title
Sections A-A & B-B and Roof Plan

Job No.	12568	Scale	1:50@A1
Drawing No.	103	Date	OCT 2017
Rev.		Drawn	TC
		Checked	DAT



Proposed Site Plan

Scale 1:100 @ A2

Key

- Concrete block paving 200 x 100mm rectangular, colour charcoal, to parking bay
- New tarmac
- Turf laid to lawn
- 600mm x 600mm concrete paving slabs
- 450mm x 450mm concrete paving slabs
- Slate chippings
- 1800mm High Close board fence
- New brick wall. With engineering brick coping to same height as existing wall.

Levitt Partnership

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Rev.	Date	Description	By

Architects
Building Surveyors
Project Managers
Principal Designers
Land Agents

Levitt Partnership Limited
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Tel.: 01767 312808
Fax: 01767 313400

Client

North Hertfordshire Homes

Project

PROPOSED RESIDENTIAL DEVELOPMENT AT GREENFIELD AVENUE, ICKLEFORD, HERTFORDSHIRE, SG4 0NU

Drawing Title

Site Plan

Job No.	12568	Scale	1:100@A2
Drawing No.	200	Date	OCT 2017
Rev.		Drawn	DAT
		Checked	

APPENDIX C

Geological Context

Geology 1:50,000 Maps Legends

Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	WMGR	Infilled Ground	Artificial Deposit	Cenozoic - Cenozoic
	MGR	Made Ground (Undivided)	Artificial Deposit	Holocene - Holocene
	WGR	Worked Ground (Undivided)	Void	Holocene - Holocene

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
		Chalk Formation (Undifferentiated)		
	GLT	Gault Formation	Mudstone	Albian - Albian
		Faults		

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	ALV	Alluvium	Clay, Silt, Sand and Gravel	Flandrian - Flandrian
	LOFT	Lowestoft Formation	Diamicton	Anglian - Anglian
	ODT	Oadby Member	Diamicton	Anglian - Anglian
	GFDMP	Glaciofluvial Deposits, Mid Pleistocene	Sand and Gravel	Ipswichian - Cromerian
	GLLMP	Glaciolacustrine Deposits, Mid Pleistocene	Clay and Silt	Ipswichian - Cromerian
	LTH	Letchworth Gravels Formation	Sand and Gravel	Pleistocene - Pleistocene
	RTDU	River Terrace Deposits (Undifferentiated)	Sand and Gravel	Quaternary - Quaternary
	HEAD	Head	Clay, Silt, Sand and Gravel	Quaternary - Quaternary
	PEAT	Peat	Peat [Unlithified Deposits Coding Scheme]	Quaternary - Quaternary
	ALF	Alluvial Fan Deposits	Sand and Silt	Quaternary - Quaternary

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	WMCH	West Melbury Marly Chalk Formation	Chalk	Cenomanian - Cenomanian
	TTST	Totternhoe Stone Member	Chalk	Cenomanian - Cenomanian
	ZZCH	Zig Zag Chalk Formation	Chalk	Cenomanian - Cenomanian
	MR	Melbourn Rock Member	Chalk	Turonian - Cenomanian
	HNCK	Holywell Nodular Chalk Formation and New Pit	Chalk	Turonian - Cenomanian

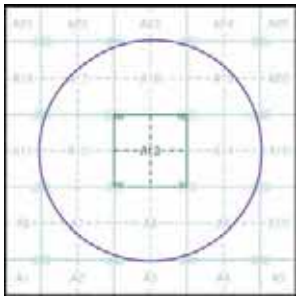
Geology 1:50,000 Maps

This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.
The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage

Map ID:	**1**
Map Sheet No:	**221**
Map Name:	**Hitchin**
Map Date:	**1995**
Bedrock Geology:	**Available**
Superficial Geology:	**Available**
Artificial Geology:	**Available**
Faults:	**Not Supplied**
Landslip:	**Available**
Rock Segments:	**Not Supplied**

Geology 1:50,000 Maps - Slice A



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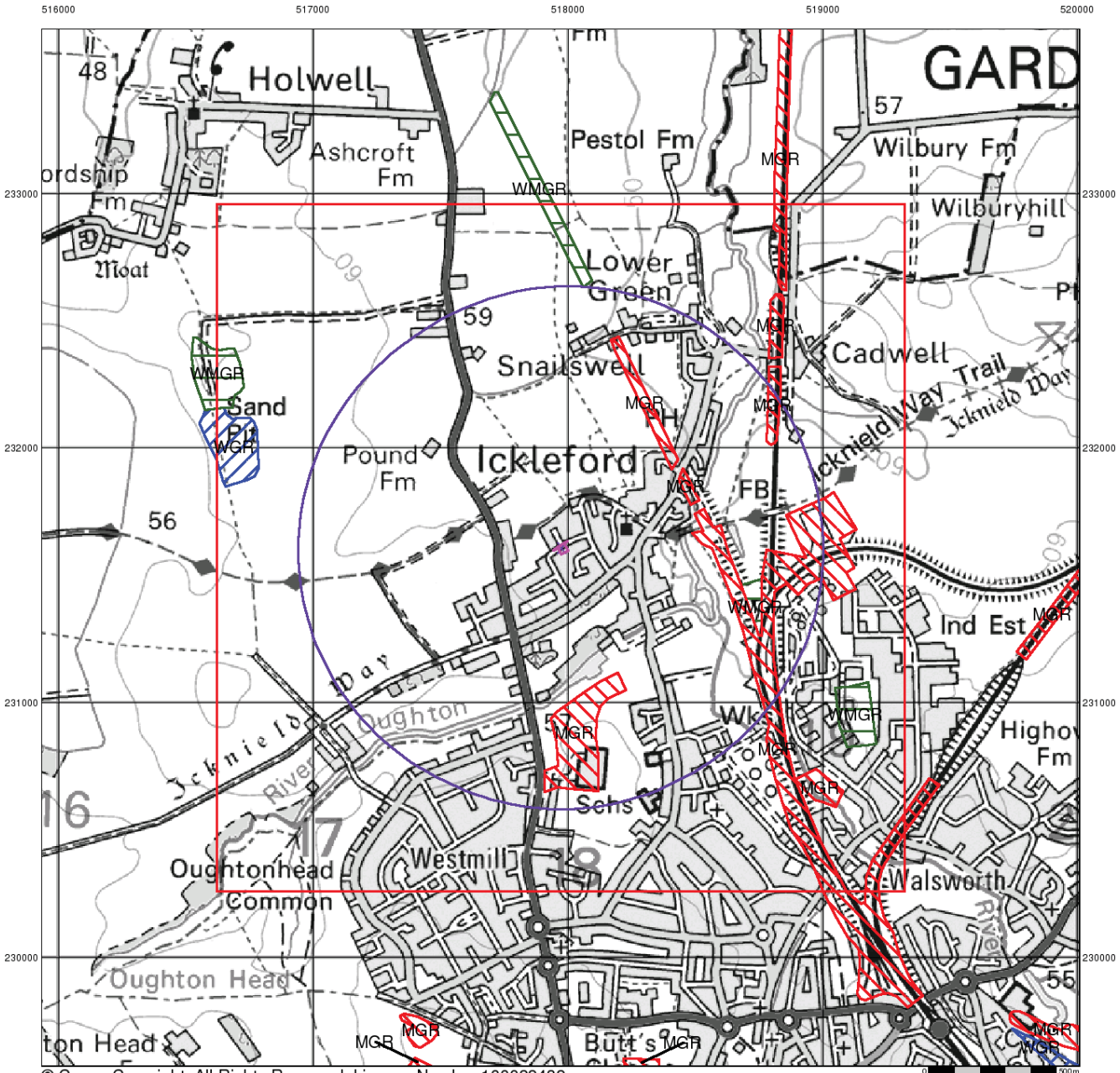

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Artificial Ground and Landslip

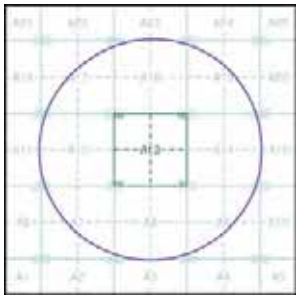
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes foundered strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



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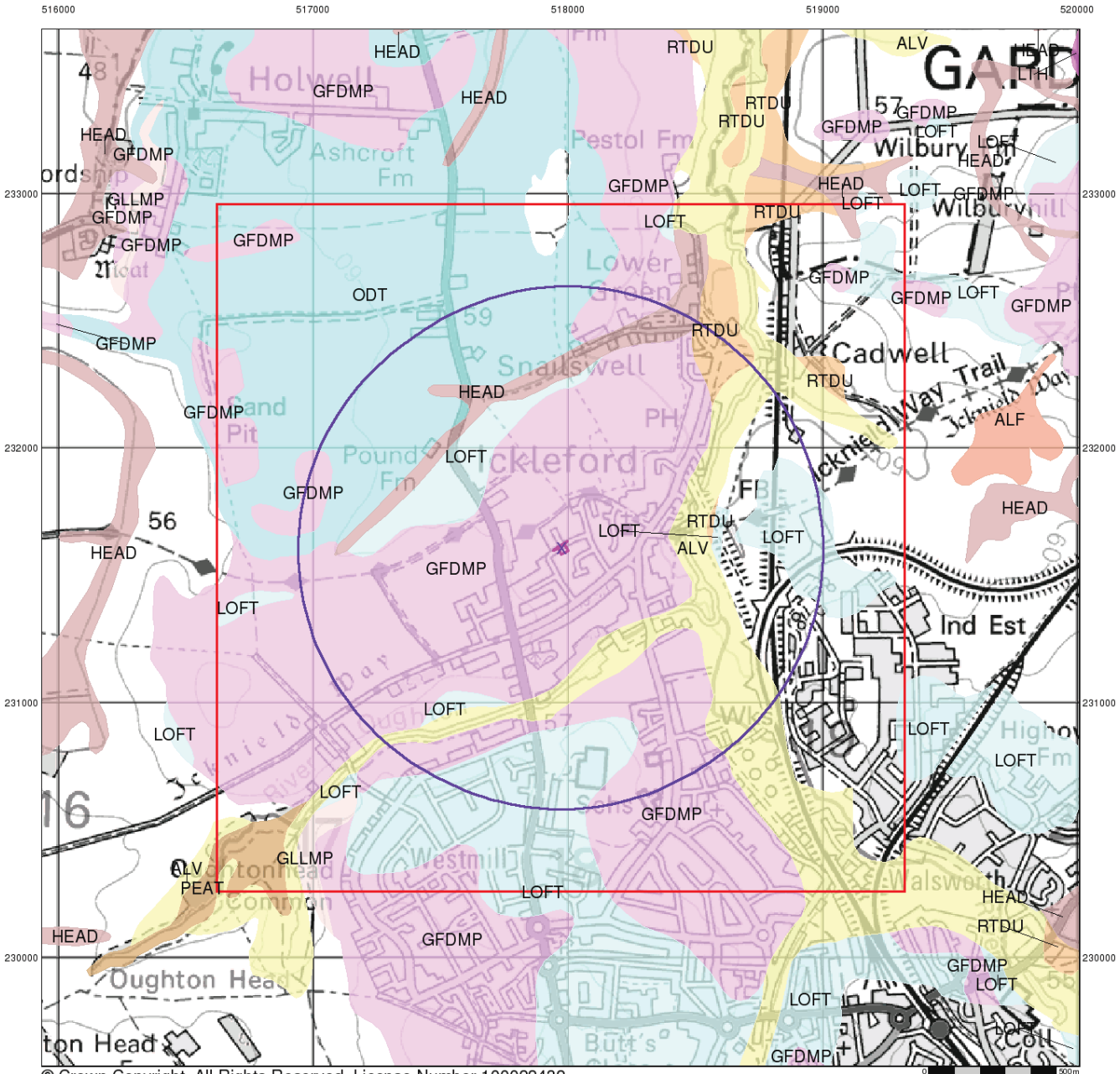

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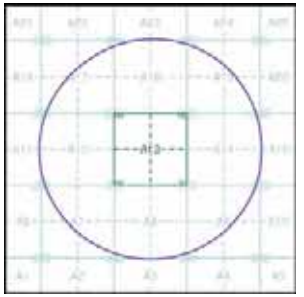
Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A



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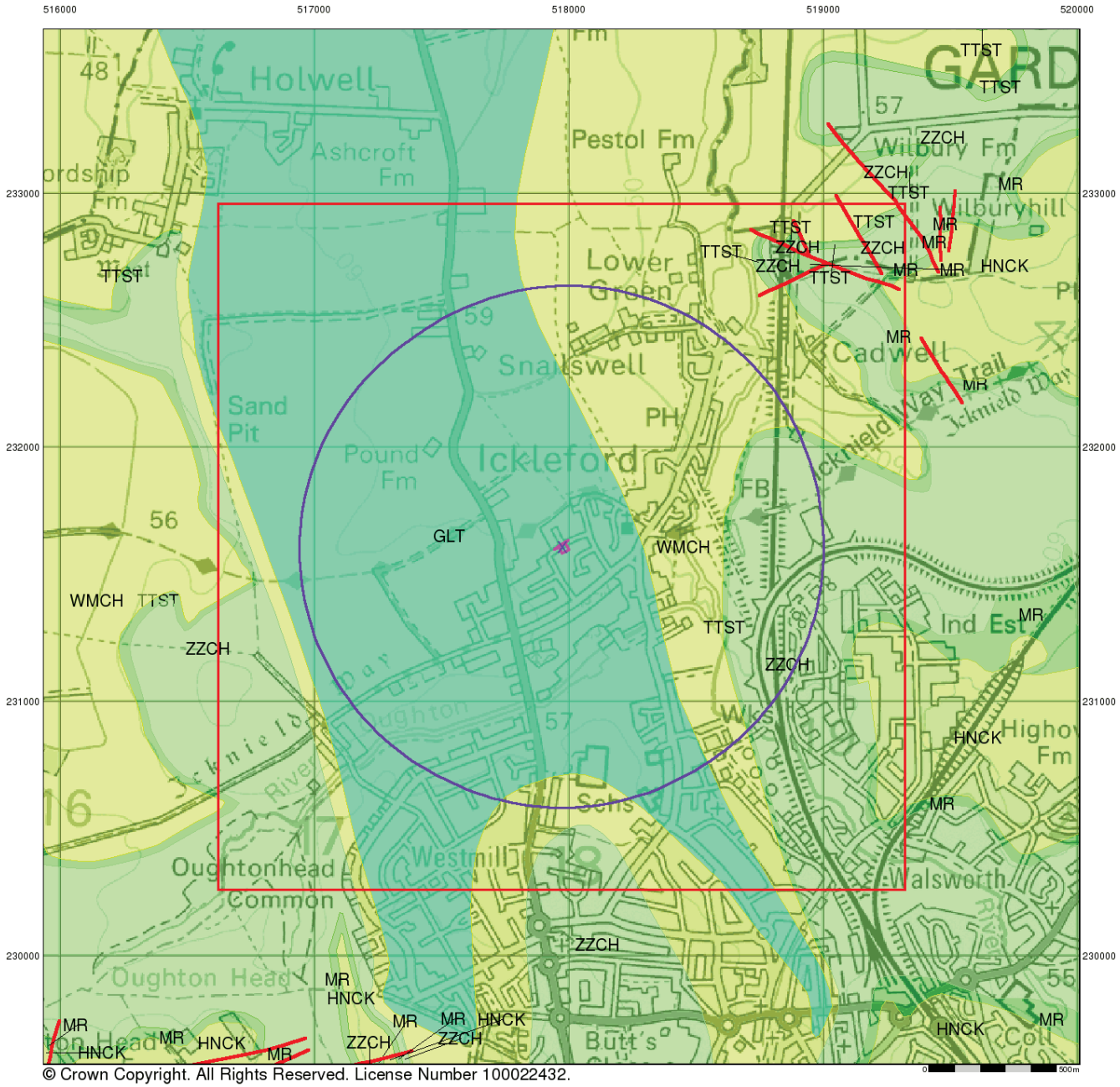


Bedrock and Faults

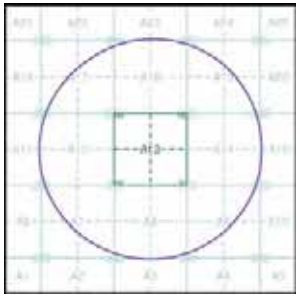
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

Bedrock and Faults Map - Slice A



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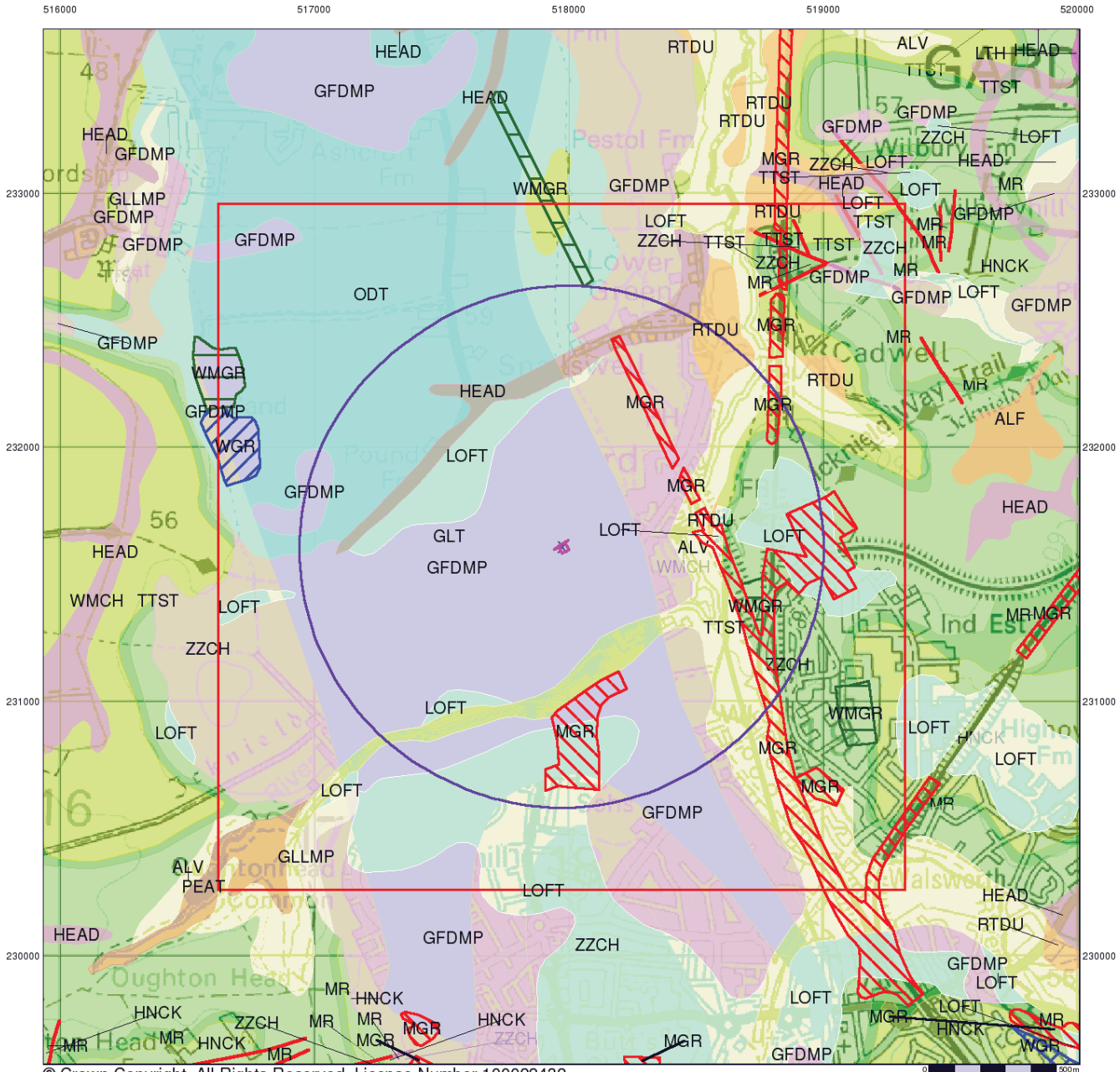

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Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

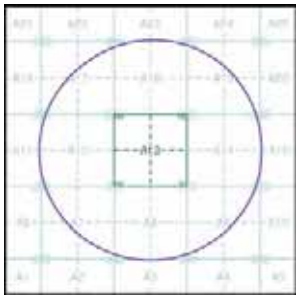
Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

Combined Geology Map - Slice A



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Search Buffer (m):	1000

Site Details:

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TL 13 SE 6

1823. 3169

221/51 The Rectory, Ickleford. (Disused)

W.S.B.II. p. 228./ Surface +177. Lining tubes: 40 × 13 in from 2½ down; 45 × 3 in from 3 down (perforated 43 to 48). Water struck at +102. R.W.L. +166. Yield 420 g.p.h. Ferruginous. *LeGrand, 1906.*

Pleist. Drift (Buried channel) ... 146 146

GEOLOGICAL CLASSIFICATION	NATURE OF STRATA	THICKNESS ft.	DEPTH ft.
Pleist Drift 146' (Bur Ch)	Soil or Mould	2	2
	Clay + Stones	15	17
	Sand + gravel	12	29
	Sand + thin veins of clay	10	39
	Sandy clay	11	50
	Boulder clay with pieces of chalk, flints etc. A thin layer of flints at 75', with water	66	116
	Boulder Clay with seams of chalk	30	146

pp. L.P. Thomas 8/2/68.

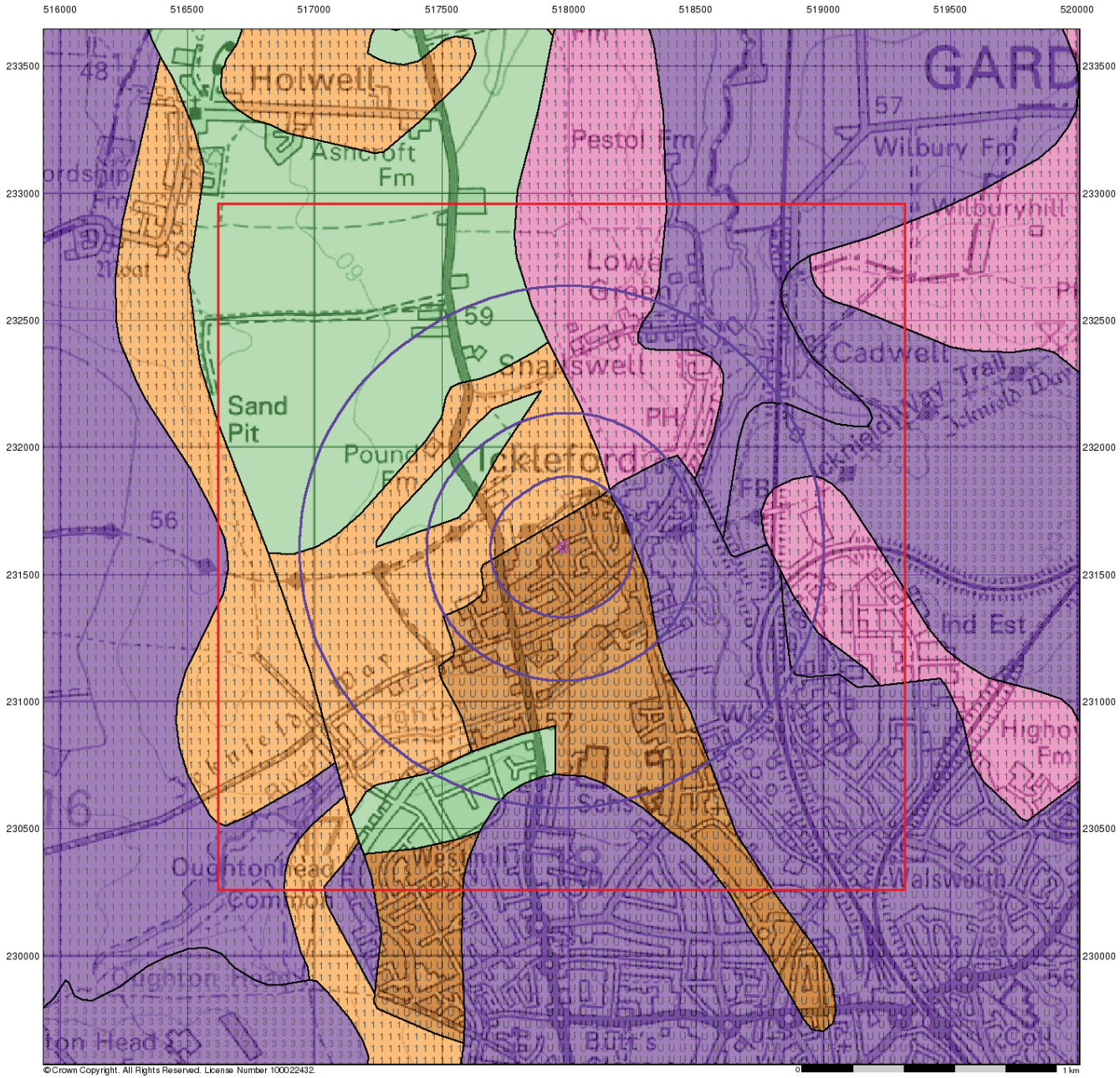
Water Supply

Bucks. & Herts.

Page 228

APPENDIX D

Groundwater Vulnerability and Flood Maps



Groundwater Vulnerability

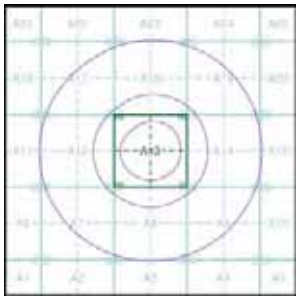
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes	Soil Classes
Major Aquifer (Highly Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Minor Aquifer (Variably Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Non Aquifer (Negligibly Permeable)	
Water or Sea	
Drift Deposit	

Site Sensitivity Context Map - Slice A



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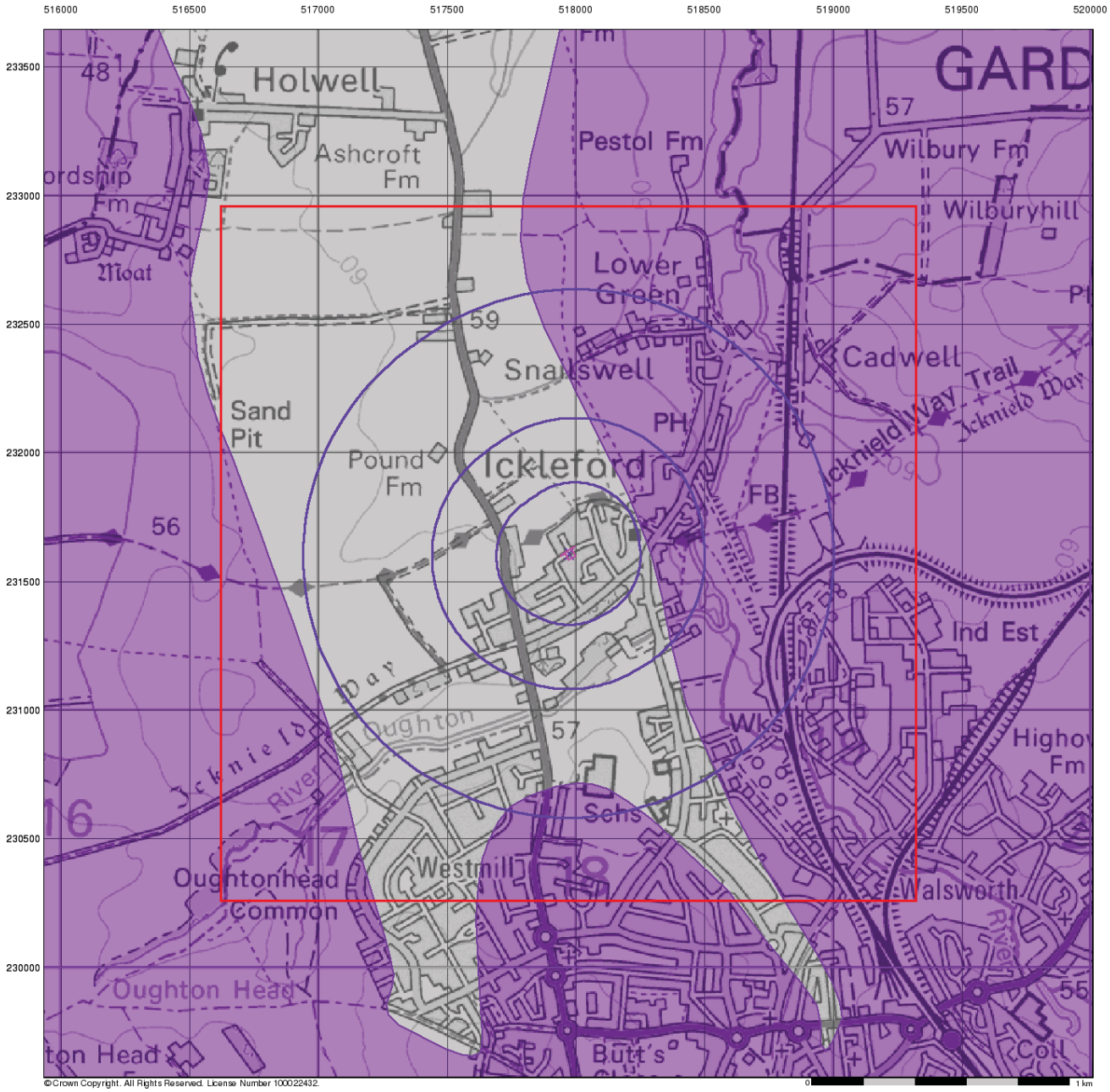


Bedrock Aquifer Designation

General

Specified Site | Specified Buffer(s) | Bearing Reference Point

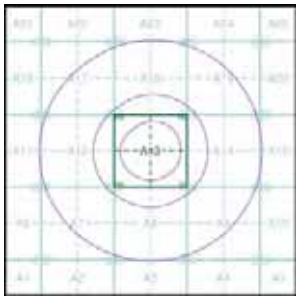
Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



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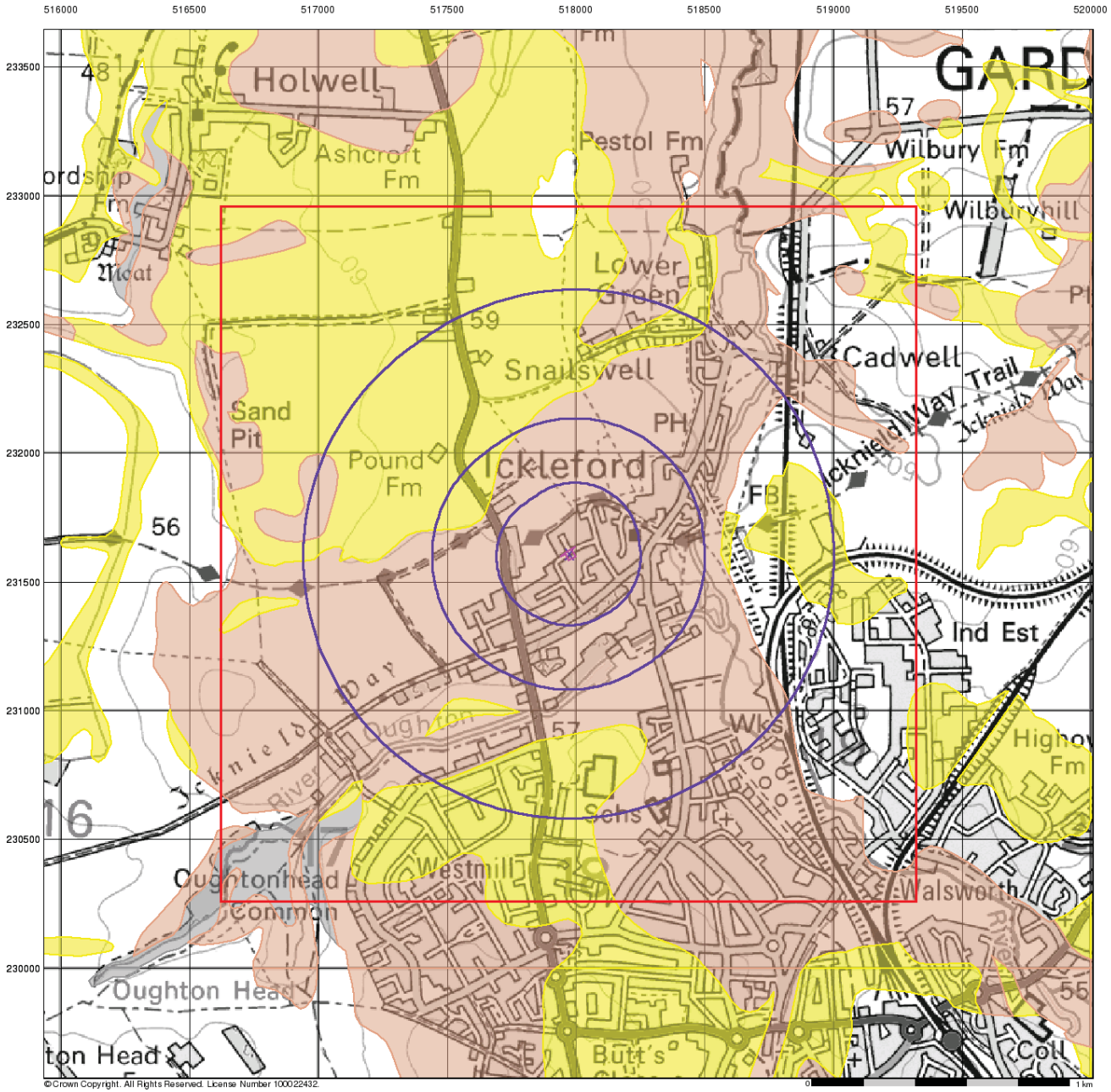


Superficial Aquifer Designation

General

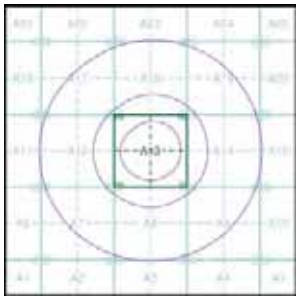
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



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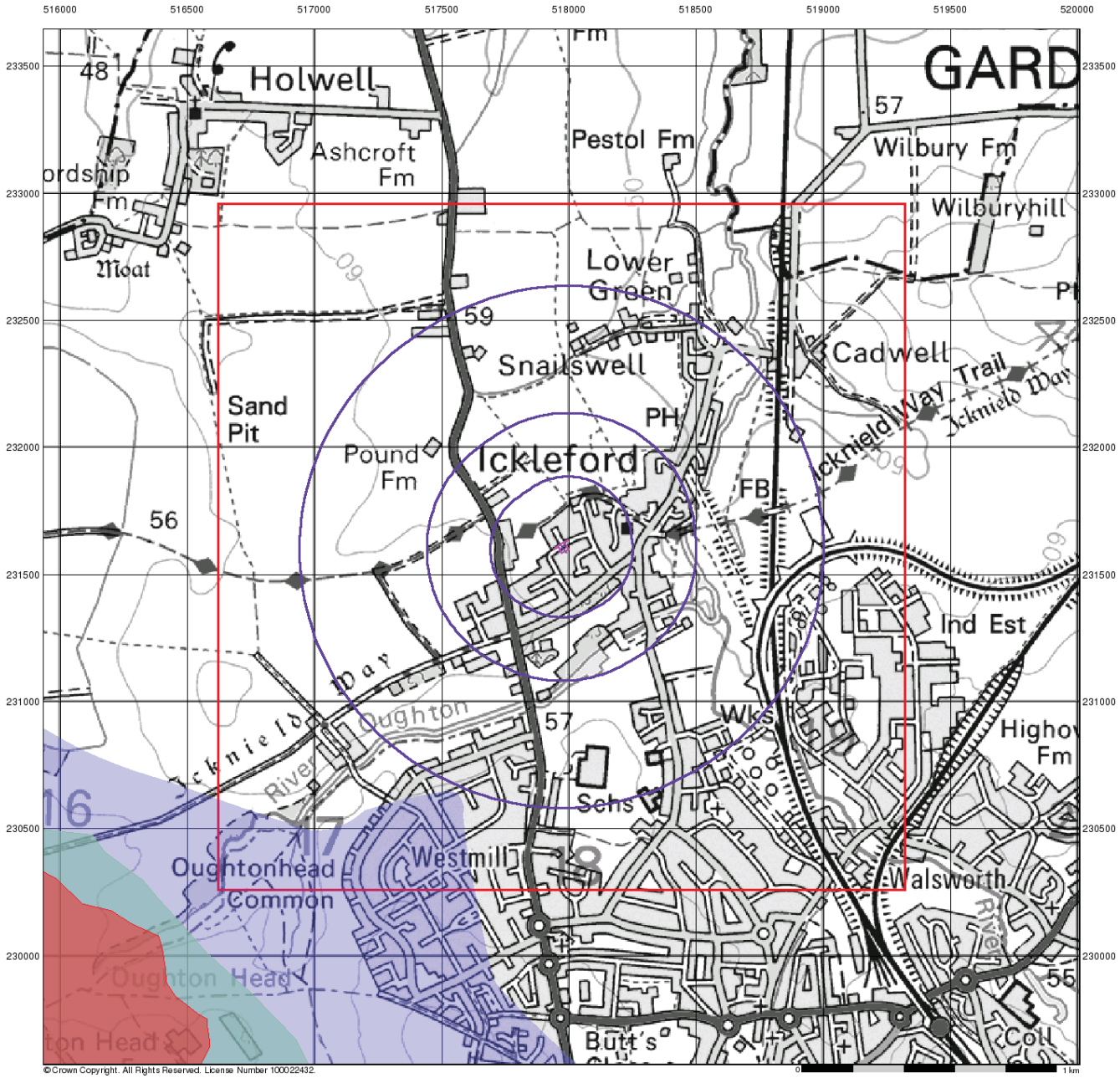


Source Protection Zones

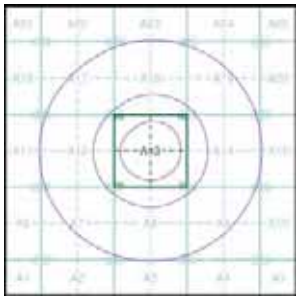
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)
- Source Protection Zone Borehole

Site Sensitivity Context Map - Slice A



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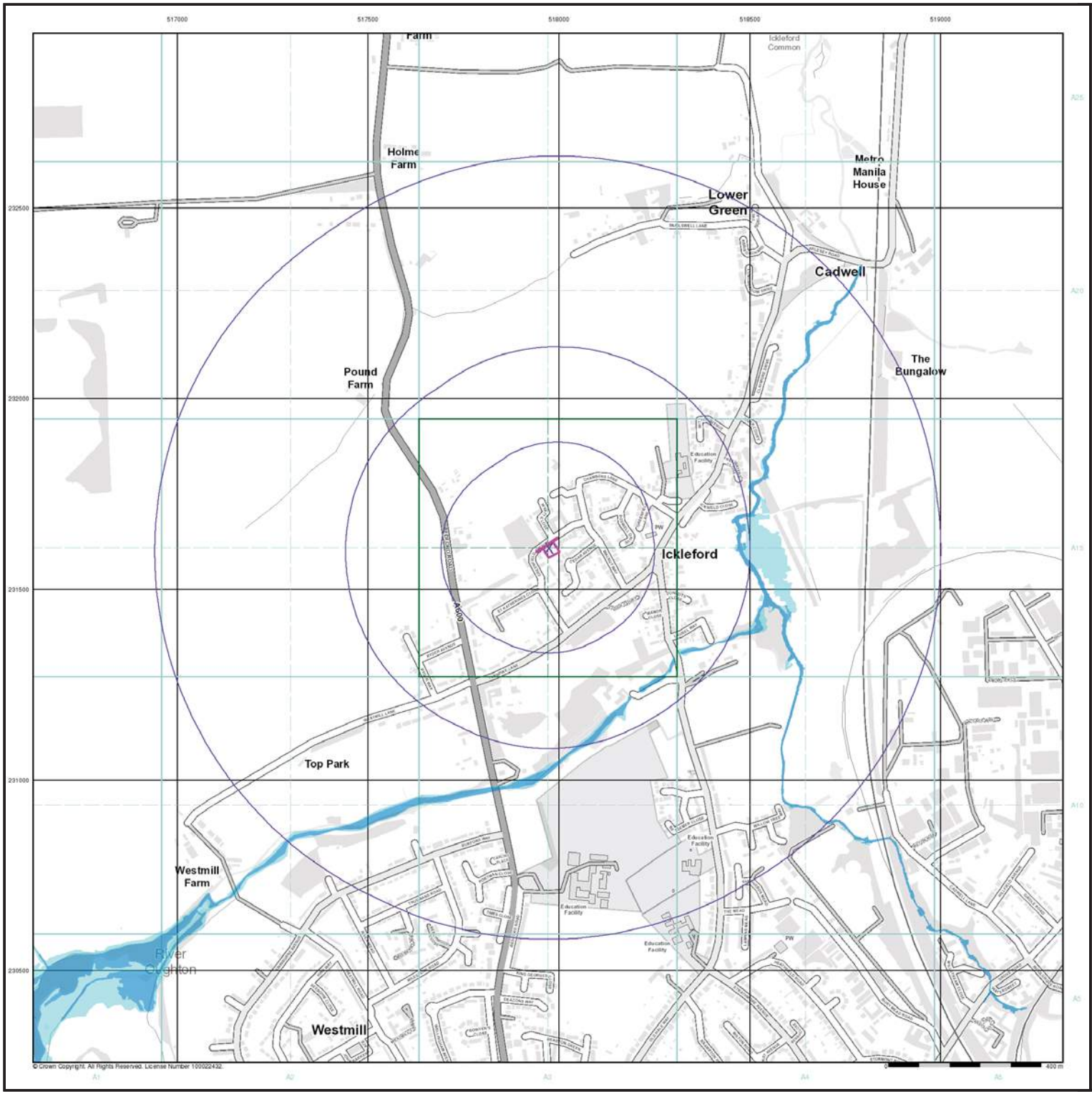


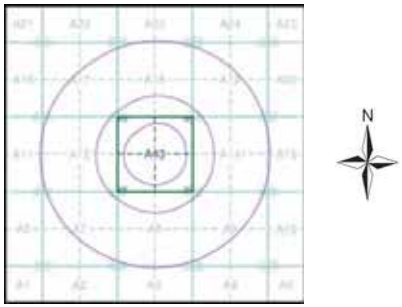
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



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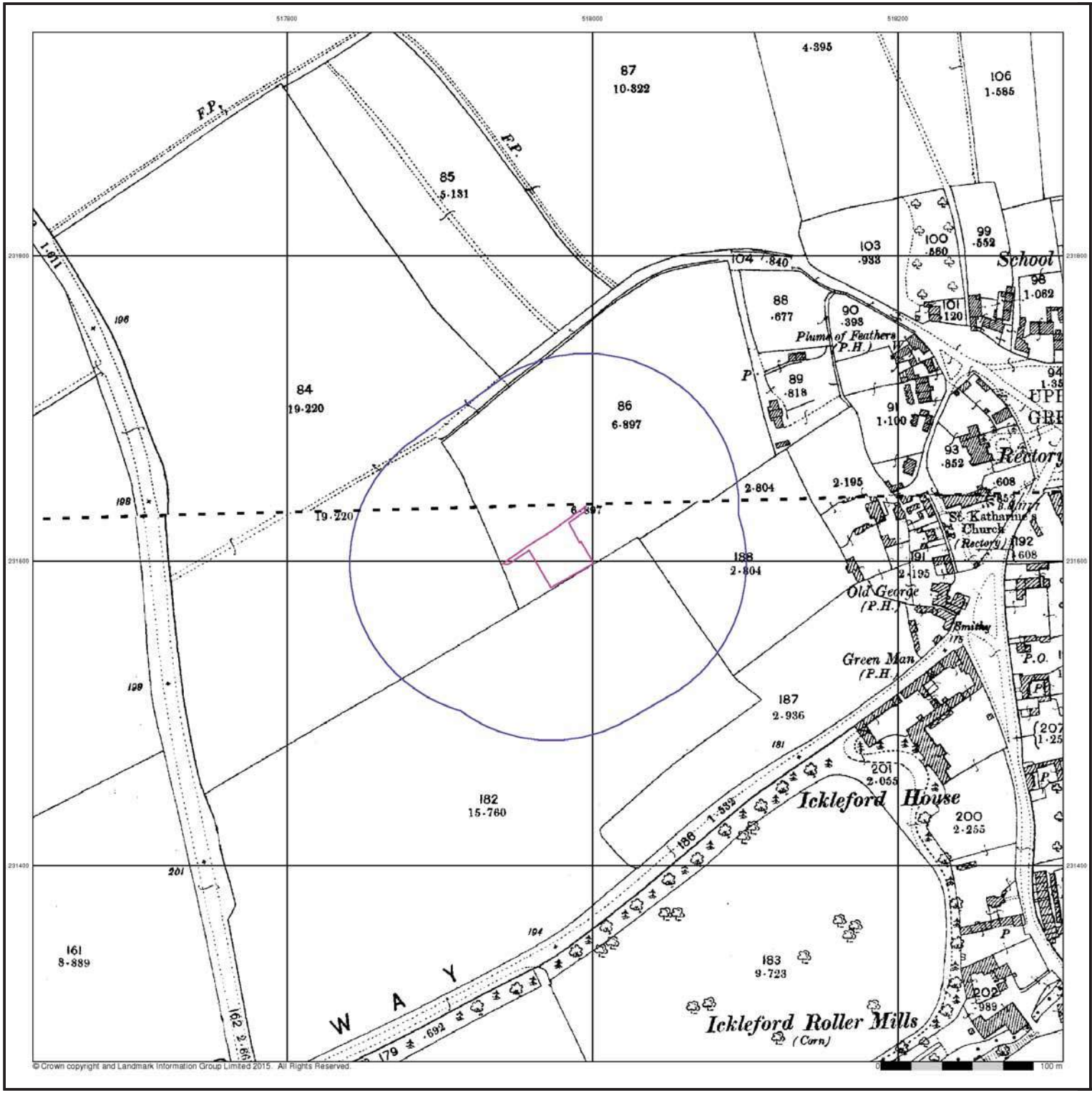
APPENDIX E

A Selection of Historic Maps



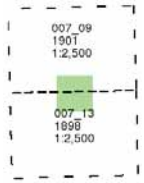
Hertfordshire

Published 1898 - 1901

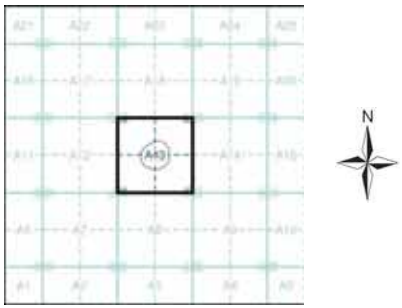
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



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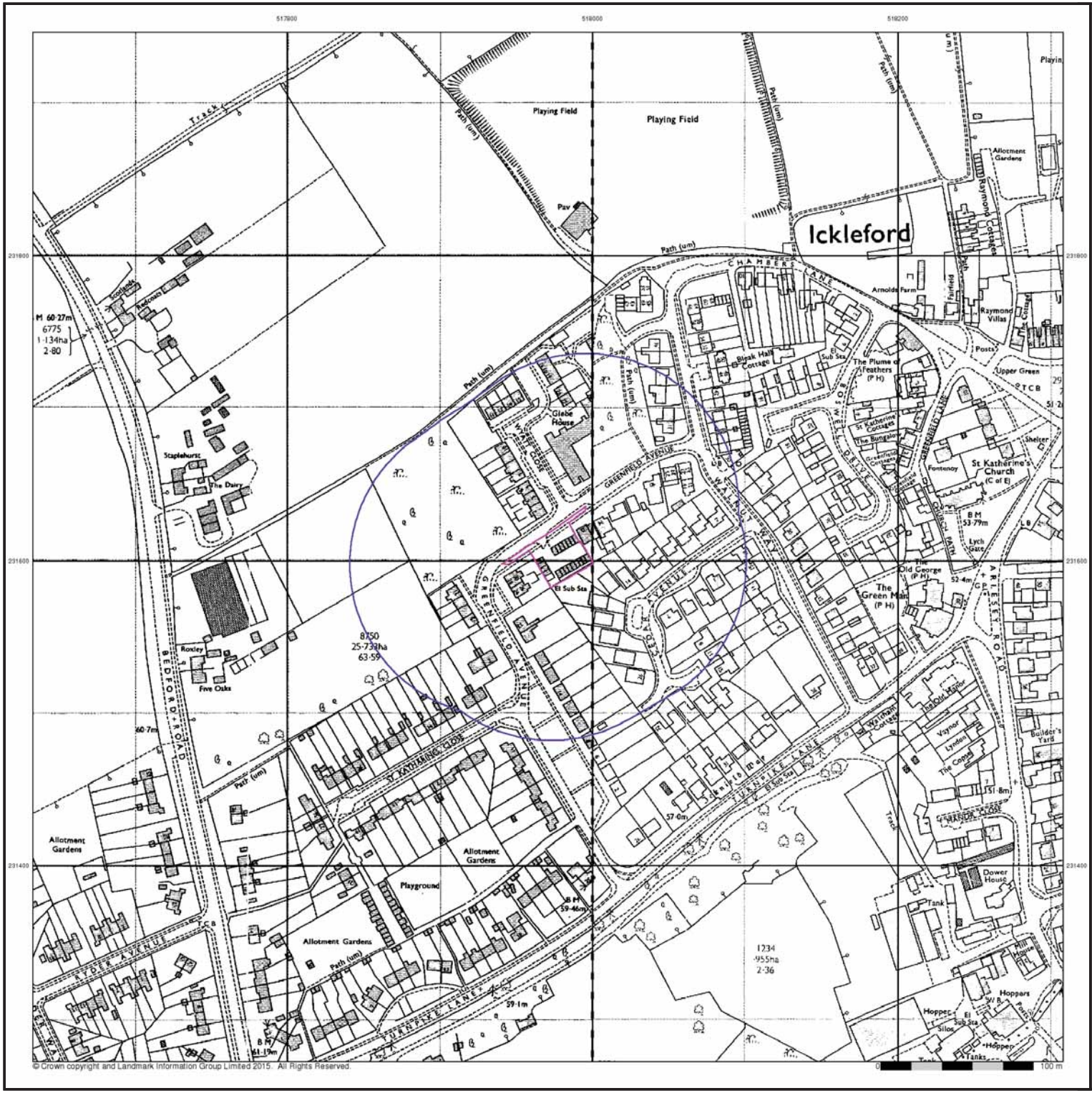

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0 100 m

Ordnance Survey Plan

Published 1978 - 1980

Source map scale - 1:2,500

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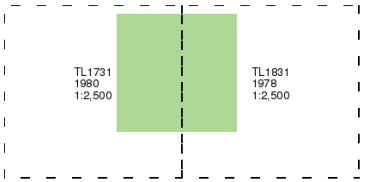
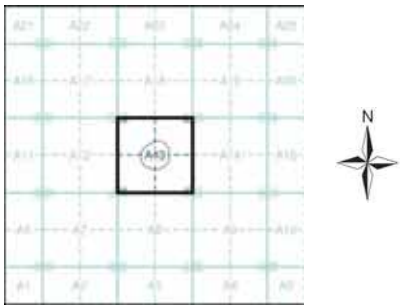
Map Name(s) and Date(s)



Historical Map - Segment A13



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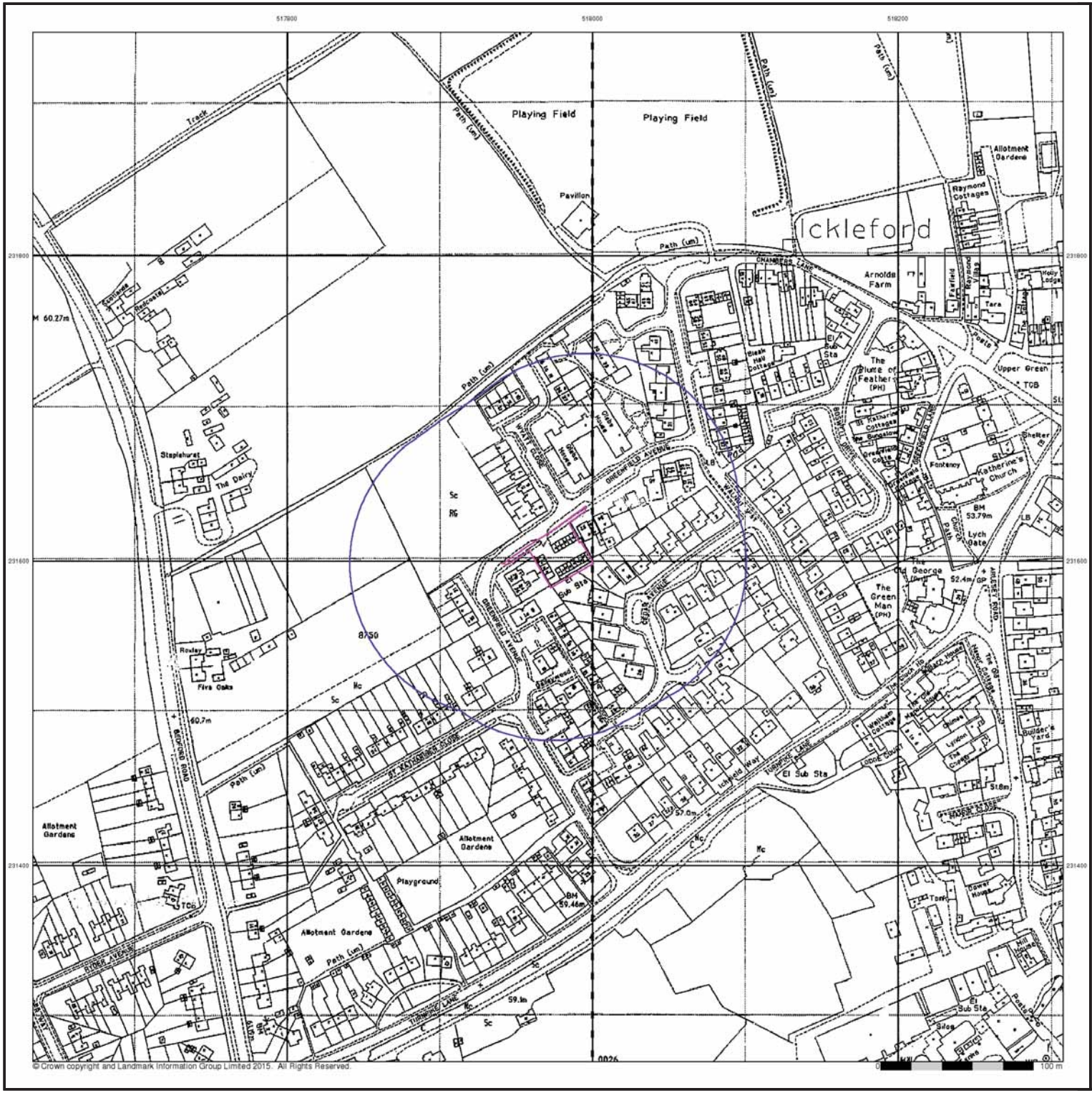

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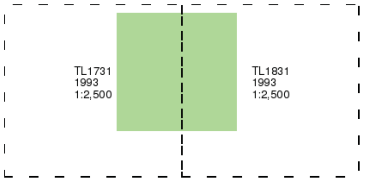
Large-Scale National Grid Data

Published 1993

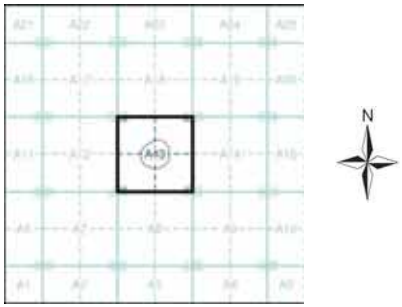
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	151620860_1_1
Customer Ref:	UK18.2974
National Grid Reference:	517970, 231610
Slice:	A
Site Area (Ha):	0.12
Search Buffer (m):	100

Site Details

Site at 517980, 231610

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

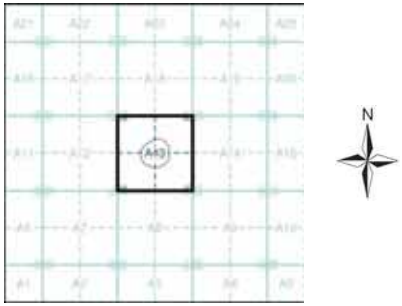


Historical Aerial Photography

Published 1999

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A13



Order Details

Order Number:	151620860_1_1
Customer Ref:	UK18.2974
National Grid Reference:	517970, 231610
Slice:	A
Site Area (Ha):	0.12
Search Buffer (m):	100

Site Details

Site at 517980, 231610

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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VectorMap Local

Published 2017

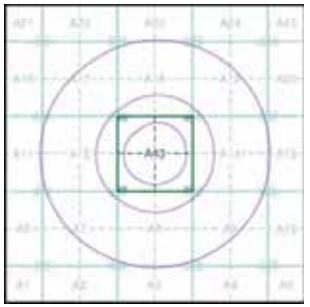
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities),1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number:	151620860_1_1
Customer Ref:	UK18.2974
National Grid Reference:	517970, 231610
Slice:	A
Site Area (Ha):	0.12
Search Buffer (m):	1000

Site Details

Site at 517980, 231610

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

APPENDIX F

Site Specific Borehole Logs

EPS Ltd | 7B Caxton House | Broad Street | Cambourne | Cambridge | CB23 6JN

Borehole Log

Borehole No. **BH1**

Sheet 1 of 1

Project Name: Greenfield Avenue	Project No. UK18.2974	Co-ords: -	Hole Type WLS
Location: Ickleford		Level:	Scale 1:20
Client: North Hertfordshire Homes		Dates: -	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20			TARMAC
		0.30 - 1.30	B		0.50			MADE GROUND: Brown and grey very gravelly sandy material with cobble and concrete fragments
	▼				0.90			Firm yellowish brown slightly gravelly sandy silty CLAY with rare dark grey pockets. Gravel is brown black and white fine to coarse angular to subrounded flint.
					1.50			Medium dense brown black and white fine to coarse angular to subangular flint GRAVEL in a soft yellowish brown slightly sandy silty matrix
		1.80 - 2.00	D		2.00			Medium dense brown black and white very sandy silty angular to subrounded flint GRAVEL with occasional white subangular chalk gravel. Sand is yellowish brown.
								End of borehole at 2.00 m

Remarks
Groundwater encountered at 1.23m

AGS

EPS Ltd | 7B Caxton House | Broad Street | Cambourne | Cambridge | CB23 6JN

Borehole Log

Borehole No. **BH2**

Sheet 1 of 1

Project Name: Greenfield Avenue	Project No. UK18.2974	Co-ords: -	Hole Type WLS
Location: Ickleford		Level:	Scale 1:20
Client: North Hertfordshire Homes		Dates: -	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20			TARMAC
		0.30 - 1.30	B		0.40			MADE GROUND: Brown and grey very gravelly sandy material with cobble and concrete fragments
					0.80			Medium dense brown black and white fine to coarse angular to subrounded flint GRAVEL in a yellowish brown sandy silty clay matrix with rare concrete fragments
	▼	1.30 - 1.50	D					Medium dense brown white and black very sandy silty clayey angular to subrounded flint GRAVEL with occasional white subangular chalk gravel. Sand is yellowish brown.
					2.00			End of borehole at 2.00 m

1 2 3 4

Remarks
Groundwater encountered at 1.1m

AGS

EPS Ltd | 7B Caxton House | Broad Street | Cambourne | Cambridge | CB23 6JN

Borehole Log

Borehole No. **BH3**

Sheet 1 of 1

Project Name: Greenfield Avenue	Project No. UK18.2974	Co-ords: -	Hole Type WLS
Location: Ickleford		Level:	Scale 1:20
Client: North Hertfordshire Homes		Dates: -	Logged By

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description	
								TARMAC	
					0.20			MADE GROUND: Brown and grey very gravelly sandy material with cobble and concrete fragments	
					0.40			Medium dense brown black and white fine to coarse angular to subrounded flint GRAVEL in a soft yellowish brown slightly sandy silty matrix	
		0.50 - 1.50	ES						
		0.60 - 0.80	D						
		0.80 - 1.00	ES						
					0.90			Medium dense brown white and black very sandy silty clayey angular to subrounded flint GRAVEL with occasional white subangular chalk gravel. Sand is yellowish brown.	1
		1.00		N=17 (5,6/5,4,4,4)					
		1.30 - 1.50	ES						
		1.50 - 2.20	ES						
		2.00		N=12 (3,3/3,3,3,3)					2
		2.20 - 4.00	ES		2.20			Firm yellowish brown slightly gravelly sandy silty CLAY. Gravel is fine to coarse angular to subrounded chalk and flint.	
		2.30 - 2.50	D						
		3.00		N=19 (3,3/4,5,5,5)	3.00			Stiff light olive brown slightly gravelly sandy silty CLAY. Gravel is fine to medium angular to subrounded chalk and rare flint	3
		3.30 - 3.50	D						
		3.95		N=45 (5,6/9,10,12,14)	4.00			End of borehole at 4.00 m	4

Remarks

Groundwater encountered at 2.0m rising to 1.23m

AGS

EPS Ltd | 7B Caxton House | Broad Street | Cambourne | Cambridge | CB23 6JN

Borehole Log

Borehole No. **BH4**

Sheet 1 of 1

Project Name: Greenfield Avenue	Project No. UK18.2974	Co-ords: -	Hole Type WLS
Location: Ickleford		Level:	Scale 1:20
Client: North Hertfordshire Homes		Dates: -	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10 - 0.40	ES					TOPSOIL: Dark brown slightly clayey gravelly sandy silty material with cobble fragments and common rootlets	
					0.40				
		0.60 - 0.80	D					Medium dense brown black and white fine to coarse angular to subrounded flint GRAVEL in a dark brown sandy silty clay matrix	
		1.00		N=19 (3,3/5,5,5,4)	1.00				1
		1.00 - 1.20	D					Medium dense brown white and black very sandy silty clayey angular to subrounded flint GRAVEL with occasional white subangular chalk gravel. Sand is yellowish brown.	
		2.00		N=8 (3,3/2,2,2,2)					2
					2.50			Firm yellowish brown slightly gravelly sandy silty CLAY. Gravel is fine to coarse angular to subrounded chalk and flint.	
		2.70 - 2.90	ES						
		3.00		N=18 (2,3/4,4,5,5)	3.00			Stiff light olive brown slightly gravelly sandy silty CLAY. Gravel is fine to medium angular to subrounded chalk and rare flint	3
		3.80 - 4.00	D						
		3.80 - 4.00	ES						
		4.00		N=33 (5,6/6,9,8,10)	4.00			End of borehole at 4.00 m	4

Remarks

Groundwater encountered at 2.0m rising to 1.4m

AGS

EPS Ltd | 7B Caxton House | Broad Street | Cambourne | Cambridge | CB23 6JN

Borehole Log

Borehole No. **BH5**

Sheet 1 of 1

Project Name: Greenfield Avenue	Project No. UK18.2974	Co-ords: -	Hole Type WLS
Location: Ickleford		Level:	Scale 1:20
Client: North Hertfordshire Homes		Dates: -	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10 - 0.60	ES					TOPSOIL: Dark brown slightly clayey gravelly sandy silty material with cobble fragments and common rootlets	
		0.60 - 0.80	ES		0.60			Medium dense brown black and white fine to coarse angular to subrounded flint GRAVEL in a soft yellowish brown slightly sandy silty clay matrix	
		1.00		N=27 (6,6/8,8,6,5)	1.00				1
		1.00 - 1.50	ES					Medium dense brown black and white fine to coarse angular to subangular flint GRAVEL in a soft yellowish brown slightly sandy silty matrix	
		2.00		N=13 (5,5/4,4,2,3)					2
					2.70			Firm yellowish brown slightly gravelly sandy silty CLAY. Gravel is fine to coarse angular to subrounded chalk and flint.	
		3.00		N=22 (5,5/5,5,6,6)	3.00			Stiff light olive brown slightly gravelly sandy silty CLAY. Gravel is fine to medium angular to subrounded chalk and rare flint	3
		4.00		N=26 (4,5/6,6,7,7)	4.00			End of borehole at 4.00 m	4

Remarks

Groundwater encountered at 2.0m rising to 0.65m

AGS

APPENDIX G

Laboratory Results – Environmental

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

EPS Ltd
7B Caxton House
Broad Street
Cambourne
Cambridgeshire
CB23 6JN

Attention :	Shaun Cahill
Date :	23rd January, 2018
Your reference :	UK18.2974
Our reference :	Test Report 18/599 Batch 1 Schedule A
Location :	Greenfield Avenue, Ickleford
Date samples received :	17th January, 2018
Status :	Final report
Issue :	1

Eleven samples were received for analysis on 17th January, 2018 of which eight were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Phil Sommerton BSc
Project Manager

Client Name: EPS Ltd
Reference: UK18.2974
Location: Greenfield Avenue, Ickleford
Contact: Shaun Cahill
JE Job No.: 18/599

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1	2	3	4	5	6	7	8			LOD/LOR	Units	Method No.
Sample ID	BH3	BH4	BH5	BH5	BH5	BH3	BH4	BH4					
Depth	0.80-1.00	0.10-0.40	0.10-0.60	0.60-0.80	1.00-1.50	1.30-1.50	2.70-2.90	3.80-4.00					
COC No / misc													
Containers	J	J	J	J	J	J	J	J					
Sample Date	16/01/2018	16/01/2018	16/01/2018	16/01/2018	16/01/2018	16/01/2018	16/01/2018	16/01/2018					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	17/01/2018	17/01/2018	17/01/2018	17/01/2018	17/01/2018	17/01/2018	17/01/2018	17/01/2018					
Arsenic #M	9.9	30.4	19.9	15.9	34.1	-	-	-			<0.5	mg/kg	TM30/PM15
Cadmium #M	<0.1	<0.1	0.2	<0.1	<0.1	-	-	-			<0.1	mg/kg	TM30/PM15
Chromium #M	86.0	78.4	60.8	95.9	46.9	-	-	-			<0.5	mg/kg	TM30/PM15
Copper #M	4	20	25	5	8	-	-	-			<1	mg/kg	TM30/PM15
Lead #M	<5	52	58	7	11	-	-	-			<5	mg/kg	TM30/PM15
Mercury #M	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-			<0.1	mg/kg	TM30/PM15
Nickel #M	11.5	25.1	32.0	23.5	28.5	-	-	-			<0.7	mg/kg	TM30/PM15
Selenium #M	<1	<1	1	<1	<1	-	-	-			<1	mg/kg	TM30/PM15
Sulphur as S	0.01	-	-	-	-	0.01	0.01	0.02			<0.01	%	TM30/PM15
Total Sulphate as SO4 #M	264	568	787	89	392	264	267	319			<50	mg/kg	TM50/PM29
Zinc #M	19	91	116	32	61	-	-	-			<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #M	<0.04	<0.04	<0.04	<0.04	<0.04	-	-	-			<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	0.06	<0.03	<0.03	<0.03	-	-	-			<0.03	mg/kg	TM4/PM8
Acenaphthene #M	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-			<0.05	mg/kg	TM4/PM8
Fluorene #M	<0.04	<0.04	<0.04	<0.04	<0.04	-	-	-			<0.04	mg/kg	TM4/PM8
Phenanthrene #M	<0.03	0.10	0.07	<0.03	<0.03	-	-	-			<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	0.06	<0.04	<0.04	<0.04	-	-	-			<0.04	mg/kg	TM4/PM8
Fluoranthene #M	<0.03	0.37	0.18	<0.03	<0.03	-	-	-			<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	0.34	0.17	<0.03	<0.03	-	-	-			<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	0.25	0.16	<0.06	<0.06	-	-	-			<0.06	mg/kg	TM4/PM8
Chrysene #M	<0.02	0.28	0.12	<0.02	<0.02	-	-	-			<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	<0.07	0.58	0.21	<0.07	<0.07	-	-	-			<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	0.28	0.10	<0.04	<0.04	-	-	-			<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	<0.04	0.25	0.09	<0.04	<0.04	-	-	-			<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	0.06	<0.04	<0.04	<0.04	-	-	-			<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	0.27	0.10	<0.04	<0.04	-	-	-			<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	2.9	1.2	<0.6	<0.6	-	-	-			<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	0.42	0.15	<0.05	<0.05	-	-	-			<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	0.16	0.06	<0.02	<0.02	-	-	-			<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	97	96	102	96	98	-	-	-			<0	%	TM4/PM8
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15	<0.15	-	-	-			<0.15	mg/kg	TM26/PM21
Natural Moisture Content	3.4	27.4	40.4	6.2	7.8	-	-	-			<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	-	-	-			<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #M	0.0020	0.0066	<0.0015	<0.0015	0.0053	0.0054	0.0146	0.0125			<0.0015	g/l	TM38/PM20
Chromium III	86.0	78.4	60.8	95.9	46.9	-	-	-			<0.5	mg/kg	NONE/NONE
Total Cyanide #M	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-			<0.5	mg/kg	TM89/PM45
Organic Matter	<0.2	6.7	8.7	0.2	<0.2	-	-	-			<0.2	%	TM21/PM24

Please see attached notes for all abbreviations and acronyms

Client Name: EPS Ltd
Reference: UK18.2974
Location: Greenfield Avenue, Ickleford
Contact: Shaun Cahill
JE Job No.: 18/599

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1	2	3	4	5	6	7	8			LOD/LOR	Units	Method No.
Sample ID	BH3	BH4	BH5	BH5	BH5	BH3	BH4	BH4					
Depth	0.80-1.00	0.10-0.40	0.10-0.60	0.60-0.80	1.00-1.50	1.30-1.50	2.70-2.90	3.80-4.00					
COC No / misc													
Containers	J	J	J	J	J	J	J	J					
Sample Date	16/01/2018	16/01/2018	16/01/2018	16/01/2018	16/01/2018	16/01/2018	16/01/2018	16/01/2018					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	17/01/2018	17/01/2018	17/01/2018	17/01/2018	17/01/2018	17/01/2018	17/01/2018	17/01/2018					
pH #M	8.89	8.22	7.53	8.26	8.79	8.37	8.19	8.26			<0.01	pH units	TM73/PM11
Sample Type	Clayey Sand	Clayey Loam	Clayey Loam	Clay	Clayey Sand	Clayey Sand	Clay	Clay				None	PM13/PM0
Sample Colour	Light Brown	Dark Brown	Dark Brown	Medium Brown	Light Brown	Light Brown	Light Brown	Light Brown				None	PM13/PM0
Other Items	stones	stones, roots	stones, roots	sand, stones, roots	stones	stones	stones	stones				None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: EPS Ltd
Reference: UK18.2974
Location: Greenfield Avenue, Ickleford
Contact: Shaun Cahill

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:



Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/599	1	BH3	0.80-1.00	1	19/01/2018	**General Description (Bulk Analysis)**	Soil/Stones
					19/01/2018	**Asbestos Fibres**	NAD
					19/01/2018	**Asbestos Fibres (2)**	NAD
					19/01/2018	**Asbestos ACM**	NAD
					19/01/2018	**Asbestos ACM (2)**	NAD
					19/01/2018	**Asbestos Type**	NAD
					19/01/2018	**Asbestos Type (2)**	NAD
					19/01/2018	**Asbestos Level Screen**	NAD
18/599	1	BH4	0.10-0.40	2	19/01/2018	**General Description (Bulk Analysis)**	Soil/Stones
					19/01/2018	**Asbestos Fibres**	NAD
					19/01/2018	**Asbestos Fibres (2)**	NAD
					19/01/2018	**Asbestos ACM**	NAD
					19/01/2018	**Asbestos ACM (2)**	NAD
					19/01/2018	**Asbestos Type**	NAD
					19/01/2018	**Asbestos Type (2)**	NAD
					19/01/2018	**Asbestos Level Screen**	NAD
18/599	1	BH5	0.10-0.60	3	19/01/2018	**General Description (Bulk Analysis)**	Soil/Stones
					19/01/2018	**Asbestos Fibres**	NAD
					19/01/2018	**Asbestos Fibres (2)**	NAD
					19/01/2018	**Asbestos ACM**	NAD
					19/01/2018	**Asbestos ACM (2)**	NAD
					19/01/2018	**Asbestos Type**	NAD
					19/01/2018	**Asbestos Type (2)**	NAD
					19/01/2018	**Asbestos Level Screen**	NAD
18/599	1	BH5	0.60-0.80	4	19/01/2018	**General Description (Bulk Analysis)**	Soil/Stones
					19/01/2018	**Asbestos Fibres**	NAD
					19/01/2018	**Asbestos Fibres (2)**	NAD
					19/01/2018	**Asbestos ACM**	NAD
					19/01/2018	**Asbestos ACM (2)**	NAD
					19/01/2018	**Asbestos Type**	NAD
					19/01/2018	**Asbestos Type (2)**	NAD
					19/01/2018	**Asbestos Level Screen**	NAD
18/599	1	BH5	1.00-1.50	5	19/01/2018	**General Description (Bulk Analysis)**	Soil/Stones
					19/01/2018	**Asbestos Fibres**	NAD
					19/01/2018	**Asbestos Fibres (2)**	NAD

Client Name: EPS Ltd
Reference: UK18.2974
Location: Greenfield Avenue, Ickleford
Contact: Shaun Cahill

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/599	1	BH5	1.00-1.50	5	19/01/2018	**Asbestos ACM**	NAD
					19/01/2018	**Asbestos ACM (2)**	NAD
					19/01/2018	**Asbestos Type**	NAD
					19/01/2018	**Asbestos Type (2)**	NAD
					19/01/2018	**Asbestos Level Screen**	NAD

Client Name: EPS Ltd
Reference: UK18.2974
Location: Greenfield Avenue, Ickleford
Contact: Shaun Cahill

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 18/599						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/599

SOILS

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

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 18/599

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes	Yes	AD	Yes

JE Job No: 18/599

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is boiled with dilute hydrochloric acid, the resulting liquor is then analysed.	Yes	Yes	AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes	Yes	AR	No
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes	Yes	AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

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EPS Ltd
7B Caxton House
Broad Street
Cambourne
Cambridgeshire
CB23 6JN

Attention :	Shaun Cahill
Date :	23rd January, 2018
Your reference :	UK18.2974
Our reference :	Test Report 18/599 Batch 1 Schedule B
Location :	Greenfield Avenue, Ickleford
Date samples received :	17th January, 2018
Status :	Final report
Issue :	1

Eleven samples were received for analysis on 17th January, 2018 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Bruce Leslie
Project Co-ordinator

Client Name: EPS Ltd
Reference: UK18.2974
Location: Greenfield Avenue, Ickleford
Contact: Shaun Cahill
JE Job No.: 18/599

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	9-11	12-14	15-17									
Sample ID	BH3	BH3	BH3									
Depth	0.50-1.50	1.50-2.20	2.20-4.00									
COC No / misc												
Containers	V J T	V J T	V J T									
Sample Date	16/01/2018	16/01/2018	16/01/2018									
Sample Type	Soil	Soil	Soil									
Batch Number	1	1	1									
Date of Receipt	17/01/2018	17/01/2018	17/01/2018									

Please see attached notes for all abbreviations and acronyms

				LOD/LOR	Units	Method No.
Arsenic #M	37.5	31.6	14.1	<0.5	mg/kg	TM30/PM15
Cadmium #M	<0.1	<0.1	0.2	<0.1	mg/kg	TM30/PM15
Chromium #M	96.8	61.0	48.6	<0.5	mg/kg	TM30/PM15
Copper #M	2	5	14	<1	mg/kg	TM30/PM15
Lead #M	13	12	10	<5	mg/kg	TM30/PM15
Mercury #M	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #M	35.4	32.6	28.3	<0.7	mg/kg	TM30/PM15
Selenium #M	<1	<1	<1	<1	mg/kg	TM30/PM15
Zinc #M	70	75	78	<5	mg/kg	TM30/PM15
PAH MS						
Naphthalene #M	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #M	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #M	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #M	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene #M	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06	mg/kg	TM4/PM8
Chrysene #M	<0.02	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	<0.07	<0.07	<0.07	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	<0.6	<0.6	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	97	116	87	<0	%	TM4/PM8
Mineral Oil (C10-C40)	<30	<30	<30	<30	mg/kg	TM5/PM16

Client Name: EPS Ltd
Reference: UK18.2974
Location: Greenfield Avenue, Ickleford
Contact: Shaun Cahill
JE Job No.: 18/599

Report : Solid

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J E Sample No.	9-11	12-14	15-17									
Sample ID	BH3	BH3	BH3									
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COC No / misc												
Containers	V J T	V J T	V J T									
Sample Date	16/01/2018	16/01/2018	16/01/2018									
Sample Type	Soil	Soil	Soil									
Batch Number	1	1	1									
Date of Receipt	17/01/2018	17/01/2018	17/01/2018									

Please see attached notes for all abbreviations and acronyms

				LOD/LOR	Units	Method No.
TPH CWG						
Aliphatics						
>C5-C6 #M	<0.1 SV	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 #M	<0.1 SV	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1 SV	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 #M	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM16
>C12-C16 #M	<4	<4	<4	<4	mg/kg	TM5/PM16
>C16-C21 #M	<7	<7	<7	<7	mg/kg	TM5/PM16
>C21-C35 #M	<7	<7	<7	<7	mg/kg	TM5/PM16
Total aliphatics C5-35	<19	<19	<19	<19	mg/kg	TM5/TM36/PM12/PM16
Aromatics						
>C5-EC7 #	<0.1 SV	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1 SV	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 #M	<0.1 SV	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM16
>EC12-EC16 #	<4	<4	<4	<4	mg/kg	TM5/PM16
>EC16-EC21 #	<7	<7	<7	<7	mg/kg	TM5/PM16
>EC21-EC35 #	<7	<7	<7	<7	mg/kg	TM5/PM16
Total aromatics C5-35 #	<19	<19	<19	<19	mg/kg	TM5/TM36/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	<38	<38	mg/kg	TM5/TM36/PM12/PM16
MTBE #	<5 SV	<5	<5	<5	ug/kg	TM31/PM12
Benzene #	<5 SV	<5	<5	<5	ug/kg	TM31/PM12
Toluene #	<5 SV	<5	<5	<5	ug/kg	TM31/PM12
Ethylbenzene #	<5 SV	<5	<5	<5	ug/kg	TM31/PM12
m/p-Xylene #	<5 SV	<5	<5	<5	ug/kg	TM31/PM12
o-Xylene #	<5 SV	<5	<5	<5	ug/kg	TM31/PM12
PCB 28 #	8	<5	7	<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	<5	<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	<35	<35	<35	ug/kg	TM17/PM8
Natural Moisture Content	9.9	12.5	15.5	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Chromium III	96.8	61.0	48.6	<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	0.07	0.05	0.11	<0.02	%	TM21/PM24

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Location: Greenfield Avenue, Ickleford
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JE Job No.: 18/599

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Sample Type	Soil	Soil	Soil									
Batch Number	1	1	1									
Date of Receipt	17/01/2018	17/01/2018	17/01/2018									

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Loss on Ignition #	2.6	1.9	2.9								<1.0	%	TM22/PM0
pH #M	8.75	8.70	8.54								<0.01	pH units	TM73/PM11
Sample Type	Clayey Sand	Sand	Clay									None	PM13/PM0
Sample Colour	Light Brown	Light Brown	Light Brown									None	PM13/PM0
Other Items	stones	stones	stones									None	PM13/PM0

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	11.9
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	89.4
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**18/599**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Sample No	**11**			
Client Sample No	**BH3**			
Depth/Other	**0.50-1.50**			
Sample Date	**16/01/2018**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.07	3	5	6
Loss on Ignition (%)	2.6	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<30	500	-	-
PAH Sum of 17(mg/kg)	<0.64	100	-	-
pH (pH Units)	8.75	-	>6	-
ANC to pH 7 (mol/kg)	-	-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated	to be evaluated

Eluate Analysis	**10:1 conc^{n} leached**		**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	C_{10}	**A_{10}**			
	mg/l	**mg/kg**	**mg/kg**		
Arsenic	<0.0025	<0.025	0.5	2	25
Barium	<0.003	<0.03	20	100	300
Cadmium	<0.0005	<0.005	0.04	1	5
Chromium	<0.0015	<0.015	0.5	10	70
Copper	<0.007	<0.07	2	50	100
Mercury	<0.001	<0.01	0.01	0.2	2
Molybdenum	0.005	0.05	0.5	10	30
Nickel	<0.002	<0.02	0.4	10	40
Lead	<0.005	<0.05	0.5	10	50
Antimony	<0.002	<0.02	0.06	0.7	5
Selenium	<0.003	<0.03	0.1	0.5	7
Zinc	<0.003	<0.03	4	50	200
Chloride	<0.3	<3	800	15000	25000
Fluoride	0.4	4	10	150	500
Sulphate as SO4	5.52	55.2	1000	20000	50000
Total Dissolved Solids	58	580	4000	60000	100000
Phenol	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	2	<20	500	800	1000

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	14.4
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	87.4
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**18/599**			
Sample No	**14**			
Client Sample No	**BH3**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Depth/Other	**1.50-2.20**			
Sample Date	**16/01/2018**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.05	3	5	6
Loss on Ignition (%)	1.9	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<30	500	-	-
PAH Sum of 17(mg/kg)	<0.64	100	-	-
pH (pH Units)	8.70	-	>6	-
ANC to pH 7 (mol/kg)	-	-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated	to be evaluated

Eluate Analysis	**10:1 conc^{n} leached**		**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	C_{10}	**A_{10}**			
	mg/l	**mg/kg**	**mg/kg**		
Arsenic	<0.0025	<0.025	0.5	2	25
Barium	<0.003	<0.03	20	100	300
Cadmium	<0.0005	<0.005	0.04	1	5
Chromium	<0.0015	<0.015	0.5	10	70
Copper	<0.007	<0.07	2	50	100
Mercury	<0.001	<0.01	0.01	0.2	2
Molybdenum	0.002	<0.02	0.5	10	30
Nickel	<0.002	<0.02	0.4	10	40
Lead	<0.005	<0.05	0.5	10	50
Antimony	0.004	0.04	0.06	0.7	5
Selenium	<0.003	<0.03	0.1	0.5	7
Zinc	<0.003	<0.03	4	50	200
Chloride	<0.3	<3	800	15000	25000
Fluoride	<0.3	<3	10	150	500
Sulphate as SO4	0.47	4.7	1000	20000	50000
Total Dissolved Solids	44	440	4000	60000	100000
Phenol	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	<2	<20	500	800	1000

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	16.6
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	85.8
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**18/599**			
Sample No	**17**			
Client Sample No	**BH3**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Depth/Other	**2.20-4.00**			
Sample Date	**16/01/2018**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.11	3	5	6
Loss on Ignition (%)	2.9	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<30	500	-	-
PAH Sum of 17(mg/kg)	<0.64	100	-	-
pH (pH Units)	8.54	-	>6	-
ANC to pH 7 (mol/kg)	-	-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated	to be evaluated

Eluate Analysis	**10:1 conc^{n} leached**		**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	C_{10}	**A_{10}**			
	mg/l	**mg/kg**	**mg/kg**		
Arsenic	<0.0025	<0.025	0.5	2	25
Barium	<0.003	<0.03	20	100	300
Cadmium	<0.0005	<0.005	0.04	1	5
Chromium	<0.0015	<0.015	0.5	10	70
Copper	<0.007	<0.07	2	50	100
Mercury	<0.001	<0.01	0.01	0.2	2
Molybdenum	0.002	<0.02	0.5	10	30
Nickel	<0.002	<0.02	0.4	10	40
Lead	<0.005	<0.05	0.5	10	50
Antimony	<0.002	<0.02	0.06	0.7	5
Selenium	<0.003	<0.03	0.1	0.5	7
Zinc	<0.003	<0.03	4	50	200
Chloride	<0.3	<3	800	15000	25000
Fluoride	<0.3	<3	10	150	500
Sulphate as SO4	1.21	12.1	1000	20000	50000
Total Dissolved Solids	78	780	4000	60000	100000
Phenol	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	2	<20	500	800	1000

Client Name: EPS Ltd **Matrix : Solid**
Reference: UK18.2974
Location: Greenfield Avenue, Ickleford
Contact: Shaun Cahill

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	EPH Interpretation
18/599	1	BH3	0.50-1.50	9-11	No interpretation possible
18/599	1	BH3	1.50-2.20	12-14	No interpretation possible
18/599	1	BH3	2.20-4.00	15-17	No interpretation possible

Client Name: EPS Ltd
Reference: UK18.2974
Location: Greenfield Avenue, Ickleford
Contact: Shaun Cahill

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:



Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/599	1	BH3	0.50-1.50	10	18/01/2018	**General Description (Bulk Analysis)**	Soil/Stone
					18/01/2018	**Asbestos Fibres**	NAD
					18/01/2018	**Asbestos Fibres (2)**	NAD
					18/01/2018	**Asbestos ACM**	NAD
					18/01/2018	**Asbestos ACM (2)**	NAD
					18/01/2018	**Asbestos Type**	NAD
					18/01/2018	**Asbestos Type (2)**	NAD
					18/01/2018	**Asbestos Level Screen**	NAD
18/599	1	BH3	1.50-2.20	13	18/01/2018	**General Description (Bulk Analysis)**	Soil/Stone
					18/01/2018	**Asbestos Fibres**	NAD
					18/01/2018	**Asbestos Fibres (2)**	NAD
					18/01/2018	**Asbestos ACM**	NAD
					18/01/2018	**Asbestos ACM (2)**	NAD
					18/01/2018	**Asbestos Type**	NAD
					18/01/2018	**Asbestos Type (2)**	NAD
					18/01/2018	**Asbestos Level Screen**	NAD
18/599	1	BH3	2.20-4.00	16	19/01/2018	**General Description (Bulk Analysis)**	Soil/Stones
					19/01/2018	**Asbestos Fibres**	NAD
					19/01/2018	**Asbestos Fibres (2)**	NAD
					19/01/2018	**Asbestos ACM**	NAD
					19/01/2018	**Asbestos ACM (2)**	NAD
					19/01/2018	**Asbestos Type**	NAD
					19/01/2018	**Asbestos Type (2)**	NAD
					19/01/2018	**Asbestos Level Screen**	NAD

Client Name: EPS Ltd
Reference: UK18.2974
Location: Greenfield Avenue, Ickleford
Contact: Shaun Cahill

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 18/599						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/599

SOILS

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

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 18/599

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes

JE Job No: 18/599

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3: 1990/USEPA 160.3 Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM22	Modified USEPA 160.4. Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (450°C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

JE Job No: 18/599

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	Modified USEPA 9060. Determination of TOC by calculation from Total Carbon and Inorganic Carbon using a TOC analyser, the carbon in the sample is converted to CO2 and then passed through a non-dispersive infrared gas analyser (NDIR).	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes	Yes	AR	No
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	PM0	No preparation is required.			AR	Yes

JE Job No: 18/599

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	NONE	No Method Code			AR	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	

APPENDIX H

Waste Classification Report

HazWasteOnline™

Waste Classification Report

LTEMZ-EJM4Z-HVSN2

Job name

Greenfield Avenue, Ickleford

Description/Comments

Project

UK18.2974

Site

Waste Stream Template

EPS Waste Stream

Classified by

Name:
Michael Judson
Date:
12/02/2018 12:24:03 UTC
Telephone:
01954 710666

Company:
EPS
Unit 7B, Caxton House
Broad Street, Great Cambourne
Cambridge
CB23 6JN

Report

Created by: Michael Judson
Created date: 12/02/2018 12:24 UTC

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	BH3	0.80-1.00	Non Hazardous		2
2	BH4	0.10-0.40	Non Hazardous		4
3	BH5	0.10-0.60	Non Hazardous		6
4	BH5[1]	0.60-0.80	Non Hazardous		8
5	BH5[2]	1.00-1.50	Non Hazardous		10
6	BH3[1]	0.50-1.50	Non Hazardous		12
7	BH3[2]	1.50-2.20	Non Hazardous		14
8	BH3[3]	2.20-4.00	Non Hazardous		16

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	18
Appendix B: Rationale for selection of metal species	20
Appendix C: Version	20

Classification of sample: BH3

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

Sample details

Sample Name:
BH3
Sample Depth:
0.80-1.00 m
Moisture content:
3.4%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 3.4% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number / EC Number / CAS Number							
1	arsenic { arsenic pentoxide }		9.9 mg/kg	1.534	14.686 mg/kg	0.00147 %	✓	
	033-004-00-6 / 215-116-9 / 1303-28-2							
2	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	1	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	048-001-00-5							
3	chromium in chromium(III) compounds { chromium(III) oxide }		86 mg/kg	1.462	121.561 mg/kg	0.0122 %	✓	
	215-160-9 / 1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }		4 mg/kg	1.126	4.355 mg/kg	0.000436 %	✓	
	029-002-00-X / 215-270-7 / 1317-39-1							
5	lead { lead compounds with the exception of those specified elsewhere in this Annex }	1	<5 mg/kg		<5 mg/kg	<0.0005 %		<LOD
	082-001-00-6							
6	mercury { mercury }		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	080-001-00-0 / 231-106-7 / 7439-97-6							
7	nickel { nickel }	7	11.5 mg/kg		11.122 mg/kg	0.00111 %	✓	
	028-002-00-7 / 231-111-4 / 7440-02-0							
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	034-002-00-8							
9	zinc { zinc oxide }		19 mg/kg	1.245	22.872 mg/kg	0.00229 %	✓	
	030-013-00-7 / 215-222-5 / 1314-13-2							
10	naphthalene		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-052-00-2 / 202-049-5 / 91-20-3							
11	acenaphthylene		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	205-917-1 / 208-96-8							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
12	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
13	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
14	●	phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
15	●	anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
16	●	fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
17	●	pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
18		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
21	●	indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
23	●	benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
24		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
26		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<**LOD**
		024-001-00-0	215-607-8	1333-82-0									
27	●	pH				8.89	pH		8.89	pH	8.89 pH		
				PH									
										Total:	0.0184 %		

Key

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

Classification of sample: BH4

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

Sample details

Sample Name:
BH4
Sample Depth:
0.10-0.40 m
Moisture content:
27.4%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 27.4% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number / EC Number / CAS Number							
1	arsenic { arsenic pentoxide }		30.4 mg/kg	1.534	36.601 mg/kg	0.00366 %	✓	
	033-004-00-6 / 215-116-9 / 1303-28-2							
2	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	1	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	048-001-00-5							
3	chromium in chromium(III) compounds { chromium(III) oxide }		78.4 mg/kg	1.462	89.942 mg/kg	0.00899 %	✓	
	215-160-9 / 1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }		20 mg/kg	1.126	17.675 mg/kg	0.00177 %	✓	
	029-002-00-X / 215-270-7 / 1317-39-1							
5	lead { lead compounds with the exception of those specified elsewhere in this Annex }	1	52 mg/kg		40.816 mg/kg	0.00408 %	✓	
	082-001-00-6							
6	mercury { mercury }		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	080-001-00-0 / 231-106-7 / 7439-97-6							
7	nickel { nickel }	7	25.1 mg/kg		19.702 mg/kg	0.00197 %	✓	
	028-002-00-7 / 231-111-4 / 7440-02-0							
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	034-002-00-8							
9	zinc { zinc oxide }		91 mg/kg	1.245	88.908 mg/kg	0.00889 %	✓	
	030-013-00-7 / 215-222-5 / 1314-13-2							
10	naphthalene		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-052-00-2 / 202-049-5 / 91-20-3							
11	acenaphthylene		0.06 mg/kg		0.0471 mg/kg	0.00000471 %	✓	
	205-917-1 / 208-96-8							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
12	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
13	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
14	●	phenanthrene				0.1	mg/kg		0.0785	mg/kg	0.00000785 %	✓	
			201-581-5	85-01-8									
15	●	anthracene				0.06	mg/kg		0.0471	mg/kg	0.00000471 %	✓	
			204-371-1	120-12-7									
16	●	fluoranthene				0.37	mg/kg		0.29	mg/kg	0.000029 %	✓	
			205-912-4	206-44-0									
17	●	pyrene				0.34	mg/kg		0.267	mg/kg	0.0000267 %	✓	
			204-927-3	129-00-0									
18		benzo[a]anthracene				0.25	mg/kg		0.196	mg/kg	0.0000196 %	✓	
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				0.28	mg/kg		0.22	mg/kg	0.000022 %	✓	
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				0.28	mg/kg		0.22	mg/kg	0.000022 %	✓	
		601-032-00-3	200-028-5	50-32-8									
21	●	indeno[123-cd]pyrene				0.25	mg/kg		0.196	mg/kg	0.0000196 %	✓	
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				0.06	mg/kg		0.0471	mg/kg	0.00000471 %	✓	
		601-041-00-2	200-181-8	53-70-3									
23	●	benzo[ghi]perylene				0.27	mg/kg		0.212	mg/kg	0.0000212 %	✓	
			205-883-8	191-24-2									
24		benzo[b]fluoranthene				0.42	mg/kg		0.33	mg/kg	0.000033 %	✓	
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				0.16	mg/kg		0.126	mg/kg	0.0000126 %	✓	
		601-036-00-5	205-916-6	207-08-9									
26		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<**LOD**
		024-001-00-0	215-607-8	1333-82-0									
27	●	pH				8.22	pH		8.22	pH	8.22 pH		
				PH									
										Total:	0.0299 %		

Key

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

Classification of sample: BH5

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

Sample details

Sample Name:
BH5
Sample Depth:
0.10-0.60 m
Moisture content:
40.4%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 40.4% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number / EC Number / CAS Number							
1	arsenic { arsenic pentoxide }		19.9 mg/kg	1.534	21.741 mg/kg	0.00217 %	✓	
	033-004-00-6 / 215-116-9 / 1303-28-2							
2	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	1	0.2 mg/kg		0.142 mg/kg	0.0000142 %	✓	
	048-001-00-5							
3	chromium in chromium(III) compounds { chromium(III) oxide }		60.8 mg/kg	1.462	63.292 mg/kg	0.00633 %	✓	
	215-160-9 / 1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }		25 mg/kg	1.126	20.048 mg/kg	0.002 %	✓	
	029-002-00-X / 215-270-7 / 1317-39-1							
5	lead { lead compounds with the exception of those specified elsewhere in this Annex }	1	58 mg/kg		41.311 mg/kg	0.00413 %	✓	
	082-001-00-6							
6	mercury { mercury }		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	080-001-00-0 / 231-106-7 / 7439-97-6							
7	nickel { nickel }	7	32 mg/kg		22.792 mg/kg	0.00228 %	✓	
	028-002-00-7 / 231-111-4 / 7440-02-0							
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		1 mg/kg	2.554	1.819 mg/kg	0.000182 %	✓	
	034-002-00-8							
9	zinc { zinc oxide }		116 mg/kg	1.245	102.84 mg/kg	0.0103 %	✓	
	030-013-00-7 / 215-222-5 / 1314-13-2							
10	naphthalene		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-052-00-2 / 202-049-5 / 91-20-3							
11	acenaphthylene		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	205-917-1 / 208-96-8							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
12	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
13	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
14	●	phenanthrene				0.07	mg/kg		0.0499	mg/kg	0.00000499 %	✓	
			201-581-5	85-01-8									
15	●	anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
16	●	fluoranthene				0.18	mg/kg		0.128	mg/kg	0.0000128 %	✓	
			205-912-4	206-44-0									
17	●	pyrene				0.17	mg/kg		0.121	mg/kg	0.0000121 %	✓	
			204-927-3	129-00-0									
18		benzo[a]anthracene				0.16	mg/kg		0.114	mg/kg	0.0000114 %	✓	
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				0.12	mg/kg		0.0855	mg/kg	0.00000855 %	✓	
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				0.1	mg/kg		0.0712	mg/kg	0.00000712 %	✓	
		601-032-00-3	200-028-5	50-32-8									
21	●	indeno[123-cd]pyrene				0.09	mg/kg		0.0641	mg/kg	0.00000641 %	✓	
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
23	●	benzo[ghi]perylene				0.1	mg/kg		0.0712	mg/kg	0.00000712 %	✓	
			205-883-8	191-24-2									
24		benzo[b]fluoranthene				0.15	mg/kg		0.107	mg/kg	0.0000107 %	✓	
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				0.06	mg/kg		0.0427	mg/kg	0.00000427 %	✓	
		601-036-00-5	205-916-6	207-08-9									
26		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<**LOD**
		024-001-00-0	215-607-8	1333-82-0									
27	●	pH				7.53	pH		7.53	pH	7.53 pH		
				PH									
										Total:	0.0276 %		

Key

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

Classification of sample: BH5[1]

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

Sample details

Sample Name:
BH5[1]
Sample Depth:
0.60-0.80 m
Moisture content:
6.2%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 6.2% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number / EC Number / CAS Number							
1	arsenic { arsenic pentoxide }		15.9 mg/kg	1.534	22.965 mg/kg	0.0023 %	✓	
	033-004-00-6 / 215-116-9 / 1303-28-2							
2	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	1	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	048-001-00-5							
3	chromium in chromium(III) compounds { chromium(III) oxide }		95.9 mg/kg	1.462	131.98 mg/kg	0.0132 %	✓	
	215-160-9 / 1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }		5 mg/kg	1.126	5.301 mg/kg	0.00053 %	✓	
	029-002-00-X / 215-270-7 / 1317-39-1							
5	lead { lead compounds with the exception of those specified elsewhere in this Annex }	1	7 mg/kg		6.591 mg/kg	0.000659 %	✓	
	082-001-00-6							
6	mercury { mercury }		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	080-001-00-0 / 231-106-7 / 7439-97-6							
7	nickel { nickel }	7	23.5 mg/kg		22.128 mg/kg	0.00221 %	✓	
	028-002-00-7 / 231-111-4 / 7440-02-0							
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	034-002-00-8							
9	zinc { zinc oxide }		32 mg/kg	1.245	37.506 mg/kg	0.00375 %	✓	
	030-013-00-7 / 215-222-5 / 1314-13-2							
10	naphthalene		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-052-00-2 / 202-049-5 / 91-20-3							
11	acenaphthylene		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	205-917-1 / 208-96-8							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
12	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
13	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
14	●	phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
15	●	anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
16	●	fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
17	●	pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
18		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
21	●	indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
23	●	benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
24		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
26		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<**LOD**
		024-001-00-0	215-607-8	1333-82-0									
27	●	pH				8.26	pH		8.26	pH	8.26 pH		
				PH									
										Total:	0.023 %		

Key

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

Classification of sample: BH5[2]

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

Sample details

Sample Name:
BH5[2]
Sample Depth:
1.00-1.50 m
Moisture content:
7.8%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 7.8% Dry Weight Moisture Correction applied (MC)

#		Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number / EC Number / CAS Number							
1		arsenic { arsenic pentoxide }		34.1 mg/kg	1.534	48.521 mg/kg	0.00485 %	✓	
		033-004-00-6 / 215-116-9 / 1303-28-2							
2		cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	1	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		048-001-00-5							
3		chromium in chromium(III) compounds { chromium(III) oxide }		46.9 mg/kg	1.462	63.587 mg/kg	0.00636 %	✓	
		215-160-9 / 1308-38-9							
4		copper { dicopper oxide; copper (I) oxide }		8 mg/kg	1.126	8.355 mg/kg	0.000836 %	✓	
		029-002-00-X / 215-270-7 / 1317-39-1							
5		lead { lead compounds with the exception of those specified elsewhere in this Annex }	1	11 mg/kg		10.204 mg/kg	0.00102 %	✓	
		082-001-00-6							
6		mercury { mercury }		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		080-001-00-0 / 231-106-7 / 7439-97-6							
7		nickel { nickel }	7	28.5 mg/kg		26.438 mg/kg	0.00264 %	✓	
		028-002-00-7 / 231-111-4 / 7440-02-0							
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
		034-002-00-8							
9		zinc { zinc oxide }		61 mg/kg	1.245	70.434 mg/kg	0.00704 %	✓	
		030-013-00-7 / 215-222-5 / 1314-13-2							
10		naphthalene		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		601-052-00-2 / 202-049-5 / 91-20-3							
11		acenaphthylene		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1 / 208-96-8							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
12		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
13		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
14		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
15		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
16		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
17		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
18		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
21		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
23		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
24		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
26		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<**LOD**
		024-001-00-0	215-607-8	1333-82-0									
27		pH				8.79	pH		8.79	pH	8.79 pH		
				PH									
										Total:	0.0231 %		

Key

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

Classification of sample: BH3[1]

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

Sample details

Sample Name:
BH3[1]
Sample Depth:
0.50-1.50 m
Moisture content:
9.9%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 9.9% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number / EC Number / CAS Number							
1	arsenic { arsenic pentoxide }		37.5 mg/kg	1.534	52.339 mg/kg	0.00523 %	✓	
	033-004-00-6 / 215-116-9 / 1303-28-2							
2	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	1	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	048-001-00-5							
3	chromium in chromium(III) compounds { chromium(III) oxide }		96.8 mg/kg	1.462	128.734 mg/kg	0.0129 %	✓	
	215-160-9 / 1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }		2 mg/kg	1.126	2.049 mg/kg	0.000205 %	✓	
	029-002-00-X / 215-270-7 / 1317-39-1							
5	lead { lead compounds with the exception of those specified elsewhere in this Annex }	1	13 mg/kg		11.829 mg/kg	0.00118 %	✓	
	082-001-00-6							
6	mercury { mercury }		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	080-001-00-0 / 231-106-7 / 7439-97-6							
7	nickel { nickel }	7	35.4 mg/kg		32.211 mg/kg	0.00322 %	✓	
	028-002-00-7 / 231-111-4 / 7440-02-0							
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	034-002-00-8							
9	zinc { zinc oxide }		70 mg/kg	1.245	79.281 mg/kg	0.00793 %	✓	
	030-013-00-7 / 215-222-5 / 1314-13-2							
10	naphthalene		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-052-00-2 / 202-049-5 / 91-20-3							
11	acenaphthylene		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	205-917-1 / 208-96-8							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
12		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
13		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
14		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-581-5	85-01-8									
15		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			204-371-1	120-12-7									
16		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-912-4	206-44-0									
17		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			204-927-3	129-00-0									
18		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
21		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
23		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-883-8	191-24-2									
24		coronene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-881-7	191-07-1									
25		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
27		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<LOD
				TPH									
28		polychlorobiphenyls; PCB				<35	mg/kg		<35	mg/kg	<0.0035 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
29		benzene				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
30		toluene				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
31		ethylbenzene				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
32		xylene				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
33		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
34		pH				8.75	pH		8.75	pH	8.75 pH		
				PH									
										Total:	0.0403 %		

Key

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

Classification of sample: BH3[2]

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

Sample details

Sample Name:
BH3[2]
Sample Depth:
1.50-2.20 m
Moisture content:
12.5%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 12.5% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number / EC Number / CAS Number							
1	arsenic { arsenic pentoxide }		31.6 mg/kg	1.534	43.085 mg/kg	0.00431 %	✓	
	033-004-00-6 / 215-116-9 / 1303-28-2							
2	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	1	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	048-001-00-5							
3	chromium in chromium(III) compounds { chromium(III) oxide }		61 mg/kg	1.462	79.249 mg/kg	0.00792 %	✓	
	215-160-9 / 1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }		5 mg/kg	1.126	5.004 mg/kg	0.0005 %	✓	
	029-002-00-X / 215-270-7 / 1317-39-1							
5	lead { lead compounds with the exception of those specified elsewhere in this Annex }	1	12 mg/kg		10.667 mg/kg	0.00107 %	✓	
	082-001-00-6							
6	mercury { mercury }		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	080-001-00-0 / 231-106-7 / 7439-97-6							
7	nickel { nickel }	7	32.6 mg/kg		28.978 mg/kg	0.0029 %	✓	
	028-002-00-7 / 231-111-4 / 7440-02-0							
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	034-002-00-8							
9	zinc { zinc oxide }		75 mg/kg	1.245	82.981 mg/kg	0.0083 %	✓	
	030-013-00-7 / 215-222-5 / 1314-13-2							
10	naphthalene		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-052-00-2 / 202-049-5 / 91-20-3							
11	acenaphthylene		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	205-917-1 / 208-96-8							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
12	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
13	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
14	●	phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-581-5	85-01-8									
15	●	anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			204-371-1	120-12-7									
16	●	fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-912-4	206-44-0									
17	●	pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			204-927-3	129-00-0									
18		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
21	●	indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
23	●	benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-883-8	191-24-2									
24	●	coronene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-881-7	191-07-1									
25		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
27	●	TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<LOD
				TPH									
28	●	polychlorobiphenyls; PCB				<35	mg/kg		<35	mg/kg	<0.0035 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
29		benzene				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
30		toluene				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
31	●	ethylbenzene				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
32		xylene				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
33		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
34	●	pH				8.7	pH		8.7	pH	8.7 pH		
				PH									
										Total:	0.0347 %		

Key

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

Classification of sample: BH3[3]

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

Sample details

Sample Name:
BH3[3]
Sample Depth:
2.20-4.00 m
Moisture content:
15.5%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 15.5% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number / EC Number / CAS Number							
1	arsenic { arsenic pentoxide }		14.1 mg/kg	1.534	18.725 mg/kg	0.00187 %	✓	
	033-004-00-6 / 215-116-9 / 1303-28-2							
2	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	1	0.2 mg/kg		0.173 mg/kg	0.0000173 %	✓	
	048-001-00-5							
3	chromium in chromium(III) compounds { chromium(III) oxide }		48.6 mg/kg	1.462	61.499 mg/kg	0.00615 %	✓	
	215-160-9 / 1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }		14 mg/kg	1.126	13.647 mg/kg	0.00136 %	✓	
	029-002-00-X / 215-270-7 / 1317-39-1							
5	lead { lead compounds with the exception of those specified elsewhere in this Annex }	1	10 mg/kg		8.658 mg/kg	0.000866 %	✓	
	082-001-00-6							
6	mercury { mercury }		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	080-001-00-0 / 231-106-7 / 7439-97-6							
7	nickel { nickel }	7	28.3 mg/kg		24.502 mg/kg	0.00245 %	✓	
	028-002-00-7 / 231-111-4 / 7440-02-0							
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	034-002-00-8							
9	zinc { zinc oxide }		78 mg/kg	1.245	84.059 mg/kg	0.00841 %	✓	
	030-013-00-7 / 215-222-5 / 1314-13-2							
10	naphthalene		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-052-00-2 / 202-049-5 / 91-20-3							
11	acenaphthylene		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	205-917-1 / 208-96-8							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
12	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
13	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
14	●	phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-581-5	85-01-8									
15	●	anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			204-371-1	120-12-7									
16	●	fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-912-4	206-44-0									
17	●	pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			204-927-3	129-00-0									
18		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
21	●	indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
23	●	benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-883-8	191-24-2									
24	●	coronene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-881-7	191-07-1									
25		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
27	●	TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<LOD
				TPH									
28	●	polychlorobiphenyls; PCB				<35	mg/kg		<35	mg/kg	<0.0035 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
29		benzene				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
30		toluene				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
31	●	ethylbenzene				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
32		xylene				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
33		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
34	●	pH				8.54	pH		8.54	pH	8.54 pH		
				PH									
										Total:	0.0308 %		

Key

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

Appendix A: Classifier defined and non CLP determinands

cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex

CLP index number: 048-001-00-5
Description/Comments: Worst Case: IARC considers cadmium compounds Group 1; Carcinogenic to humans
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Risk Phrases: None.
Additional Hazard Statement(s): Carc. 1A H350
Reason for additional Hazards Statement(s)/Risk Phrase(s):
29/09/2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

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

Conversion factor: 1.462
Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17/07/2015
Risk Phrases: R61 , R60 , R50/53 , R43 , R42 , R38 , R37 , R36 , R22 , R20
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Repr. 1B H360FD , Skin Sens. 1 H317 , Resp. Sens. 1 H334 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302 , Acute Tox. 4 H332

dicopper oxide; copper (I) oxide (EC Number: 215-270-7, CAS Number: 1317-39-1)

CLP index number: 029-002-00-X
Description/Comments: M-factor for long-term aquatic hazard not included as per paragraph (5), ATP9
Data source: Regulation (EU) 2016/1179 of 19 July 2016 (ATP9)
Additional Risk Phrases: N R50/53 >= 0.25 %, N R50/53
Additional Hazard Statement(s): None.
Reason for additional Hazards Statement(s)/Risk Phrase(s):
10/10/2016 - N R50/53 >= 0.25 % risk phrase sourced from: WM3 v1 still uses ecotoxic risk phrases
10/10/2016 - N R50/53 risk phrase sourced from: WM3 v1 still uses ecotoxic risk phrases

lead compounds with the exception of those specified elsewhere in this Annex

CLP index number: 082-001-00-6
Description/Comments: Least-worst case: Lead REACH Consortium considers some lead compounds Carcinogenic category 2B
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Risk Phrases: None.
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s)/Risk Phrase(s):
03/06/2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html. Review date 29/09/2015

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17/07/2015
Risk Phrases: R38 , R37 , R36 , R27 , R26 , R22
Hazard Statements: Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 1 H310 , Acute Tox. 1 H330 , Acute Tox. 4 H302

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17/07/2015
Risk Phrases: N R51/53 , N R50/53 , R38 , R37 , R36
Hazard Statements: Aquatic Chronic 2 H411 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06/08/2015
Risk Phrases: N R50/53
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06/08/2015
Risk Phrases: N R50/53 , R43 , R40 , R38 , R37 , R36 , R22
Hazard Statements: Skin Irrit. 2 H315 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Carc. 2 H351 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17/07/2015
Risk Phrases: N R50/53 , R43 , R38 , R37 , R36
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21/08/2015
Risk Phrases: N R50/53 , Xn R22
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Acute Tox. 4 H302

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

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21/08/2015
Risk Phrases: N R50/53 , Xi R36/37/38
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Irrit. 2 H315

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06/08/2015
Risk Phrases: R40
Hazard Statements: Carc. 2 H351

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

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23/07/2015
Risk Phrases: N R50/53
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25/05/2015
Risk Phrases: None.
Hazard Statements: None.

coronene (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en
Data source date: 16/06/2014
Risk Phrases: R68/20
Hazard Statements: STOT SE 2 H371

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

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25/05/2015
Risk Phrases: R65 , R63 , R51/53 , R46 , R45 , R10
Hazard Statements: Aquatic Chronic 2 H411 , Repr. 2 H361d , Carc. 1B H350 , Muta. 1B H340 , STOT RE 2 H373 , Asp. Tox. 1 H304 , Flam. Liq. 3 H226

polychlorobiphenyls; PCB (EC Number: 215-648-1, CAS Number: 1336-36-3)

CLP index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Risk Phrases: None.
Additional Hazard Statement(s): Carc. 1A H350
Reason for additional Hazards Statement(s)/Risk Phrase(s):
29/09/2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

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

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

Appendix B: Rationale for selection of metal species

arsenic {arsenic pentoxide}

Worst Case

cadmium {cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex}

Using elemental Cadmium with no CrVI

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

Worst case species

copper {dicopper oxide; copper (I) oxide}

Worst case species

lead {lead compounds with the exception of those specified elsewhere in this Annex}

Worst case species

mercury {mercury}

Worst case species

nickel {nickel}

Worst case species

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

Worst case species

zinc {zinc oxide}

Elemental Zinc with no CrVI

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case species

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition, May 2015
HazWasteOnline Classification Engine Version: 2018.30.3501.7153 (30 Jan 2018)
HazWasteOnline Database: 2018.30.3501.7153 (30 Jan 2018)

This classification utilises the following guidance and legislation:
WM3 - Waste Classification - May 2015
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010
2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

APPENDIX I

Laboratory Results - Geotechnical

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 31/01/2018

0998

Contract	**UK18.2974 - Greenfield Avenue, Ickleford**
Serial No.	**S32448**

Client:

Environmental Protection Strategies Ltd
Unit 7
Caxton House
Broad Street
Great Cambourne
Cambridge
CB23 6JN

Soil Property Testing Ltd

15, 16, 18 Halcyon Court, St Margaret's Way, Stukeley Meadows, Huntingdon, Cambridgeshire, PE29 6DG

Tel: 01480 455579
Email: enquiries@soilpropertytesting.com
Website: www.soilpropertytesting.com

Samples Submitted By:

Environmental Protection Strategies Ltd

Samples Labelled:

UK18.2974 - Greenfield Avenue, Ickleford

Approved Signatories:

- ☑ **J.C. Garner B.Eng (Hons) FGS** Technical Director
- ☐ **S.P. Townend FGS** Quality Manager
- ☐ **W. Johnstone** Materials Lab Manager
- ☐ **D. Sabnis** Operations Manager

Date Received: 17/01/2018

Samples Tested Between: 17/01/2018 **and** 31/01/2018

Remarks:

For the attention of Mr S Cahill
Your Reference No: UK18.2974
Your Order No: 18830

Notes:

1 All remaining samples or remnants from this contract will be disposed of after 21 days from today, unless we are notified to the contrary.

2 (a) UKAS - United Kingdom Accreditation Service
(b) Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

3 Tests marked "NOT UKAS ACCREDITED" in this test report are not included in the UKAS Accreditation Schedule for this testing laboratory.

4 This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 31/01/2018

0998

Contract	**UK18.2974 - Greenfield Avenue, Ickleford**		
Serial No.	**S32448**	**Target Date**	31/01/2018
Scheduled By	Environmental Protection Strategies Ltd		

SCHEDULE OF LABORATORY TESTS

Schedule Remarks

Bore Hole No.	Type	Sample Ref.	Top Depth	Water Content BSEN	Liquid/Plastic Limits	Wet Sieve Preparation	CBR 2.5kg Recompaction	CBR Test	PSD by Wet Sieve													Sample Remarks
BH1	B	1	0.30	1	1	1	1	1														
BH1	D	1	1.80						1													
BH2	B	2	0.30	1	1	1	1	1														
BH2	D	2	1.30						1													
BH3	D	3	0.60	1	1	1																
BH3	D	4	2.30	1	1	1																
BH4	D	6	1.00						1													
BH4	D	7	3.80	1	1	1																
Totals				**5**	**5**	**5**	**2**	**2**	**3**													**End of Schedule**

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 31/01/2018

0998

Contract	**UK18.2974 - Greenfield Avenue, Ickleford**
Serial No.	**S32448**

SUMMARY OF WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole /Pit No.	Depth (m)	Type	Ref.	Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasti-city Index (%)	Liquid-ity Index (%)	SAMPLE PREPARATION				Description	CLASS
									Method	Ret'd 0.425mm (%)	Corr'd W/C <0.425mm	Curing Time (hrs)		
BH1	0.30 - 1.30	B	1	**11.7**	31	16	15	-0.29	Wet Sieved	44 (M)	20.9*	25	Yellowish brown slightly gravelly sandy silty CLAY with rare dark grey pockets. Gravel is brown, black and white fine to coarse angular to subrounded flint	CL
BH2	0.30 - 1.30	B	2	**10.4**	28	19	9	-0.96	Wet Sieved	63 (M)	28.0*	24	Brown, black and white fine to coarse angular to subrounded flint GRAVEL in a yellowish brown sandy silty clay matrix with rare concrete fragments	CL
BH3	0.60 - 0.80	D	3	**13.3**	37	18	19	-0.25	Wet Sieved	52 (M)	27.8*	26	Brown, black and white fine to coarse angular to subangular flint GRAVEL in a soft yellowish brown slightly sandy silty matrix	CI
BH3	2.30 - 2.50	D	4	**16.6**	39	14	25	0.10	Wet Sieved	16 (M)	19.8*	24	Firm yellowish brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to coarse angular to subrounded chalk and flint.	CI
BH4	3.80 - 4.00	D	7	**17.7**	39	16	23	0.07	Wet Sieved	15 (M)	20.8*	24	Stiff light olive brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to medium angular to subrounded chalk and rare flint.	CI

Method Of Preparation: BS EN ISO: 17892-1: 2014 & BS 1377: Part 2:1990:4.2
Method of Test: BS EN ISO: 17892-1: 2014 & BS1377:Part 2:1990:3.2, 4.4
Type of Sample Key: U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter
Comments: *Corrected water content assume material greater than 0.425mm is non-porous. See BS1377: Part 2: 1990: Clause 3 Note 1

Remarks to Include: Sample disturbance, loss of water, variation from test procedure, location and origin of test specimen within original sample, oven drying temperature if not 105-110C

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 31/01/2018

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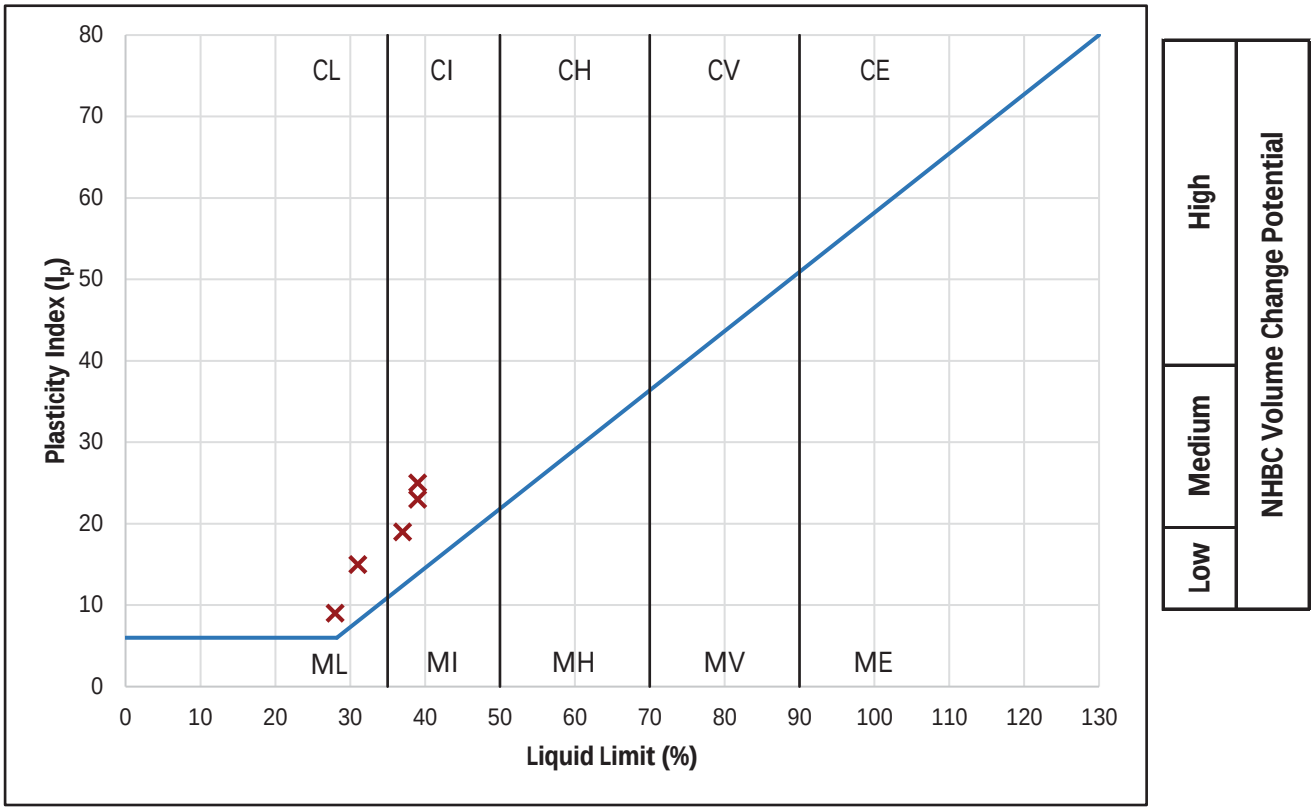
Contract	**UK18.2974 - Greenfield Avenue, Ickleford**
Serial No.	**S32448**

PLOT OF PLASTICITY INDEX AGAINST LIQUID LIMIT USING CASAGRANDE CLASSIFICATION CHART

Plasticity				
Low	Medium	High	Very High	Extremely High



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS1377: Part 2: 3.2, 4.4, 5.3, 5.4
Type of Sample Key:	U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter
Comments:	Volume Change Potential: NHBC Standards Chapter 4.2 Unmodified Plasticity Index

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 31/01/2018

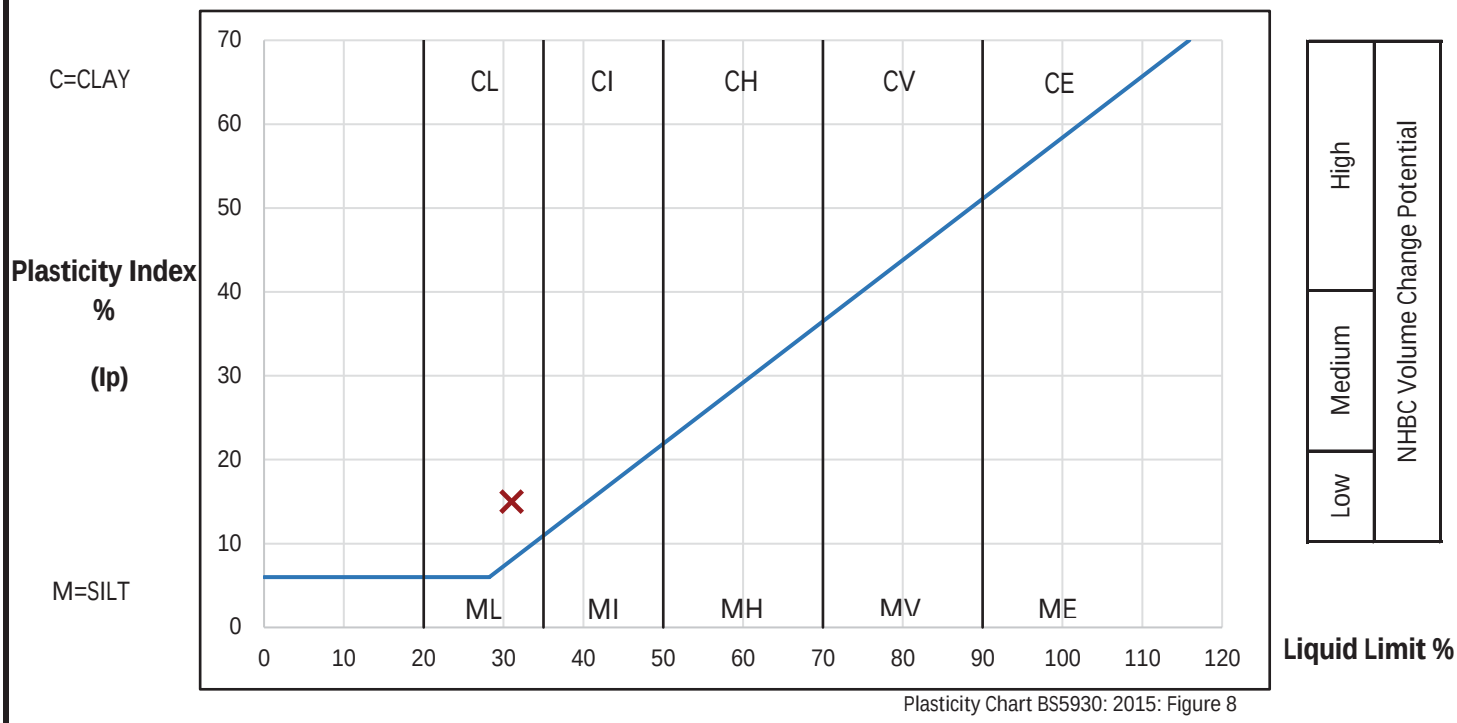
0998

Contract	**UK18.2974 - Greenfield Avenue, Ickleford**
Serial No.	**S32448**

DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
BH1	0.30 - 1.30	B	1	11.7	Yellowish brown slightly gravelly sandy silty CLAY with rare dark grey pockets. Gravel is brown, black and white fine to coarse angular to subrounded flint	

PREPARATION				Liquid Limit	31 %
Method of preparation	Wet sieved over 0.425mm sieve			Plastic Limit	16 %
Sample retained 0.425mm sieve	(Measured)	44 %		Plasticity Index	15 %
Corrected water content for material passing 0.425mm		20.9 %		Liquidity Index	-0.29
Sample retained 2mm sieve	(Measured)	23 %		NHBC Modified (I'p)	8 %
Curing time	25 hrs	Clay Content	Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1337: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS1377: PART 2: 1990: 3.2, 4.4, 5.3, 5.4
Type of Sample Key:	U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:	Corrected water content assume material greater than 0.425mm non-porous. See BS1377: Part2: 1990 Clause 3 Note 1 Volume Change Potential: NHBC Standards Chapter 4.2 Unmodified Plasticity Index Note: Modified Plasticity Index I'p = Ip x (% less than 425microns/100)

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 31/01/2018

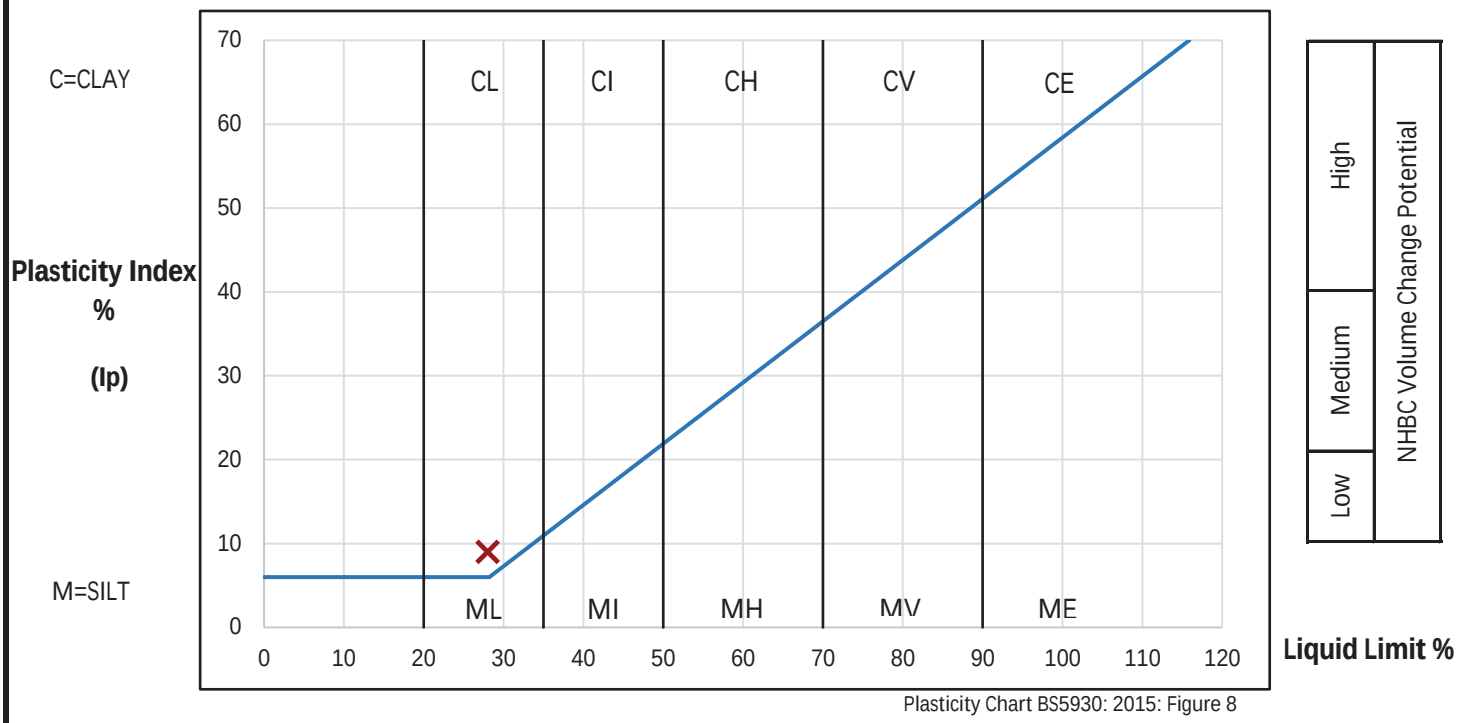
0998

Contract	**UK18.2974 - Greenfield Avenue, Ickleford**
Serial No.	**S32448**

DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
BH2	0.30 - 1.30	B	2	10.4	Brown, black and white fine to coarse angular to subrounded flint GRAVEL in a yellowish brown sandy silty clay matrix with rare concrete fragments	

PREPARATION				Liquid Limit	28 %
Method of preparation	Wet sieved over 0.425mm sieve			Plastic Limit	19 %
Sample retained 0.425mm sieve	(Measured)	63 %		Plasticity Index	9 %
Corrected water content for material passing 0.425mm		28.0 %		Liquidity Index	-0.96
Sample retained 2mm sieve	(Measured)	40 %		NHBC Modified (I'p)	3 %
Curing time	24 hrs	Clay Content	Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1337: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS1377: PART 2: 1990: 3.2, 4.4, 5.3, 5.4
Type of Sample Key:	U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:	Corrected water content assume material greater than 0.425mm non-porous. See BS1377: Part2: 1990 Clause 3 Note 1 Volume Change Potential: NHBC Standards Chapter 4.2 Unmodified Plasticity Index Note: Modified Plasticity Index I'p = Ip x (% less than 425microns/100)

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 31/01/2018

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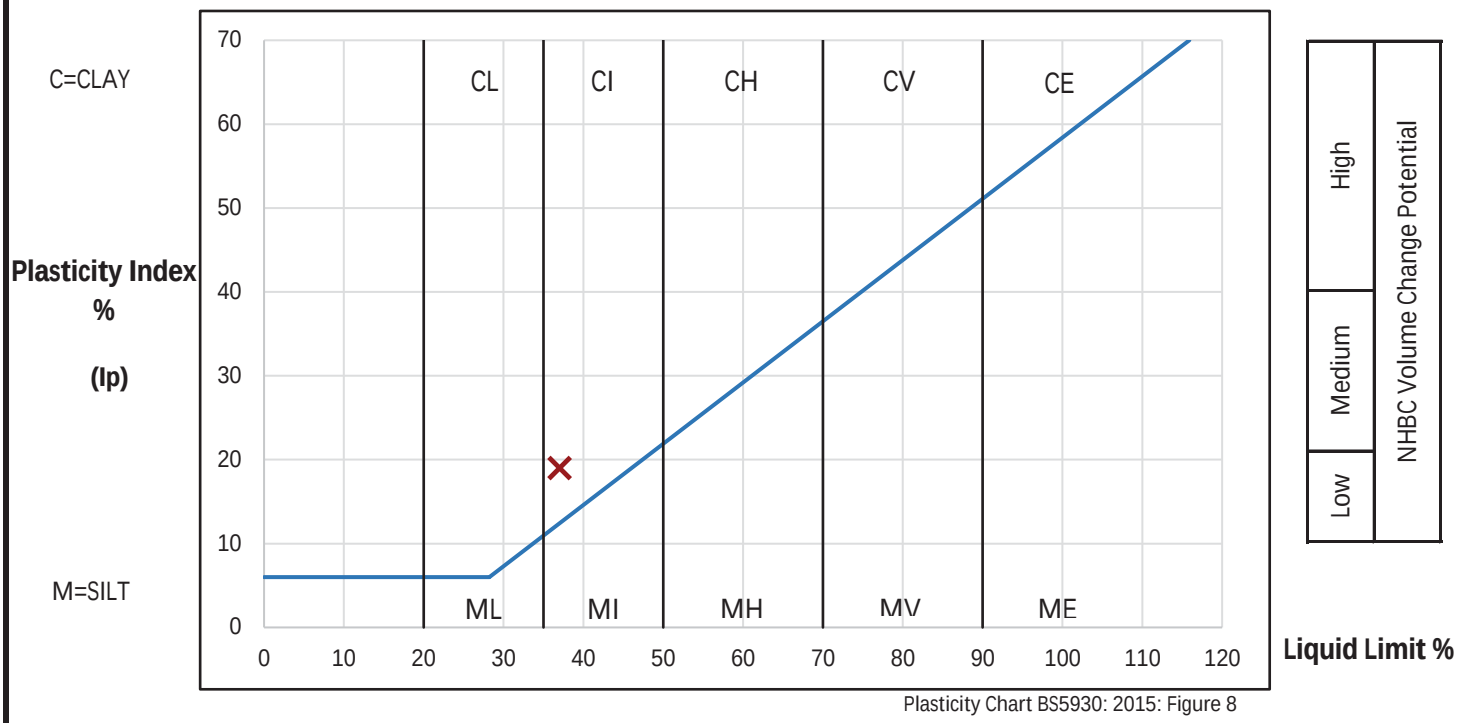
Contract	**UK18.2974 - Greenfield Avenue, Ickleford**
Serial No.	**S32448**

DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
BH3	0.60 - 0.80	D	3	13.3	Brown, black and white fine to coarse angular to subangular flint GRAVEL in a soft yellowish brown slightly sandy silty matrix	

PREPARATION				Liquid Limit	37 %
Method of preparation	Wet sieved over 0.425mm sieve			Plastic Limit	18 %
Sample retained 0.425mm sieve	(Measured)	52 %		Plasticity Index	19 %
Corrected water content for material passing 0.425mm		27.8 %		Liquidity Index	-0.25
Sample retained 2mm sieve	(Measured)	50 %		NHBC Modified (I'p)	9 %
Curing time	26 hrs	Clay Content	Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1337: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS1377: PART 2: 1990: 3.2, 4.4, 5.3, 5.4
Type of Sample Key:	U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:	Corrected water content assume material greater than 0.425mm non-porous. See BS1377: Part2: 1990 Clause 3 Note 1 Volume Change Potential: NHBC Standards Chapter 4.2 Unmodified Plasticity Index Note: Modified Plasticity Index I'p = Ip x (% less than 425microns/100)

TEST REPORT

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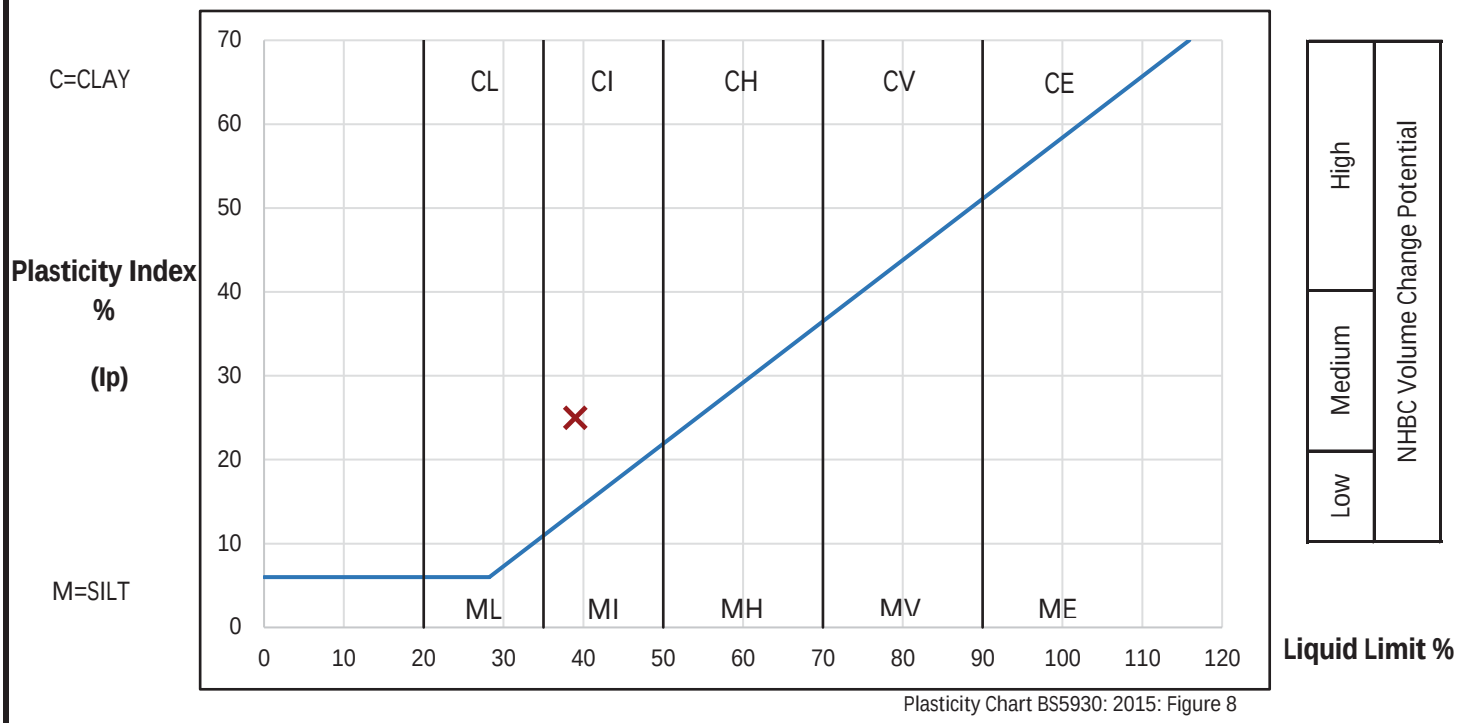
Contract	**UK18.2974 - Greenfield Avenue, Ickleford**
Serial No.	**S32448**

DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
BH3	2.30 - 2.50	D	4	16.6	Firm yellowish brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to coarse angular to subrounded chalk and flint.	1 x flint cobble not included in test being unrepresentative.

PREPARATION				Liquid Limit	39 %
Method of preparation	Wet sieved over 0.425mm sieve			Plastic Limit	14 %
Sample retained 0.425mm sieve	(Measured)	16 %		Plasticity Index	25 %
Corrected water content for material passing 0.425mm		19.8 %		Liquidity Index	0.10
Sample retained 2mm sieve	(Measured)	11 %		NHBC Modified (I'p)	21 %
Curing time	24 hrs	Clay Content	Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1337: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS1377: PART 2: 1990: 3.2, 4.4, 5.3, 5.4
Type of Sample Key:	U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:	Corrected water content assume material greater than 0.425mm non-porous. See BS1377: Part2: 1990 Clause 3 Note 1 Volume Change Potential: NHBC Standards Chapter 4.2 Unmodified Plasticity Index Note: Modified Plasticity Index I'p = Ip x (% less than 425microns/100)

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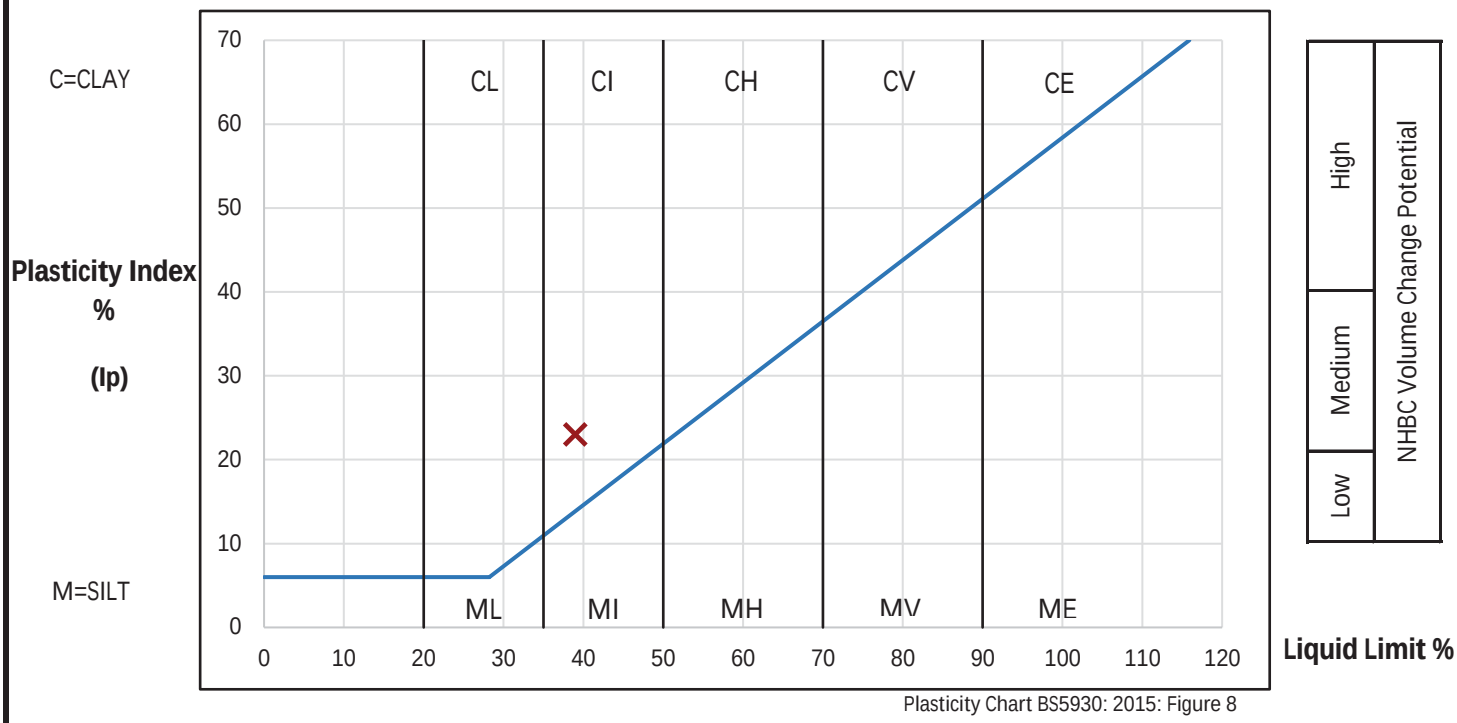
DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
BH4	3.80 - 4.00	D	7	17.7	Stiff light olive brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to medium angular to subrounded chalk and rare flint.	

PREPARATION				Liquid Limit	39 %
Method of preparation	Wet sieved over 0.425mm sieve			Plastic Limit	16 %
Sample retained 0.425mm sieve	(Measured)	15 %		Plasticity Index	23 %
Corrected water content for material passing 0.425mm		20.8 %		Liquidity Index	0.07
Sample retained 2mm sieve	(Measured)	10 %		NHBC Modified (I'p)	20 %
Curing time	24 hrs	Clay Content	Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1337: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS1377: PART 2: 1990: 3.2, 4.4, 5.3, 5.4
Type of Sample Key:	U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:	Corrected water content assume material greater than 0.425mm non-porous. See BS1377: Part2: 1990 Clause 3 Note 1 Volume Change Potential: NHBC Standards Chapter 4.2 Unmodified Plasticity Index Note: Modified Plasticity Index I'p = Ip x (% less than 425microns/100)

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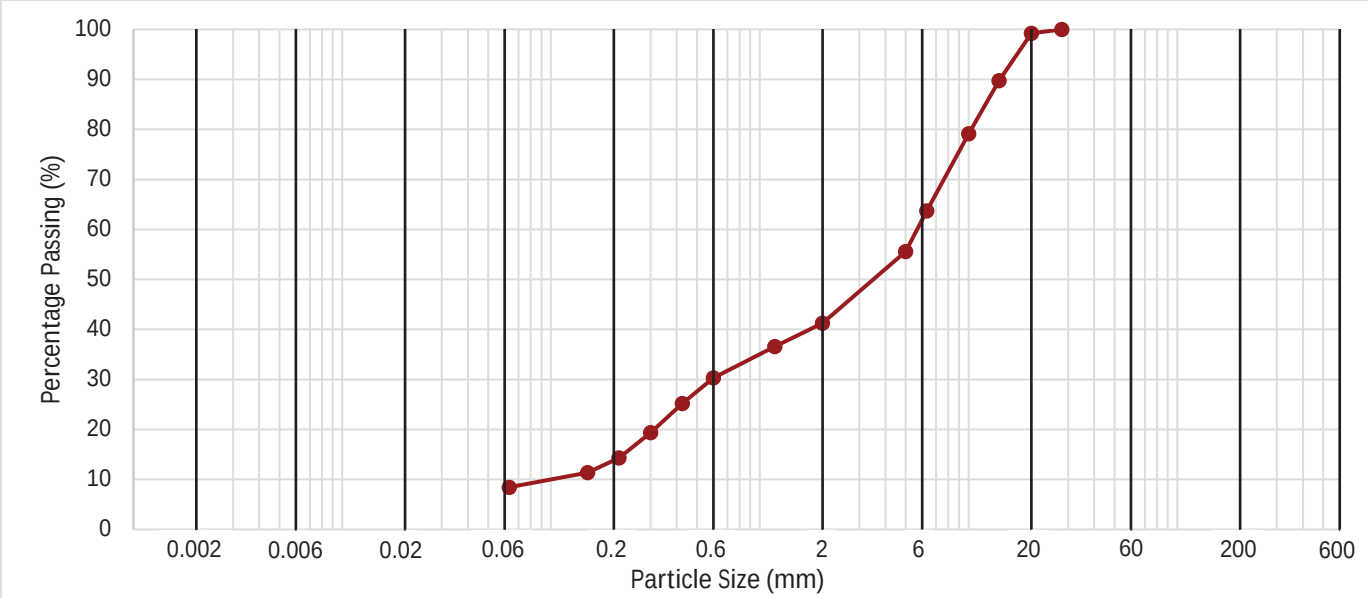
DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Pit No.	Depth (m)	Sample Type	Sample Reference	Description	Remarks
BH1	1.80 - 2.00	D	1	Brown, black and white very sandy silty angular to subrounded flint GRAVEL with occasional white subangular chalk gravel. Sand is yellowish brown.	

Method of Test:	Wet Sieve	Method of Pretreatment:	Not Required



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Hydrometer	Particle Size (mm)	Passing (%)	Silt by Dry Mass (%)
			Clay by Dry Mass (%)

Sieve Size (mm)	Passing (%)	Sand By Dry Mass (%)
2.00	41	33
1.18	37	
0.600	30	
0.425	25	
0.300	19	
0.212	14	
0.150	11	
0.063	8	

Fines By Dry Mass (%)	
<0.063mm	8

Sieve Size (mm)	Passing (%)	Gravel By Dry Mass (%)
150		59
125		
90		
63		
50		
37.5		
28	100	
20	99	
14	90	
10	79	
6.3	64	
5	56	

Method of Preparation: BS1377: Part 1: 2016: 8.3 & 8.4.5
Method of test: BS1377: Part2: 1990: 9.2,
Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:

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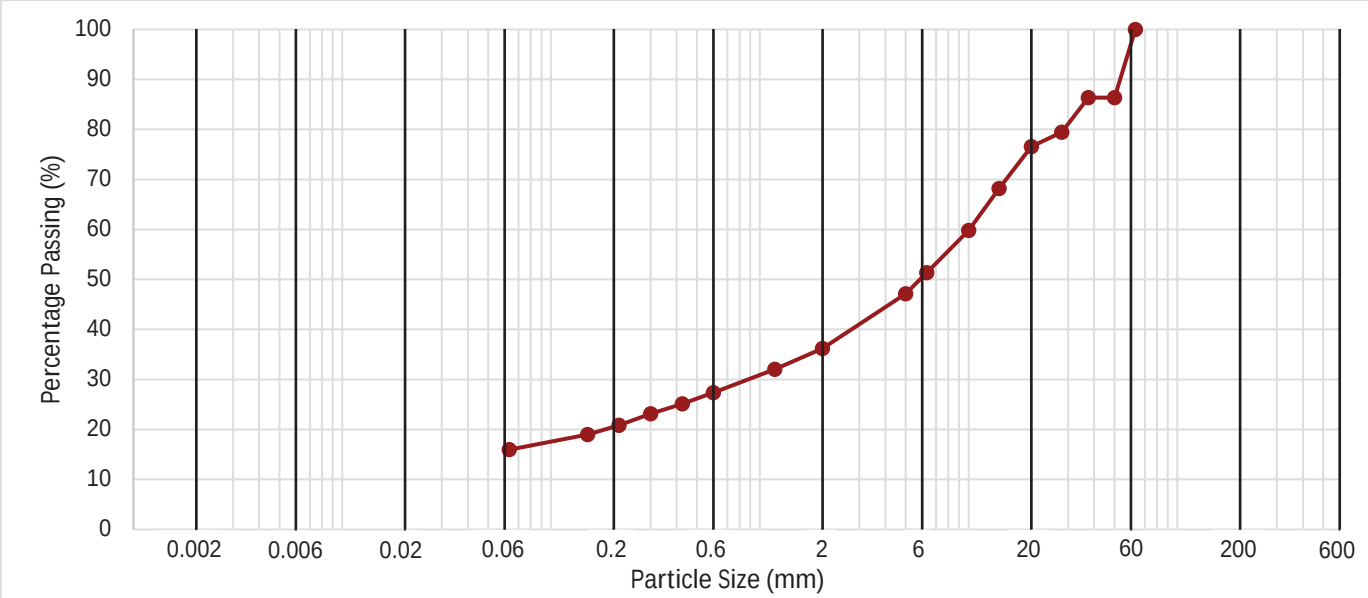
DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Pit No.	Depth (m)	Sample Type	Sample Reference	Description	Remarks
BH2	1.30 - 1.50	D	2	Brown,white and black very sandy silty clayey angular to subrounded flint GRAVEL with occasional white subangular chalk gravel. Sand is yellowish brown.	

Method of Test:	Wet Sieve	Method of Pretreatment:	Not Required



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Hydrometer	Particle Size (mm)	Passing (%)	Silt by Dry Mass (%)
			Clay by Dry Mass (%)

Sieve Size (mm)	Passing (%)	Sand By Dry Mass (%)
2.00	36	20
1.18	32	
0.600	27	
0.425	25	
0.300	23	
0.212	21	
0.150	19	
0.063	16	

Fines By Dry Mass (%)	
<0.063mm	16

Sieve Size (mm)	Passing (%)	Gravel By Dry Mass (%)
150		64
125		
90		
63	100	
50	86	
37.5	86	
28	79	
20	77	
14	68	
10	60	
6.3	51	
5	47	

Method of Preparation: BS1377: Part 1: 2016: 8.3 & 8.4.5
Method of test: BS1377: Part2: 1990: 9.2,
Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:

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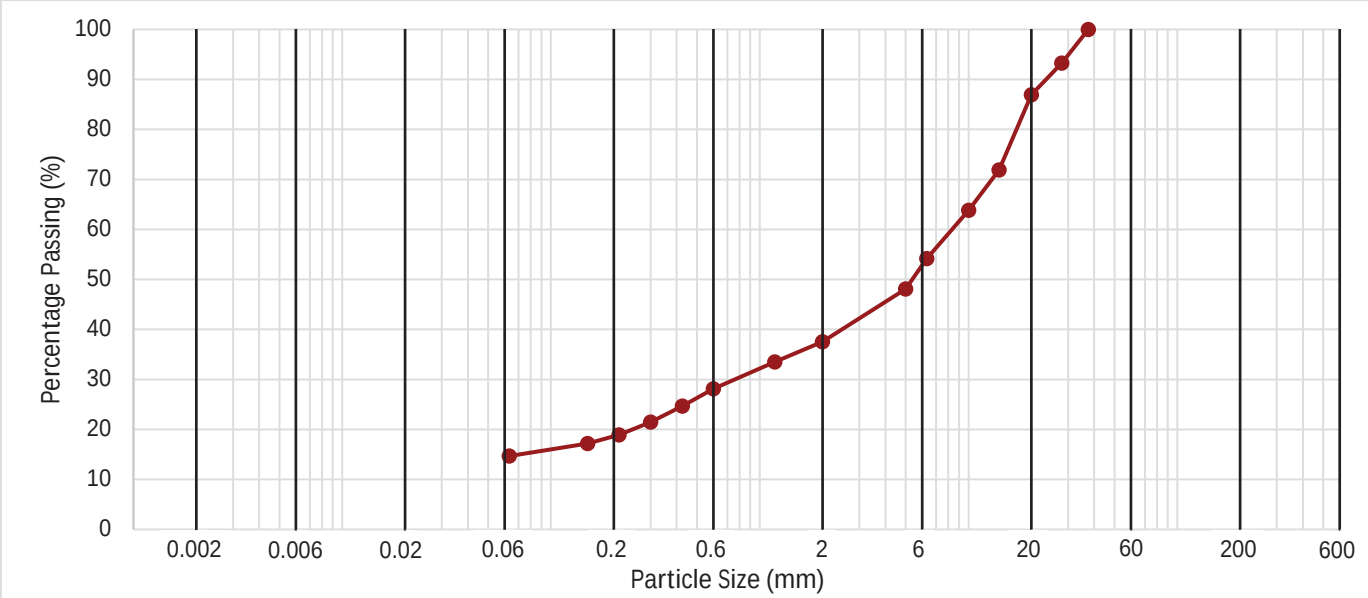
DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Pit No.	Depth (m)	Sample Type	Sample Reference	Description	Remarks
BH4	1.00 - 1.20	D	6	Brown, white and black very sandy silty clayey angular to subrounded flint GRAVEL with occasional white subangular chalk gravel. Sand is yellowish brown.	

Method of Test:	Wet Sieve	Method of Pretreatment:	Not Required



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Hydrometer	Particle Size (mm)	Passing (%)	Silt by Dry Mass (%)	Clay by Dry Mass (%)

Sieve Size (mm)	Passing (%)	Sand By Dry Mass (%)
2.00	38	23
1.18	34	
0.600	28	
0.425	25	
0.300	21	
0.212	19	
0.150	17	
0.063	15	

Fines By Dry Mass (%)	
<0.063mm	15

Sieve Size (mm)	Passing (%)	Gravel By Dry Mass (%)
150		62
125		
90		
63		
50		
37.5	100	
28	93	
20	87	
14	72	
10	64	
6.3	54	
5	48	

Method of Preparation: BS1377: Part 1: 2016: 8.3 & 8.4.5
Method of test: BS1377: Part2: 1990: 9.2,
Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:

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Contract	**UK18.2974 - Greenfield Avenue, Ickleford**
Serial No.	**S32448**

LABORATORY CALIFORNIA BEARING RATIO TESTS ADJUSTED FOR SEASONAL WATER CONTENT CHANGES

Due to seasonal variations of water content in near surface soils, many clients require CBR test samples to be subjected to sample preparation in the laboratory before testing. With Clay soils, liquid and plastic limits and water contents are carried out to classify them on material passing 20mm. The plastic limit is then compared against the water content with due regard to the proportion of material then retained on a 0.425mm sieve. If the moisture content is already 2% or more above the plastic limit, compaction may take place immediately. If this is not the case a calculated amount of water is added to the sample and cured for 24 hours before compaction. The samples are then cured for a further 24 hours before CBR tests are carried out at both the top and bottom of the sample.

Calculation of Adjusted Water Content for CBR testing

When a significant proportion of a basically clay, material is >0.425mm, the adjusted water content (WC) for test shall be derived as follows:

Obtain test specimens for CBR, Limits and Water Content from Material Passing 20mm. (If the sample is large enough a water content may also be carried out on a representative portion of the whole sample including material greater than 20mm, and reported for information)

The Plastic Limit (PL) for the fine fraction is obtained by testing material passing the 0.425mm sieve. A notional 5% Water Content is to be allowed for material passing 20mm, and retained on the 0.425mm sieve. The proportion passing the 0.425mm is obtained by the wet sieve preparation method.

If X% passes 0.425mm, (100-X) % is retained on 0.425mm and with the 5% WC required to be incorporated for the retained

$$\frac{X(PL+2) + (100-X)5}{100} \%$$ for the sample passing 20mm

BH/ TP No.	Depth (m)	Type	Reference	WC as received*	Plastic Limit	% Passing 0.425mm	% Retained 20mm and excluded	WC required for CBR	WC after CBR Test	Remarks
BH1	0.30 - 1.30	B	1	11.7	16	56	15		12.3	I'p = 8. No adjustment req.
BH2	0.30 - 1.30	B	2	10.4	19	37	-		9.9	I'p = 3. No adjustment req.

* Water content excluding material +20mm

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Serial No.	**S32448**

CALIFORNIA RATIO BEARING TEST

Borehole /Pit No.	Depth (m)	Sample Type	Sample Reference	Description	Remarks
BH1	0.30 - 1.30	B	1	Yellowish brown slightly gravelly sandy silty CLAY with rare dark grey pockets. Gravel is brown, black and white fine to coarse angular to subrounded flint	

Specimen Preparation

Condition	Remoulded
Details	Recompacted with specified standard effort using 2.5kg rammer

Material Retained on 20mm Sieve Removed		15	%
Intitial Specimen Details:	Bulk Density	2.17	Mg/m³
	Dry Density	1.93	Mg/m³

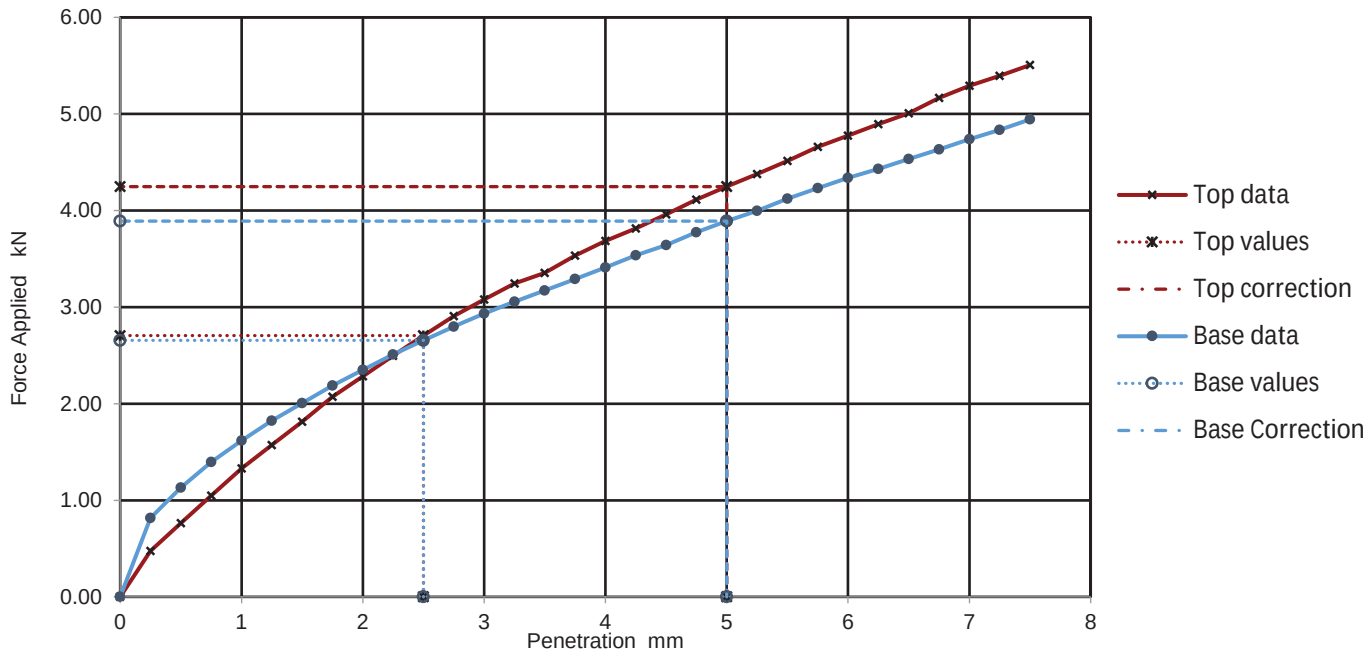
Soaking Details	Not Soaked	
Period of Soaking		days
Time to Surface		days
Amount of Swell Recorded		mm
Initial Water Content		%

Surcharge Applied	15	kg

Test Results

	Curve Correction	CBR Values (%) 2.5mm	5.0mm	Highest	Average*	Water Content (%)
TOP	No	20	21	21	21	11.7
BASE	No	20	19	20		12.8

Force v Penetration Plots



Method of Preparation: BS1377: Part1: 2016 & BS1377: Part 4: 1990: 7.2.4.4

Method of Test: BS1377: Part 4: 1990: 7

Type of Sample Key: U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT= Split Spoon Sample, C = Core Cutter

Comments: *Only reported if the results from each end of the sample are within ±10% of the mean value.

Remarks to Include: Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample, oven drying temperature if not 105-110°C.

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CALIFORNIA RATIO BEARING TEST

Borehole /Pit No.	Depth (m)	Sample Type	Sample Reference	Description	Remarks
BH2	0.30 - 1.30	B	2	Brown, black and white fine to coarse angular to subrounded flint GRAVEL in a yellowish brown sandy silty clay matrix with rare concrete fragments	

Specimen Preparation

Condition	Remoulded
Details	Recompacted with specified standard effort using 2.5kg rammer

Material Retained on 20mm Sieve Removed		-	%
Intitial Specimen Details:	Bulk Density	2.21	Mg/m³
	Dry Density	2.01	Mg/m³

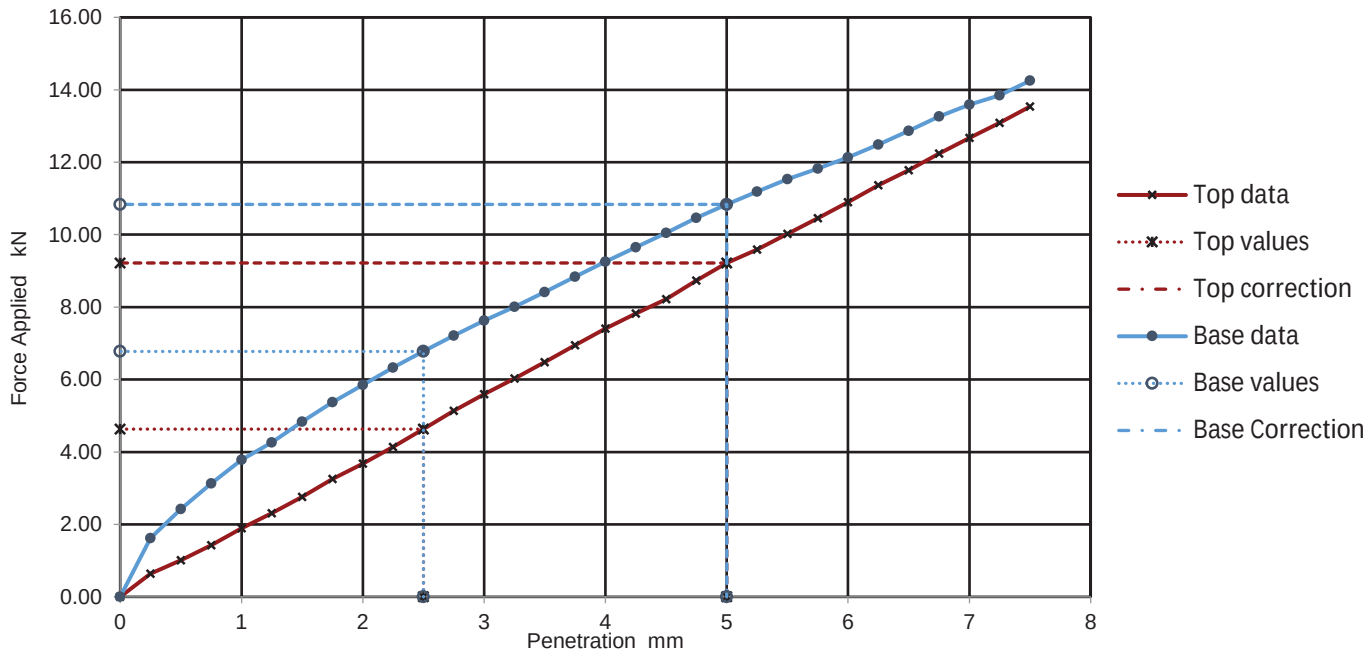
Soaking Details	Not Soaked	
Period of Soaking		days
Time to Surface		days
Amount of Swell Recorded		mm
Initial Water Content		%

Surcharge Applied		kg

Test Results

	Curve Correction	CBR Values (%) 2.5mm	5.0mm	Highest	Average*	Water Content (%)
TOP		35	46	46	50	9.8
BASE		51	54	54		10.0

Force v Penetration Plots



Method of Preparation: BS1377: Part1: 2016 & BS1377: Part 4: 1990: 7.2.4.4

Method of Test: BS1377: Part 4: 1990: 7

Type of Sample Key: U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT= Split Spoon Sample, C = Core Cutter

Comments: *Only reported if the results from each end of the sample are within ±10% of the mean value.

Remarks to Include: Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample, oven drying temperature if not 105-110°C.

APPENDIX J

Summary of Screening Criteria

EPS Generic Quantitative Risk Assessment

Minimal Risk Generic Screening Criteria - Residential Land Use

Contaminant	Soil Targets			Groundwater Targets	
	Human Health	Controlled Waters		Controlled Waters	
		LGwRP	HGwRP	LGwRP	HGwRP
Unit	**mg/kg**			**ug/l**	
Arsenic	37	n/c	n/c	50	10
Cadmium	11	n/c	n/c	5	5
Chromium III	910	n/c	n/c	250	50
Chromium VI	6	n/c	n/c	n/c	n/c
Copper	2400	n/c	n/c	28	28
Mercury (elemental)	1.2	n/c	n/c	1	1
Nickel	180	n/c	n/c	200	50
Lead	NA	n/c	n/c	250	10
Selenium	250	n/c	n/c	10	10
Zinc	3700	n/c	n/c	500	500
Benzene	0.087	0.252	0.008	30	1
Toluene	130	1.17	1.17	50	50
Ethylbenzene	47	15.0	10.0	300	200
Xylene (para)	56	0.885	0.885	30	30
MTBE#	49	0.138	0.0276	75	15
Benzo(a)Pyrene	2.2	10	1.44	0.7	0.1
Naphthalene	2.3	0.934	0.02	10	0.1
Dibenz(ah)anthracene	0.24	n/c	n/c	n/c	n/c
Aliphatic C5-C6	42	5.27	1.05	50	10
Aliphatic C6-C8	100	23.2	4.64	50	10
Aliphatic C8-C10	27	175	35.1	50	10
Aliphatic C10-C12	130(48)*	1380	276	50	10
Aliphatic C12-C16	1100(8.48)**	27500	5490	50	10
Aliphatic C16-C35	65000 (8.48)**	3.46E+06	6.91E+05	50	10
Aromatic C8-C10	34	8.74	1.75	50	10
Aromatic C10-C12	74	13.8	2.76	50	10
Aromatic C12-C16	140	27.5	5.5	50	10
Aromatic C16-C21	260	86.9	17.4	50	10
Aromatic C21-C35	1100	690	138	50	10

Notes:

LGwRP - Low Groundwater Resource Potential HGwRP - High Groundwater Resource Potential

f = Oral, dermal and inhalation exposure compared with oral HCV N/C = Not Calculated

* = S4UL exceeds vapour saturation limit (in brackets) ** = S4UL exceeds solubility saturation limit (in brackets)

Soil Targets

Targets for Human Health have been taken from *S4ULs 'Suitable For Use Levels for Human Health Risk Assessment' – LQM and CIEH (2014)* derived using standard sandy loam soil with 1% SOM, except (#) = *EIC/AGS/CL:AIRE GAC 'Soil Generic Assessment Criteria' (2010)* . For sites where ground conditions differ significantly from sandy loam or site-specific SOM and pH are available, the generic human health targets may be revised.

Targets for Controlled waters have been derived using EA Remedial Targets Worksheet (v3.1) - using standard Sandy Loam ground conditions as described in Science Report SC050021/SR3, assuming no degradation for a 10m compliance distance with criteria of EQS or UKDWS for LGwRP and HGwRP respectively (see notes for GW targets).

Groundwater Targets

For LGwRP, targets have been taken as Freshwater EQS where available. For Ethylbenzene and BaP the WHO Health limit has been used and for MTBE and individual TPH fractions a 5 times multiplier of taste threshold and UKDWS has been taken repectively.

For HGwRP, targets have been taken as UKDWS where available, with the exception of Copper and Zinc where the EQS is lower than the DWS and therefore the EQS has been used as the groundwater target. For Ethlylbenzene the upper WHO ATO limit has been used. For Toluene and Xylene, the WHO ATO limit is higher than the EQS and so the lower value has been taken. For MTBE the taste threshold has been taken.

Work carried out to calculate generic screening criteria for concentrations of contaminant in groundwater with respect of risks to Human Health has generally found that criteria far exceed (by at least 2 orders of magnitude) those listed for the protection of either LGwRP and HGwRP receptors. On this basis, the above Groundwater criteria are also considered protective of human health and further evaluation of these risks should be considered alongside any detailed quantitative risk assessments carried out for groundwater on a site specific basis.

EPS Generic Quantitative Risk Assessment

Low Risk Generic Screening Criteria - All Land Uses

Contaminant	Soil Targets					
	Residential		Allotments	Commercial	Public Open Spaces	
	With Home Grown Produce	Without Home Grown Produce			Residential	Parks
Unit	mg/kg					
Arsenic	37	40	49	640	79	168
Benzene	0.87	3.3	0.18	98	140	230
Benzo(a)pyrene	5	5.3	5.7	76	10	21
Cadmium	26	149	4.9	410	220	880
Chromium (VI)	21	21	170	49	23	250
Lead	200	310	80	2330	630	1300

Notes:

Targets for Human Health have been taken from available Category 4 Screening Levels (C4SLs) for assessment of land affected by contamination issued by DEFRA in December 2013.

APPENDIX K

Method Statement for Encountering Unexpected Contamination

METHOD STATEMENT

ACTIONS TO BE TAKEN IN THE EVENT OF DISCOVERING UNEXPECTED CONTAMINATION DURING INTRUSIVE GROUNDWORKS

If at any point during intrusive groundworks at a site, evidence of unforeseen contamination is encountered in the form of significant noxious odours, discolouration, or instability within soils or sheen/ discolouration in groundwater, the following actions will be taken:

- Intrusive works in the immediate area of the impacted ground will be suspended and the continuation of work in other areas of the site will be considered within the context of the site specific health & safety plan.
- Environmental Protection Strategies Ltd (EPS) will be contacted and appraised of the situation so that arrangements can be made to characterise the impact and determine what action may be necessary in addition to the scheduled site works. Where possible / health & safety plan permits, digital photographs of the impacted ground will be taken and emailed to EPS at the address below to assist in the initial assessment.
- It may well be necessary for EPS to attend site to undertake visual inspection and obtain samples for field and/or laboratory analysis, although the actions taken will be dependent on the nature of what is encountered.
- In cases where EPS consider the unforeseen contamination likely to pose a significant risk of significant harm to adjacent site users or local environmental receptors, the local authority and the Environment Agency will be informed of the situation and the actions being taken.
- Once appropriate action has been agreed and undertaken, a written summary will be produced by EPS for submission to the Local Authority, (and where relevant, the Environment Agency) in accordance with planning requirements. The submission will include details of work undertaken, analytical results of investigative and validation samples obtained and conclusions and recommendations for any further actions considered necessary.
- Where regulatory bodies have been involved, site works should only recommence following their agreement and in all cases should only recommence when the site manager considers it safe to do so within the context of the site specific health & safety plan.

EPS Contact Details:

Giles Lock	Director	Tel: 0781 253 9656
Will Evans	Director	Tel: 0781 253 9655
Steve Bullock	Director	Tel: 0786 694 9221

Email: info@epstrategies.co.uk (Automatically forwarded to the above and office based personnel.)